University of Kentucky®

Procurement Services

Request for Proposal
UK-2564.0-6-24
Proposal Due Date – 02/29/2024

UK Construct Health Education Building
TC-001 Early Subcontractor Involvement Architectural Precast
UK Project #2564.0

An Equal Opportunity University

University of Kentucky
Procurement Services

REQUEST FOR PROPOSAL (RFP)

ATTENTION: This is not an order. Read all instructions, terms and conditions carefully.

PROPOSAL NO.:	**UK-2564.0-6-24**
Issue Date:	**2/15/2023**
Title:	**Health Education Building Architectural Precast**
Purchasing Officer:	**Corey W. Leslie**
Phone:	**859-323-5405** email **cckbidquestions@uky.edu** **(preferred)**

RETURN ORIGINAL COPY OF PROPOSAL TO:
UNIVERSITY OF KENTUCKY
PROCUREMENT SERVICES
411 S LIMESTONE
ROOM 322 PETERSON SERVICE BLDG.
LEXINGTON, KY 40506-0005

IMPORTANT: PROPOSALS MUST BE RECEIVED BY: 02/29/2024 3 P.M. LEXINGTON, KY TIME.

NOTICE OF REQUIREMENTS

1. The University's General Terms and Conditions and Instructions to Bidders, viewable at https://purchasing.uky.edu/bid-and-proposal-opportunities, apply to this RFP. When the RFP includes construction services, the University's General Conditions and Special Conditions for Construction and Instructions to Bidders, viewable at https://purchasing.uky.edu/bid-and-proposal-opportunities, apply to the RFP.
2. Contracts resulting from this RFP must be governed by and in accordance with the laws of the Commonwealth of Kentucky.
3. Any agreement or collusion among offerors or prospective offerors, which restrains, tends to restrain, or is reasonably calculated to restrain competition by agreement to bid at a fixed price or to refrain from offering, or otherwise, is prohibited.
4. Any person who violates any provisions of KRS 45A.325 shall be guilty of a felony and shall be punished by a fine of not less than five thousand dollars nor more than ten thousand dollars, or be imprisoned not less than one year nor more than five years, or both such fine and imprisonment. Any firm, corporation, or association who violates any of the provisions of KRS 45A.325 shall, upon conviction, be fined not less than ten thousand dollars or more than twenty thousand dollars.

AUTHENTICATION OF BID AND STATEMENT OF NON-COLLUSION AND NON-CONFLICT OF INTEREST

I hereby swear (or affirm) under the penalty for false swearing as provided by KRS 523.040:

1. That I am the offeror (if the offeror is an individual), a partner, (if the offeror is a partnership), or an officer or employee of the bidding corporation having authority to sign on its behalf (if the offeror is a corporation);
2. That the attached proposal has been arrived at by the offeror independently and has been submitted without collusion with, and without any agreement, understanding or planned common course of action with, any other Contractor of materials, supplies, equipment or services described in the RFP, designed to limit independent bidding or competition;
3. That the contents of the proposal have not been communicated by the offeror or its employees or agents to any person not an employee or agent of the offeror or its surety on any bond furnished with the proposal and will not be communicated to any such person prior to the official closing of the RFP:
4. That the offeror is legally entitled to enter into contracts with the University of Kentucky and is not in violation of any prohibited conflict of interest, including, but not limited to, those prohibited by the provisions of KRS 45A.330 to .340, and164.390;
5. That the offeror, and its affiliates, are duly registered with the Kentucky Department of Revenue to collect and remit the sale and use tax imposed by Chapter 139 to the extent required by Kentucky law and will remain registered for the duration of any contract award;
6. That I have fully informed myself regarding the accuracy of the statement made above.

SWORN STATEMENT OF COMPLIANCE WITH CAMPAIGN FINANCE LAWS

In accordance with KRS45A.110 (2), the undersigned hereby swears under penalty of perjury that he/she has not knowingly violated any provision of the campaign finance laws of the Commonwealth of Kentucky and that the award of a contract to a bidder will not violate any provision of the campaign finance laws of the Commonwealth of Kentucky.

CONTRACTOR REPORT OF PRIOR VIOLATIONS OF KRS CHAPTERS 136, 139, 141, 337, 338, 341 & 342

The contractor by signing and submitting a proposal agrees as required by 45A.485 to submit final determinations of any violations of the provisions of KRS Chapters 136, 139, 141, 337, 338, 341 and 342 that have occurred in the previous five (5) years prior to the award of a contract and agrees to remain in continuous compliance with the provisions of the statutes during the duration of any contract that may be established. Final determinations of violations of these statutes must be provided to the University by the successful contractor prior to the award of a contract.

CERTIFICATION OF NON-SEGREGATED FACILITIES

The contractor, by submitting a proposal, certifies that he/she is in compliance with the Code of Federal Regulations, No. 41 CFR 60-1.8(b) that prohibits the maintaining of segregated facilities.

SIGNATURE REQUIRED: This proposal cannot be considered valid unless signed and dated by an authorized agent of the offeror. Type or print the signatory's name, title, address, phone number and fax number in the spaces provided. Offers signed by an agent are to be accompanied by evidence of his/her authority unless such evidence has been previously furnished to the issuing office.

DELIVERY TIME:	**NAME OF COMPANY:**	**DUNS #**
PROPOSAL FIRM THROUGH:	**ADDRESS:**	**Phone/Fax:**
PAYMENT TERMS:	**CITY, STATE & ZIP CODE:**	**E-MAIL:**
SHIPPING TERMS: F. O. B. DESTINATION PREPAID AND ALLOWED	**TYPED OR PRINTED NAME:**	**WEB ADDRESS:**
FEDERAL EMPLOYER ID NO.:	**SIGNATURE:**	**DATE:**

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- Attachment “L” Tree Protection Standards
- HEB Site Logistics Plan
- Q&A Document from UK-2564.0-1-24

1.0 DEFINITIONS

The term "addenda" means written or graphic instructions issued by the University of Kentucky prior to the receipt of proposals that modify or interpret the RFP documents by additions, deletions, clarifications and/or corrections.

The term "competitive negotiations" means the method authorized in the Kentucky Revised Statutes, Chapter 45A.085.

The terms "offer" or “proposal” mean the offeror’s/offerors’ response to this RFP.

The term "offeror" means the entity or contractor group submitting the proposal.

The term "contractor" means the entity receiving a contract award.

The term "purchasing agency" means the University of Kentucky, Purchasing Division, Room 322 Peterson Service Building, Lexington, KY 40506-0005.

The term "purchasing official" means the University of Kentucky’s appointed contracting representative.

The term "responsible offeror" means a person, company or corporation that has the capability in all respects to perform fully the contract requirements and the integrity and reliability that will assure good faith performance. In determining whether an offeror is responsible, the University may evaluate various factors including (but not limited to): financial resources; experience; organization; technical qualifications; available resources; record of performance; integrity; judgment; ability to perform successfully under the terms and conditions of the contract; adversarial relationship between the offeror and the University that is so serious and compelling that it may negatively impact the work performed under this RFP; or any other cause determined to be so serious and compelling as to affect the responsibility of the offeror.

The term "solicitation" means RFP.

The term "University" means University of Kentucky.

2.0 GENERAL OVERVIEW

2.1 Intent and Scope

This Requests for Proposals (RFP) is issued to solicit proposals from qualified, experienced, financially sound, and responsible firms to provide labor, equipment and materials for complete Preconstruction Assistance and Construction phase scope of services for Architectural Precast for the University of Kentucky.

- The successful Contractor must provide Preconstruction Assistance services including constructability reviews, budget development, detailed cost estimates, schedule development, special studies and commissioning criteria, value engineering, material selection, BIM creation, prefabrication planning, and long lead material items during the design phases of the project.
- The successful Contractor must actively participate with the Project Team, the Architect/Engineer of Record and other design consultants during the design phase and preparation of contract documents.
- The Contractor selected to implement the system must provide a single point of contact during the project period. This single point of contact must have the authority to ensure that the project requirements are completed.
- Following Design, this Contractor must provide all equipment, labor, and materials necessary to perform the **Architectural Precast Wall Assemblies** related work as shown on the Contract Documents.
- The Architectural Precast scope generally includes PCS-01 and PCS-02

Offerors must demonstrate successful completion of curtainwall projects with similar size, scope of work, and quality requirements as this project. The University and Construction Manager reserve the right to contact any person materially involved with the referenced projects.

The scope of services for this contract are further detailed in section **7.0 Scope of Services**.

Proposals for the following work will be received by University of Kentucky Procurement Services in Room #322 Peterson Service Building, Lexington, Kentucky 40506-0005, in the manner and on the date hereinafter specified for the furnishing of all labor, materials, supplies, tools, appliances, equipment, services, etc., necessary for the construction of **Trade Contract 001 – Early Subcontractor Involvement and Construction Phase Services for Architectural Precast Assemblies for Project #2564.0**, as set forth in the specifications and as shown on the sketch as prepared by JRA Architects and the Scope of Services prepared by Turner Construction Company and approved by the Capital Project Management Division and the under the terms and conditions of this RFP.

Attachment J is an electronic agreement to be signed for viewing rights to a copy of the design model of the façade to understand project details and assist contractor to complete this RFP.

2.2 Background Information

This package involves the Preconstruction Assistance services and Construction Phase services for the architectural precast for the new Health Education Building. The work will be performed under contract with the Construction Manager, Turner Construction Company.

IMPORTANT NOTE: THE SUCCESSFUL OFFEROR WILL ENTER INTO A SUBCONTRACT WITH TURNER CONSTRUCTION COMPANY. THE FORM OF CONTRACT IS INCLUDED WITH THE SOLICITATION DOCUMENTS. THERE WILL BE NO DIRECT CONTRACTUAL RELATIONSHIP BETWEEN THE SUCCESSFUL OFFEROR AND THE UNIVERSITY OF KENTUCKY.

2.3 University Information

Upon his arrival in 2011, President Eli Capilouto set an ambitious agenda to extend and enhance our role as Kentucky's land-grant and flagship research university. By focusing on infrastructure growth and improvement; creating opportunities for innovative teaching, learning and academic excellence; fostering a robust research enterprise; providing life-saving subspecialty care; empowering communities through service and outreach; and encouraging a transparent and shared dialogue about institutional priorities; the University of Kentucky will help ensure a Kentucky tomorrow that is healthier, wealthier and wiser than it is today.

Our mission is to advance Kentucky.

Founded in 1865 as a land-grant institution adjacent to downtown Lexington, UK is nestled in the scenic heart of the beautiful Bluegrass region of Kentucky. From its early beginnings, with only 190 students and 10 professors, UK's campus now covers more than 900 acres. The university enrolled more than 32,000 students in Fall 2022 and has approximately 25,000 employees, including nearly 3,000 full-time faculty.

UK is one of a small number of universities in the United States that has programs in agriculture, engineering, law, fine arts and a full complement of health colleges including medicine and pharmacy, on a single campus alongside an academic health system, leading to groundbreaking discoveries and unique interdisciplinary collaboration.

The state's flagship university consists of 18 academic and professional colleges where students can choose from more than 200 majors and degree programs at the undergraduate and graduate levels. The colleges are Agriculture, Food and Environment; Arts and Sciences; Business and Economics; Communication and Information; Dentistry; Design; Education; Engineering; Fine Arts; Graduate School; Health Sciences; Honors; Law; Medicine; Nursing; Pharmacy; Public Health; and Social Work. These colleges are supported by a modern research library system.

Research at the University of Kentucky is a dynamic enterprise encompassing both traditional scholarship and emerging technologies. UK's research faculty, staff and students are establishing UK as one of the nation's most prolific public research universities. UK researchers were awarded more than $452.9 million in extramural grant and contract funding in fiscal year 2022. Fifty-six percent of this funding comes from agencies in the federal government ($256 million) such as the National Institutes of Health, National Science Foundation, Department of Energy, Department of Defense and numerous other federal, state and industry sponsors. Expenditures from research and development (R&D) activities at the university generate more than $772 million in economic development across the Commonwealth of Kentucky and support more than 4,395 jobs.

With more than 70 research centers and institutes, UK researchers are discovering new knowledge, providing a rich training ground for current students and the next generation of researchers and advancing the economic growth of the Commonwealth of Kentucky. Several centers excel in the services offered to the public. The Gluck Equine Research Center is one of only three facilities of its kind in the world, conducting equine disease research.

The Center for Applied Energy Research (CAER) is internationally recognized for research in algae for carbon dioxide clean up, carbon materials, concrete and cement, emissions control in utilities, energy policy, fuels research, hydrogen, materials characterization and plant optimization.

Among the brightest examples of UK's investment in transformative research is the Markey Cancer Center. As a center of excellence and distinction at UK, Markey's robust research and clinical enterprise is the cornerstone of our commitment to Kentucky – fundamental to our success in uplifting lives through our endeavors and improving the general health and welfare of our state – burdened by the nation's highest rate of cancer deaths per 100,000 people. In 2013, Markey earned the prestigious National Cancer Institute-designation (NCI) – one of 68 nationally and the only one in Kentucky. The designation was renewed in 2018.

Both CAER and Markey are cornerstones of seven Research Priority Areas (RPAs) at the University of Kentucky. These areas — chosen based on local relevance, existing funding strength, sustainability and disciplinary scholarly diversity — focus UK's top research talent on the most pressing challenges confronting our state.

The University of Kentucky is the recipient of a Clinical Translational Sciences Award (CTSA) from the National Institutes of Health (NIH). As one of only 60 institutions with this research distinction, UK was awarded the CTSA for its potential in moving research and discovery in the lab into practical field and community applications. The CTSA and NCI are part of a trifecta of federal research grants that includes an Alzheimer's Disease Center. UK is one of only 29 universities in the country to hold all three premier grants from NIH.

Established in 1957, the medical center at UK is one of the nation's finest academic medical centers and includes the university's clinical enterprise, UK HealthCare. Licensed for 965 beds across UK Albert B. Chandler Hospital, Kentucky Children's Hospital and UK Good Samaritan Hospital, the system is supported by a growing faculty and staff providing the most advanced subspecialty care for the most critically injured and ill patients throughout the Commonwealth and beyond. Since 2014, the number of patients served by the medical enterprise has nearly doubled, with more than 38,000 discharges in 2022.

UK Chandler Hospital includes the only Level 1 Trauma Center for both adult and pediatric patients in Central and Eastern Kentucky. In addition, UK HealthCare recently opened one of the country's largest robotic hybrid operating rooms and the first of its kind in the region. While the new patient care pavilion is the leading health care facility for advanced medical procedures in the region, our talented physicians consult with and travel to our network of affiliate hospitals so Kentuckians can receive the best health care available close to their home and never need to leave the Bluegrass for complex subspecialty care.

As of December 1, 2022, King's Daughters Medical Center, based in Ashland, Kentucky, officially became part of the University of Kentucky. King's Daughters Medical Center serves a 16-county region across Kentucky, Ohio and West Virginia. Its health system is composed of two acute-care hospitals totaling 465 licensed beds, more than 50 ambulatory centers and practice locations, a long-term care facility, medical transport company and six urgent care centers.

UK's agenda remains committed to accelerating the university's academic excellence in all areas and gaining worldwide recognition for its outstanding academic programs, its commitment to students, its investment in pioneering research and discovery, its success in building a diverse community and its engagement with the larger society. This commitment is all part of the

university's mission as a 21st century flagship and land-grant research university. From its Nobel Laureates to cutting-edge work in addressing health disparities, and from the artistic wonders that stir souls to our scientific creativity that inspires minds, UK seeks a brighter future through the contributions of our faculty, staff, students and alumni.

We are the University of Kentucky. We are committed to advancing Kentucky in everything that we do.

SUSTAINABILITY

Sustainability is an institution-wide priority for the University of Kentucky. We strive to ensure that all activities are ecologically sound, socially just, and economically viable, and that they will continue to be so for future generations. This commitment also prioritizes the integration of these principles in curricula, research, athletics, health care, creative works, and outreach. This principled approach to operational practices and intellectual pursuits is intended to prepare students and empower the campus community to support sustainable development in the Commonwealth and beyond. The UK Sustainability Strategic Plan guides these efforts (https://www.uky.edu/sustainability/sustainability-strategic-plan).

2.4 Economic Inclusion and Procurement

The University of Kentucky is committed to serving as an advocate for diverse businesses and Kentucky located businesses. Diverse Business Enterprises (DBE) consist of minority, women, disabled, veteran and disabled veteran owned business firms that are at least fifty-one percent owned and operated by an individual(s) of the aforementioned categories. Also included in this category are disabled business enterprises and non-profit work centers for the blind and severely disabled. To be deemed a Kentucky located Business a company must have a physical facility located in the Commonwealth of Kentucky that is engaged in on-going business operations.

The University is committed to increasing the amount of goods and services acquired from businesses owned and controlled by diverse persons to 10% of all procurement expenditures. The University expects its suppliers to support and assist in this effort. The University is also dedicated to increasing the amount of goods and services acquired from Kentucky located companies to the greatest extent possible in support of our economic development efforts.

Among the University's goals for DBE participation in procurement are:

- To ensure the absence of barriers that reduce their participation.
- Educate vendors on "how to" do business with the University.
- Support diverse and Kentucky located vendors seeking to do business with the University in the areas of goods, services, construction, and other areas of procurement.
- Encourage participation of qualified diverse and Kentucky located vendors by directing them to agencies that can benefit from their product or service.
- Provide resources for diverse and Kentucky located vendors.
- Sponsor events to assist diverse and Kentucky located vendors in becoming active, responsible, and responsive participants in the University's purchasing opportunities.

For additional information regarding how diverse and Kentucky located suppliers may participate in this Request for Proposal, submit any questions to the Procurement Officer as indicated in Section 3.2 by the Deadline for Written Questions date.

3.0 PROPOSAL REQUIREMENTS

3.1 Key Event Dates and Lexington, KY Prevailing Times

Release of RFP	2/15/2024
Pre-Proposal Conference (Voluntary)	11:00AM 2/21/2024 via Zoom
Deadline for Written Questions	3:00PM 2/22/2024
Final Addendum (on or about)	2/26/2024
RFP Proposals Due	3:00PM 02/29/2024

3.2 Offeror Communication

All communications with the University regarding this RFP shall only be directed to the procurement officer listed above.

All addenda and updates will be communicated through the Lynn Imaging Planroom.

Plans, Specifications, and official solicitation documents are available from:

Lynn Imaging
328 Old Vine Street
Lexington Kentucky 40507
Phone (859) 255-1021
Fax (859) 233-1558

In addition, Lynn Imaging and the University have a web site at: www.ukplanroom.com where plans can be ordered.

Interested vendors must identify the status of their firm as a prime contractor, miscellaneous subcontractor, material supplier or other when ordering Plans and Specifications.

3.3 Pre-Proposal Conference

A pre-proposal conference will be held in Lexington, Kentucky on 2/21/2024 at 11:00AM Via Zoom to allow prospective contractors an opportunity to ask questions and clarify the University's expectations. This conference provides offerors an opportunity for oral questions.

Meeting URL: https://uky.zoom.us/j/89621279061

Call in: 1 309 205 3325

Meeting ID: 896 2127 9061

The following items should be noted in reference to the pre-proposal conference:

- Attendance at the pre-proposal conference is voluntary**.** At this conference, the scope of services will be discussed in detail.

- Offerors are encouraged to submit written questions after the conference by the date listed in Section 3.1.

The University will prepare written responses to all questions submitted and make them available to all offerors. The questions and answers will be made part of the RFP and may become part of the contract with the successful contractor. Answers given orally at the conference are not binding.

3.4 Offeror Presentations

All offerors whose proposals are judged acceptable for award may be required to make a presentation to the evaluation committee.

3.5 Preparation of Offers

The offeror is expected to follow all specifications, terms, conditions and instructions in this RFP.

The offeror will furnish all information required by this solicitation.

Proposals should be prepared simply and economically, providing a description of the offeror's capabilities to satisfy the requirements of the solicitation. Emphasis should be on completeness and clarity of content. All documentation submitted with the proposal should be bound in the single volume except as otherwise specified.

An electronic version of the RFP, in .PDF format only, is available through the University of Kentucky Purchasing Division website at: https://purchasing.uky.edu/bid-and-proposal-opportunities.

3.6 Proposed Deviations from the RFP

The stated requirements appearing elsewhere in this RFP shall become a part of the terms and conditions of any resulting contract. The standard, responsive proposal to this RFP will not have any exclusions or introduce any conditions upon either party. Clarifications and requests for modifications to the RFP and attachments must be made using the RFI process to be considered as part of a base proposal. Deviations will be considered as an alternate proposal and will be evaluated accordingly as long as such deviations do not conflict with the basic nature of the RFP.

Note: Offerors shall not submit their standard terms and conditions as exceptions to the University's General Terms and Conditions as the basis of an alternate proposal. Each exception to the University's General Terms and Conditions should be individually addressed.

3.7 Proposal Submission and Deadline

Offeror must provide the following materials prior to 3 p.m. (Lexington, KY time) on the date specified in Section 3.1 and addressed to the purchasing officer listed in Section 3.2:

- **Technical Proposal:** One (1) electronic storage device (USB) clearly marked with the proposal number and name, firm name and what is included (Technical Proposal) and two (2) printed copies

- **Financial Proposal:** One (1) electronic storage device (USB) clearly marked with the proposal number and name, firm name and what is included (Financial Offer) and two (2) printed copies

  Do not password protect the electronic storage devices.

Proposals shall be enclosed in sealed envelopes to the above referenced address and shall show on the face of the envelope: the closing time and date specified, the solicitation number and the name and address of the offeror. The technical proposal shall be submitted in a sealed envelope and the financial proposal shall be submitted in a sealed envelope under separate cover. Both sealed envelopes shall have identical information on the cover, with the addition that one will state "Technical Information," and the other, "Financial Proposal."

Proposals received after the closing date and time will not be considered. In addition, proposals received via fax or e-mail are not acceptable.

Please note: the University of Kentucky accepts deliveries of RFPs Monday through Friday from 8 a.m. to 5 p.m. Lexington, KY time. However, RFPs must be received by 3 p.m. Lexington, KY time on the date specified on the RFP in order to be considered.

Note: In accordance with the Kentucky Revised Statute 45A.085, there will be no public opening.

3.8 Modification or Withdrawal of Offer

An offer and/or modification of offer received at the office designated in the solicitation after the exact hour and date specified for receipt will not be considered.

An offer may be modified or withdrawn by written notice before the exact hour and date specified for receipt of offers. An offer also may be withdrawn in person by an offeror or an authorized representative, provided the identity of the person is made known and the person signs a receipt for the offer, but only if the withdrawal is made prior to the exact hour and date set for receipt of offers.

3.9 Acceptance or Rejection and Award of Proposal

The University reserves the right to accept or reject any or all proposals (or parts of proposals), to waive any informalities or technicalities, to clarify any ambiguities in proposals and (unless otherwise specified) to accept any item in the proposal. In case of error in extension or prices or other errors in calculation, the unit price shall govern. Further, the University reserves the right to make a single award, split awards, multiple awards or no award, whichever is in the best interest of the University.

3.10 Rejection

Grounds for the rejection of proposals include (but shall not be limited to):

- Failure of a proposal to conform to the essential requirements of the RFP.
- Imposition of conditions that would significantly modify the terms and conditions of the solicitation or limit the offeror's liability to the University on the contract awarded on the basis of such solicitation.
- Failure of the offeror to sign the University RFP. This includes the Authentication of Proposal and Statement of Non-Collusion and Non-Conflict of Interest statements.
- Receipt of proposal after the closing date and time specified in the RFP.

3.11 Addenda

Any addenda or instructions issued by the purchasing agency prior to the time for receiving proposals shall become a part of this RFP. Such addenda should be acknowledged in the proposal. No instructions or changes shall be binding unless documented by a proper and duly issued addendum.

3.12 Disclosure of Offeror's Response

The RFP specifies the format, required information and general content of proposals submitted in response to this RFP. The purchasing agency will not disclose any portions of the proposals prior to contract award to anyone outside the Purchasing Division, the University's administrative staff, representatives of the state or federal government (if required) and the members of the committee evaluating the proposals. After a contract is awarded in whole or in part, the University shall have the right to duplicate, use or disclose all proposal data submitted by offerors in response to this RFP as a matter of public record.

Any submitted proposal shall remain valid six (6) months after the proposal due date.

The University shall have the right to use all system ideas, or adaptations of those ideas, contained in any proposal received in response to this RFP. Selection or rejection of the proposal will not affect this right.

3.13 Restrictions on Communications with University Staff

From the issue date of this RFP until a contractor is selected and a contract award is made, offerors are not allowed to communicate about the subject of the RFP with any University administrator, faculty, staff or members of the board of trustees except: the purchasing office representative, any University purchasing official representing the University administration, others authorized in writing by the purchasing office and University representatives during offeror presentations. If violation of this provision occurs, the University reserves the right to reject the offeror's proposal.

3.14 Cost of Preparing Proposal

Costs for developing the proposals and any subsequent activities prior to contract award are solely the responsibility of the offerors. The University will provide no reimbursement for such costs.

3.15 Disposition of Proposals

All proposals become the property of the University. The successful proposal will be incorporated into the resulting contract by reference.

3.16 Alternate Proposals

Offerors may submit alternate proposals. If more than one proposal is submitted, all must be complete (separate) and comply with the instructions set forth within this document. Each proposal will be evaluated on its own merits.

3.17 Questions

All questions should be submitted by either fax or e-mail to the purchasing officer listed in Section 3.2 no later than the date listed in Section 3.1.

3.18 Section Titles in the RFP

Section titles used herein are for the purpose of facilitating ease of reference only and shall not be construed to infer the construction of contractual language.

3.19 No Contingent Fees

No person or selling agency shall be employed or retained or given anything of monetary value to solicit or secure this contract, except bona fide employees of the offeror or bona fide established commercial or selling agencies maintained by the offeror for the purpose of securing business. For breach or violation of this provision, the University shall have the right to reject the proposal, annul the contract without liability, or, at its discretion, deduct from the contract price or otherwise recover the full amount of such commission, percentage, brokerage or contingent fee or other benefit.

3.20 Proposal Addenda and Rules for Withdrawal

Prior to the date specified for receipt of offers, a submitted proposal may be withdrawn by submitting a written request for its withdrawal to the University purchasing office, signed by the offeror. Unless requested by the University, the University will not accept revisions or alterations to proposals after the proposal due date.

3.21 Requirement To Perform Vendor Onboarding and Registration

As a condition of award, and for any renewals performed during the life of the contract, successful Contractor agrees to register their company with PaymentWorks, Inc., the University's vendor onboarding application. Registration information will be provided by the Purchasing Division as part of the award process. During the vendor registration process, successful Contractor agrees to provide any applicable information pertaining to diversity demographics for their company. Further, should any company or diversity information change during the life of the contract, successful Contractor agrees to update this information in PaymentWorks as applicable.

4.0 PROPOSAL FORMAT AND CONTENT

4.1 Proposal Information and Criteria

The following list specifies the items to be addressed in the proposal. Offerors should read it carefully and address it completely and in the order listed to facilitate the University's review of the proposal.

Proposals shall be organized into the sections identified below. The content of each section is detailed in the following pages. It is strongly suggested that offerors use the same numbers for the following content that are used in the RFP.

- Signed Authentication of Proposal and Statement of Non-Collusion and Non-Conflict of Interest Form
- Transmittal Letter
- Executive Summary and Proposal Overview
- Criteria 1 - Offeror Qualifications
- Criteria 2 - Services Defined
- Criteria 3 - Financial Proposal
- Criteria 4 - Evidence of Successful Performance and Implementation Schedule
- Criteria 5 - Other Additional Information

4.2 Signed Authentication of Proposal and Statements of Non-Collusion and Non-Conflict of Interest Form

The Offeror will sign and return the proposal cover sheet and print or type their name, firm, address, telephone number and date. The person signing the offer must initial erasures or other changes. An offer signed by an agent is to be accompanied by evidence of their authority unless such evidence has been previously furnished to the purchasing agency. The signer shall further certify that the proposal is made without collusion with any other person, persons, company or parties submitting a proposal; that it is in all respects fair and in good faith without collusion or fraud; and that the signer is authorized to bind the principal offeror.

4.3 Transmittal Letter

The Transmittal Letter accompanying the RFP shall be in the form of a standard business letter and shall be signed by an individual authorized to legally bind the offeror. It shall include:

- A statement referencing all addenda and written questions, the answers and any clarifications to this RFP issued by the University and received by the offeror (If no addenda have been received, a statement to that effect should be included.).

- A statement that the offeror's proposal shall remain valid for six (6) months after the closing date of the receipt of the proposals.

- A statement that the offeror will accept financial responsibility for all travel expenses incurred for oral presentations (if required) and candidate interviews.

- A statement that summarizes any deviations or exceptions to the RFP requirements and includes a detailed justification for the deviation or exception.

- A statement that identifies the confidential information as described in Section 6.23.

4.4 Executive Summary and Proposal Overview

The Executive Summary and Proposal Overview shall condense and highlight the contents of the technical proposal in such a way as to provide the evaluation committee with a broad understanding of the entire proposal.

As part of the Executive Summary and Proposal Overview, Offeror shall submit with their response a summarized profile describing the demographic nature of their company or organization:

1. When was your organization established and/or incorporated?

2. Indicate whether your organization is classified as local, regional, national, or international.

3. Describe the size of your company in terms of number of employees, gross sales, etc.

4. Is your company certified as small business, minority-owned, women-owned, veteran-owned, disabled-owned, or similar classification?

5. Include other demographic information that you feel may be applicable to the Request for Proposal submission.

6. Offeror shall describe in detail their company's commitment to diversity, equity, and inclusion. Information shall be provided as to the number of diverse individuals that the vendor employees as well as a description of vendors efforts to do business with Diverse Business Enterprises as they conduct their own business. In additional, please indicate the diversity nature of your company as well as ownership race/ethnicity.

Diverse Business Description	Check All That Apply
Minority-Owned	
Woman-Owned	
Small Business	
Veteran-Owned	
LGBTQ-Owned	
Disability-Owned Business Entity (DOBE)	
Diversity not indicated	

Race/Ethnicity	Check One
Asian	
Black/African American	
Hispanic or Latino	
Native American	
Native Hawaiian/Pacific Islander	
White	
Other	
Prefer not to say	

4.5 Criteria 1 - Offeror Qualifications

The purpose of the Offeror Qualifications section is to determine the ability of the offeror to respond to this RFP. Offerors should describe and offer evidence of their ability to meet each of the qualifications listed below.

Our supply chains and business partnerships are an important aspect of this work. In your proposal, please (A) provide your company's mission and vision relative to sustainability, and (B) how your company, through services, products, and partnerships, will help the University of Kentucky advance specific elements of the Sustainability Strategic Plan.

1. Professional qualifications including history and organization, how the offeror would service a project in Kentucky, knowledge of the local market, offerors financial strength, and other information relevant to this project.
2. Please provide 3 to 5 examples of projects similar in size and scope with a Preconstruction Assistance Role. Highlight work at major universities/colleges.
    a. Provide contract size
    b. Provide year of completion
    c. Was project completed within original stated budget and schedule?
    d. Provide project references from Designers and CM/GC
3. Please provide information relating to your firm's specific regional experience working under a Preconstruction Assistance scenario.
4. Provide an organization chart and resumes for key personnel whom will be involved with the project including but not limited to executives, designers, engineers, project managers, and/or field personnel.

4.6 Criteria 2 – Services Defined

1. Provide a brief narrative explaining how your company will accomplish the services described in this RFP, including number and type of staff (engineering, project management, etc.). In the narrative, please describe each phase of the work, (design, equipment selection, installation, training and after warranty service).
2. Please provide your company's approach to establishing and maintaining Target Budgets from current drawing sets to final Construction Drawings.
3. Please provide your company's approach to design/constructability review and value engineering.
4. Provide specific manufacturers recommendations for the design and fabrication of a complete system that meets the intent shown on the RFP Documents.

4.7 Criteria 3 – Financial Proposal

The Financial Summary Form shall contain the complete financial offer made to the University using the format contained in Section 8.0. All financial information must be submitted in a sealed envelope under separate cover.

4.8 Criteria 4 – Evidence of Successful Performance and Implementation Schedule

1. Please provide your company's approach to scheduling related to identification of long lead items, adhering to the time frame to complete Construction Drawings, and input to the Master Schedule regarding sequences and installation durations.
    a. Provide detailed schedule indicating major activities from procurement through project completion and in accordance with **Construction Schedule Milestones in section 7.1.**

4.9 Criteria 5 – Other Additional Information

Please provide any additional information that the offeror feels should be considered when evaluating their proposal.

The offeror may present any creative approaches that might be appropriate. The offeror may also provide supporting documentation that would be pertinent to this RFP.

Offeror shall describe in detail their company's commitment to diversity, equity and inclusion. Information shall be provided as to the number of diverse individuals that the vendor employees as well as a description of vendors efforts to do business with Diverse Business Enterprises as they conduct their own business.

5.0 EVALUATION CRITERIA PROCESS

A committee of University officials appointed by the Chief Procurement Officer will evaluate proposals and make a recommendation to the Chief Procurement Officer. The evaluation will be based upon the information provided in the proposal, additional information requested by the University for clarification, information obtained from references and independent sources and oral presentations (if requested).

The evaluation of responsive proposals shall then be completed by an evaluation team, which will determine the ranking of proposals. Proposals will be evaluated strictly in accordance with the requirements set forth in this solicitation, including any addenda that are issued. The University will award the contract to the responsible offeror whose proposal is determined to be the most advantageous to the University, taking into consideration the evaluation factors set forth in this RFP.

The evaluation of proposals will include consideration of responses to the list of criteria in Section 4.0. Offerors must specifically address all criteria in their response. Any deviations or exceptions to the specifications or requirements must be described and justified in a transmittal letter. Failure to list such exceptions or deviations in the transmittal letter may be considered sufficient reason to reject the proposal.

The relative importance of the criteria is defined below:

Primary Criteria

- Offeror Qualifications
- Services Defined
- Financial Proposal
- Evidence of Successful Performance and Implementation

Secondary Criteria

- Other Additional Services

The University will evaluate proposals as submitted and may not notify offerors of deficiencies in their responses.

Proposals must contain responses to each of the criteria, listed in Section 4 even if the offeror’s response cannot satisfy those criteria. A proposal may be rejected if it is conditional or incomplete in the judgment of the University.

6.0 SPECIAL CONDITIONS

6.1 Contract Term

The contract resulting from this RFP shall be awarded by Turner Construction.

6.0.1 Attachment “A” 3A Page
6.0.2 General Requirements
6.0.3 General Conditions
6.0.4 Special Conditions
6.0.5 Sample Turner Subcontract Form 36
6.0.6 Form 36 Early Subcontractor Involvement Rider
6.0.7 Attachment “C” Project Safety Program
6.0.8 Attachment “D” E&O Insurance Provisions
6.0.9 Attachment “E” Accounting Procedures
6.0.10 Attachment “F” Percentage Markup
6.0.11 Attachment “G” Project Schedule
6.0.12 Attachment “I” Lean Subcontract Exhibit
6.0.13 Attachment “J” Electronic Agreement
6.0.14 Attachment “K” CCIP Manual
6.0.15 Attachment “L” Tree Protection Standards
6.0.16 SK-001 Site Logistics Plan

6.2 Effective Date

The effective date of the contract shall be the date upon which the parties execute it and all appropriate approvals, including that of the Commonwealth of Kentucky Government Contracts Review Committee, have been received.

6.3 Competitive Negotiation

It is the intent of the RFP to enter into competitive negotiation as authorized by KRS 45A.085.

The University will review all proposals properly submitted. However, the University reserves the right to request necessary modifications, reject all proposals, reject any proposal that does not meet mandatory requirement(s) or cancel this RFP, according to the best interests of the University.

Offeror(s) selected to participate in negotiations may be given an opportunity to submit a Best and Final Offer to the purchasing agency. All information-received prior to the cut-off time will be considered part of the offeror’s Best and Final Offer.

The University also reserves the right to waive minor technicalities or irregularities in proposals providing such action is in the best interest of the University. Such waiver shall in no way modify the RFP requirements or excuse the offeror from full compliance with the RFP specifications and other contract requirements if the offeror is awarded the contract.

6.4 Appearance Before Committee

Any, all or no offerors may be requested to appear before the evaluation committee to explain their proposal and/or to respond to questions from the committee concerning the proposal. Offerors are prohibited from electronically recording these meetings. The committee reserves the right to request additional information.

6.5 Additions, Deletions or Contract Changes

The University reserves the right to add, delete, or change related items or services to the contract established from this RFP. No modification or change of any provision in the resulting contract shall be made unless such modification is mutually agreed to in writing by the contractor and the Chief Procurement Officer and incorporated as a written modification to the contract. Memoranda of understanding and correspondence shall not be interpreted as a modification to the contract.

6.6 Contractor Cooperation in Related Efforts

The University reserves the right to undertake or award other contracts for additional or related work to other entities. The contractor shall fully cooperate with such other contractors and University employees and carefully fit its work to such additional work. The contractor shall not commit or permit any act which will interfere with the performance of work by any other contractor or by University employees. This clause shall be included in the contracts of all contractors with whom this contractor will be required to cooperate. The University shall equitably enforce this clause to all contractors to prevent the imposition of unreasonable burdens on any contractor.

6.7 Entire Agreement

The RFP shall be incorporated into any resulting contract. The resulting contract, including the RFP and those portions of the offeror's response accepted by the University, shall be the entire agreement between the parties.

6.8 Governing Law

The contractor shall conform to and observe all laws, ordinances, rules and regulations of the United States of America, Commonwealth of Kentucky and all other local governments, public authorities, boards or offices relating to the property or the improvements upon same (or the use thereof) and will not permit the same to be used for any illegal or immoral purposes, business or occupation. The resulting contract shall be governed by Kentucky law and any claim relating to this contract shall only be brought in the Franklin Circuit Court in accordance with KRS 45A.245.

6.9 Kentucky's Personal Information Security and Breach Investigation Procedures and Practices Act

To the extent Company receives Personal Information as defined by and in accordance with Kentucky's Personal Information Security and Breach Investigation Procedures and Practices Act, KRS 61.931, 61.932 and 61.933 (the "Act"), Company shall secure and protect the Personal Information by, without limitation: (i) complying with all requirements applicable to non-affiliated third

parties set forth in the Act; (ii) utilizing security and breach investigation procedures that are appropriate to the nature of the Personal Information disclosed, at least as stringent as University's and reasonably designed to protect the Personal Information from unauthorized access, use, modification, disclosure, manipulation, or destruction; (iii) notifying University of a security breach relating to Personal Information in the possession of Company or its agents or subcontractors within seventy-two (72) hours of discovery of an actual or suspected breach unless the exception set forth in KRS 61.932(2)(b)2 applies and Company abides by the requirements set forth in that exception; (iv) cooperating with University in complying with the response, mitigation, correction, investigation, and notification requirements of the Act , (v) paying all costs of notification, investigation and mitigation in the event of a security breach of Personal Information suffered by Company; and (vi) at University's discretion and direction, handling all administrative functions associated with notification, investigation and mitigation.

6.10 Termination for Convenience

The University of Kentucky, Purchasing Division, reserves the right to terminate the resulting contract without cause with a thirty (30) day written notice. Upon receipt by the contractor of a "notice of termination," the contractor shall discontinue all services with respect to the applicable contract. The cost of any agreed upon services provided by the contractor will be calculated at the agreed upon rate prior to a "notice of termination" and a fixed fee contract will be pro-rated (as appropriate).

6.11 Termination for Non-Performance

Default

The University may terminate the resulting contract for non-performance, as determined by the University, for such causes as:

- Failing to provide satisfactory quality of service, including, failure to maintain adequate personnel, whether arising from labor disputes, or otherwise any substantial change in ownership or proprietorship of the Contractor, which in the opinion of the University is not in its best interest, or failure to comply with the terms of this contract;

- Failing to keep or perform, within the time period set forth herein, or violation of, any of the covenants, conditions, provisions or agreements herein contained;

- Adjudicating as a voluntarily bankrupt, making a transfer in fraud of its creditors, filing a petition under any section from time to time, or under any similar law or statute of the United States or any state thereof, or if an order for relief shall be entered against the Contractor in any proceeding filed by or against contractor thereunder. In the event of any such involuntary bankruptcy proceeding being instituted against the Contractor, the fact of such an involuntary petition being filed shall not be considered an event of default until sixty (60) days after filing of said petition in order that Contractor might during that sixty (60) day period have the opportunity to seek dismissal of the involuntary petition or otherwise cure said potential default; or

- Making a general assignment for the benefit of its creditors, or taking the benefit of any insolvency act, or if a permanent receiver or trustee in bankruptcy shall be appointed for the Contractor.

Demand for Assurances

In the event the University has reason to believe Contractor will be unable to perform under the Contract, it may make a demand for reasonable assurances that Contractor will be able to timely perform all obligations under the Contract. If Contractor is unable to provide such adequate assurances, then such failure shall be an event of default and grounds for termination of the Contract.

Notification

The University will provide ten (10) calendar days' written notice of default. Unless arrangements are made to correct the non-performance issues to the University's satisfaction within ten (10) calendar days, the University may terminate the contract by giving forty-five (45) days' written notice of its intent to cancel this contract.

6.12 Funding Out

The University may terminate this contract if funds are not appropriated or are not otherwise available for the purpose of making payments without incurring any obligation for payment after the date of termination, regardless of the terms of the contract. The University shall provide the contractor thirty (30) calendar days' written notice of termination under this provision.

6.13 Prime Contractor Responsibility

Any contracts that may result from the RFP shall specify that the contractor(s) is/are solely responsible for fulfillment of the contract with the University.

6.14 Assignment and Subcontracting

The Contractor(s) may not assign or delegate its rights and obligations under any contract in whole or in part without the prior written consent of the University. Any attempted assignment or subcontracting shall be void.

6.15 Permits, Licenses, Taxes

The contractor shall procure all necessary permits and licenses and abide by all applicable laws, regulations and ordinances of all federal, state and local governments in which work under this contract is performed.

The contractor must furnish certification of authority to conduct business in the Commonwealth of Kentucky as a condition of contract award. Such registration is obtained from the Secretary of State, who will also provide the certification thereof. However, the contractor need not be registered as a prerequisite for responding to the RFP.

The contractor shall pay any sales, use, personal property and other tax arising out of this contract and the transaction contemplated hereby. Any other taxes levied upon this contract, the transaction or the equipment or services delivered pursuant hereto shall be the responsibility of the contractor.

The contractor will be required to accept liability for payment of all payroll taxes or deductions required by local and federal law including (but not limited to) old age pension, social security or annuities.

6.16 Attorneys' Fees

In the event that either party deems it necessary to take legal action to enforce any provision of the contract and in the event that the University prevails, the contractor agrees to pay all expenses of such action including attorneys' fees and costs at all stages of litigation.

6.17 Royalties, Patents, Copyrights and Trademarks

The Contractor shall pay all applicable royalties and license fees. If a particular process, products or device is specified in the contract documents and it is known to be subject to patent rights or copyrights, the existence of such rights shall be disclosed in the contract documents and the Contractor is responsible for payment of all associated royalties. To the fullest extent permitted by law the Contractor shall indemnify, hold the University harmless, and defend all suits, claims, losses, damages or liability resulting from any infringement of patent, copyright, and trademark rights resulting from the incorporation in the Work or device specified in the Contract Documents.

Unless provided otherwise in the contract, the Contractor shall not use the University's name nor any of its trademarks or copyrights, although it may state that it has a Contract with the University.

6.18 Indemnification

The contractor shall indemnify, hold and save harmless the University, its affiliates and subsidiaries and their officers, agents and employees from losses, claims, suits, actions, expenses, damages, costs (including court costs and attorneys' fees of the University's attorneys), all liability of any nature or kind arising out of or relating to the Contractor's response to this RFP or its performance or failure to perform under the contract awarded from this RFP. This clause shall survive termination for as long as necessary to protect the University.

6.19 Insurance

See: Special Conditions, E&O Insurance Provisions

6.20 Method of Award

It is the intent of the University to award a contract to the qualified offeror whose offer, conforming to the conditions and requirements of the RFP, is determined to be the most advantageous to the University, cost and other factors considered.

Notwithstanding the above, this RFP does not commit the University to award a contract from this solicitation. The University reserves the right to reject any or all offers and to waive formalities and minor irregularities in the proposal received.

6.21 Reciprocal Preference

In accordance with KRS 45A.494, a resident offeror of the Commonwealth of Kentucky shall be given a preference against a nonresident offeror. In evaluating proposals, the University will apply a reciprocal preference against an offeror submitting a proposal from a state that grants residency preference equal to the preference given by the state of the nonresident offeror. Residency and non-residency shall be defined in accordance with KRS 45A.494(2) and 45A.494(3), respectively. Any offeror claiming Kentucky residency status shall submit with its proposal a notarized affidavit affirming that it meets the criteria as set forth in the above reference statute.

6.22 Reports and Auditing

All records relating directly or indirectly to the Project which are in the possession or control of Contractor shall be made available to Owner, its designee, and any governmental authority for audit, inspection, and copying upon the request of the Owner or the Owner's Representative(s). Such records include, without limitation: all drawings, specifications, Submittals, subcontractor bids, subcontracts, the Daily Log, correspondence, the Request Log, the Submittal Log, minutes, memoranda, tape or videotape recordings, or other writings or things which document the Project, its design, and its construction.

6.23 Confidentiality

The University recognizes an offeror's possible interest in preserving selected information and data included in the proposal; however, the University must treat such information and data as required by the Kentucky Open Records Act, KRS 61.870, et seq.

Information areas which normally might be considered proprietary, and therefore confidential, shall be limited to individual personnel data, customer references, formulae and company financial audits which, if disclosed, would permit an unfair advantage to competitors. If a proposal contains information in these areas and the offeror declares them to be proprietary in nature and not available for public disclosure, the offeror shall declare in the Transmittal Letter the inclusion of proprietary information and shall noticeably label as confidential or proprietary each sheet containing such information. Proposals containing information declared by the offeror to be proprietary or confidential, either wholly or in part, outside the areas listed above may be deemed non-responsive and may be rejected.

The University's General Counsel shall review each offeror's information claimed to be confidential and, in consultation with the offeror (if needed), make a final determination as to whether or not the confidential or proprietary nature of the information or data complies with the Kentucky Open Records Act.

6.24 Conflict of Interest

This Request for Proposal and resulting Contract are subject to provisions of the Kentucky Revised Statutes regarding conflict of interest and the University of Kentucky's Ethical Principles and Code of Conduct (www.uky.edu/Legal/ethicscode.htm). When submitting and signing a proposal, an offeror is certifying that no actual, apparent or potential conflict of interest exists between the interests of the University and the interests of the offeror. A conflict of interest (whether contractual, financial, organizational or otherwise) exists when any individual, contractor or subcontractor has a direct or indirect interest because of a financial or pecuniary interest, gift or other activities or relationships with other persons (including business, familial or household relationships) and is thus unable to render or is impeded from rendering impartial assistance or advice, has impaired objectivity in performing the proposed work or has an unfair competitive advantage.

Questions concerning this section or interpretation of this section should be directed to the University purchasing officer identified in this RFP.

6.25 Personal Service Contract Policies

Not applicable

6.26 Copyright Ownership and Title to Designs and Copy

The contractor and University intend this RFP to result in a contract for services, and both consider the products and results of the services to be rendered by the contractor hereunder to be a work made for hire. The contractor acknowledges and agrees that the work and all rights therein, including (without limitation) copyright, belongs to and shall be the sole and exclusive property of the University. For any work that is not considered a work made for hire under applicable law, title and copyright ownership shall be assigned to the University.

Title to all dies, type, cuts, artwork, negatives, positives, color separations, progressive proofs, plates, copy and any other requirement not stated herein required for completion of the finished product for use in connection with any University job shall be the property of and owned by the University. Such items shall be returned to the appropriate department upon completion and/or delivery of work unless otherwise authorized by the University. In the event that time of return is not specified, the contractor shall return all such items to the appropriate University department within one week of delivery.

6.27 University Brand Standards

The contractor must adhere to all University of Kentucky Brand Standards. University Brand Standards are maintained by the University Public Relations Office (UKPR) and can be viewed at http://www.uky.edu/prmarketing/brand-standards. Non-adherence to the standards can have a penalty up to and including contract cancellation. Only the UKPR Director or designee can approve exceptions to the University standards.

Graphics standards for the UK HealthCare areas are governed by UK HealthCare Clinical Enterprise Graphic Standards, found at: https://ukhealthcare.uky.edu/staff/brand-strategy.

Contractor warrants that its products or services provided hereunder will be in compliance with all applicable Federal disabilities laws and regulations, including without limitation the accessibility requirements of Section 255 of the Federal Telecommunications Act of 1996 (47 U.S.C. § 255) and Section 508 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794d), and its implementing regulations set forth at Title 36, Code of Federal Regulations, Part 1194. For purposes of clarity, updated regulations under Section 508 standards now incorporate WCAG 2.0, and for purposes of this agreement WCAG 2.0 Level AA compliance is expressly included. Contractor agrees to promptly respond to, resolve and remediate any complaint regarding accessibility of products or services in a timely manner and provide an updated version to University at no cost. If deficiencies are identified, University reserves the right to request from Contractor, a timeline by which accessibility standards will be incorporated into the products or services provided by Contractor and shall provide such a timeline within a commercially reasonable duration of time. Failure to comply with these requirements shall constitute a material breach of this Agreement and shall be grounds for termination of this Agreement.

Where any customized web services are provided, Contractor represents that it has reviewed the University's Web Policy and all products or services will comply with its published standards.

Contractor will provide University with a current Voluntary Product Accessibility Template (VPAT) for any deliverable(s). If none is available, Vendor will provide sufficient information to reasonably assure the University that the products or services are fully compliant with current requirements.

6.28 Printing Statutes

Not applicable

6.29 Requirement for Contract Administration Fee

Not applicable

6.30 Payment Terms

The University adheres to a strategic approach regarding payables management based on risk minimization, processing costs, and industry best practices. As such, suppliers and individuals doing business with the University will be paid based on the following protocol:

1. The University utilizes Payment Plus (e-payables) as its primary default form of payment. By enrolling in Payment Plus, suppliers can receive payments immediately (all invoices will be paid immediately upon confirmation of goods receipt and invoice). The process is electronic and the supplier receives real-time payment notices. Additional information regarding Payment Plus (and enrollment form) can be found at: https://www.uky.edu/ufs/payment-plus-supplier-enrollment-form.

2. Payments by check. Payment terms for check payments are Net-30.

3. Individuals receiving payments from the University that require ACH direct payments will only be processed under special circumstances as approved by the Controller's office. Payment terms for ACH are Net-40.

7.0 SCOPE OF SERVICES

The terms “Sub-contractor”, “Trade contractor” & “Contractor” will be used interchangeably throughout the contract documents. A Sub-contractor, Trade contractor or contractor has a contract with Turner Construction Company, the Construction Manager. This Trade Contractor is responsible for all contract documents (specifications, drawings and scope of work). In the event of a conflict, this scope of work takes precedence.

The scope of work in this Trade Contract includes all labor, material, equipment, services, and supervision necessary to complete all work specified herein, in accordance with the Contract Documents. All work will be completed in accordance with local codes and ordinances. This work shall include but not be limited to the following (see section 7.1 for details):

- ALL architectural precast concrete
- Embeds
- Preconstruction Assistance and Construction Phase services
    - Should Turner and this contractor fail to reach agreement on Lump Sum value of work by Core and Shell construction document completion, Turner shall be under no further obligation to this contractor beyond compensation for preconstruction assistance services.

7.1 Detailed Services Defined

The following information is intended to clarify and or further define the scope of work included in the solicitation documents. This shall not be construed as the entire scope of work for this work category. All work described or indicated in the respective specification sections or divisions listed shall be included, except as specifically excluded herein.

1. All work of this Trade Contractor shall be properly coordinated with the Lexington Fayette Urban County Government (LFUCG), University of Kentucky, and any other authorities having jurisdiction inclusive of premium time for night work required by said authorities.
2. **This Trade Contractor is required to sign Turner form 36 with Early Subcontractor Involvement Rider subcontract agreement included in the scope of work manual, which takes precedence over the General & Special Conditions**
3. Without limiting this Scope of Work and as indicated in the Contract Documents the following Specifications generally outline the work and **as described below**:

DIVISION 1 GENERAL REQUIREMENTS (ALL SECTIONS)

SECTION 01 4339 MOCKUPS

DIVISION 3 CONCRETE

SECTION 03 4500 PRECAST ARCHITECTURAL CONCRETE

This Trade Contractor is also responsible for trade specifications not specifically listed above but required by reference in the listed specifications or as required to perform the scope of work described herein, as well as Division 1 specifications and the use of the Construction Documents as a whole.

A. Construction Schedule and Milestones

Attachment G is a conceptual level construction/design schedule. This is preliminary and is intended to be used as information only to understand sequencing/logistics of the project. The schedule is a dynamic tool and is routinely being developed as information is gained from design requirements.

1. Project will utilize Lean Scheduling methods through the use of pull planning schedule meeting. Subcontractor's Superintendent and Project Manager will be required to attend pull plan schedule sessions in-person.

This Subcontractor shall include work on overtime, at no additional cost as required, to maintain the construction schedule. Lost time due to inclement weather must be made up either by working extended hours during the workweek, or by working weekends as required to maintain the construction schedule. Include the cost for overtime and shift work as may be required to ensure that all milestone dates are met.

Onsite storage is limited. Ensure "Just-in-Time" deliveries of architectural precast panels. To the East and West of the Area B section of the building, there is to be no obstructions or material storage that will prevent flow of traffic around the building and to the buckhoist.

1. Include the storing of all material off-site with each piece of precast scheduled for delivery coinciding with its scheduled erection date and coordinated with other onsite trade contractors.

NOTE: Project has bought two (2) tower cranes (see SK-001 Logistics Plan) for usage of this project. Should this contractor require crane operation beyond 60 hours per week, this contractor will be responsible for cost of services of crane operator.

a. If panel weights exceed limits of tower crane, then this contractor is to provide their own hoisting as necessary. Reference SK-001 Logistics Plan for crane charts.
b. This contractor to provide their own hoisting for any precast panels that occur under overhangs or canopy that would obstruct the tower crane from servicing.
c. Assume tower cranes will come down 7.11.25.

NOTE: Project will have exterior vertical transportation (construction hoist) for use for materials and personnel as concrete floors are poured. Assume car capacity is 6000 lbs. Approx. Dimensions of cars will be 12'4"L x 4'8"W x 7'2"H.

a. All material deliveries will need to be scheduled.
b. Hoist operations for material deliveries will be coordinated with other activities on-site such as personnel transportation and debris removal from the building.
    i. Assume deliveries/transport on hoist will only be able to occur between 8am and 12pm

NOTE: This contractor to assume erection of precast panels will occur on 2nd shift.

1. Preconstruction Assistance Start… 01.19.24
2. Structural CDs complete by design team… 03.04.24
3. Core & Shell CDs complete by design team… 05.20.24
4. Architectural Precast Work Start… 03.06.25
5. Architectural Precast Work Complete… 06.05.25
6. Full building Dry-In… 06.26.25

B. <u>Preconstruction Assistance Scope of Services</u>

1. This contractor shall assist the design team to design and select systems utilizing the best industry practices to establish the optimum solution for the project.
2. This contractor shall produce various/multiple conceptual estimates with different scenarios and assist the Design Team to design the systems to an agreed upon target budget in full compliance with all code regulations and local agencies.
3. Produce detailed estimates as necessary for all design schemes including system cost analysis as requested. Provide estimating services throughout development of the design. Provide estimating exercises that the Owner, Design Team, and Turner deem necessary. Submit estimates in a format approved by Turner.
    a. Provide check estimates at 100% Design Development
    b. Provide check estimates at 50% Construction Documents
4. This contractor will provide competitive pricing of major components including manufacturers' options and will present pricing, along with detailed information, recommendations and comparisons that can be reviewed by the Owner and Design Team for final selection. This contractor will be responsible for scheduling interviews with manufacturer's representatives with Owner's Representatives and Design Team participation.
5. This contractor shall be responsible for continuous and on-going value engineering to maintain the agreed upon budgets. The goal is to maximize the quality of the installations, at the best possible price, through detailed design to minimize re-work and be as efficient as possible in the field.
    a. Prepare a value engineering analysis including cost and construction feasibility considerations relating to labor and material availability as well as off-site pre-fabrication at each phase of the design.
6. This contractor shall participate with the Project Team to perform constructability reviews of the design as presented by the Design Team. Evaluate project details for practicality and efficiency of design, technical examination of details, and adequacy of building systems design. Collaborate with Design Team in developing solutions to any identified issues. These reviews are to determine that the design is proceeding in a manner that will result in complete, accurate and coordinated drawings for construction.
    a. Review weights, special attachments, etc… with Structural Engineer to ensure the structure can accommodate the architectural precast assemblies. Any attachments to the structure need to be incorporated and indicated on the 100% CD structural drawings (Early March 2024).
    b. BIM and modeling will be required for collaboration with the Design Team. This contractor shall have the ability to use REVIT. A final coordinated model of the façade assemblies to be provided by this contractor and turned over for use by the project design team and other trade partners.
        i. Contractor shall participate in BIM coordination meetings for purpose of clash detection and overall project coordination during construction phase services as well.

7. Mandatory attendance to a minimum of two (2) weekly meetings will be required through the CD phase. Mandatory kickoff meeting will not count toward standard weekly meetings.
    a. Involve Second Tier trade contractors and major vendors as necessary for collaboration.
    b. Include one (1) in-person meeting per month during this time period.
8. This contractor shall provide input regarding the Master Construction Schedule as related to this scope of work. Review of long lead items, logistics, sequences, and installation durations.
9. The intent is that through the preconstruction assistance phase that this contractor will have produced shop drawings throughout this process and will be ready to release for fabrication once 100% CD's are produced.
10. Structural calculations are to be done by a professional engineer.
    a. NOTE the requirements in the specifications for Delegated Design Submittals.
11. With this RFP response, provide typical details showing your preferred connection for precast concrete architectural cladding panel attachment to concrete foundation wall. The intent of this request is to allow the design team to detail the foundation wall, quickly, in a manner that will be compatible to receive the precast cladding panels. The foundation package Construction Drawings sets are to be complete in January 2024. (ADD #2)
    a. If you anticipate multiple details will be required, provide each detail, and indicate where on plan each detail will occur. (ADD #2)
    b. Details from past example projects are acceptable; provided they reflect similar detailing to what will be used for this project.(ADD #2)
12. This contractor shall have an experienced senior technical staff member available for up to 12 hours of design team assistance (focus on connection detailing) within the first 7-days of contract award. (ADD #2)
13. Provide total panel cross-section dimensions (thickness of each layer of panel assembly) for each veneer type used. (ADD #2)
14. Provide preferred dimensions from inside face of panel to edge of slab at steel framing. This does not guarantee this dimension will be used.(ADD #2)
15. If there is a preferred dimension from inside face of panel to column grid line, list the dimension. This does not guarantee this dimension will be used. (ADD #2)

C. <u>Construction Services</u>

1. Contract Price is LUMP SUM. There shall be NO additional labor and material escalations allowed.
2. **Examination of Site** – Subcontractor warrants that they have sufficiently reviewed the project site to inform themselves of all items about existing site that are relevant to their work, and the cost of their work.
3. Include protection of all adjacent structures during performance of this work. Plan for protection of adjacent structures must be part of the overall plan submitted for approval prior to start of work.

4. All guardrail, perimeter rail, tie-off connections, or any other material/equipment necessary to perform this contract safely is included in this contract.
5. **SITE LOGISTICS:** Refer to the Site Logistics plans included in the Contract Documents. Delivery trucks are to be scheduled with Turner at least one (1) week in advance.
6. Subcontractor change order requests shall be provided with sufficient detail (as acceptable to Turner) to allow for satisfactory review. Subcontractor shall be allowed a maximum mark up for overhead and profit per the markup provisions included in the Subcontract Agreement, or as clarified in Contract Documents above.
7. Subcontractor understands that **time is of the essence** in the prosecution of Work under this agreement.
8. All engineering and layout to complete this scope of work is included in this contract including protection of reference points and replacement of such points that are lost or damaged during the execution of this work. The Trade Contractor is responsible for all lines, elevations, and measurements executed under this contract. The Trade Contractor shall layout and establish all lines and elevations required for this work. The Trade Contractor shall verify figures and dimensions shown on the drawings or indicated in the approved shop drawings before laying out the work. Verify conditions and dimensions of previously installed work. Report any perceived inconsistency or error in drawings, layout, or previously installed work to the Construction Manager prior to proceeding with the work.
    a. Project Survey Control will be established by CM and file will be provided to this contractor for use for layout.
9. All Subcontractors must be licensed as required by local, State, or Federal jurisdiction required for work of this trade in this project location.
10. This contractor shall include necessary supervision normal and customary to the scope of work of this size, difficulty, and scale.
11. This Subcontractor will comply with **Turner's corporate safety policy** contained in Attachment C of this RFP.
    a. Note the requirements for a full time Safety Manager.
12. **Refer to Project General Work Requirements**" in the project manual. Any costs for work scope items listed in this section shall be included in your lump sum offer. Some work items are listed for specific trade contractors and they shall include those costs in their respective total lump sum bid price.
13. **Temporary Provisions**
    a. Include provisions to leave openings in the Architectural Precast Facade at material hoist building floor access. Include base offer comeback cost to install at a later date. Include necessary weather protection to maintain building dry-in condition. Assume 1 location from column to column from level 1 through level 10.
        i. Include necessary hoisting, rigging, transportation, etc… to set these panels at a later date.
    b. This contractor to provide sufficient task lighting for erection of precast panels on 2nd shift.

c. This contractor is to provide their own power for welders. At no time shall the noise generated by generators be overwhelming or disruptive to University operations. Generators shall be placed to minimize noise and exhaust impacts.

14. Provide all embeds and miscellaneous metal plates and anchors as required for attachment of this work to others. Provide plan of embeds for use by others. Install embeds provided by others including but not limited to attachment of structural steel, and window washing equipment anchors. Include coordination with respective trades.
    a. Embeds installed by other shall have shop drawings with setting procedures, dimensions, and elevations with inserts or embeds.
    b. Prior to concrete placement, field verify location and elevation of all inserts and/or embeds. Report any discrepancies to the CM.
15. Provide **Mockups** (Partial) as it pertains to this contractor's scope of work in accordance with the documents.
    a. Include all material and labor to construct Visual Mockup for the exterior enclosure system applicable to this scope of work. Assume mockup sized to include all major building assemblies.
    b. Assume mockups will be built off site due to site constraints.
    c. Include separate shop drawings for mockups.
    d. Include separate mobilization to install mockups.
    e. Include all hoisting needs for the installation of mockups.
    f. In addition to full size mockups, include sample panels per the documents for each type of precast. Include any hoisting or off loading of these panels as necessary.
16. Provide **Architectural Precast Concrete** COMPLETE in accordance with the documents.
    a. Include PCS-01 and PCS-02. This includes panels with pattern and honed finish as called out in the documents.
    b. Include separate mobilization to erect the precast at the loading dock area. Include necessary hoisting, rigging, transportation, etc… to set the panels at a later date.
    c. Coordinate with Stone Panel (STP-02) and Curtain Wall/Metal Panel contractor where precast terminates into these assemblies.
    d. Coordinate with electrical contractor for any areas to receive accent lighting on precast wall assemblies. This includes any necessary box outs, or openings in precast panels.
    e. Assume roof membrane will be in place prior to erecting Precast panels. Coordinate installation of precast panels with roofing contractor for rolling the membrane back and maintaining a building dry-in condition at all times.
    f. Include blockouts for any MEP items including but not limited to: hose bibs, electrical junction boxes etc. Prior to casting, coordinate with the MEP Trade Contractors to ensure all items are addressed. Assume (30) 12"x12" box outs.
        i. Include all necessary labor, materials, and equipment to field cut ten (10) 12"x12" openings in panels at the CM's discretion.
    g. Provide all shims, bearing pads and anchors required to complete this work.

h. All prewelds must be installed prior to fireproofing. The Precast Trade Contractor is responsible to patch all fireproofing removed by the work of the scope.

i. All panels must be constructed in accordance with the joint layout as shown in the elevations. Under no circumstances is a deviation of the joint layout permitted unless authorized by the Owner and the Architect.

j. Provide 200 Journeyman hours and $5,000 worth of material for additional temp openings in the architectural precast assemblies to be used at the discretion of the CM.

k. Protect all existing buildings & utilities from damage due to this work.

l. Furnish and install all steel embeds required to be cast in precast. Furnish and install all miscellaneous steel for headers, block outs, etc… located within the precast system.

m. Include all necessary repairs of chips, spalls, touch up painting and misfits in accordance with the specifications.

    i. Include an additional 150 hours of labor and necessary materials and equipment to touch up/repair chips and spalls.

17. Provide **Joint Sealants** (Partial) as related to this scope of work in accordance with the documents.

    a. Provide all caulking and sealants to provide a complete and operational system, including, but not limited to precast to precast, precast to metal panels, and control joints.

    b. Provide all grouting, caulking of keyways, joints, lifting holes, etc. Also, include pointing and/or sealants for precast to precast and precast to other materials/joints.

18. The Structural Steel Subcontractor is to provide steel cable railing system at all leading edges and openings in the structure. When appropriate and in accordance with Turner's Safety Policy, provide **REMOVAL OF CABLE GUARDRAIL ASSEMBLY** at the perimeter of the building. This includes debris netting and associated toe-boards. Cables and components are to be discarded in dumpster. Turn debris netting over to CM.

19. All unloading, distribution, staging, hoisting, rigging, scaffolding, lifts, platforms, scissor lifts, boom lifts, planking, guying, sheeting, shoring, dewatering, bracing transportation, access for material, equipment and personnel required to perform this work is included in this contract. Turner will provide tower crane with operator at no charge to contractor for unloading and setting units.

20. This subcontractor will be responsible to reasonably protect their finish product until acceptance and will provide touch up as required.

21. This subcontractor is required to maintain a clean work area. This includes cleaning up at the end of each shift and as work progresses from one area to the next. Include disposing of materials from your work area to the dumpsters located at the construction hoist dock (See Logistics Plan).

    a. Include **2%** of total expected on-site labor hours to be applied toward composite clean crew. A composite clean schedule will be produced by the CM based on workload. Individual(s) will be required to sign in and sign out each day composite cleaning will occur.

22. Provide all winter weather protection required to perform this scope of work including but not limited to temporary heat.

23. This Subcontractor is responsible to repair any asphalt, roadway, curb/gutter, granite and sidewalk outside the area of demolition that is damaged by this Contractor, his Subcontractors, or haulers.
24. Include any site & street cleaning related to work performed by this scope.
25. Include any patching of fireproofing as a result of this scope of work.
26. Upon completion of the installation, the precast units shall be cleaned thoroughly prior to turnover. This cleaning is to include any dirt, stains, or markings caused during the fabrication, delivery, and installation process.
27. Include attending the following mandatory meetings through the duration of this scope of work:
    a. Once a week Coordination Meeting (approx. 1hr).
    b. Daily trade huddles (approx.. 15-20 mins).
    c. Preparatory Meetings prior to first installation of a feature of work as identified in this scope of work (1-3hrs depending on scope of work being covered).

B. Work Excluded

This Scope of Work shall exclude the following
1. Interior Structural Precast Shafts (i.e. stair shafts, elevator shafts, and mechanical shafts).
2. Expansion Joint Assemblies
3. STP-01

7.2 Optional Services

None

8.0 FINANCIAL OFFER SUMMARY

Offerors are to provide a fixed price for the services offered.

8.1 Mandatory Services (Section 7.1)

Please complete and attach Section 7.1 to provide support for your firm fixed price offer.

The Offeror agrees to furnish all labor, materials, supplies and services required to complete the Work, for the above referenced Project, for the Capital Construction Procurement Section, University of Kentucky, as described in the Specifications and Contract Documents and shown on the Drawings enumerated below and as modified by the Addenda listed above.

BASE OFFER

FOR THE LUMP SUM OF_____
(USE WORDS)

_____DOLLARS AND_____CENTS.
(USE WORDS) (USE WORDS)

($_____)

8.2 Optional Services (Section 7.2)

None

8.3 Alternate Pricing

Alternate 2 – Delete PCS-02 Material and Installation and add Exterior Wall Thin Brick on Unitized Frame

Provide pricing to not provide and install architectural precast at PCS-02 locations ONLY. This includes all materials, labor, shop drawings, trucking, rigging, etc…

Alternate 2 ADD/DEDUCT $_____

Bond Cost

Cost of Performance and Payment Bond (Base Offer + Alternates) $_____

DO NOT INCLUDE THIS COST IN YOUR BASE OFFER OR ALTERNATES

8.5 Cost Breakdown

Fill in the following breakdown of costs included in your base offer. Each item is to include labor, material & equipment. These will neither be considered unit prices nor will the numbers listed here limit obligations required in the solicitation documents. It will be used only to aid in verifying completeness of the offers.

DESCRIPTION OF WORK	COST INCLUDED IN OFFER
Preconstruction Assistance Services	$_____
SECTION 01 4439 Mockups	$_____
SECTION 03 4500 Precast Architectural Concrete (PCS-01)	$_____
SECTION 03 4500 Precast Architectural Concrete (PCS-02)	$_____
Cast-in Window Cleaning Anchor Allowance	$_50,000_____
General Work Requirements	$_____
Remaining work not listed above, Overhead & Profit	$_____
TOTAL BASELINE AMOUNT (SHOULD MATCH PROPOSAL)	$_____

Additional Financial Commitment

In addition to the financial offers, please propose a financial commitment to assist the University. Options may include a signing bonus, scholarships, internships, commitment to hire University Graduates or a (%) percentage rebate.

8.6 Unit Prices

None

8.7 Allowances

Cast-in Window Cleaning Anchor Allowance $50,000

8.8 Schedule of Values

Within seven (7) days after the contract signing, the SUCCESSFUL OFFEROR is to provide a breakdown for Monthly progress billing purposes in a format furnished by the Construction Manager. Each item is to be separated into Labor and Material, except Allowances. Minimum line items will be included for CCIP, Mobilization, Engineering/ Submittals, Safety, Clean Up, Close-Out, Punchlist, Record Drawings, Warranty, etc. The Successful Contractor is to list MBE/WBE Subcontracts and Purchase Orders separately in the Schedule of Values.

The Successful Contractor is to list MBE/WBE Subcontracts and Purchase Orders separately in the Schedule of Values.

8.9 Supplemental Information

1. Company Financial Statement
   * Pursuant to KRS 45A.110, if the offeror wishes nondisclosure of certain information he/she shall enclosed the confidential information in a separate envelope marked CONFIDENTIAL and forward it with the information and other submittals required by this document.

9.0 DRAWINGS AND SPECIFICATIONS

The following is a listing of contract documents:

1. Contract Drawings – UK Construct Health Education Building Project Number 2564.0 as prepared by JRA Architects, dated October 20th, 2023.
2. Project Manual, prepared by Turner Construction & JRA Architects, Inc. – Volumes One (1) University of Kentucky Health Education Building Project Number 2564.0
3. TCCo Sketches: SK-001, SK-002.1, SK-002.2, SK-002.3, SK-002.4

The Offeror, in compliance with your Request for Proposal for the above referenced Project, having carefully examined the site of the Work, the Drawings and complete Contract Documents as defined in Article I of the General Conditions, as well as the Specifications affecting the work as prepared by the Consultant, hereby proposes to furnish all labor, materials, supplies and services required to construct the Project in accordance with the Contract Documents, within the time set forth therein, and at the price stated below without qualification. Offeror understands that successful offeror will enter into a contract with Turner Construction Company utilizing Turner's Subcontract Agreement Form 36 without modification.

The Offeror hereby acknowledges receipt of the following Addenda:

ADDENDUM NO. _____ DATED _____

ADDENDUM NO._____ DATED _____

ADDENDUM NO._____ DATED _____

(Here insert the number and date of any Addenda issued and received. If none has been issued and received, the word NONE should be inserted.)

.

Attachment "A"
ADDITIONAL PROVISIONS

A. GENERAL

Attachment A – Additional Provisions and Attachment B – (Technical) Scope of Work go together to define the requirements of this Subcontract. Attachment A is a more of a general Summary of the Contract Documents, Price, etc., while Attachment B is the Trade Specific (technical) Scope of Work.

The Additional Provisions and Scope of Work is intended to be general in nature. The intention is to have this Subcontractor perform all related work shown on the Contract Documents other than those items specifically indicated below to be excluded. The Additional Provisions and Scope of Work takes precedence over the Drawings & Specifications in the event of a conflict in trade assignment or responsibility. By accepting this contract, the Subcontractor is verifying that the plans and specifications clearly identify the Subcontractor's work.

The terms "Sub-contractor", "Trade contractor" & "Contractor" will be used interchangeably throughout the contract documents. A Sub-contractor, Trade contractor or contractor has a contract with Turner Construction Company, the Construction Manager. This Trade Contractor is responsible for all contract documents (specifications, drawings and scope of work).

B. CONTRACT DOCUMENTS

- Contract Drawings – University of Kentucky Health Education Building #2564.0 as prepared by JRA Architects, dated October 20th, 2023.
- Project Manual, prepared by Turner Construction & JRA Architects. – University of Kentucky Health Education Building
- Addendum #__ dated _____ prepared by Turner
- Addendum #__ dated _____ prepared by Turner
- Addendum #__ dated _____ prepared by Turner
- Addendum #__ dated _____ prepared by Turner

C. ADDITIONAL CONTRACT DOCUMENTS

- **Attachment "B" – Trade Contractor ___ Scope of Work**
- **Project General Requirements**
- **Project General Conditions**
- **Project Special Conditions**
- Turner Subcontract Form 36
- Form 36 Early Subcontractor Involvement Rider
- **Attachment "C"** Project Safety Program
- **Attachment "D"** E&O Insurance Provisions
- **Attachment "E"** Accounting Procedures
- **Attachment "F"** Percentage Markup Sheet
- **Attachment "G"** Project Schedule
- **Attachment "I"** Lean Subcontract Exhibit
- **Attachment "J"** Electronic Agreement
- **Attachment "K"** CCIP Manual dated November 15th, 2023
- **Attachment "L"** UK HEB Tree Protection Standard
- **Sketches** SK-001
- Note: The General Building Permit will be provided by the others (architect). Obtain all other required permits; submit copies to the Construction Manager.
- Note: This Trade Contractor is required to sign Turner form 36 subcontract agreement included in the scope of work manual, which takes precedence over the General & Special Conditions
- All "Additional Contract Documents" have either been provided to Subcontractor, or are attached to this contract. Signature of Contract by Subcontractor indicates receipt and acceptance of these documents as part of the Contract.

D. CONSTRUCTION SCHEDULE

ADDITIONAL PROVISIONS

- Refer to Project Milestone schedule (ATTACHMENT "G") included in project manual.
- Shift work, multiple mobilizations, and out of sequence work will be required. It is imperative that all milestones be met. The Bidders shall include all necessary costs, including, but not limited to, premium time, shift work, out of sequence work, etc. to meet these milestones.
- Due to the critical nature of the schedule, the Trade Contactor must supply the Construction Manager a detailed plan for his production on the project within 20 calendar days of Contract Award. Please note that this plan must be compatible and complimentary to the Project Schedule. Plan shall include the following items:
    A. Starting, peak, and final manpower requirements, including subcontractors. Include production rates if requested
    B. Shift work plan.
    C. Number of Foremen
    D. Anticipated lead times and permit approval.
    E. The Trade Contractor shall work with the Construction Manager and Contractors in "Pull Planning" and the 6-week look-ahead schedule, including manpower information, on a weekly basis. Compliance is a prerequisite for payment.

E. WORK INCLUDED

Refer to Attachment "B" – Scope of Work

F. SPECIAL REQUIREMENTS

- Sales/Use Tax Status: Refer to "Instruction to Bidders" of Bid Manual for details. This project is taxable, all applicable taxes in your bid.
- Prevailing Wage: N/A, not required.
- Insurance Program: This Project shall utilize a Contractor Controlled Insurance Program ("CCIP"). Refer to attachment D of Bid Manual for details, instructions, etc.
- Retainage: If job is Kentucky (any job) – Retainage Conditions shall be in accordance with the "Fairness in Construction Act" of 2007. Namely, Retainage for all Subcontractors shall be 10% until both the Project and the Subcontractor achieves 50% completion. At that point, retainage for all Subcontractors shall be reduced to 5% of Total Contract Value.
- E&O Insurance: N/A
- Builders Risk: (policy by Turner). Refer to Project General Requirements document for details including responsibility for deductible. Any such event occurring upon the Work site, covered under Builder's Risk policy and for which a claim is filed, the causing subcontractor shall be held responsible to incur the deductible cost of this policy in its entirety for said occurrence.
- Application for Payment: Unless otherwise directed or authorized, in writing, by Contractor, all Applications for Payment and all supporting documents (including but not limited to lien waivers, sworn statements, and the like) for Subcontractor and its sub-subcontractors and suppliers, shall be in electronic format and shall be submitted to Contractor using the Textura-CPM™ payment management system. Subcontractor shall be responsible for the fees and costs owed associated with Subcontractor's use of the Textura-CPM™ payment management system. Subcontractor shall include a similar provision in its sub-subcontracts and purchase orders. Fees to Subcontractors are calculated as 0.22% (22 basis points) of contract value, with a minimum fee of $50 and a maximum fee of $3,750. Fees to Subcontractors' sub-subcontractors and suppliers are a fixed fee of $100 per sub-subcontractor or supplier contract.
- Turner Accelerated Payment Program - The attached KENTUCKY Rider - Accelerated Payment Program amends and supplements your Agreement with Turner and provides you the opportunity to enroll in the Program through Textura CPM and receive accelerated payments from Turner on your invoices. Formal enrollment into the Program can then be accomplished via the Textura CPM system. Additional information and Program benefits are included in the attached Turner Accelerated Payment Program summary. You may be contacted by a representative from Turner or Textura who can provide additional information on the Program and answer questions you may have or you may call Textura at 1-866-TEXTURA (839-8872) with any questions.
- OSHA 30 Hour Certification: All subcontractors must have completed an OSHA 30 hour class. One person must be certified for all contracts under $5M, and two people must be certified for contracts over $5M. The 30

hour certified person(s) must be on-site 100% of the time. This OSHA 30 hour certification must be updated through Turner's 1.5 hour Safety Update Training every two years through Turner University.

- Stormwater Compliance: If this project is required to obtain an NPDES permit per the EPA, all subcontractors working on the site will be required to attend the Turner Stormwater Subcontractor Orientation and Pre-Plan meeting prior to beginning work, and weekly coordination meetings. Furthermore, Subcontractors involved in earth moving/disturbing activities (excavation, foundation or utility trenching/excavation, grading, landscaping, paving, on site batch plant) or those responsible for installing or maintaining BMP's will be required to take the online Turner Stormwater Subcontractor Short Course Intro into Erosion and Sediment Control prior to attending the preconstruction meeting. The person or persons taking this online course must have a regular presence on the project. All subcontractors must comply with the requirements of the Stormwater Permit.
- Asbestos/ Lead Awareness: **N/A**
- Waste Tracking Requirements: Subcontractor who includes removal of waste from the project site ("dumpsters") as part of their scope of work, will submit all waste data using TurnerTracker account (monthly cost paid by subcontractor or their waste hauler). Data must be entered into the Online Waste Tracking system by the fifth (5th) day of the month following the invoice period. Subcontractor shall make every effort to maximize percentage of material recycled.

  All Subcontractors shall comply with the project Construction Waste Plan. This may include sorting your construction waste and placing it in appropriate dumpsters (either co-mingled or site-sorted) per the project CWP. All subcontractors are required to recycle to the maximum extent possible per the terms of the Subcontract Agreement
- MBE/WBE participation: Refer to MBE/WBE Participation Goals document for details regarding the project inclusion program and/or goals for the University of Kentucky.
- No-Idling Standard: Trade partner agrees to comply with Turner's No-Idling Standard. All trade partner vehicles within the project site fence (including, but not limited to, transportation and construction equipment, delivery trucks and personal or company trucks) shall not idle. The only allowable exceptions to the standard are as follows:
  1. Ambient air temperature exceeds 85°F or falls below 32°F (or as defined by local or regional temperature limits, whichever is stricter)
  2. Engine idling is required for the function of auxiliary equipment (i.e. cranes, concrete pumps, etc.)
- **Additional Subcontract Agreement Article Pertaining to Harassment**

  This agreement includes and acknowledges the addition of the following Article as if inserted immediately following the Ethics and Compliance Article of this agreement as follows:

  New Article XV: Harassment

  It is the goal of Contractor to promote a work environment at the Project that is free from harassment of any kind. Contractor has ZERO TOLERANCE for harassment, including harassment on the basis of race, sex, gender, gender identity, gender expression, transgender status, sexual orientation, pregnancy, childbirth and other pregnancy-related conditions, color, national origin, ancestry, age, religious creed, citizenship, marital status (including registered domestic partners), parental status, physical disability, mental disability, medical condition, genetic information, military or veteran status (including protected veteran status), or any other characteristic or status protected by law. Subcontractor agrees to be bound by the Policy Statement on Harassment referenced in Article XXII below, and any violation or suspected violation of such policy by Subcontractor or any of its officers, agents, servants, employees, subcontractors or suppliers shall be considered as Subcontractor's failure to perform its obligations under the terms and conditions of this Agreement. Such failure shall be considered adequate and justifiable grounds for Contractor to effectuate its rights and remedies under the provisions of Article XI of this Agreement. Subcontractor shall actively promote a harassment-free work environment among its officers, agents, servants, employees, subcontractors, and suppliers.

G. WORK EXCLUDED

Refer to Attachment "B" – Scope of Work

Attachment "A"
ADDITIONAL PROVISIONS

H. ALTERNATE PRICES

Refer to Attachment "B" – Scope of Work for Description of Alternate

I. ALLOWANCES

Refer to Attachment "B" – Scope of Work for Description of Allowances. Contract Prices INCLUDES Allowances

J. UNIT PRICES

Refer to Attachment "B" – Scope of Work for Description of Unit Prices

K. CONTRACT PRICE SUMMARY

Base Bid Amount	$
Adjustments	
CONTRACT TOTAL	**$**

By execution of this Agreement, Subcontractor agrees that Subcontractor's proposal, including all quantities, terms, and conditions, is Null and Void. This Subcontract Agreement details the terms of the Agreement, and shall be the primary reference point for clarifications of issues during course of project.

END OF ADDITIONAL PROVISIONS

Attachments:

- Attachment B - Scope of Work for this Subcontract Agreement

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FOR CONSTRUCTION BY TRADE CONTRACTORS
via CONSTRUCTION MANAGER AT RISK CONTRACT
University of Kentucky
Capital Construction Division

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GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION BY A CONSTRUCTION MANAGER AT RISK
University of Kentucky Capital
Construction Division

These General Conditions are binding upon the Construction Manager and all Sub-contractors as each are subject to the provisions contained herein.

ARTICLE 1 - DEFINITIONS

1.1 Wherever used in these General Conditions or in other Contract Documents, the following terms have the meaning indicated which are applicable to both the singular and plural thereof:

1.1.1 ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS (ASI) - The term "ASI" means a written order issued by the Consultant that clarifies or interprets the Contract Documents, that orders minor changes in the Work, that does not require an adjustment in either cost or time, and that does not require a Change Order.

1.1.2 BUSINESS DAY – The term "Business Day" means a Calendar Day that is not a Saturday, Sunday or legal holiday in Fayette County, Kentucky.

1.1.3 CALENDAR DAY - The term "Calendar Day" means a day of twenty-four hours measured from midnight to the next midnight

1.1.4 CHANGE ORDER - The term "Change Order" means a written order to the Construction Manager, signed by the Owner and issued after the execution of the Contract, directing a change in the Work or an adjustment in the Contract Amount or the Contract Time. A Change Order may be an agreed change by the Construction Manager and the Owner or it may be a unilateral change by the Owner.

1.1.5 CONSULTANT - The term "Consultant" means the person and/or entity, whether singular or plural, either Architect, Engineer or other Consultant, who is or are identified as such in the Contract Documents.

1.1.6 CONSTRUCTION MANAGER or CONSTRUCTION MANAGER AT RISK (CM) - The term "Construction Manager" or "Construction Manager at Risk" (CM) means the person or entity who will or has entered into a contract with the Owner that assumes the risk for construction of the Project as the construction manager, and who will provide consultation and collaboration regarding the construction during and after design of the Project. The CM shall execute and hold all construction Trade Contracts and Purchase Orders for the Project.

1.1.7 CONTRACT - The term "Contract" means the Contract between Owner and Construction Manager and consists of all Contract Documents as defined in Article 1.1.10 of these General Conditions.

1.1.8 CONTRACT AMOUNT - The term "Contract Amount" means the sum stated in the Agreement which represents the total amount payable by the Owner to the Construction Manager for the performance of the Work under the Contract Documents, plus or minus adjustments as provided for in the Contract Documents or by approved Change Orders.

1.1.9 CONTRACT DOCUMENTS - The "Contract Documents" include the Agreement of Contract between the Owner and the Construction Manager (the "Agreement"); the Request for Proposal; the General Conditions; the Special Conditions; the Construction Manager's Form of Proposal; the Construction Manager's Bonds; the Specifications, Drawings and Addenda for the construction of the Project which are to be used for bidding of the bid pack/Trade Contracts; and any Change Orders issued after execution of this Contract. The Contract Documents shall not be construed to create a contractual relationship of any kind between the Owner and any Sub-contractor, or any person or entity other than the Construction Manager. Documents not included or expressly contemplated in this Article do not, and shall not, form any part of the Contract for Construction. Without limiting the generality of the foregoing, shop drawings and other submittals from the Construction Manager or its Sub-contractors and suppliers do not constitute a part of the Contract Documents. Except as

otherwise provided, where these Contract Documents obligate the Construction Manager to certain responsibilities or require the Construction Manager to perform certain actions, the Construction Manager may require these same responsibilities and/or actions of one or more Sub-contractors. However, assignment of such responsibilities or actions to one or more Sub-contractors shall not be construed to relieve the Construction Manager of its obligation to the University under this contract.–

1.1.10 CONTRACT TIME - The term "Contract Time", unless otherwise provided, means the specified number of consecutive Calendar Days following the stipulated commencement of the Work as stated in the Work Order, plus or minus adjustments as provided for by approved Change Orders, within which the Trade Contractor shall complete the Work required by the Contract and shall achieve certification of substantial and final completion.

1.1.11 KRS REFERENCES - Reference to “KRS” means the "Kentucky Revised Statutes" adopted by the Commonwealth of Kentucky, including all laws that may have been revised, amended, supplemented or new laws enacted.

1.1.12 OWNER - The term "Owner" means the University of Kentucky, a statutory body corporate existing pursuant to Sections 164.100 et seq. of the Kentucky Revised Statutes.

1.1.13 PROJECT - The term "Project" means the total construction of the Work performed under the Contract Documents, which may be the whole or a part, and which may include construction by the Owner or by separate contracts.

1.1.14 PROJECT MANAGER - The term "Project Manager", when used alone, means the Owner's representative responsible for administration and management of the Project. The Owner's Project Manager during construction shall be the designated University of Kentucky Capital Projects Management Project Manager that is in charge of the Project. The term “CM Project Manager” means the individual employed by the Construction Manager who is assigned to the Project to provide overall management during both the design and construction phases of the Project, and who has total responsibility for the successful completion of the Project

1.1.15 PROVIDE - The term "Provide," as used throughout the specifications, shall mean furnish, install and pay for.

1.1.16 SHOP DRAWINGS - The term "Shop Drawings" means drawings, diagrams, schedules, and other data specially prepared for the Work by the Trade Contractor or any Sub-contractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

1.1.17 SUBSTANTIAL COMPLETION - The term "Substantial Completion" is the point at which, as certified in writing by the Owner, a project is at the level of completion, in strict compliance with the contract, where (a) necessary approval by public regulatory authorities (and by other authorities having jurisdiction or as identified in Article 11.2, as necessary) has been given; (b) the Owner has received all required warranties and documentation, and (c) the Owner may enjoy beneficial use or occupancy and may use, operate, and maintain the project in all respects, for its intended purpose. Partial use or occupancy shall not necessarily result in the project being deemed substantially complete and shall not be evidence of Substantial Completion. In order for the Owner to enjoy beneficial use or occupancy and use, operate, and maintain the project in all respects, for its intended purpose, the stage or progress of the Work or a designated portion thereof shall be sufficiently complete, accessible, operable and usable, and all parts, systems and site Work shall be 100% complete, cleaned and available for the Owner’s full use without interruption in accordance with the Contract Documents, including but not limited to the provisions of Article 28 of these General Conditions. The Work will not be considered acceptable for Substantial Completion review until all Project systems included in the Work are operational as designed and scheduled, all designated or required governmental inspections and certifications have been made and approvals provided to the Owner, designated instruction of the Owner’s personnel in the operation of systems has been completed, and all final finishes within the Contract Documents are in place. In general, the only remaining Work shall be minor in nature so that the Owner and/or the Owner’s tenants could occupy the Project on that date and the completion of the Work by the Trade Contractor would not materially

interfere or hamper the Owner's or the Owner's tenants' normal business operations. As a further condition of Substantial Completion acceptance, the Construction Manager shall certify in writing that all remaining Work, the same being solely of a "punch list" nature, will be completed within thirty (30) consecutive Calendar Days following the date of Substantial Completion.

1.1.17.1 The parties agree that "substantial completion" as defined in Article No. 2 of the Agreement and Article 1 of the General Conditions, as extended by approved Change Order(s) pursuant to Article 18.1 of the General Conditions, shall be the "date of completion specified in the contract" for purposes of KRS. 45A.250(2).

1.1.18 SUB-CONTRACTOR (Trade Contractor) - The term "Sub-contractor" ("Trade Contractor ") means the person, company, corporation, joint venture or other legal entity with whom the Construction Manager has executed a Contract for a portion of the Work.

1.1.19 WORK - The term "Work" means the scope of construction and services required by the Contract Documents and all approved Change Orders, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Trade Contractor to perform and complete the Construction Manager's obligations under the Contract in an expeditious, orderly and workmanlike manner. The Work may constitute the whole or a part of the Project.

1.1.20 WORK ORDER - The term "Work Order" means a written notice by the Owner to the Construction Manager authorizing the Construction Manager to commence Work under the Contract and establishing the beginning date from which the time for Substantial and Final Completion shall be established.

1.1.21 UNIT PRICE - The term "Unit Price" means the amount per unit of measurement for materials or services as described in the bid documents.

ARTICLE 2 - CONSULTANT

2.1 The Consultant will be the Owner's representative during construction and until the Work is complete. The Consultant will advise and consult with the Owner. The Owner's instructions to the Construction Manager may be forwarded through the Consultant.

2.2 The Consultant will regularly, but no less frequently that monthly, visit the site to become familiar with the progress of the Work, the quality of the Work being provided and to determine if the Work is proceeding in accordance with the Contract Documents. On the basis of these on-site inspections, the Consultant will inform the Owner of the progress of the Work, will advise the Owner of any defects and deficiencies observed in the Work and, when appropriate, will certify to the Owner that the Work in place equals or exceeds the amount requested by the Construction Manager on all applications for progress payments.

2.2.1 If applicable for the Work, the Consultant will verify to the Owner that the Trade Contractor(s) is performing erosion prevention and sediment control inspections as required by the Kentucky Division of Water Construction General Permit (KYR10) at least once every 7 days and shall include the findings in the site visit reports.

2.3 The Consultant will be the interpreter of the requirements of the drawings and specifications and any changes made to the drawings and specifications.

2.4 Claims, disputes, and other matters in question that arise relating to the execution or the progress of the Work shall be referred in writing to the Construction Manager by the Trade Contractor. The Consultant will provide a response in accordance with and subject to the provisions of Article 38 of these General Conditions.

2.5 The Consultant will have the authority to reject Work which does not conform to the Contract Documents or to the required level of quality and performance.

2.6 The Consultant will review and approve, or take other appropriate action upon receipt of the Trade Contractor(s) submittals such as Shop Drawings, product data, and samples. The review of submittals will be for general conformance with the design concept of the work, and for compliance with the information provided by the Contract Documents. Such review will not relieve the Trade Contractor(s) of any responsibility for errors or omissions in submittals, and will in no way constitute a waiver of or change to the requirements of the Contract Documents.

2.6.1 The Consultant's review and response will be completed with reasonable promptness with a goal of ten (10) business days or less. The Consultant's review of a specific item shall not indicate approval of an assembly of which the item is a component.

2.7 The Consultant will prepare Change Orders for the Owner to direct changes in the Work. Minor changes in the Work, not involving modifications to the contract cost or completion times and that are consistent with the purpose of Work, may be directed by the Consultant through Architect's Supplemental Instructions (ASI).

2.8 When requested by the Construction Manager, the Consultant will conduct inspections to determine if the Project is at the level of completion required by and is in strict compliance with the Contract such that the Owner may enjoy beneficial use or occupancy and may use, operate, and maintain the project in all respects for its intended purpose, as further defined in the Contract. If the level of completion warrants, the Consultant will confirm that all necessary approvals by public regulatory authorities or other authorities having jurisdiction have been given, will confirm that the Owner has received all required warranties and documentation, will recommend dates for certification of Substantial Completion and Final Completion by the Owner, and will complete and submit the Notice of Termination of coverage under the KPDES General Permit for Storm Water Discharges Associated with Construction Activity.

2.9 The Construction Manager will accept direction for the Work on the Project only from the Owner's Project Manager or from the Consultant. Requests for information from the Trade Contractor(s) shall be directed to the Consultant.

ARTICLE 3 - CORRELATION AND INTENT OF CONTRACT DOCUMENTS

3.1 Execution of the Contract by the Trade Contractor(s) is a representation that the Trade Contractor(s) has or shall thoroughly and carefully examine the site of the of Work; shall timely investigate all conditions which can affect the Work or its cost, including but not limited to availability of labor, materials, supplies, water, electrical power, roads, access to the site, uncertainties of weather, water tables, the character of equipment and facilities needed to perform the Work, and local conditions under which the Work is to be performed; and further, that the Construction Manager shall insure that the documents issued for bidding by Sub-contractors reflect the results of this investigation and are adequate to complete the Work. It is the responsibility of the Trade Contractor(s) to be familiar with and comply with all Federal, State, and local laws, ordinances, and regulations which might affect those engaged in the Work, and to be familiar with the materials, equipment, or procedures to be used in the Work, or which in any other way could affect the completion of the Work. The Trade Contractor(s) shall carefully study and compare the Contract Documents with each other and with other information provided to the Trade Contractor(s) by the Construction Manager, Consultant, or the Owner pursuant to the Contract Documents and shall notify the Owner and the Consultant via the Construction Manager in writing of any errors, inconsistencies or omissions in the Contract Documents recognized by the Trade Contractor(s). Any failure to properly familiarize itself with the proposed Work shall not relieve the Trade Contractor(s) from the responsibility for completing the Work in accordance with the Contract Documents.

3.2 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Trade Contractor(s). All labor or materials which are reasonably inferable from the Contract Documents and which are necessary to produce the desired result, even though not specifically mentioned in the Contract Documents, shall be included in the Work at no additional cost to the Owner.

3.3 In the event a question arises regarding the meaning or intent of the Contract Documents, the Trade Contractor(s) shall report it by preparing an RFI in eCommunication® to the Consultant. The Consultant shall

furnish, with reasonable promptness and with a goal of three (3) business days and by whatever means as may be appropriate, additional instructions necessary for the proper execution of the Work. All such drawings and instructions shall be consistent with the Contract Documents, true developments thereof, and reasonably inferable therefrom. The Work shall be executed in conformity therewith and the Construction Manager shall do no Work without proper drawings and instructions. Items indicated on drawings as "N.I.C." or "Not In Contract" are shown for explanation purposes only and are not to be included in this Contract.

3.4 The Contract Documents are complementary, and what is required by one shall be binding as if required by all. In case of conflicts between the various documents, the order of precedence will be as follows: (1) Addenda, (2) Special Conditions, (3) General Conditions, (4) Technical provisions of the Specifications and (5) Drawings.

3.5 Any notice to the Construction Manager from the Owner regarding this Contract shall be in writing and delivery and service of such notice shall be considered complete when sent by certified mail to the Construction Manager at Construction Manager's last known address. Such notice may also, at the Owner's election, be hand-delivered to the Construction Manager or the Construction Manager's authorized representative.

ARTICLE 4 - PRE-CONSTRUCTION CONFERENCE

4.1 Following the execution of the Contract, a pre-construction conference will be held. Representatives of the Capital Project Management Division, Consultant, Construction Manager, and all major Sub-contractors shall be present to discuss the time for construction, methods and plan of operation, authority of the Consultant, procedures for handling shop drawings, progress estimates and requests for payments, and other relevant issues. The time and location of this meeting will be the responsibility of the Construction Manager in consultation with the Consultant, Owner and other interested parties.

4.2 Environmental aspects of the project, including erosion prevention and sediment control (EPSC) and storm water management shall be discussed during this conference. The Group shall discuss the Storm Water Pollution Prevention Plan (SWPPP) to ensure that all parties understand the requirements. During this meeting the responsibility for reading the rain gage on a daily basis will be established. The Construction Manager will identify the initial measures to be installed prior to land disturbing activities beginning. Any modifications to the SWPPP due to constructability issues should be discussed at this conference.

ARTICLE 5 - SHOP DRAWINGS

5.1 The Trade Contractor(s) shall submit a shop drawing and product sample submittal schedule to the Construction Manager establishing dates for the submission of Shop Drawings and product samples prior to the submittal of the Trade Contractor(s)'s first application for payment for construction phase services. The schedule shall have been coordinated with all Sub-contractors and material suppliers as well as the Construction Manager's construction schedule and shall allow for adequate and reasonable time for review of the samples and submittals by the Consultant. The Trade Contractor(s) shall be responsible for compliance with the submittal schedule and shall insure that the submittal schedule is maintained in order to accurately reflect the status of processing all required submittals.

5.2 The Trade Contractor(s) shall review product samples and Shop Drawings for compliance with the requirements of the Contract Documents, and shall submit them to the Consultant via the Construction Manager in accordance with submittal procedure and schedule established. The Trade Contractor(s) review and submittal to the Consultant via the Construction Manager of any Shop Drawing or sample shall constitute a representation to the Owner and Consultant that a) the Trade Contractor(s) has determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, or assumes full responsibility for doing so, and that b) each Shop Drawing or sample has been reviewed or coordinated with the requirements of the Work and the Contract Documents. Shop Drawings and submittal requirements shall not be deemed satisfied until approvable documents are received by the Consultant. Incorrect or incomplete submittals will be returned to the Trade Contractor(s) without action. No claim for additional time or extension of the

contract will be considered if such claim is the result of failure by the Trade Contractor(s) to provide correct, accurate, complete and approvable submittals.

5.3 The Consultant will review submittals with reasonable promptness, and take appropriate action or return submittals to the Trade Contractor(s) for corrections as may be required. The Trade Contractor(s) shall make any corrections required by the Consultant for compliance with the Contract and shall return the required number of corrected copies of Shop Drawings and resubmit new samples until approved. The Trade Contractor(s) shall direct specific attention, in writing, or on resubmitted Shop Drawings, to revisions other than the corrections called for by the Consultant on previous submissions.

5.4 Where a Shop Drawing or sample submission is required by the specifications, no related Work shall be commenced until the submission has been accepted in writing by the Consultant. The review and acceptance shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents. The acceptance of a separate item will not indicate acceptance of the assembly in which the item functions. A copy of each accepted Shop Drawing and product sample shall be kept in good order by the Trade Contractor(s) at the site and shall be made available to the Consultant on request.

5.5 The Consultant's acceptance of Shop Drawings or samples shall not relieve the Trade Contractor(s) from the responsibility for any deviations from the requirements of the Contract Documents unless the Trade Contractor(s) has in writing called the Consultant's attention to such deviation at the time of submission and the Consultant has given written approval to the specific deviation. Any acceptance by the Consultant does not relieve the Trade Contractor(s) from responsibility for errors or omissions in the Shop Drawings.

ARTICLE 6 - LAYING OUT WORK

6.1 The Trade Contractor(s) will secure all data at the site of the building such as grades of lot, convenience of receiving and sorting material, location of public services, and other information which will have a bearing proposals or on the execution of the Work and shall address these issues in the preparation of scopes of work for the Subcontract bid packages. No allowance shall be made for failure of the Trade Contractor(s) to obtain such site information prior to submitting their proposal or to include such information in the Subcontract bid packages, and no adjustment to the Trade Contractor(s) Contract amount or stipulated time for completion shall be allowed when due to failure by the Trade Contractor(s) to do so.

6.2 The Trade Contractor(s) shall be responsible for all lines, levels and measurements of all Work executed under the Contract. The Trade Contractor(s) shall verify all dimensions before laying out the Work and will be held responsible for any error resulting from failure to do so. Working from lines and levels established by the property survey or by other Contract Documents, and as shown in relation to the Work, the Trade Contractor(s) will establish and maintain bench marks and other dependable markers to set lines and levels for Work at each area of construction and elsewhere on the site as needed to properly locate each element of the entire Project. The Trade Contractor(s) shall calculate and measure from the bench marks and dependable markers required dimensions as shown (within recognized tolerances if not otherwise indicated), and shall not scale drawings to determine dimensions. The Trade Contractor(s) shall advise Sub-contractors and trades persons performing Work of marked lines and levels provided for their use in layout work. The Trade Contractor(s) shall verify layout information shown on drawings as required for the Work.

6.3 The Trade Contractor(s) shall be responsible for coordination of the installation of all elements of the Work, including preparation of coordination drawings if required by the Contract Documents or deemed necessary by the Trade Contractor(s) for performance of the Work.

6.4 If any encroachments are made by the Trade Contractor(s) or any Sub-contractor on any adjacent property, the Trade Contractor(s) shall, at the Trade Contractor(s) expense, and within thirty (30) Calendar Days after written notice from the Owner or the Consultant, correct any encroachments and obtain approval from the owner of such adjacent property for any encroachments that cannot be feasibly corrected. The Trade Contractor(s) shall not be entitled to any adjustment to the Contract Amount or the Contract Time as a result of any such encroachment or the correction thereof.

ARTICLE 7 - PLANS, DRAWINGS, SPECIFICATIONS AND RECORD DRAWINGS

7.1 Unless otherwise provided in the Contract Documents, the Owner will furnish the Construction Manager free of charge one electronic or reproducible copy of the Drawings and Specifications for execution of the Work. The Trade Contractor(s) shall pay for the cost of duplication of all sets required over and above this amount.

7.2 The cost of additional plans, specifications and official contract documents for use by Sub- contractors for bidding and for construction shall be borne by the Trade Contractor(s) or by the Sub-contractors. Arrangements for orders and payment for plans, specifications and other contract documents must be made with Lynn Imaging, Lexington, Kentucky (http://www.ukplanroom.com) or by phone at 1.800.888.0693 or 859.255.1021) before a set of documents will be issued.

7.3 The Trade Contractor(s) shall keep one copy of all Contract Documents, including Drawings, Specifications and Shop Drawings on the site and in good order. A qualified representative of the Trade Contractor(s) shall record on these documents, from day to day as Work progresses, all changes and deviations from the Contract Documents. Prior to Substantial Completion, each Trade Contractor (via the Construction Manager) shall complete and turn over to the Consultant the As-Built drawings, with a digital copy (in PDF format) submitted to the Owner simultaneously. The As-Built drawings shall consist of a set of drawings which indicate all field changes that were made to adapt to field conditions, changes resulting from Change Orders and all concealed and buried installations of piping, conduit and utility services. All buried and concealed items, both inside and outside the facility, shall be accurately located on the As-Built drawings as to depth and in relationship to not less than two permanent features such as interior or exterior wall faces. The As-Built drawings shall be clean and all changes, corrections and dimensions shall be given in a neat and legible manner in a contrasting color. For any changes or corrections in the Work which are made subsequent to the Substantial Completion Inspection, revisions shall be made to the As-Built drawings and submitted to the Consultant prior to final payment. Approval of the final payment request shall be contingent upon compliance with these provisions.

7.4 All drawings, specifications and copies thereof, furnished by the Consultant to the Owner, are the property of the University of Kentucky. They shall not be used by the Consultant, Construction Manager, or any Sub-contractor or Supplier on any other Project.

ARTICLE 8 - TEMPORARY UTILITIES

8.1 The Trade Contractor(s) shall provide and pay for, unless modified in the Special Conditions, all temporary conveniences including, but not limited to, wiring, lighting, power and electrical outlets, heat, water, and sanitary facilities required for construction. In the event the Owner elects to make available, at no cost to the Trade Contractor(s), the electric power required for construction activities, the electric power supplied shall not be utilized as a means to provide temporary heat or for welding.

8.2 The Trade Contractor(s) is responsible for paying all utility costs, whether the costs are from an outside utility company or from the University, for utility services used in the course of completing the Work. The Trade Contractor(s) shall provide temporary heating, ventilation, telephones, water, electricity, portable gas, lighting for the Work, safety lighting, security lighting, and trash removal/dumpster service for both Trade Contractor(s) and Sub-contractor use during the Project. Work and safety lighting shall be provided continuously during working hours. Security lighting shall be provided at all hours of darkness.

ARTICLE 9 - MATERIALS, EQUIPMENT, APPLIANCES, AND EMPLOYEES

9.1 Unless otherwise provided in the Contract Documents, the Trade Contractor(s) shall provide and pay for all materials, labor and personnel, tools, equipment, construction equipment and machinery, utilities, supplies, appliances, transportation, taxes, temporary facilities, licenses, permits and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and the proper execution and completion of the Work safely, without damage to persons and property, and in compliance with all applicable law. The

Trade Contractor(s) shall furnish, erect, maintain, and remove at the completion of the Contract, all temporary installations as may be required during the construction period.

9.2 Immediately following the execution of each of the Trade Contracts, the Trade Contractor(s) shall determine the source of supply for all materials required under that Trade Contract and the length of time required for their delivery, and shall assure that orders are placed for such materials in sufficient time to assure delivery to the site so that such materials are available to be incorporated into the Work when needed to comply with the schedule of Work.

9.3 The Trade Contractor(s) shall immediately notify the Consultant (via the Construction Manager) in writing of any known problems with the procurement, fabrication or ordering of any materials. Unless changes are approved in writing by the Consultant, the Trade Contractor(s) will not be excused for delays in securing materials specified.

9.4 The Trade Contractor(s) or Sub-contractors shall not place purchase orders or issue contracts for materials, supplies, equipment and services necessary to complete this Project using the name of the University of Kentucky. All orders placed by the Trade Contractor(s) that are related to this Project must use the name of the Trade Contractor(s) or Sub-contractor placing the order. The use of the University of Kentucky's name for ordering purposes is strictly prohibited. Payment for all goods and services required for the completion of the Work is the sole responsibility of the Trade Contractor(s). Any invoices received at the University that are related to this Project will be immediately forwarded to the Trade Contractor(s). Copies of these invoices will be made and placed in the Trade Contractor(s)'s file and proof must be provided that these invoices have been paid in full prior to the processing of the next scheduled application for progress payment.

9.5 The route for delivery of all materials to the Project shall be coordinated with the Owner's Project Manager.

9.6 The Trade Contractor(s) shall be responsible for the proper and adequate storage of materials and equipment. Unless otherwise provided in the Contract Documents, all materials shall be of good quality and new. Workmanship and materials supplied and incorporated into this Work shall be of first quality. The Trade Contractor(s), if required, shall furnish satisfactory evidence as to the kind and quality of materials.

9.7 The Trade Contractor(s) shall at all times enforce strict discipline and good order among all employees and Sub-contractors. The conduct of all individuals performing Work or operations related to the Work is the responsibility of the Trade Contractor(s). The consumption of alcohol or drugs on the job by any workers is strictly prohibited. Any individual apprehended under the influence of alcohol or drugs on the premises at any time shall be subject to automatic removal from the Project by the Construction Manager, the Consultant or the Owner. Improper conduct of any kind will not be permitted and may result in the offending individual, Sub-contractor or Trade Contractor(s) being barred from the Owner's premises. The Trade Contractor(s) shall not permit the employment on the Project of any person unfit or not skilled in the Work assigned.

ARTICLE 10 - ROYALTIES AND PATENTS

10.1 The Trade Contractor(s) shall pay all royalties and license fees. If a particular process, product or device is specified in the Contract Documents and it is known to be subject to patent rights or copyrights, the existence of such rights shall be disclosed in the Contract Documents and the Trade Contractor(s) is responsible for payment of all associated royalties. The Trade Contractor(s) hereby agrees to indemnify, defend and hold the Owner, and any subsidiary, parent, or affiliates of the Owner, or other persons or entities designated by the Owner, and their respective directors, officers, agents, employees and designees (collectively, the “Indemnities”) harmless from all losses, claims, liabilities, injuries, damages and expenses, including attorneys’ fees and legal expenses, that the Indemnities may incur as a result of the Trade Contractor(s)’s failure to strictly comply with its obligations under this Paragraph 10.1.

ARTICLE 11 - SURVEYS, PERMITS, REGULATIONS, AND STANDARD CODES

11.1 The Owner will furnish only such surveys that are specifically required by the Contract Documents. Approvals, assessments, and easements for permanent structures or permanent changes in existing structures shall be secured and paid for by the Owner, unless otherwise specified. All required utility tap-on fees shall be secured and paid for by the Trade Contractor(s), or included in a Trade Contract, including the Lexington-Fayette Urban County Government (LFUCG) sewer tap-on fee**.** All construction permits, where required by local ordinances, except excavation permit, shall be obtained by the Trade Contractor(s), but no fee shall be charged to or paid by the Trade Contractor(s) as the Owner is exempt from such charges. A Contractor's license fee for doing business in the locale, if applicable, shall be paid for by the Trade Contractor(s).

11.2 All branches of Work shown on the plans and specifications shall be executed in strict compliance with all state and federal regulations and codes, with all national codes, and with the requirements of both ADA and JCAHO when applicable.

11.3 The Contractor, on projects disturbing 1 acre or more, or projects less than 1 acre that are part of a large common development plan, including grading, clearing, excavation, material laydown or other earth moving activities, shall assure full compliance with the requirements of the KYR10 and shall:

11.3.1 File a Notice of Intent (KPDES FORM eNOI-SWCA) with the Kentucky Division of Water and copy the UKCPM Project Manager and Water Quality Manager prior to the start of any excavation, grading or site development work.

11.3.2 The permittee (contractor) shall develop a Stormwater Pollution Prevention Plan (SWPPP) based on the Erosion Prevention and Sediment Control Plan (EPSC) as a minimum design standard. Ensure all requirements of KYR10 are fully addressed in the SWPPP. **Once the SWPPP is written, forward a copy to the Capital Projects Project Manager and to the Water Quality Manager for approval. Work cannot begin until SWPPP is approved and permit coverage obtained.**

11.3.3 Install BMP's such as, basins, traps, drainage, and sediment barriers before beginning land disturbing activities, including the construction entrance/exit. Once prevention measures have been installed, grading can commence. In the event a new construction entrance is added to the site, this new entrance must be built according to the EPSC design details with a wheel wash, a water supply and a sediment catch basin for washed wheel sediment.

11.3.4 Maintain all measures in working condition. Perform maintenance activities identified during inspections prior to the next rain event. Remove sediment from BMPs when 1/3 the storage volume has been filled.

11.3.5 Stabilize disturbed areas within 14 days of inactivity or reaching final grade on any portion of the site according to permit requirements.

11.3.6 Inspect the site every 7 calendar days and after each rainfall of ½"or more. Document site conditions, rainfall, maintenance activities needed and performed, stabilization needed and performed, and where new measures are needed. Discuss deficiencies with UK Project Manager and Water Quality Manager and note on the SWPPP Inspection Sheets.

Per the KPDES Permit, Section 2.1.7. "Inspections – Permittee Conducted". "Inspections shall be performed by personnel knowledgeable and skilled in assessing conditions at the construction site that could impact storm water quality and assessing the effectiveness of erosion prevention measures, sediment control measures, and other site management practices chosen to control the quality of the storm water discharges. Inspectors shall have training in storm water construction management such as Kentucky Erosion Prevention & Sediment Control (KEPSC), Certified Professional in Stormwater Quality (CPSWQ), Certified Erosion, Sediment and Stormwater Inspector (CESSWI), or other similar training."

Inspections shall include a tour of the total site and verification that all BMPs are performing as constructed. Inspector shall certify that all observations are correct as stated and sign and date the inspection form.

11.3.7 Keep Permit, SWPPP, weekly/rain event inspections sheets in binder in construction trailer. Any BMP change/alteration from SWPPP and EPSC plan must be noted on the EPSC and SWPPP.

11.3.8 No soil and sediment shall leave the construction site. BMPs shall be repaired immediately if failure has occurred. No Mud shall be permitted on any street. All entrances/exits shall have a means by which to wash wheels. If an entrance/exit does not have a wheel wash, that exit shall not be used in muddy conditions. If for any reason mud is tracked offsite, the area must be cleaned in such a way as to prevent sediment from entering the storm sewer system. The use of tractor brooms solely will not be permitted.

11.3.9 When it is necessary to dewater an excavation, proper BMPs must be implemented. Dewatering filter bags must be sized and used according to manufacturer's requirements and Standard Operating Procedures for Dewatering Bags.

11.3.10 UK (the MS4) routinely inspects sites for compliance with the EPSC/SWPPP. Any deficiencies noted become record for the Kentucky Division of Water and shall be remedied/installed as soon as site conditions are favorable but no more than 7 days from the inspection date.

11.3.11 At the conclusion of the project and all bare areas, slopes and ditches are 70% vegetated with the permanent ground cover, the contactor shall notify the UK Project Manager and Water Quality Manager and request a final site inspection prior to filing a "Notice of Termination (NOT) with the state. This inspection verifies that Construction BMPs can be removed, and Post-Construction BMPs are in place and functioning.

11.3.12 Failure of the site contractor (permitee of the KPDES Permit) to timely comply with requirements of KPDES, the Construction Manager shall inform the site contractor that a third party contractor shall be retained to remediate all BMP deficiencies immediately, and all third party costs shall be passed to the permitee of the KPDES Permit. Any fines or other costs resulting from failure to comply, levied against the Owner will be assessed against the site contractor's or General Constructor's funds.

11.3.13 Refer to 334000S01 STORM DRAINAGE UTILITIES – Information for Consultants & Contractors.

11.3.14 Reference to standards, codes, specifications, and regulations refer to the latest edition of printing in effect at the date of issue shown in the Contract Documents unless another date is implied by the suffix

number of the standard.

11.4 Reference to standards, codes, specifications, and regulations refer to the latest edition of printing in effect at the date of issue shown in the Contract Documents unless another date is implied by the suffix number of the standard

11.5 The Construction Manager shall furnish a final occupancy permit from the proper agency or agencies as required.

11.6 The Trade Contractor(s) shall, by provision within each applicable subcontract or by inclusion in the lump sum fee proposed to the Owner, insure the payment of all sales, consumer, use and similar taxes for materials, equipment and supplies incorporated into the Work, by unless otherwise specified in the bid documents.

ARTICLE 12 - PROTECTION OF WORK, PROPERTY, AND PUBLIC

12.1 The Trade Contractor(s) shall continuously maintain adequate protection of all Work from damage and shall protect the Owner's property from injury or loss arising in connection with this Contract. Except as otherwise covered by Builder's Risk insurance, the Trade Contractor(s) shall pay for any damage, injury, or loss, except such as may be directly due to errors in the Contract Documents or caused by agents or employees of the Owner. The Trade Contractor(s) shall adequately protect adjacent property as provided by law and the Contract Documents.

12.2 In an emergency affecting the safety of life, or of the Work, or of adjoining property, the Trade Contractor(s), without special instruction or authorization from the Consultant or the Owner, is obligated to act to prevent such threatened damage, loss or injury.

12.3 The Trade Contractor(s) shall maintain fire protection as required by the Kentucky Building Code. Access to the Project site and surrounding buildings for local fire truck access during construction must be maintained. The Trade Contractor(s) shall maintain construction to allow access to new, existing or temporarily relocated standpipes, fire hydrant connections and fire alarm communication panels pursuant to Section 3018.8 of the Kentucky Building Code. If the Trade Contractor(s) utilizes the Owner's fire protection equipment, the Trade Contractor(s) shall replace any such materials lost, consumed or misplaced during the Contract period. The Trade Contractor(s) is responsible for any false alarms caused by dust created in the Work area or dust traveling to areas beyond the Work area due to inadequate dust protection barriers. Should there be a need for any existing or newly installed fire alarm system, or parts of a system that requires service, to be removed from service or disconnected, prior approval must be obtained from the Owner and the Trade Contractor(s) shall immediately provide alternate protection such as a fire watch until such systems are returned to full normal operations. When work or service is completed on a disabled fire alarm system, the Owner shall be immediately notified so the system can be placed in service.

12.4 The Trade Contractor(s) and Sub-contractors are responsible for the security of their own materials, tools and equipment at the Project site.

12.5 The Construction Manager shall provide to the Owner's Project Manager a key to Construction Manager's field office or job trailer.

ARTICLE 13 - BLASTING

13.1 Blasting is not allowed unless permission is granted in the Special Conditions. Should blasting be allowed by the Special Conditions, it shall be completed in accordance with all laws, regulations, ordinances and instructions contained in the Special Conditions.

ARTICLE 14 - CONSTRUCTION AND SAFETY DEVICES

14.1 The Trade Contractor(s) shall provide safety controls for protection of the life and health of employees and visitors. The Trade Contractor(s) will utilize precautionary methods for the prevention of damage to property, materials, supplies, and equipment, and for avoidance of work interruptions in the performance of this Contract. In order to provide such safety control, the Trade Contractor(s) shall comply with all pertinent provisions of the Kentucky Fire Prevention Code, Kentucky Building Code, Kentucky Labor Cabinet's Division of Occupational Safety and Health Program Construction Standards and Federal Occupational Safety and Health (Construction) Standards that are in effect at the time the Contract is entered into and during the period in which the Contract is to be performed.

14.2 The Trade Contractor(s) shall provide a written safety program which includes all pertinent written specialty standards such as, but not limited to, Control of Hazardous Energy Sources (Lockout/Tagout), Hazard Communications Program, First Aid, Blood Borne Pathogen Program, Respirator Use Program and Hearing Conservation Program. The Construction Manager shall require all Sub-contractors to have an effective written safety program or be required to follow the Construction Manager's written safety program.

14.3 The Construction Manager shall maintain an accurate record of and shall report to Kentucky Labor Cabinet's Division of Occupational Safety and Health in the manner and on the forms prescribed by that Division, exposure data and all accidents resulting in death, traumatic injury, or occupational disease. The Construction Manager shall maintain an accurate record of and shall report to the Owner's Project Manager, any damage to property, materials, supplies, or equipment incident to Work under this Contract.

14.4 The Kentucky Labor Cabinet's Division of Occupational Safety and Health may notify the Trade Contractor(s) of any noncompliance with the foregoing provisions. The Trade Contractor(s) shall, upon receipt of such notice, immediately correct the cited conditions. Notice delivered to the Trade Contractor(s) or the Trade Contractor(s)'s representative at the site of the Work shall be deemed sufficient for this purpose. If the Trade Contractor(s) fails or refuses to comply promptly, the Owner may issue an order stopping all or part of the Work until satisfactory corrective action has been taken. Failure or refusal to comply with the order will be grounds for reducing or stopping all payments due under the Contract to the Trade Contractor(s). No part of the construction time lost due to any such stop order shall be cause for, or the subject of a claim for, extension of time or for additional costs or damages by the Trade Contractor(s).

14.5 The Trade Contractor(s) or any Sub-contractor shall immediately contact the University of Kentucky's Department of Occupational Health and Safety through the Construction Manager should they be selected for an inspection by the Kentucky Occupational Safety and Health Compliance Division.

14.6 Compliance with the provisions of the foregoing sections by Sub-contractors shall be the responsibility of the Trade Contractor(s).

14.7 Nothing in the provisions of this Article 14 shall prohibit the U.S. Department of Labor or the Kentucky Department of Labor Division of Occupational Safety and Health from enforcing pertinent occupational safety and health standards as authorized under Federal or State Occupational Safety and Health Standards.

14.8 The Trade Contractor(s) shall take all necessary precautions for the safety of employees on the Work, and shall comply with all applicable provisions of federal, state, and municipal safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the premises where the Work is being performed. If the Trade Contractor(s) or any Sub-contractor has questions related to the health or safety required by their written safety program, they should contact the Kentucky Labor Cabinet Occupational Safety and Health Program Division of Education and Training. The Trade Contractor(s) shall designate a responsible member of the on-site work force as the safety officer and shall report to the Consultant and to the Owner the name of the person selected. The duties of the safety officer include the enforcement of safety regulations.

ARTICLE 15 - HAZARDOUS MATERIALS

15.1 If the Trade Contractor(s) encounters material reasonably believed to be or suspected to be asbestos containing material, lead, polychlorinated biphenyls (PCBs), fluorescent light bulbs and ballasts, mercury or

other hazardous material, the following procedures must be followed:

15.1.1 The Trade Contractor(s) shall immediately stop work in the affected area and notify the Owner's Project Manager (via the Construction Manager). The Owner's Project Manager will contact the Owner's Environmental Health and Safety unit to arrange for collection of samples, review of existing data, or other testing necessary to confirm the presence of hazardous materials. The Owner's Project Manager will notify the Construction Manager in writing of the results. Until that notification is received, the Work must not continue in the affected area.

15.1.2 If the material is confirmed to be asbestos, lead, polychlorinated biphenyls (PCBs), fluorescent light bulbs and ballasts, mercury or other hazardous material, the Owner will take appropriate action to remove the material before the Trade Contractor(s) can continue Work in the affected area.

15.1.3 The Trade Contractor(s) shall not be required to perform any Work related to asbestos, lead, polychlorinated biphenyls, or other hazardous material. The Trade Contractor(s) is advised that certain classes of building materials (thermal system insulation, sprayed or troweled surfacing materials, and resilient flooring) installed before 1981 are required by law to be treated as asbestos containing until proven otherwise. These presumed asbestos containing materials must not be disturbed without confirmation from the Owner that asbestos is not present.

15.2 The Owner, the Construction Manager, the Trade Contractor(s), and Sub-contractors will be under the requirements of the OSHA Hazard Communication Standard (29) CFR 1910.1200. The Trade Contractor(s) and Sub-contractors must provide their own written Hazard Communication Program. The Hazard Communication Standard must include: (1) A list of the hazardous chemicals to which the Trade Contractor(s)'s employees may be exposed; (2) Statement of the measures that Trade Contractor(s)'s employees and Sub-contractors may take to lessen the possibility of exposure to the hazardous materials; (3) The location of and access to the Material Safety Data Sheets (MSDS's) related to the hazardous chemicals located in the Work area; (4) Procedures that the Trade Contractor(s)'s employees and Sub-contractors are to follow if they are exposed to hazardous chemicals above the Permissible Exposure Limit (PEL). Material Safety Data Sheets may be reviewed upon request by the Trade Contractor(s) or any Sub-contractor as they pertain to the Work areas of the Project. Photocopies of the MSDS's may be made by Trade Contractor(s) at its expense.

15.3 The Trade Contractor(s) and Sub-contractors shall provide the Construction Manager with a list of any hazardous materials that will be used on the job site. The Trade Contractor(s) and Sub-contractors shall provide the Owner with copies of Material Data Sheets for all such materials to be used via the Construction Manager.

15.4 It is the policy of the Owner that PCB containing equipment will be treated by the Construction Manager and the Owner in a manner that conforms to the intent of all applicable laws and regulations (primarily 40 CFR Part 761). The following procedures shall be followed by the Trade Contractor(s) and Sub-contractors while present on the Owner's Project or other property: (1) Only authorized, trained personnel may inspect, repair, or maintain PCB transformers; and (2) No combustible materials may be stored within a PCB transformer room or within five meters of a PCB transformer. Such materials include, but are not limited to, paints, solvents, plastic, paper, and wood. The Trade Contractor(s) shall not use rooms containing PCB transformers for storage rooms, staging areas, job site offices or break rooms. Violation of this policy may be grounds for dismissal of the offending Trade Contractor(s) and/or Sub-contractor from the Project. All PCB transformers at the University of Kentucky are identified by a PCB label as defined in federal regulations. If the Trade Contractor(s) should have a question as to the location of a PCB transformer, it should contact the Owner's Project Manager.

15.5 The Trade Contractor(s) shall ensure that NO asbestos-containing materials (including but not limited to: drywall, joint compound, roof mastic or floor tile adhesive) will be install on any University project without prior written approval of the University's Environmental Health and Safety Division. Additionally, the Trade Contractor(s) shall submit MSDS sheets and have prior approval before installing any materials that contains hazardous substances or could pose an environmental hazard. If any environmental hazardous materials are installed without written approval of the University, the Trade Contractor(s) will be responsible for all material

replacement cost, all removal and all other associated damages. Any materials removed shall be taken out in accordance with all applicable federal, state and local regulations.

ARTICLE 16 - INSPECTION OF WORK

16.1 Inspections, tests, measurements or other acts of the Consultant are for the sole purpose of assisting the Consultant in determining if the Work, materials, rate of progress, and quantities comply with the Contract Documents. These acts or functions shall not relieve the Trade Contractor(s) from performing the Work in full compliance with the Contract Documents, nor relieve the Trade Contractor(s) from any of the responsibility for the Work assigned to it by the Contract Documents. No inspection by the Consultant shall constitute or imply acceptance. Approval of material is general and shall not constitute waiver of the Owner's right to demand full compliance with Contract Documents.

16.2 All Work completed and all materials incorporated for the Project are subject to inspection by the Owner, the Consultant or their representatives to determine conformance with the Contract Documents. The Owner, Consultant and their representatives shall at all times have access to the Work whenever it is in preparation or progress. The Trade Contractor(s) shall provide, at no additional cost to the Owner, any facilities necessary for sufficient and safe access to the Work to complete any inspections required. The Consultant shall be given timely notification in order to arrange for the proper inspections to be performed on any Work outside of the normal working day or week. If the Consultant provides the Construction Manager with a list of construction milestones that require inspection, the Trade Contractor(s) shall provide the Consultant with at least five (5) Business Days written notice prior to the commencement of Work with respect to such milestone in order to permit the Consultant time to coordinate an inspection of the commencement of the applicable Work.

16.2.1 Normal Work hours are defined as a period between 7:00 a.m. and 5:00 p.m. Monday through Friday. The Trade Contractor(s) shall notify the Owner’s Project Manager (via the Construction Manager) at least one working day prior to performance of any Work for permission to do any Work during non-normal Work hours.

16.3 If the Specifications, the Consultant's instructions, laws, ordinances, or any public authority require any Work to be specially inspected, tested or approved, the Trade Contractor(s) shall give the Consultant (via the Construction Manager) timely notice of the readiness of the Work for inspection. The Consultant shall promptly make all required inspections. If any portion of the Work should be covered contrary to the request of the Consultant, or to the requirements specifically expressed in the Contract Documents, the Work must be uncovered for inspection and observation and shall be uncovered and replaced at the Trade Contractor(s)'s expense.

16.4 If any other portion of the Work has been covered, which the Consultant has not specifically requested to observe prior to being covered, the Consultant, with the Owner's approval, may request to see such Work and it shall be uncovered by the Trade Contractor(s). If such Work is found to be in accordance with the Contract Documents, the cost of uncovering and replacement shall be charged to the Owner by appropriate Change Order. If such uncovered Work is not in accordance with the Contract Documents, the Trade Contractor(s) shall pay all costs for uncovering and replacement of such Work.

ARTICLE 17 - SUPERINTENDENT - SUPERVISION

17.1 The Trade Contractor(s) shall completely and thoroughly direct and superintend the Work in accordance with the highest standard of care for the Trade Contractor(s)'s profession so as to ensure expeditious, workmanlike performance in accordance with requirements of the Contract Documents. Except as otherwise dictated by specific requirements of the Contract Documents, the Trade Contractor(s) shall be solely responsible for and have control over all construction means, methods, techniques, sequences and procedures. The Trade Contractor(s) shall be responsible for the acts and omissions of all Sub-contractors and persons directly or indirectly employed by the Trade Contractor(s) in the completion of the Work. The Trade Contractor(s) shall be responsible for coordinating and scheduling all portions of the Work unless the Contract Documents give other specific instructions. The Trade Contractor(s) shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by the activities of the Consultant in the

administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Trade Contractor(s).

17.2 The Trade Contractor(s) shall have a competent superintendent on the Project site at all times during the process of the Work. The superintendent shall have authority to act on the Trade Contractor(s)'s behalf with regard to all aspects of performance of this Contract. The superintendent shall have such assistants with individual specialized competencies as may be necessary to fully understand and oversee all aspects of the Work. The Trade Contractor(s) shall also provide administrative, supervisory and coordinating personnel required to fully perform the Work and for interfacing the Work with other work of the Project. The superintendent and all assistants shall be physically fit for their work and capable of going to all locations where Work is being performed. A communication given to the superintendent shall be binding on the Trade Contractor(s). Immediately after the award of Contract, the Trade Contractor(s) shall submit to the Consultant (via the Construction Manager) a list of Trade Contractor(s)'s employees and consultants, including names, positions held, addresses, telephone numbers and emergency contact numbers.

17.3 The superintendent assigned shall not be changed except under the following circumstances: (1) Where the superintendent ceases to be employed by the Trade Contractor(s), in which case the Trade Contractor(s) shall give timely written notice to the Owner (via the Construction Manager) of the impending change of the superintendent and a reasonable explanation for the change; or (2) Where the Owner or the Consultant have reasonable grounds for dissatisfaction with the performance of the superintendent and give written notice to the Trade Contractor(s) of the grounds. In either case, the Trade Contractor(s) shall obtain prior written approval from the Owner of the qualifications of the proposed replacement superintendent. Such prior approval will not be unreasonably withheld.

17.4 If the Owner or Consultant determines that the superintendent is not performing, or is incompetent to perform the required Work, the Owner may direct the Trade Contractor(s) to remove the superintendent from the Project and replace the superintendent with an employee who has the necessary expertise and skills to satisfactorily perform the Work.

ARTICLE 18 - CHANGES IN THE WORK

18.1 The Owner, at any time after execution of the Contract, may make changes within the general scope of the Contract or issue additional instructions, require additional Work, or direct the deletion of Work. The Owner's right to make changes shall not invalidate the Contract or relieve the Trade Contractor(s) of any obligations under the Contract Documents. All such changes to the Work shall be authorized in writing by Change Order and shall be executed under the conditions of the Contract Document. Any adjustment of the Contract Amount or Time of Completion, as may be appropriate, shall be made only at the time of ordering such change. Change order proposals based on a reservation of rights, whether for additional compensation to be determined at a later date or for an extension of time to be determined at a later date, will not be considered for approval and shall be returned to the Trade Contractor(s) via the Construction Manager without action.

18.2 The cost or credit resulting from a change in Work shall be determined in one or more of the following ways:

18.2.1 By unit prices named in the Contract or additional unit prices subsequently agreed upon;

18.2.2 By agreement on a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

18.2.3 By an amount agreed upon by the Construction Manager and the Owner as a mutually acceptable fixed or percentage fee.

18.3 All lump sum proposals shall include a detailed cost breakdown satisfactory to the Consultant and to the Owner for each component of Work indicating both labor and material costs. This cost breakdown shall be submitted to the Consultant promptly and with a goal of seven (7) Calendar Days or less after receipt of the proposal request.

18.3.1 In computing labor costs, the hourly labor rates shall not exceed a mutually agreeable combined hourly labor rate plus fringe benefits negotiated with the Owner based on a presentation of acceptable documentation by the CM. For the purposes of this Article, the term "fringe benefits" shall mean those funds transferred irrevocably to a third party for payment/distribution. In addition, there may be added by the Sub-contractor an amount agreed upon, but not to exceed ten percent (10%) of the actual cost, for overhead and profit.

18.3.2 The CM is entitled to a mark-up for bonds and insurance on all change orders. For change orders coded "End User Requested Changes" or "Other Owner Requested Changes" the CM may add overhead & profit in addition to the bonds and insurance referenced above. The mark-ups shall not exceed the combined percentage for overhead and profit, bonds, and insurance stated in the CM's "Financial Proposal Summary". These mark-ups will not be added to the individual change orders but will be reconciled by amendment at the completion of the project and/or on an annual basis for those projects exceeding 12 months in duration.

18.4 If none of the above methods are mutually agreed upon or if the Trade Contractor(s) does not respond promptly, a change may be made by unilateral determination by the Construction Manager, Owner, and/or the Consultant of reasonable costs or savings attributable to the change, including a reasonable allowance for overhead and profit. If this method is utilized, the Trade Contractor(s) shall promptly proceed with the Work involved in the change upon receipt of a written order signed by the Owner. In such case, the Trade Contractor(s) shall keep and present an itemized accounting of labor, equipment, material and other costs, in such form as may be prescribed by the Consultant.

18.5 In all cases where Change Orders are determined by unit prices set forth in the Contract Documents, no amount is to be added for additional overhead and profit.

18.6 The Trade Contractor(s) shall keep and present in such form as the Consultant may direct, a correct account of all items comprising the net cost of such Work, together with vouchers. The determination of the Consultant and/or the Owner shall be final upon all questions of the amount and cost of extra Work and changes in the Work, and it shall include in such cost, the cost to the Construction Manager of all materials used, the cost of all labor (including social security, old age and unemployment insurance, fringe benefits to which the employee is entitled, and Workers Compensation insurance), and the fair rental of all machinery used upon the extra Work, for the period of such use, which was upon the Work before or which shall be otherwise required by or used upon the Work before or after the extra Work is done. If the extra Work requires the use of machinery not already on the Project site, or to be otherwise used upon the Work, then the cost of transportation of such machinery to and from the Project site shall be added to the fair rental value. Transportation costs shall not be allowable for distances exceeding one hundred (100) miles.

18.7 The Trade Contractor(s) shall not include or allow to be included in the cost of change in the Work any cost or rental of small tools, or any portion of the time of the Trade Contractor(s) or the superintendent, or any allowance for the use of capital, or for the cost of insurance or bond premium or any actual or anticipated profit, or job or office overhead. These items are considered as being covered under the added amount for general overhead addressed in Article 18.3

18.8 The Owner will not pay claims made for lost opportunities, claims made for lost production or production inefficiencies or claims made that are formula based.

18.9 Pending final determination of value, partial payments on account of changes in the Work may be made on recommendation of the Consultant. All Change Orders shall be in full payment and final settlement of all claims for direct, indirect and consequential costs, including all items covered and affected. Any such claim not presented by the Trade Contractor(s) for inclusion in the Change Order shall be waived.

18.10 The Consultant may authorize minor changes in the Work which do not involve additional cost or extension of the Contract Time, and which are not inconsistent with the intent of the Contract Documents. Such changes shall be made by an ASI issued by the Consultant, and shall be binding on the Owner and the Trade

Contractor(s). The Trade Contractor(s) shall carry out such orders promptly. If the Trade Contractor(s) should claim that an ASI involves additional cost or delay to the completion of the Work, the Trade Contractor(s) shall give the Consultant via the Construction Manager written notice thereof within ten (10) Calendar Days after receipt of the written ASI. If this notification does not occur, the Trade Contractor(s) shall be deemed to have waived any right to claim or adjustment to the contract sum or to the contract completion time.

18.10.1 If the Trade Contractor(s) claims that any instructions by the Consultant involve additional cost or time extension, the Trade Contractor(s) shall give the Consultant via the Construction Manager written notice thereof within ten (10) Calendar Days after the receipt of such instructions and before proceeding to execute the change in Work. The written notice shall state the date, circumstances, whether a time extension will be requested, and the source of the order that the Trade Contractor(s) regards as a Change Order. Unless the Trade Contractor(s) acts in accordance with this procedure, any oral order shall not be treated as a change and the Construction Manager hereby waives any claim for an increase of the Contract amount or extension of the contract time.

18.11 Requests for extension of time related to changes in the Work shall be submitted in accordance with the requirements of Article 21 of these General Conditions.

18.12 Prior to final payment, the Construction Manager shall provide to the Owner a full accounting of executed change orders by and between the Construction Manager and the Trade Contracts. The Construction Manager shall also provide a reconciliation of that accounting against the executed change orders by and between the Owner and the Construction Manager.

ARTICLE 19 - RULES AND MEASUREMENTS FOR EXCAVATION

19.1 If applicable, the following Rules and Measurements shall apply to the use of Unit Prices for the excavation portion of the Work:

19.1.1 Except as provided in this Article 19 for arbitrary measurements, the quantity of excavation shall be its in-place volume before removal.

19.1.2 No allowance will be made for excavating additional material of any nature taken out for the convenience of the Trade Contractor(s) beyond the quantity computed under these "Rules and Measurements."

19.1.3 The quantities of excavation shall be computed from instrument readings taken by the Consultant’s representative in vertical cross sections located at such intervals that will assure accuracy.

19.1.4 "Trench Excavation" for pipes shall arbitrarily be assumed to be two feet (2') wider than the outside diameter of the pipe barrel and with sides vertical.

19.1.5 The quantities shall be computed from plan size, or if there are no drawings, from actual measurements of the Work in place.

19.1.6 Each unit price shall cover, among other things, engineering (surveying) costs and keeping excavating dry.

19.1.7 Earth excavation for structures will be measured between the vertical planes passing 18 inches beyond the outside of the footings and from the surface of the ground to the neat lines of the bottom of the structure.

19.1.8 Rock excavation for structures will be measured between the vertical planes passing 18 inches beyond the outside of the footings and from the surfaces of the rock to the neat lines of the bottoms of the structures or the actual elevation of the rock ledge.

19.1.9 Rock excavation for pipelines trenches, unless otherwise provided for in the Specifications, shall be measured as follows: An arbitrary width of 18 inches plus the nominal diameter of the pipe multiplied by the

depth from the surface the rock to six (6) inches below the invert for pipe 24 inches in diameter or less and eight (8) inches below the invert for all pipe greater than 24 inches in diameter. No additional compensation will be allowed for excavation for bell holes, gates or other purposes. The measurement of rock excavation for manholes shall be in accordance with Section
19.1.8 above.

19.1.10 Unclassified excavation shall be measured in the same manner as earth excavation.

ARTICLE 20 - CONCEALED CONDITIONS

20.1 The Contract Drawings show the approximate location of the existing and new utility lines. These lines have been identified and located as accurately as possible using available information. The Trade Contractor(s) is responsible for verifying all actual locations. If utilities require relocation or rerouting that is not shown or indicated to be relocated or rerouted, the Trade Contractor(s) shall contact and cooperate with the Consultant to make the required adjustments. Any request for change in the Contract Amount by the Trade Contractor(s) shall be made pursuant to Article 18 of the General Conditions.

20.2 If any charted or uncharted utility service is interrupted by activities of the Construction Manager or the Construction Manager's Trade Contractor(s) for any reason, the Trade Contractor(s) shall work continuously to restore service to the satisfaction of the Owner.

20.2.1 If any charted utility service, or any uncharted utility service the existence of which could have been discovered by careful examination and investigation of the site of the Work by the Trade Contractor(s), is interrupted by activities of the Trade Contractor(s) or the Trade Contractor(s)'s Sub-contractor(s) for any reason, the entire cost to restore service to the satisfaction of the Owner shall be paid by the Trade Contractor(s). Should the Trade Contractor(s) fail to proceed with appropriate repairs in an expedient manner, the Owner reserves the right to have the work/repairs completed and the cost of such work/repairs deducted from the monies due or to become due to the Trade Contractor(s) pursuant to Article 22 of the General Conditions.

20.3 The Trade Contractor(s) shall promptly, but in no case more than ten (10) Calendar Days from the time of discovery, and before the conditions are disturbed, notify Consultant via the Construction Manager in writing of:

20.3.1 Subsurface or latent physical conditions or any condition encountered at the site which differ materially from those indicated in the Contract Documents and which were not known by Trade Contractor(s) or could not have been discovered by careful examination and investigation of the site of the proposed Work;

20.3.2 Unknown and unexpected physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered in the locale or generally recognized as inherent in the Work provided for in this Contract or,

20.3.3 Concealed or unknown conditions in an existing structure which are at variance with the conditions indicated by the Contract Documents, which are of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the Work provided for in this Contract, and which were not known by the Trade Contractor(s) and could not have been discovered by careful examination and investigation of the site of the Work.

20.4 The Consultant shall promptly investigate the conditions discovered. If the Consultant finds that conditions, which are materially different from those ordinarily encountered and generally recognized as inherent in the Work provided for in this Contract, were not known by the Trade Contractor(s), and could not have been discovered by careful examination and investigation of the site of the Work, have caused or would cause a material increase or decrease in the Trade Contractor(s)'s cost of construction or the time required for performance of any part of the Work under this contract, the Consultant will recommend and the Owner will make an equitable adjustment in the Contract Amount and/or the time allotted for performance in the Contract Documents. Failure by the Trade Contractor(s) to provide written notice to the Owner of such claims for

additional compensation or time for performance within ten (10) Calendar Days of discovery of such conditions shall constitute a waiver by the Trade Contractor(s) of the right to make such claims. The Owner will not pay claims made for lost opportunities, claims made for lost production or production inefficiencies or claims made that are formula based.

20.5 If the Consultant determines that changed conditions do not exist or are not materially different and no adjustment in the Contract Amount or time is warranted, the Trade Contractor(s) shall continue performance of the Contract as directed by the Consultant. No claim by the Trade Contractor(s) under this clause shall be allowed unless the required written notice is given and the Consultant is given adequate opportunity to investigate the conditions encountered prior to disturbance. The failure of the Trade Contractor(s) to give the Consultant proper notice of a differing site condition shall not affect the Owner's right to an equitable adjustment of the contract price or time if there is a decrease in the Contract Amount or time required to perform the Work.

ARTICLE 21 - DELAYS AND EXTENSION OF TIME

21.1 It is agreed that time is of essence for each and every portion of this Contract and where additional time is allowed for the completion of the Work or any part of the Work under this Contract, the new time limit fixed by such time extension shall be of the essence of this Contract. An extension of time shall not be cause for extra compensation under this Contract, except as set forth in Article 21.10 below.

21.2 The Trade Contractor(s) will, subject to the provisions of Articles 21.7, 21.8 and 21.9 below, be granted an extension of time and/or relief from liquidated damages when the delay in completion of the Work is due to:

21.2.1 Any preference, priority, or allocation order duly issued by the government;

21.2.2 Unforeseeable causes beyond the control and without the fault or negligence of the Trade Contractor(s) including, but not limited to, acts of God, or of the public enemy, acts of the Owner, acts of another contractor in the performance of a contract with the Owner, floods, epidemics, quarantine restrictions, strikes, and freight embargoes.

21.2.2.1 For such delays which stop all work on the Project for thirty (30) Calendar Days or more, the Trade Contractor(s) shall be authorized at its discretion to remove its people from the site and return when the normal progress of the work may continue.

21.2.3 Regardless of the cause of a delay, the Trade Contractor(s) shall expend all reasonable effort to mitigate the impact of any delay.

21.2.4 Requests for additional time due to delays in transportation or due to failures of suppliers shall not be considered for approval.

21.3 Requests for extensions of time and/or relief from liquidated damages, except for weather related claims, shall be made in writing not later than ten (10) Calendar Days after the beginning of the delay. Requests for extension of time or relief from liquidated damages shall be stated in numbers of whole Calendar Days.

21.4 Except as otherwise provided in the Contract Documents, extensions of the contractually required completion dates may be granted for unusually bad weather on the Project. Unusually bad weather as used herein means daily temperature or precipitation that exceeds the normal weather recorded and expected for the locality and/or the season or seasons of the year. For the purposes of this contract, it is mutually agreed that the following chart accurately defines the number of days in each month on which bad weather can reasonably be anticipated to impact weather dependent construction operations, and the Trade Contractor(s) shall anticipate this normal seasonal weather in the development of the Project baseline schedule.

Mean Number of Days When	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Max Temp 32° or Below	9	6	1	0	0	0	0	0	0	0	1	5
Precip. Is 0.10 Inch or Greater	7	6	9	7	8	8	8	6	5	5	7	7

For the purpose of this Contract, "unusually bad weather" shall be interpreted as either 1) those days in a given month on which rainfall was 0.10 inch or more that exceed the number of days shown in the row for "Precip" or 2) those days in a given month on which maximum temperature was 32 degrees F or below that exceed the number of days shown in the row for "Max Temp", whichever is greater.

21.4.1 Requests for extension of time due to unusually bad weather that could not reasonably have been anticipated at the time of execution of the Contract shall be made in writing not later than the tenth calendar day of the month following the month in which the delay occurred.

21.4.2 Requests for an extension of time due to unusually bad weather shall be considered for approval only if it is shown that a) the unusual weather event delayed work on a specific weather dependent activity or activities that had been planned to be underway on the date(s) on which the weather event occurred, as shown in the most recent update to the Project schedule that had been submitted to the Owner prior to the date of the event, and b) only if the delay to that activity or activities is shown to be the proximate cause of a corresponding delay to the contractually required completion dates for the Project shown in the most recent update to the Project schedule. The actual dates on which the delay(s) occurred must be stated and the specific activities that were directly impacted must be identified. In the event of concurrent delays, only those activities actually impacting contractually required completion dates will be considered in evaluating the merit of a delay request. Time extensions will not be considered if such adjustments do not exceed the total or remaining "float" associated with the impacted activities at the time of delay as shown in the most recent update to the Project schedule, nor for concurrent delays not caused by the Owner.

21.4.3 In anticipation of the possibility of delay due to unusually bad weather, the Trade Contractor(s) shall identify those activities in the baseline schedules, and those activities subsequently added to updated schedules, that might reasonably be expected to be delayed by such weather.

21.4.4 Delays caused by unusually bad weather shall be incorporated in the Project schedule when the schedule is next updated by showing actual dates and/or percent complete for those activities that were impacted by the unusually bad weather as well as the effects of any effort to mitigate such delays. When claims are submitted for time extensions resulting from more than one occurrence of unusually bad weather during a month, the Project schedule shall be updated to reflect such separate events sequentially so that the impact of each subsequent occurrence is shown on an adjusted Project schedule that includes all prior claims for additional time.

21.5 In addition to the requirements of Article 21.7 and Article 21.8 below, any request for an extension of time for strikes or lockouts shall be supported by a written statement of facts concerning the strike including, but not limited to, the dates, the craft(s) affected, the reason for the strike, efforts to resolve the dispute, and efforts to minimize the impact of the strike on the Project.

21.6 Approval of time extensions for changes in the Work will depend upon the extent, if any, to which the changes cause delay in the completion of the various elements of construction. The Change Order granting the time extension may provide that the Contract Time will be extended only for those specific elements so

delayed and that other Work will not be altered.

21.7 The Contract Time will only be adjusted for causes specified above. Extensions of time will only be approved if the Trade Contractor(s) provides justification supported by the Project schedule or other acceptable data that 1) such changes are, in fact, on the critical path and extend the contractually required completion dates, and 2) the Trade Contractor(s) has expended all reasonable effort to minimize the impact of such changes on the construction schedule. No additional extension of time will be granted subsequently for claims having the basis in previously approved extensions of time.

21.8 In support of requests for an extension of time not caused by unusual inclement weather, and concurrently with the submittal of any such request, the Trade Contractor(s) shall submit to the Consultant and the Owner via the Construction Manager a written impact analysis showing the influence of each such event on contractually required completion dates as shown in the updated Project schedule most recently submitted to the Owner prior to the event. The analysis shall include a partial network diagram showing a sequence of new or revised activities and/or durations that are proposed to be added to the existing schedule including related logic (a "fragnet"). This impact analysis and the fragnet shall include the new activities and/or activity revisions proposed to be added to the existing schedule and shall demonstrate the claimed impact on the critical path and the contractually required completion dates. The Trade Contractor(s) will not be granted an extension of time and/or relief from liquidated damages when the delay to completion of the work is attributable to, within the control of, or due to the fault, negligence, acts, or omissions of the Construction Manager and/or the Construction Manager's contractors, subcontractors, suppliers, or their respective employees and agents. Time extensions will not be considered in the event such adjustments do not exceed the total or remaining "float" associated with the impacted activities at the time of delay, nor for concurrent delays not caused by the Owner. In the event of concurrent delays, only that event actually impacting contractually required completion dates will be considered in adjusting the schedule and evaluating the merit of a delay claim. Requests for an extension of time which are not supported by this information shall not be considered for approval.

21.9 Approved extensions of time not caused by unusual inclement weather shall be incorporated in a revised schedule at the time of approval. No subsequent requests for time extension will be considered unless all previous approved time extensions have been incorporated in the Project schedule on which the requests are based.

21.10 Except as provided for in Article 21.10.1 through 21.10.3 below, no payment or compensation shall be made to the Trade Contractor(s) and extensions of the time fixed for completion of the Contract shall be the Trade Contractor(s)'s sole remedy for any and all delays, hindrances, obstructions or impacts in the orderly progress of the Work.

21.10.1 In addition to the provisions of Articles 18.3 and 18.3.1 above, and subject to the requirements of Article 21.8 and 21.8.1 above, if the Owner orders changes to the scope of Work for the Project that extend the then current contractually required completion dates of the Project, the Trade Contractor(s) shall be entitled to reimbursement for job site, general conditions and staffing costs associated with such delay.

21.10.2 If delays, hindrances, impacts or obstructions of the Trade Contractor(s)'s performance of the Contract are in whole or in part within the control of the Owner and, subject to the requirements of Article 21.8 and 21.8.1, extend contractually required completion dates of the Project, the Trade Contractor(s) shall be entitled to reimbursement for job site, general conditions and staffing costs for that portion of the costs caused by acts or omissions of the Owner.

21.10.3 Such reimbursements shall not include consequential or similar damages, exemplary damages, damages based on unjust enrichment theory, formula based delay claims, or any element of home office overhead.

ARTICLE 22 - CORRECTION OF WORK BEFORE FINAL PAYMENT

22.1 The Trade Contractor(s) shall promptly remove from the site and replace any material and/or correct

any Work found by the Consultant to be defective or that fails to conform to the requirements of the Contract, whether incorporated in the Work or not, and whether observed before or after Substantial or Final Completion. The Trade Contractor(s) shall bear all costs of removing, replacing or correcting such Work or material including the cost of additional professional services necessary, and the cost of repairing or replacing all Work of separate contractors damaged by such removal or replacement.

22.2 The Consultant will notify the Trade Contractor(s) via the Construction Manager and the Owner immediately upon its knowledge that additional services will be necessary. The Owner may consent to accept such nonconforming Work and materials with an appropriate adjustment in the Contract Amount. Otherwise, the Trade Contractor(s) shall promptly replace and re-execute the Work in accordance with the Contract Documents and without expense to the Owner and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement. If the Trade Contractor(s) fails to commence and continue to correct non-conforming Work within a reasonable time as determined by the Consultant, the Owner may without limitation of other rights available to the Owner and without prejudice to other remedies, take any necessary action to make the necessary corrections. If the Owner makes required corrections for non conforming Work or materials, a Change Order will be issued reflecting an equitable deduction from the Contract Amount. This amount will be deducted from payments due to the Trade Contractor(s) or, if no additional payments are due, Trade Contractor(s) or the Trade Contractor(s)'s surety shall be responsible for payment of this amount.

ARTICLE 23 - CORRECTION OF WORK AFTER FINAL PAYMENT

23.1 Neither the final certificate of payment nor any provisions in the Contract Documents shall relieve the Trade Contractor(s) of responsibility for materials and equipment incorporated into the Work that fails to meet specification requirements, or for the use of faulty materials or poor quality workmanship. If within one year after the date of Substantial Completion of the Work or designated portion thereof, any of the Work is found to be defective or not in accordance with the requirements of the Contract Documents, the Trade Contractor(s) shall correct it promptly after receipt of written notice from the Owner to do so. The Trade Contractor(s) shall correct any defects due to these conditions and pay for any damage to other Work resulting from their use. Nothing contained in this clause shall be construed to establish a period of limitation with respect to any obligation of the Trade Contractor(s) under the Contract including, but not limited to, warranties. The obligation of the Trade Contractor(s) under this section shall be in addition to and not in limitation of any obligations imposed by special guarantees or warranties required by the Contract, given by the Trade Contractor(s), or otherwise recognized or prescribed by law.

23.2 In addition to being responsible for correcting the Work and removing any non-conforming Work or materials from the job site, the Trade Contractor(s) shall bear all other costs of bringing the affected Work into compliance with the Contract requirements. This includes costs of any required additional testing and inspection services, Consultant's services, and any resulting damages to other property or to work of other contractors or of the Owner.

23.3 If the Trade Contractor(s) fails to correct nonconforming Work within a reasonable time as determined by the Consultant, the Owner may take necessary actions to make the necessary corrections. If the Owner makes required corrections for nonconforming Work or materials after Final Payment to the Trade Contractor(s), the Owner shall be entitled to recover all amounts for such corrections, including costs and attorney's fees, from Trade Contractor(s) via the Construction Manager or surety.

ARTICLE 24 - TERMINATION OF CONTRACT FOR CONVENIENCE OF OWNER

24.1 The Owner, by written notice to the Trade Contractor(s) via the Construction Manager, may terminate this Contract in whole or in part when it is in the interest of the Owner, at the sole discretion of the Owner. In such case, the Trade Contractor(s) shall be paid for all Work in place and a reasonable allowance for profit and overhead on Work done, provided that such payments shall not exceed the total Contract price as reduced by the value of the Work as yet not completed. The Trade Contractor(s) shall not be entitled to profit and overhead on Work not performed.

ARTICLE 25- OWNER'S RIGHT TO STOP WORK

25.1 If the Trade Contractor(s) fails to correct defective Work as required, or persistently fails to carry out the Work in accordance with the Contract Documents, the Owner by written notice may order the Trade Contractor(s) via the Construction Manager to stop the Work or any portion of the Work until the cause for the order has been eliminated to the satisfaction of the Owner. The Consultant may stop Work without written notice for 24 hours whenever in its professional opinion such action is necessary or advisable to insure conformity with the Contract Documents. The Trade Contractor(s) shall not be entitled to an adjustment in the Contract Time or Amount under this clause in the event such stoppages are determined to be the fault of the Trade Contractor(s) or its Sub-contractor(s). The right of the Owner or Consultant to stop Work shall not give rise to a duty on the part of the Owner or Consultant to exercise this right for the benefit of the Trade Contractor(s) or others.

ARTICLE 26 -TERMINATION OF CONTRACT FOR DEFAULT ACTION OF TRADE CONTRACTOR(S)

26.1 In addition to its rights under Articles 24 and 25, the Owner may terminate the contract upon the occurrence of any one or more of the following events:

26.1.1 If the Trade Contractor(s) refuses or fails to prosecute the Work (or any separable part thereof) with such diligence as will insure its completion within the agreed upon time; or if the Trade Contractor(s) fails to complete the Work within such time;

26.1.2 If the Trade Contractor(s) is adjudged a bankrupt or insolvent, or makes a general assignment for the benefit of creditors, or if the Trade Contractor(s) or a third party files a petition to take advantage of any debtor's act or to reorganize under the bankruptcy or similar laws concerning the Trade Contractor(s), or if a trustee or receiver is appointed for the Trade Contractor(s) or for any of the Trade Contractor(s)'s property on account of the Trade Contractor(s)'s insolvency, and the Trade Contractor(s) or its successor in interest does not provide adequate assurance of future performance in accordance with the Contract within ten (10) days of receipt of a request for assurance from the Owner;

26.1.3 If the Trade Contractor(s) repeatedly fails to supply sufficient qualified supervision of the work, or repeatedly fails to ensure that Sub-contractors supply adequate supervision, suitable materials or equipment, or adequate numbers of skilled workmen and supervision to the Work;

26.1.4 If the Trade Contractor(s) repeatedly fails to make prompt payments to Sub-contractors or suppliers at any tier, or for labor, materials or equipment;

26.1.5 If the Trade Contractor(s) disregards laws, ordinances, rules, codes, regulations, orders or similar requirements of any public entity having jurisdiction;

26.1.6 If the Trade Contractor(s) disregards the authority of the Consultant or the Owner;

26.1.7 If the Trade Contractor(s) performs Work which deviates from the Contract Documents, and neglects or refuses to correct rejected Work; or

26.1.8 If the Trade Contractor(s) otherwise violates in any material way any provisions or requirements of the Contract Documents.

26.2 Once the Owner determines that sufficient cause exists to justify the action, the Owner may terminate the Contract without prejudice to any other right or remedy the Owner may have, after giving the Trade Contractor(s) and its Surety three (3) Calendar Days notice by issuing a written Declaration of Default (via Construction Manager). The Owner shall have the sole discretion to permit the Trade Contractor(s) to remedy the cause for the contemplated termination without waiving the Owner's right to terminate the Contract.

26.3 In the event that the Contract is terminated, the Owner may demand that the Trade Contractor(s)'s

Surety take over and complete the Work on the Contract. The Owner may require that in so doing, the Trade Contractor(s)'s Surety not utilize the Trade Contractor(s) in performing the Work. Upon the failure or refusal of the Trade Contractor(s)'s Surety to take over and begin completion of the Work within twenty (20) Calendar Days after the demand, the Owner may take over the Work and prosecute it to completion as provided below.

26.3.1 In the event that the Contract is terminated and the Trade Contractor(s)'s Surety fails or refuses to complete the Work, the Owner may take over the Work and prosecute it to completion in accordance with the laws of the Commonwealth, by contract or otherwise, and may exclude the Trade Contractor(s) from the site. The Owner may take possession of the Work and of all of the Trade Contractor(s)'s tools, appliances, construction equipment, machinery, materials, and plant which may be on the site of the Work, and use the same to the full extent they could be used by the Trade Contractor(s), without liability to the Trade Contractor(s). At the Owner's sole discretion, the Owner has the right to take assignment of any or all portions of the contract work in order to prosecute the completion of the Work. In exercising the Owner's right to prosecute the completion of the Work, the Owner may also take possession of all materials and equipment stored at the site or for which the Owner has paid the Trade Contractor(s) but which are stored elsewhere, and finish the Work as the Owner deems expedient. In such case, the Trade Contractor(s) shall not be entitled to receive any further payment until the Work is finished.

26.3.2 If the unpaid balance of the Contract Price exceeds the direct and indirect costs and expenses of completing the Work including compensation for additional professional and Consultant services, such excess shall be used to pay the Trade Contractor(s) for the cost of the Work it performed and a reasonable allowance for overhead and profit. If such costs exceed the unpaid balance, the Trade Contractor(s) or the Trade Contractor(s)'s Surety shall pay the difference to the Owner. In exercising the Owner's right to prosecute the completion of the Work, the Owner shall have the right to exercise its sole discretion as to the manner, methods, and reasonableness of the costs of completing the Work and the Owner shall not be required to obtain the lowest figure for Work performed in completing the Contract. In the event that the Owner takes bids for remedial Work or completion of the Project, the Trade Contractor(s) shall not be eligible for the award of such Contract.

26.3.3 The Trade Contractor(s) shall be liable for any damage to the Owner resulting from the termination or the Trade Contractor(s)'s refusal or failure to complete the Work, and for all costs necessary for repair and completion of the Project above the amount of the Contract. The Trade Contractor(s) shall be liable for all attorney's fees, costs and expenses incurred by the Owner to enforce the provisions of the Contract.

26.3.4 If liquidated damages are provided in the Contract and the Owner terminates the Contract, the Trade Contractor(s) shall be liable for such liquidated damages, as provided for in Article 29.2 and 29.3 below, until Substantial Completion and Final Completion of the Work are achieved.

26.3.5 In the event the Contract is terminated, the termination shall not affect any rights of the Owner against the Trade Contractor(s). The rights and remedies of the Owner under this Article are in addition to any other rights and remedies provided by law or under this Contract. Any retention or payment of monies to the Trade Contractor(s) via the Construction Manager by the Owner will not release the Trade Contractor(s) from liability.

26.3.6 In the event the Contract is terminated under this Article, and it is determined for any reason that the Trade Contractor(s) was not in default under the provisions of this Article, the termination shall be deemed a Termination for Convenience of the Owner pursuant to Article 24 and the rights and obligations of the parties shall be determined in accordance with Article 24.

ARTICLE 27 - SUSPENSION OF WORK

27.1 The Owner or the Consultant may, at any time and without cause, order the Trade Contractor(s) in writing (via the Construction Manager) or cause the Trade Contractor(s) to suspend, delay or interrupt all or any part of the Work for such period of time as the Owner may determine to be appropriate for its convenience. Adjustment may be made for any increase in the Contract time necessarily caused by such suspension or delay, in accordance with Article 21.

ARTICLE 28 - TIME OF COMPLETION

28.1 The Trade Contractor(s) shall begin the Work on the date of commencement as specified in the Work Order. All time limits stated in the Contract Documents are of the essence of the Contract. The actual end of the Contract Time shall be the date specified on the approved certificate of Substantial Completion. The time for completion set forth in the Contract is a binding part of the Contract upon which the Owner may rely in planning the use of the facilities to be constructed and for all other purposes.

28.2 Substantial Completion is defined in Article 1.1.17 of these General Conditions. Only incidental corrective Work under punch lists and final cleaning (if required) for Owner's full use shall remain for Final Completion. The ability to occupy or utilize shall include regulatory authority approval unless regulatory approval is delayed due to actions of the Owner or the Consultant. When the Owner accepts and occupies a portion of the Project, the operation, maintenance, utilities, and insurance of that portion of the Project becomes the responsibility of the Owner.

28.3 The date of Substantial Completion shall be that date certified by the Owner, in accordance with the following procedures, that the Work is sufficiently complete to occupy or utilize as defined above.

28.3.1 When the Trade Contractor(s) considers the entire Work is substantially complete as defined in Article 1.1.17 of these General Conditions, and is ready for its intended use, the Trade Contractor(s) shall notify the Consultant (via the Construction Manager) in writing and request an inspection. The declaration and request shall be accompanied by a list prepared by the Construction Manager of those items of Work still to be completed or corrected. The failure of the Construction Manager or Consultant to include any item or items which are not completed or which need correction on such list shall not alter the responsibility of the Construction Manager to complete all Work in accordance with the Contract Documents.

28.3.2 The Consultant shall, within a reasonable time after receipt of notification from the Construction Manager of a declaration of Substantial Completion and request for inspection, make such inspection. Prior to the Substantial Completion Inspection and within sufficient time to allow the Consultant's review, the Trade Contractor(s) shall submit all As-Built drawings, Notice of Termination, catalog data, complete operating and maintenance instructions, manufacturer specifications, certificates, warranties, written guarantees and related documents required by the contract. The Consultant shall review said documents for accuracy and compliance with the Contract Documents and incorporate them into complete operating instructions and deliver them to the Owner.

28.3.3 If the Consultant considers the Work substantially complete, the Consultant shall recommend that the Owner prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion and the responsibilities between the Owner and Construction Manager for security, maintenance, heat, utilities and insurance, if not otherwise provided for in the Contract Documents, and a tentative list of items to be completed or corrected, and shall fix the time within which the Trade Contractor(s) shall complete the items listed therein. This time shall not exceed thirty (30) Calendar Days unless otherwise provided for in the Work Order. The Certificate of Substantial Completion shall be submitted to the Consultant and Construction Manager for their written acceptance of the responsibilities assigned to them in the certificate. The Project shall not be deemed substantially complete until the certificate is issued. If, after making the inspection, the Consultant does not consider the Work substantially complete, the Consultant will notify the Owner and the Construction Manager in writing

28.4 Operation and Maintenance Manual Deliverables. In anticipation and preparation of completion of the Work and the closing out of the Project, and to facilitate training of the Owner’s personnel in the maintenance and operation of the new installations, the Trade Contractor(s) shall comply with the requirements of Article 8.7 of the Special Conditions. (For the purposes of this article, air test and balance reports may be submitted at a later date with the request for certification of substantial completion.) These manuals shall be submitted to the Consultant for approval, and subsequently forwarded to the Owner's Project Manager by or before the time construction is 75% complete, as reflected by the Contractor’s most recently submitted Application for Payment.

28.4.1 The provisions of Article 30.11 notwithstanding, if the Trade Contractor(s) meets the requirements of Article 28.4 above with respect to timely submittal of approvable Operation and Maintenance manuals and provided the project construction is 1) at least 75% complete and 2) is equal to or ahead of the approved progress schedule and 3) the Work completed is in compliance with the requirements of the contract documents, the Owner, at the sole discretion of the Director, Capital Projects Management Division may reduce the retainage to not less than three percent (5%) of the current Contract Amount. In the event the Trade Contractor(s) fails to submit acceptable O&M manuals prior to reaching 75% completion, it is agreed that the Owner at its sole discretion may deduct from the current and subsequent Applications for Payment an amount deemed by the Owner to be sufficient to encourage prompt compliance with this contractual requirement, until such time as acceptable O&M manuals are received.

28.5 Project Close Out. When the Trade Contractor(s) considers that all Work required by the Contract is 100% complete, including correction of any remaining punch list work or deficiencies, the Trade Contractor(s) shall notify the Consultant via the Construction Manager in writing and request a final inspection. The Consultant, upon receipt of written notice from the Construction Manager that the Work is complete and is ready for final inspection and acceptance, will promptly make such inspection and if the Consultant finds the Work completed and acceptable under the Contract Documents and the Contract fully performed, the Consultant will notify the Construction Manager in writing to submit, and will certify to the Owner a final Certificate for Payment in accordance with Articles 30.9 and 30.9.1 of these General Conditions. If the Construction Manager does not complete the punch items within the time designated, the Owner retains the right to have these items corrected at the expense of the Construction Manager including all architectural, engineering and inspection costs and expenses incurred by the Consultant and the Owner, and to deduct such costs and expenses from the funds being held in retainage. The Owner shall not be required to release the retainage until such items have been completed.

ARTICLE 29 - LIQUIDATED DAMAGES

29.1 The Owner, Construction Manager, and the Trade Contractor(s) recognize and agree that time is of the essence of this Contract and that the Owner will suffer financial loss if the Work is not completed within the time specified in the Contract plus any extensions that may be allowed. The parties further recognize the delays, expense and difficulties involved in proving the actual loss suffered by the Owner should the Work not be completed on time. The Owner and the Construction Manager agree on the amounts stated as liquidated damages in the Agreement. The Owner and Construction Manager agree that the amount stated as liquidated damages are not intended to be penalties.

29.2 Should the Trade Contractor(s) fail to satisfactorily complete the Work under Contract on or before the date stipulated for Substantial Completion, as adjusted by approved Change Orders, if any, the Trade Contractor(s) will be required to pay liquidated damages to the Owner foreach consecutive Calendar Day that the Owner is deprived of full use of the area beyond the date specified unless otherwise stipulated elsewhere by Owner. After the date for Substantial Completion has been certified by the Owner, the Trade Contractor(s) shall cease to owe liquidated damages until the date established for Final Completion.

29.3 If Final Completion is not achieved by the date established for Final Completion, as adjusted by approved Change Orders, if any, liquidated damages in the amount stipulated in the Agreement will become due and collectable. The Contract will be considered complete and Final Completion shall be deemed to have occurred when all Work has been completed in compliance with the Contract Documents and the Certificate of Final Completion has been issued by the Owner. No deduction or payment of liquidated damages will, in any degree, release the Trade Contractor(s) from further obligations and liabilities to complete the entire Contract. Permitting the Trade Contractor(s) to continue and finish the Work, or any part of it, after expiration of the Contract Time, shall in no way constitute a waiver on the part of the Owner of any liquidated damages due under the Contract.

ARTICLE 30 - PAYMENT TO THE CONSTRUCTION MANAGER

30.1 Payments on account of this Contract shall be made monthly as Work progresses. The Construction

Manager shall submit to the Consultant, in the manner and form prescribed, an application for each payment, and, if required, receipts or other vouchers showing payments made for materials and labor, including payments to Sub-contractors. All payments shall be subject to any withholding or retainage provisions of this contract. All pay request documents, except the final payment, shall be submitted in whole dollar amounts. All payment applications from the Construction Manager shall include line items for overhead, profit and general condition costs.

30.2 The Consultant shall, within ten (10) Business Days after receipt of each application for payment, certify approval of payment in writing to the Owner and present the application to the Owner, or return the application to the Construction Manager indicating in writing its reasons for refusing to approve payment. The Owner, provided no exception is taken to the application for payment submitted by the Consultant, will issue payment on or within thirty (30) Business Days from the date received from the Consultant. A reasonable delay on the part of the Owner in making payment to the Construction Manager for any given payment shall not be grounds for breach of Contract. The Consultant may refuse to approve the whole or any part of any payment if it would be incorrect to make such presentation to the Owner.

30.3 If payment is requested on the basis of materials and equipment not incorporated in the Work, but delivered and suitably stored at an off jobsite location agreed to in writing by the Owner that meets the manufacturer's requirements for the stored material and not-comingled with other material, the Trade Contractor(s) via the Construction Manager must furnish the following:

30.3.1 A list of the materials consigned to the Project (which shall be clearly identified), giving the place of storage, together with copies of invoices.

30.3.2 Certification that all items have been tagged for delivery to the Project and that they will not be used for any other purpose.

30.3.3 A letter from the Surety indicating that the Surety agrees to the arrangements and that payment to the Trade Contractor(s) shall not relieve either the Construction Manager or its Surety of their responsibility to complete the Work.

30.3.4 Evidence of adequate insurance listing the Owner as an additional insured covering the material in storage.

30.3.5 Evidence that representatives of the Construction Manager has visited the Trade Contractor(s) place of storage and checked all items listed on the Trade Contractor(s) certificate. They shall certify, insofar as possible, that the items are in agreement with the Specifications and approve their incorporation into the Project.

30.4 The Owner will pay 80% of the invoiced value less retainage for materials stored off site providing the above conditions are met.

30.5 The Trade Contractor(s)'s signature on each subsequent application for payment shall certify that all previous progress payments received on account of the Work have been applied to discharge in full all of the Trade Contractor(s)'s obligations reflected in prior applications for payment.

30.6 Each payment made to the Trade Contractor(s) shall be on account of the total amount payable to the Trade Contractor(s) and the Trade Contractor(s) warrants and guarantees that the title to all materials, equipment and Work covered by the paid partial payment shall become the sole property of Owner free and clear of all encumbrances. Nothing in this Article shall be construed as relieving Trade Contractor(s) from the sole responsibility for care and protection of materials, equipment and Work upon which payments have been made or restoration of any damaged Work or as a waiver of the right of Owner to require fulfillment of all terms of the Contract Documents.

30.7 Within thirty (30) Calendar Days of the award of any Trade Contracts, and prior to submitting the next application for payment, the Trade Contractor(s) shall submit to the Consultant and the Owner via the

Construction Manager for approval a detailed breakdown of the Contract Amount including all trade contracts that have been awarded as of the date of that application for payment pursuant to CSI specification divisions, divided so as to facilitate payment and correlated to the schedule required by General Conditions Article 32 of the Contract Documents. The total value of all activities shall add up to the Contract Amount. When approved by the Consultant and the Owner, this schedule shall be used as a basis for Trade Contractor(s)'s applications for payment and may be used by the Owner to determine costs or credits resulting from changes in the Work. Failure to obtain the approval of the Schedules of Values shall be a basis for withholding payment to the Trade Contractor(s)

30.8 Retainage – The Owner will retain ten percent (10%) of the Construction Manager and Trade Contractor(s)'s progress payments, including amounts claimed for construction management fee until fifty one percent (51%) of the construction project has been completed. Thereafter, if the Work is fully in compliance with the requirements of the Contract and except as provided for in Article 28.4.1 above, the Owner shall retain five percent (5%) of the total contract amount until Substantial Completion and acceptance of all Work covered by this Contract, as collateral security to insure successful completion of the Work. For the purposes of this Article, the term "in full compliance" shall mean 1) that the progress of the Work is equal to or ahead of that predicted by the Project Baseline schedule and 2) the Work completed is in compliance with the requirements of the contract documents. Subsequent to the issuance of the Substantial Completion Certificate and depending upon the cost involved for the completion and/or correction of punch list items, the Consultant may recommend to the Owner an adjustment to the amount being held as retainage and, if approved by Owner, the amount of retainage may then be reduced and a sufficient sum retained by Owner to assure completion of the remaining unfinished Work. Retainage reduction as provided for in this Article 30.8 is contingent upon the Trade Contractor(s) and/or Sub-contractors being on or ahead of the approved progress schedule and on verification by the Consultant that the Work completed is in compliance with the requirements of the contract documents.

30.8.1 In addition to the retainage set forth above, the Owner may withhold from any monthly progress payments or nullify any progress payments in whole or in part as necessary to protect the Owner from loss on account of:

30.8.1.1 Defective Work which has not been remedied or completed Work which has been damaged requiring correction or replacement, or

30.8.1.2 Action required by the Owner to correct Defective Work or complete Work which the Trade Contractor(s) has failed or refused to correct or complete, or

30.8.1.3 Failure of the Trade Contractor(s) to perform any of its obligations under the Contract, or

30.8.1.4 Failure of the Trade Contractor(s) to make payment properly to Sub-contractors; suppliers of material, services or labor; or to reimburse the University for utilities or other services as provided for in the Contract;

30.8.1.5 Amounts to be withheld as liquidated damages for failure to complete the Project in the allotted Contract time.

30.8.2 When the Owner is satisfied that the Trade Contractor(s) has remedied any such deficiency, payments shall be made of the amount being withheld on the next scheduled application for payment.

30.9 Final Payment – When all Work is completed and acceptable and the Contract is fully performed, the Construction Manager will be directed to submit a final payment application for certification and the entire balance shall be due and payable upon a certification of completion by the Consultant that the Work is in accordance with the Contract Documents. Final change order reconciliation as per Article 18.12 must be provided prior to final payment.

30.9.1 Upon issuance of the Certificate of Final Completion by the Owner and submittal by the Construction Manager and Trade Contractor(s) of all required documents and releases, all retained amounts shall be paid to the Construction Manager as part of the Final Payment. By accepting such payment, the Construction Manager certifies that all amounts due or that may become due to any Trade Contractor(s), Sub-contractor, any Consultant of the Construction Manager, or any vendors or material suppliers, have been paid or will be paid

from the proceeds of the final payment; and that, further, there are not liens, claims or disputes involving the Owner or the Consultant that are outstanding or unresolved.

30.10 The Trade Contractor(s) shall promptly pay each Sub-contractor and material supplier upon receipt of payment from the Construction Manager (via the Owner) the amount to which said Sub-contractor and supplier is entitled, reflecting the percentage actually retained from payments to the Trade Contractor(s) on account of such Sub-contractor's work. The Trade Contractor(s) shall, by an appropriate Agreement with each Sub-contractor and material supplier, require each Sub-contractor and supplier to make payments to their sub-contractors, vendors and suppliers in similar manner.

The Consultant may, on request, furnish to any Sub-contractor or material supplier information regarding the percentages of completion applied for by the Trade Contractor(s) and the action thereon by the Consultant.

30.10.2 Neither the Owner nor the Consultant shall have any obligation to make payment to any Sub-contractor or material supplier except as may otherwise be required by law.

ARTICLE 31 - AUDITS

31.1 The Construction Manager's Trade Contractors', sub-contractors' and/or vendor's "records" shall upon reasonable notice be open to inspection and subject to audit and/or reproduction during normal business working hours as may be deemed necessary by the Owner at its sole discretion.
Such audits may be performed by an Owner's representative or an outside representative engaged by the Owner. The Owner or its designee may conduct such audits or inspections throughout the term of this contract and for a period of three years after final payment, or longer if required by law. Owner's representative may (without limitation) conduct verifications such as counting employees at the Construction Site, witnessing the distribution of payroll, verifying information and amounts through interviews and written confirmations with Construction Manager's employees, field and agency labor, Trade Contractors and vendors.

31.2 "Records" as referred to in this Contract shall include any and all information, materials and data of every kind and character, including without limitation, records, books, papers, documents, subscriptions, superintendents' reports, drawings, receipts, vouchers and memoranda, and any and all other agreements, sources of information and matters that may in the Owner's judgment have any bearing on or pertain to any matters, rights, duties or obligations under or covered by any Contract Document. Such records shall include hard copy, as well as computer readable data if it can be made available, written policies and procedures; time sheets; payroll registers; cancelled payroll checks; subcontract files (including proposals of successful and unsuccessful bidders, bid recaps, etc.); original estimates; estimating work sheets; correspondence; change order files (including documentation covering negotiated settlements); back charge logs and supporting documentation; invoices and related payment documentation; general ledger; records detailing cash and trade discounts earned; insurance rebates and dividends; and any other Construction Manager or contractor records which may have a bearing on matters of interest to the Owner in connection with the Construction Manager's dealings with the Owner (all foregoing hereinafter referred to as the "records") to the extent necessary to adequately permit evaluation and verification of any or all of the following:

Compliance with Contract requirements for deliverables;
Compliance with approved plans and specifications;
Compliance with Owner's business ethics expectations;
Compliance with Contract provisions regarding the pricing of change orders;
Accuracy of Trade Contractor(s) representations regarding pricing of invoices; and
Accuracy of Trade Contractor(s) representations related to claims submitted by the Construction Manager or its payees.

31.3 The Construction Manager shall require all payees (examples of payees include Trade Contractors, Sub-contractors, vendors, and/or material suppliers) to comply with the provisions of this Article by including the requirements hereof in a written contract agreement between the Construction Manager and payees. Such requirements to include flow-down right of audit provisions in contracts with payees will also apply to Subcontractors and Sub-subcontractors, material suppliers, etc. The Construction Manager will cooperate fully

and will cause all related parties and all of the Construction Manager's Trade Contractors and/or subcontractors (including those entering into lump sum subcontracts) to cooperate fully in furnishing or in making available to Owner from time to time whenever requested, in an expeditious manner, any and all such information, materials and data.

31.4 Owner's authorized representative or designee shall have reasonable access to the Construction Manager's facilities, shall be allowed to interview all current or former employees to discuss matters pertinent to the performance of this contract and shall provide adequate and appropriate work space in order to conduct audits in compliance with this Article. The Construction Manager and its payees agree bear their costs and expenses relating to any inspections and audits.

31.5 If an audit inspection or examination in accordance with this Article discovers any fraud or misrepresentation, or discloses overpricing or overcharges (of any nature) by the Trade Contractor(s) to the Construction Manager and/or Owner, in addition to making adjustments for the overcharges, the reasonable actual cost of the Owner's audit shall be reimbursed to the Owner by the Construction Manager. Any adjustments and/or payments that must be made as a result of any such audit or inspection of the Construction Manager's invoices and/or records shall be made within Ninety (90) Calendar Days from presentation of the Owner's findings to the Construction Manager.

31.6 The provisions of Articles 31.1, 31.2 and 31.5 notwithstanding, the Owner shall have the right to conduct inspections and audits of any matter relating to the Contract Documents or the Work, which shall be for the Owner's sole benefit and shall not relieve the Trade Contractor(s), its sureties, contractors, subcontractors suppliers and their respective employees and agents of any obligations under the Contract Documents.

31.7 Any audits or inspections under Article 31 shall not constitute a waiver of any right the Owner has to accounting or discovery of records in the possession, custody or control of the Trade Contractor(s), its sureties, contractors, subcontractors, vendors and their respective employees and agents

ARTICLE 32 - PROGRESS & SCHEDULING

32.1 If requested by the Owner during the Design Phase of the Project, and working in cooperation with the Owner and the Consultant(s), the Construction Manager shall prepare a Critical Path Method (CPM) type Design Phase schedule incorporating design phase and review activities through completion of the design and bidding of the Trade Contracts, shall include in this Design Phase schedule the broad categories of Work to be accomplished in the subsequent implementation of the design and construction of the Project, and shall modify and update this Design Phase schedule as necessary to reflect the actual status and then current plan for the Project.

32.2 The schedules submitted for this Project shall be prepared using Primavera P6 scheduling software. If approved by the University, and at the sole discretion of the University, schedules submitted using earlier versions of Primavera scheduling software (Primavera SureTrak or Primavera P3) may be converted to Primavera P6 format by the University for review purposes. However, the University will not be responsible for any inaccuracies that may result from such conversions.

32.2.1 Prior to bidding Trade Contracts, the Construction Manager shall prepare and submit to the Owner and the Consultant a preliminary CPM construction schedule for the Work that will be included in the Project bidding documents.

3.2.2.2 The schedules submitted for this Project shall coordinate Work in accordance with all schedules included in the Owner's approved Program. Construction work shall be scheduled and executed such that operations of the University are given first priority. This applies particularly to outages and restriction of access.

32.2.3 The schedules submitted for this Project shall not exceed time limits established for the Project. Schedules which reflect a duration less than the Contract Time are for the convenience of the Construction

Manager and shall not be the basis of any claim for delay or extension of time.

32.2.4 Schedules shall be revised at appropriate intervals as required by the condition of the Work and the Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

32.2.5 The Construction Manager shall also submit a payment schedule indicating the percentage of the Contract Amount and the amount of the anticipated monthly payments that will be requested as the Project proceeds.

32.2.6 The Owner may withhold approval of all or a portion of progress payments until the progress payment schedule and construction schedule have been submitted by the Construction Manager.

32.3 The Construction Manager shall prepare and keep current, for the Consultant's approval, a separate schedule of submittals coordinated with the Construction Manager's CPM construction schedule that provides reasonable time for the Consultant to review the submittals.

32.4 The Trade Contractor(s) shall cause the work to be performed pursuant to the most recent schedules.

ARTICLE 33 - USE OF COMPLETED PORTIONS

33.1 Upon mutual Agreement between the Owner, Construction Manager, and Consultant, the Owner may use a completed portion of the Project after an inspection is made. Such possession and use shall not be deemed as acceptance of any Work not completed in accordance with the Contract Documents, nor shall such possession and use be considered to alter warranty obligations or cause any warranty period to commence prior to Substantial Completion.

ARTICLE 34 - INDEMNIFICATION

34.1 To the fullest extent permitted by law, the Trade Contractor(s) shall indemnify and hold harmless the Owner, Construction Manager, its consultants, and their respective employees and agents from and against all claims, damages, losses and expenses, including attorney's fees, provided that any such claim, loss, damage or expense: (a) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom, and (b) is caused in whole or in part by any negligent act or omission of the Trade Contractor(s), any Sub-contractor or material supplier, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable This basic obligation to indemnify shall not be construed to nullify or reduce other indemnification rights which the Owner, its consultants, and their respective employees and agents would otherwise have.

34.2 The Trade Contractor(s) shall also indemnify and hold harmless the Owner, Construction Manager, its consultants, and their respective employees and agents from any claims relating to the Project brought against the Owner, its consultants, and their respective employees and agents by any Sub-contractor unless such claims are due to the gross negligence or misconduct of the Owner or Consultant.

34.3 In any and all claims against the Owner its consultants, and their respective employees and agents, by any employee of the Trade Contractor(s), any Sub-contractor, any one directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Article shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Trade Contractor(s) or any Sub-contractor under Worker's Compensation acts, disability benefit acts or other employee benefit acts.

34.4 The obligations of the Trade Contractor(s) under this Article shall not extend to the liability of the Consultant, his agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (2) the

giving of or the failure to give directions or instructions by the Consultant, his agents or employees, provided such giving or failure to give is the primary cause of injury or damage.

ARTICLE 35 - INSURANCE

35.1 The Trade Contractor(s) shall furnish the Owner (via the Construction Manager) the Certificates of Insurance or other acceptable evidence that insurance is effective, and guarantee the maintenance of such coverage during the term of the Contract. Each policy of insurance, except Workers Compensation, shall name the University of Kentucky and the directors, officers, trustees and employees of the University as additional insured on a primary and non-contributory basis as their interest appears. Waiver of subrogation in favor of the University of Kentucky shall apply to all policies. Any endorsements required to validate such waiver of subrogation shall be obtained by the Trade Contractor(s) at the Trade Contractor(s)'s expense. Reference the Turner CCIP manual for additional details

35.2 The Trade Contractor(s) shall not commence, nor allow any Sub-contractor to commence Work under this Contract, until the Owner has reviewed the certificates and approved coverages and limits as satisfying the requirements of the bidding process.

35.3 Workers' Compensation and Employers' Liability Insurance. The Trade Contractor(s) shall acquire and maintain Workers' Compensation insurance with Kentucky's statutory limits and Employers' Liability insurance as defined in the Special Conditions for all employees who will be working at the Project site. In the event any Work is sublet, the Trade Contractor(s) shall require any Sub-contractor to provide proof of this insurance for the Sub-contractors' employees, unless such employees are covered by insurance provided by the Trade Contractor(s).

35.4. The Trade Contractor(s) shall either require each Sub-contractor to procure and maintain insurance of the type and limits stated during the terms of the Contract, or insure the activities of such Sub-contractors under a blanket form as described below:

35.4.1 Commercial General Liability Insurance. The Trade Contractor(s) shall acquire and maintain a Broad Form Comprehensive General Liability (CGL) Insurance Policy including premises
- operations, products/completed operations, blanket contractual, broad form property damage, real property fire legal liability and personal injury liability coverage. The Insurance Policy must be on an "occurrence" form only, unless approved by the Owner. Contractual liability must be endorsed to include defense costs. Products and completed operations insurance must be carried for two years following completion of the Work. Policies which contain Absolute Pollution Exclusion endorsements are not acceptable. Coverage must include pollution from "hostile fires". Where required by the risks involved, Explosion, Collapse and Underground (XCU) coverages shall be added by endorsement. If the work involved requires the use of helicopters, a separate aviation liability policy as defined in the Special Conditions will be required. If cranes and rigging are involved, a separate inland marine policy with liability limits as defined in the Special Conditions will be required.

35.4.1.1 The limits of liability shall not be less than defined in the Special Conditions.

35.4.2 Comprehensive Automobile Liability Insurance. The Trade Contractor(s) shall show proof and guarantee the maintenance of insurance to cover all owned, hired, leased or non-owned vehicles used on the Project. Coverage shall be for all vehicles including off the road tractors, cranes and rigging equipment and include pollution liability from vehicle upset or overturn. Policy limits shall not be less than defined in the Special Conditions.

35.4.3 Excess or Umbrella Liability Insurance. The Trade Contractor(s) shall acquire and maintain a policy of excess liability insurance in an umbrella form for excess coverages over the required primary policies of broad form commercial general liability insurance, business automobile liability insurance and employers' liability insurance. This policy shall have a minimum as defined in the Special Conditions for each occurrence in excess of the applicable limits in the primary policies. The excess liability policy shall not contain an absolute pollution exclusion and shall include coverages for pollution that may occur due to hostile fires and vehicle upset and overturn. The limits shall be increased as appropriate to cover any anticipated special exposures.

35.5 Builders Risk Insurance. The Construction Manager shall purchase and maintain an "all risk" Builder's Risk Insurance policy upon the Work at the site to the full insurable value thereof. Such insurance shall include interests of the Owner, Construction Manager, and all Sub-contractors and of their subcontractors. It shall insure against perils of fire, extended coverage, vandalism and malicious mischief. Trade Contractor(s)'s work performed, and materials to be incorporated into the project and stored on the jobsite, will be covered. Any such event occurring upon the Work Site covered under this policy and for which a claim is filed, **the causing trade contractor shall held responsible to incur the deductible cost of this policy in its entirety for said occurrence per below costs.** Builder's Risk does not include temporary buildings, or Trade Contractor(s) or Trade Contractor(s)'s tools, equipment, or trailers and contents.

Deductibles applied per OCCURANCE:
$ 10,000: Base Rate
$ 50,000: Water Damage, Gross Negligence
$100,000: Flood, Earthquake, Windstorm, Costal Windstorm

35.6 Insurance Agent and Company Insurance as required in the bidding process of the Project shall be written according to applicable state law in Kentucky. The policies shall be written by an insurer duly authorized to do business in Kentucky in compliance with KRS: 304.1-.100 and -110.

ARTICLE 36 - PERFORMANCE AND PAYMENT BONDS

36.1 The Construction Manager shall furnish a Performance Bond in the form provided in the Contract Documents in the full amount of the Contract Amount as security for the faithful performance of the Contract. The Construction Manager shall also furnish a Payment Bond in the form provided in the Contract Documents in the full amount of the Contract Amount for the protection of all persons performing labor or furnishing materials, equipment or supplies for the Construction Manager or its Sub-contractors for the performance of the Work provided for in the Contract, including security for payment of all unemployment contributions which become due and payable under Kentucky Unemployment Insurance Law.

36.2 Each bond furnished by the Construction Manager shall incorporate by reference the terms of the Contract as fully as though they were set forth verbatim in such bonds. In the event the Contract Amount is adjusted by Change Order, the penal sum of both the performance bond and the payment bond shall be deemed increased by like amounts.

36.3 The performance and payment bonds shall be executed by a surety company authorized to do business in the Commonwealth of Kentucky, and the contract instrument of bonds must be countersigned by a duly appointed and licensed resident agent.

ARTICLE 37 - DAMAGED FACILITIES

37.1 The Trade Contractor(s) shall repair or replace, at no expense to the Owner, any damaged section of existing buildings, paving, landscaping, streets, drives, utilities, watersheds, etc. caused by Work performed under the Contract or incidental thereto, whether by the Trade Contractor(s)'s own forces, Sub-contractors or by material suppliers. Such repair or replacement shall be performed by craftsmen skilled and experienced in the trade or craft for the original Work.

37.2 Water damage to the interior of any building caused by Work performed under the Contract or incidental thereto, whether by the Trade Contractor(s)'s own forces, Sub-contractors, or by material suppliers, and whether occurring in a new or existing building, shall be repaired by the Trade Contractor(s) at the Trade Contractor(s)'s expense, and any materials damaged inside the building, including personal property, shall be repaired or replaced at the full replacement cost by the Trade Contractor(s) at the Trade Contractor(s)'s expense.

37.3 For existing buildings, the Trade Contractor(s), along with the Owner's Representative and Consultant, will tour the Project site to evaluate existing conditions and determine any existing damage before

any Work on this Contract is done.

37.4 Should the Trade Contractor(s) fail to proceed with appropriate repairs in an expedient manner, the Owner reserves the right to have the Work/repairs completed and deduct the cost of such Work/repairs from amounts due or to become due to the Trade Contractor(s). If the Owner deems it not expedient to repair the damaged Work, or if repairs are not done in accordance with the Contract, an equitable deduction from the Contract price shall be made.

ARTICLE 38 - CLAIMS & DISPUTE RESOLUTION

38.1 All Trade Contractor(s) claims and disputes shall be referred to the Consultant via the Contruction Manager for review and recommendation. All claims shall be made in writing to the Consultant and to the Owner's Project Manager not more than ten (10) days from the occurrence of the event which gives rise to the claim or dispute, or not more than ten (10) days from the date that the Trade Contractor(s) knew or should have known of the claim or dispute. Unless the claim is made in accordance with these requirements, it shall be waived. Any claim not submitted before Final Payment shall be waived. The Consultant shall render a written decision within fifteen (15) days following receipt of a written demand for the resolution of a claim or dispute.

38.1.1 The provisions of Article 43.2 notwithstanding, claims and disputes between the Construction Manager and any Sub-contractor or supplier shall not be referred to the Consultant except to request interpretation and/or clarification of the intent of the plans or specifications. Such claims and disputes between the Construction Manager and any Sub-contractor shall be resolved between those parties as required by Article 43.4 of these General Conditions.

38.2 The Consultant's decision shall be final and binding on the Trade Contractor(s) unless the Construction Trade Contractor(s) submits to the Consultant via the Construction Manager and the Owner's Project Manager a written notice of appeal within fifteen (15) Calendar Days of the Consultant's decision. The Trade Contractor(s) must present within fifteen (15) Calendar Days of such notice to appeal a narrative claim in writing with complete supporting documentation. After receiving the written claim, the Project Manager will review the materials relating to the claim and may meet with the Consultant and/or the Trade Contractor(s) to discuss the merits of the claim. The Project Manager will render a decision within thirty (30) Calendar Days after receiving the written claim and supporting documentation. The decision of the Project Manager shall be final and binding pending further appeal as provided for in Article 39. If the Consultant or the Project Manager do not issue a written decision within thirty (30) calendar days after receiving the claim and supporting documentation, or within a longer period as may be established by the parties to the Contract in writing, then the Trade Contractor(s) may proceed as if an adverse decision had been received.

38.3 If the Project Manager does not agree with the Consultant's decision on a claim by the Trade Contractor(s), the Project Manager shall notify the Trade Contractor(s) via the Construction Manager and the Consultant and direct the Trade Contractor(s) to perform the Work about which the claim was made and the Trade Contractor(s) shall proceed with such Work in accordance with the Project Manager's instruction. If the Trade Contractor(s) disagrees with a decision of the Project Manager concerning a Trade Contractor(s)'s claim, the Trade Contractor(s)'s shall proceed with the Work as indicated by the Project Manager's decision.

38.4 The Trade Contractor(s) shall continue to diligently pursue Work under the Contract pending resolution of any dispute, and the Owner shall continue to pay for undisputed work in place.

ARTICLE 39 - CLAIMS FOR DAMAGE

39.1 Should either party to the Contract suffer damage because of wrongful act or neglect of the other party, or of anyone employed by them, or others for whose act they are legally liable, or if other controversy should arise under the Contract, such claim or controversy shall be made in writing to the other party within thirty (30) days after the first occurrence of the event. Prior to the institution of any action in court, the claim or controversy (together with supporting data) shall be presented in writing to the Director of the Capital Project Management Division at the University of Kentucky ("Director") or his designee. The Director, or designee, is authorized, subject to any limitations or conditions imposed by regulations, to settle, comprise, pay, or otherwise adjust the claim or controversy with the Trade Contractor(s). The Director, or designee, shall

promptly issue a decision in writing. A copy of the decision shall be mailed or otherwise furnished to the Trade Contractor(s). The decision rendered shall be final and conclusive unless the Trade Contractor(s) files suit pursuant to KRS 45A.245. If the Director, or designee, does not issue a written decision within one hundred and twenty (120) days after written request for a final decision, or within a longer period as may be established by the parties to the Contract in writing, then the Trade Contractor(s) may proceed as if an adverse decision had been received.

39.2 Any legal action on the Contract shall be brought in the Franklin Circuit Court and shall be tried by the Court sitting without a jury. All defenses in law or equity, except the defense of government immunity, shall be preserved to the Owner. The Owner shall recover from the Trade Contractor(s) all attorney's fees, costs and expenses incurred to the extent the Owner prevails in defending or prosecuting each claim in litigation of disputes under the Contract. The Owner is the prevailing party under this provision and is entitled to recover attorneys' fees, costs and expenses on a claim-by-claim basis to the extent the Owner successfully defeats or prosecutes each claim. A recovery of a net judgment by the Trade Contractor(s) shall not be determinative of the Owner's right to recover attorneys' fees, expenses and costs. Rather, such a determination shall be made based on the extent that the Owner successfully defends or prosecutes each distinct claim in litigation under the Contract, even if the Owner does not prevail on every claim. The Trade Contractor(s) shall be liable to the Owner for all attorney's fees, costs and expenses incurred by the Owner to enforce the provisions of the Contract.

ARTICLE 40 - LIENS

40.1 The filing and perfection of liens for labor, materials, supplies, and rental equipment supplied on the Work are governed by KRS 376.195 et seq.

40.2 Statements of lien shall be filed with the Fayette County Clerk and any action to enforce the same must be instituted in the Fayette Circuit Court, pursuant to KRS 376.250 (5).

40.3 The lien shall attach only to any unpaid balance due the Trade Contractor(s) for the improvement from the time a copy of statement of lien, attested by the Fayette County Clerk, is delivered to the Owner, pursuant to the provisions of KRS 376.240.

ARTICLE 41 - ASSIGNMENT

41.1 Neither party to the Contract shall assign the Contract, or any portion thereof without the prior written consent of the other, which consent may be granted or withheld in the granting party's sole and absolute discretion. The Trade Contractor(s) shall not assign any amount or part of the Contract or any of the funds to be received under the Contract unless the Construction Manager has the prior written approval of the Owner (which approval may be granted or withheld in the Owner's sole and absolute discretion) and the Surety on the Construction Manager's bond has given written consent to any such assignment.

ARTICLE 42 - SEPARATE CONTRACTS

42.1 The Owner reserves the right to enter into other Contracts in connection with the Project or to perform any work with the Owner's forces in the normal sequence of the work as depicted in the then current construction schedule. Except for work performed by University personnel, such contracts shall be assignable to the Construction Manager and shall contain the same terms and conditions as the contracts between the Construction Manager and the Sub-contractors. The Construction Manager will be entitled to a maximum of three percent (3%) overhead and profit on the value of such assigned contracts. The Construction Manager shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate its Work with theirs in such manner as the Consultant may direct.

42.2 Should the Trade Contractor(s) cause damage to any separate contractor on the Work, and the separate contractor sues the Owner on account of any damage alleged to have been so sustained, the Trade Contractor(s) shall be responsible for all costs, attorney's fees and expenses incurred by the Owner for defending such proceedings unless the Owner prevails on behalf of the Trade Contractor(s)'s in which case

fees and expenses will be the responsibility of the separate contractor and if any judgment against the Owner arises therefrom, the Trade Contractor(s) shall pay or satisfy it and shall pay all costs, attorney's fees and expenses incurred by the Owner.

42.3 If any part of the Trade Contractor(s)'s Work depends upon the work of any other separate contractor, the Trade Contractor(s) shall promptly report to the Consultant via the Construction Manager any observed defects in such work that render it unsuitable for proper execution connection. The failure to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of the work, except as to defects which may develop in the other contractor's work after the execution ofthe work.

42.4 Whenever work being done by the Owner's forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various parties involved shall be established by the Owner to secure the completion of the various portions of the Work in general harmony.

ARTICLE 43 - CONSTRUCTION MANAGER/SUB-CONTRACTOR RELATIONSHIP

43.1 The Construction Manager is fully responsible to the Owner for the acts and omissions of the Sub-contractors and of persons either directly or indirectly employed by them. The Construction Manager is responsible for the acts and omissions of persons employed directly by the Construction Manager and for the coordination of the Work, including placement and fittings of the various component parts. No claims for extra costs as a result of the failure to coordinate the Work, or by acts or omissions of the various Sub-contractors, will be paid by the Owner.

43.2 Except as otherwise provided in these Contract Documents, the Construction Manager agrees to bind every Sub-contractor by the terms and conditions of the Contract Documents as far as applicable to their portion of the Work. Upon request, the Construction Manager shall provide copies of any subcontracts and purchase orders to the Owner or Consultant.

43.3 The Construction Manager shall make no substitution or change in any Sub-contractor listed and accepted by the Consultant or Owner except as approved in writing by the Owner. The Construction Manager shall not employ any Sub-contractor or supplier against whom the Owner or the Consultant has made reasonable and timely objection. The Construction Manager (CM) will not be allowed to self-perform work or bid on any of the proposed work categories unless a subcontractor fails to perform and upon prior approval by the Universities authorized representatives."

43.4 Nothing contained in the Contract Documents shall create any contractual relationship between the Owner and any Sub-contractor, Trade Contractor or Supplier, nor shall the Construction Manager include any language in their contracts with any Sub-contractor, Trade Contractor and/or Supplier that might Imply such a relationship. The Construction Manager is hereby notified that it is the Construction Manager's contractual obligation to settle disputes between Sub-contractors, Trade Contractors, and/or Suppliers. Neither the Owner nor the Consultant will settle disputes between the Construction Manager and any Sub-contractor, Trade Contractor, and/or Supplier or between Sub- contractors, Trade Contractors, and/or Suppliers.

43.4.1 The Owner does not waive sovereign immunity under KRS 45A.245(1) for any claim or claims made by parties not having a written contract with the University ofKentucky.

43.4.2 Third party and/or flow-through type claims, from Sub-contractors and/or suppliers or any other entity not having a written contract directly with the University, are specifically prohibited by this Contract and no provision of the Construction Manager's contracts with such entities shall indicate otherwise.

43.4.3 The Construction Manager shall indemnify and hold harmless the Owner and its agents and employees from any claims relating to the Project brought against the Owner by any of the Construction Manager's Sub-contractors or suppliers, or between their sub-contractors orsuppliers.

ARTICLE 44 - CASH ALLOWANCE

44.1 The Construction Manager is to provide or require the Sub-contractor(s) to include in the Contract

Amount all costs necessary to complete the Work. Costs based on “allowances” shall be permitted only for objectively quantifiable material items and only with the prior written approval of the Owner.

ARTICLE 45 - PROJECT SITE LIMITS

45.1 The Construction Manager shall confine the apparatus, the storage of materials, and the operations of Workmen to Project site limits indicated in the Contract Documents and as permitted by law, ordinances, and permits, and shall not unreasonably encumber the site with materials and equipment.

ARTICLE 46 - CLEAN UP

46.1 The Trade Contractor(s) shall at all times keep the premises free from accumulation of waste material or rubbish caused by the operations in connection with the Work. All corridors and exit doors must be kept clear at all times. All exit ways, walks, and drives must be kept free of debris, materials, tools and vehicles.

46.2 At the completion of the Work, and prior to final inspection and acceptance, the Trade Contractor(s) shall remove all remaining waste materials, rubbish, Trade Contractor(s)'s construction equipment, tools, machinery, and surplus materials and shall leave the Work in a clean and usable condition, satisfactory to the Consultant and the Owner. If the Trade Contractor(s) fails to clean up as provided in the Contract Documents, the Owner and the Construction Manager may perform the cleaning tasks and charge the cost to the Trade Contractor(s).

ARTICLE 47 - POINTS OF REFERENCE

47.1 The Trade Contractor(s) shall carefully preserve bench marks, reference points and stakes, and in case of willful or careless destruction, the Trade Contractor(s) shall be charged with the resulting expense of replacement and shall be responsible for any mistake that may be caused by their loss or disturbance.

ARTICLE 48 - SUBSTITUTION - MATERIALS AND EQUIPMENT

48.1 Reference to or the listing of items to be incorporated in the construction without referring to any specific article, device, equipment, product, material, fixture, patented process, form, method or type of construction, or by name, make, trade name, or catalog number shall be interpreted as establishing the general intent of the Contract and the general standard of quality for that item.

48.2 Specific references in the Contract Documents to any article, device, equipment, product, material, fixture, patented process, form, method or type of construction, or by name, make, trade name, or catalog number, with the words "or equal", shall be interpreted as establishing a minimum standard of quality, and shall not be construed as limiting competition.

48.2.1 Substitution of other equipment and materials as “or equal” to items named in the specifications will be allowed provided the proposed substitution is approved by the Consultant and will perform the functions called for by the general design, be similar and of equal quality to that specified and be suited to the same use and capable of performing the same function of that specified. The Trade Contractor(s) has the burden to prove equality of any substitution requested.

48.3 Specific references in the Contract Documents to any article, device, equipment, product, material, fixture, patented process, form, method or type of construction, or by name, make, trade name, or catalog number, without the words “or equal”, shall be interpreted as defining an item or source that has after careful consideration been determined by the University as necessary to be compliant with, and/or to function properly within, the University operational system. No substitutions will be allowed.

48.3.1 In the event the Contract Documents contain specific reference to two or more items as described in Article 48.3, any of those listed will be acceptable.

48.4 Substitution of equipment and materials previously submitted by the Trade Contractor(s) and

approved by the Consultant will be considered only for the following reasons:

48.4.1 Unavailability of the materials or equipment due to conditions beyond the control of the supplier.

48.4.2 Inability of the supplier to meet Contract Schedule.

48.4.3 Technical noncompliance to specifications.

48.5 In substituting materials or equipment, the Trade Contractor(s) assumes responsibility for any changes in systems or modifications required in adjacent or related work to accommodate such substitutions, despite consultant approval, and all costs associated with the substitution shall be the responsibility of the Trade Contractor(s). The Consultant shall be reimbursed by the Trade Contractor(s) for any architectural or engineering revisions required as the result of such substitutions.

48.6 Inclusion of a certain make or type of materials or equipment in the Trade Contractor(s)'s bid proposal shall not obligate the Owner to accept such materials or equipment if they do not meet the requirements of the Contract Documents and any such substitutions in the preparation of the bid without written approval shall be at the sole risk of the Trade Contractor(s).

ARTICLE 49 - TEST AND INSPECTION

49.1 Regulatory agencies of the government having jurisdiction may require any Work to be inspected, tested or approved. The Trade Contractor(s) shall assume full responsibility therefore, pay all costs in connection therewith, unless otherwise noted, and furnish the Consultant the required certificates of inspection, testing or approval.

49.2 The Trade Contractor(s) shall give the Consultant (via the Construction Manager) timely notice of readiness of the Work for all inspections, tests or approvals.

49.3 The technical specifications may indicate specific testing requirements to be performed by the Trade Contractor(s). Unless otherwise provided in the Contract Documents, the cost of all such testing shall be the responsibility of the Trade Contractor(s). Testing shall be completed using a testing facility or laboratory approved by the Owner.

49.4 The costs of all inspection fees as may be required to construct and occupy the Work shall be the responsibility of the Trade Contractor(s).

ARTICLE 50 - WARRANTY

50.1 The Trade Contractor(s) warrants to the Owner and the Consultant that all materials and equipment furnished under this Contract shall be new and in accordance with the requirements of the Contract Documents, and that all Work shall be of good quality, free from faults and defects and in conformance with the Contract Documents. If required by the Consultant or the Owner, the Trade Contractor(s) shall furnish satisfactory evidence as to the kind and quality of materials and equipment. If the Trade Contractor(s) requests approval of a substitution of material or equipment, the Trade Contractor(s) warrants that such installation, construction, material, or equipment will equally perform the function for which the original material or equipment was specified. The Trade Contractor(s) explicitly warrants the merchantability, the fitness for a particular purpose, and quality of all substituted items in addition to any warranty given by the manufacturer and/or supplier. Approval of any such substitution is understood to rely on such warrant of performance. Prior to the Substantial Completion inspection, the Trade Contractor(s) shall deliver to the Consultant all warranties and operating instructions required under the Contract or to which the Trade Contractor(s) is entitled from manufacturers, suppliers, and Sub-contractors. All warranties for products and materials incorporated into the Work shall begin on the date of Substantial Completion. The warranty provided in this Article 50 shall be in addition to and not a limitation of any other warranty or remedy required by law or by the Contract Documents, and such warranty shall be interpreted to require the Trade Contractor(s) to replace defective material and equipment and re-

execute defective Work which is disclosed to the Trade Contractor(s) by or on behalf of the Owner within a period of one (1) year after Substantial Completion of the entire Work in addition to other warranty obligations beyond one year from Substantial Completion as provided for by law or by the Contract Documents.

50.2 Neither the final payment, any provision in the Contract Documents nor partial or entire use or occupancy of the premises by the Owner shall constitute an acceptance of Work not done in accordance with Contract Documents or relieve the Trade Contractor(s) or its Sureties of liability with respect to any warranties or responsibilities for faulty materials and workmanship. The Trade Contractor(s) or its sureties shall remedy any defects in Work and any resulting damage to Work at the Trade Contractor(s)'s own expense. The Trade Contractor(s) shall be liable for correction of all damage resulting from defective Work. If the Trade Contractor(s) fails to remedy any defects or damage, the Owner may correct Work or repair damages and the cost and expense incurred in such event shall be paid by or be recoverable from the Trade Contractor(s) or the surety. The Owner will give notice of observed defects with reasonable promptness.

50.3 The Trade Contractor(s) shall guarantee that labor, material, and equipment will be free of defects for a period of one (1) year from the date shown on the Certificate of Substantial Completion unless special conditions or additional warranty periods are required by the contract pursuant to Article 23 in addition to warranty obligations which extend beyond one year from Substantial Completion. The Owner will give notice of observed defects with reasonable promptness. Expendable items and wear from ordinary use are excluded from this warranty.

50.4 Should the Trade Contractor(s) be required to perform tests that must be delayed due to climate conditions, it is understood that such tests will be accomplished by the Trade Contractor(s) at the earliest possible date with provisions of the general warranty beginning upon satisfactory completion of said test. The responsibility of the Trade Contractor(s) under this Article will not be abrogated if the Owner should elect to initiate final payment. If the Owner initiates final payment, consent of Trade Contractor(s)'s surety acknowledging that Work not yet tested is required. The Trade Contractor(s) shall warrant that the entire Project will conform to the Contract Documents.

50.5 In addition to the foregoing, the Trade Contractor(s) shall warrant for a period of one (1) year that all buildings and other improvements constructed as a part of the Work shall be watertight and leak proof at every point and in every area. The Trade Contractor(s) shall, immediately upon notification by or on behalf of the Owner of water penetration, determine the source of water penetration and, at the Trade Contractor(s)'s expense, (a) do any work necessary to make such buildings or improvements watertight and (b) repair and replace any other damaged material, finishes and furnishings damaged as a result of such water penetration and return the buildings or other improvements to their original condition.

50.6 The Trade Contractor(s) shall address and resolve to the Owner's satisfaction any warranty claims made by or on behalf of the Owner during the above described warranty period and all repairs and replacements made by the Trade Contractor(s) pursuant to this Article 50 shall be warranted by the Trade Contractor(s), on the terms set forth in this Article 50, for a period of time commencing upon the completion of such repairs and replacements and ending on the later of (a) the expiration of the one (1) year warranty period provided for above or (b) six (6) months after the date such repair or replacement is completed.

50.7 All costs, attorney's fees and expenses incurred by the Owner as a result of the Trade Contractor(s)'s failure to honor any warranty for the Work shall be paid by or recoverable from the Trade Contractor(s).

ARTICLE 51 - PREVAILING WAGE LAW REQUIREMENTS (NO LONGER USED AS OF 1/9/17)

ARTICLE 52 - APPRENTICES

52.1 Apprentices (for all classifications of work) shall be permitted to work only under an apprenticeship agreement approved by the Kentucky Supervisor of Apprenticeship and by the Kentucky Apprenticeship and Training, United States Department of Labor.

ARTICLE 53 - GOVERNING LAW

53.1 This Contract and all issues and disputes arising out of this Contract shall be governed by, construed and enforced in accordance with the laws of the Commonwealth of Kentucky without consideration of its conflicts of laws principles.

ARTICLE 54 - NONDISCRIMINATION IN EMPLOYMENT

54.1 During the performance of the Contract, the Trade Contractor(s) agrees as follows:

54.1.1 The Trade Contractor(s) will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, national origin, or disability in employment. The Construction Manager will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, age, national origin, or disability in employment. Such action shall include, but not be limited to the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. The Trade Contractor(s) agrees to post in conspicuous places available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

54.1.2 The Trade Contractor(s) will, in all solicitations or advertisements for employees placed by or on behalf of the Trade Contractor(s); state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, national origin or disability in employment.

54.1.3 The Trade Contractor(s) will send to each labor union or representatives of workers with which it has a collective bargaining agreement or other contract or understanding, a notice advising the said labor union or workers' representatives of the Trade Contractor(s)'s commitments under this Article, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

54.2 Failure to comply with the above nondiscrimination clause constitutes a material breach of Contract.

ARTICLE 55 - AFFIRMATIVE ACTION; REPORTING REQUIREMENTS

55.1 The Construction Manager and any Sub-contractor is exempt from any affirmative action or reporting requirements, under the Kentucky Equal Employment Opportunity Act of 1978, KRS 45.550 to KRS 45.640 “The Act", if any of the following conditions are applicable:

55.1.1 The Trade Contract awarded is in the amount of two hundred and fifty thousand dollars ($250,000.00) or less, and the amount of the Trade Contract is not a subterfuge to avoid compliance with the provisions of the Act;

55.1.2 The Construction Manager or Sub-contractor utilizes the services of fewer than eight (8) employees during the course of the Contract;

55.1.3 The Construction Manager or Sub-contractor employs only family members or relatives;

55.1.4 The Construction Manager or Sub-contractor employs only persons having a direct ownership interest in the business and such interest is not a subterfuge to avoid compliance with the provisions of The Act.

55.2 The Construction Manager and any Sub-contractor, not otherwise exempted, shall:

55.2.1 For the length of the Contract, hire DBE’s from within the drawing area to satisfy the agreed upon goals and timetables. Should the union with which the Trade Contractor(s) or Sub-contractor have collective bargaining agreements be unwilling to provide sufficient DBE’s to satisfy the agreed upon goals and timetables, the Trade Contractor(s) and Sub-contractors shall hire DBE’s from other sources within the drawing area;

55.2.2 Diverse Business Enterprises (DBE) consist of minority, women, disabled, veteran and disabled

veteran owned business firms that are at least fifty-one percent owned and operated by an individual(s) of the aforementioned categories. Also included in this category are disabled business enterprises and non-profit work centers for the blind and severely disabled. MBE, WBE, Veterans, Disabled Veterans and Disabled make up Diverse Business Enterprises (DBE)

55.2.3 The equal employment provisions of The Act may be met in part by the Trade Contractor(s) contracting to a DBE contractor or Sub-contractor. A DBE contractor, or Sub-contractor shall mean a business established under the definition of a DBE in Article 55.2.1

55.2.4 The Trade Contractor(s) shall, for the length of the Contract, furnish such information as required by The Act and by such rules, regulations and orders issued pursuant thereto and will permit access by the contracting agency and the department to all books and records pertaining to its employment practices and Work sites for purposes of investigation to ascertain compliance with The Act and such rules, regulations and orders issued pursuant thereto.

55.3 If the Trade Contractor(s) is found to have committed an unlawful practice against a provision of The Act during the course of performing under this Contract, a Trade Contract or a subcontract covered under The Act, the Owner may cancel or terminate the Contract, conditioned upon a program for future compliance approved by the Owner. The Owner may also declare such Trade Contractor(s) ineligible to submit proposals on further contracts until such time as the Trade Contractor(s) complies in full with the requirements of The Act.

55.4 Any provisions of The Act notwithstanding, the Trade Contractor(s) shall not be required to terminate an existing employee, upon proof that employee was employed prior to the date of the Contract, nor to hire anyone who fails to demonstrate the minimum skills required to perform a particular job.

END OF DOCUMENT

010000S01- Special Conditions – For Trade Contractor on UK Health Education Building - Construction Manager at Risk Contract

UNIVERSITY OF KENTUCKY
SPECIAL CONDITIONS OF THE CONTRACT
FOR CONSTRUCTION BY TRADE CONTRACTORS
VIA CONSTRUCTION MANAGER AT RISK CONTRACT

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ARTICLE 01 GENERAL INFORMATION

1.1 These Special Conditions are intended to modify, supplement, or delete from, applicable Articles of the General Conditions.

1.2 Where any Article of the General Conditions is supplemented by these Special Conditions, the Article shall remain in effect and the supplement shall be added thereto.

1.3 Where Special Conditions conflict with General Conditions, provisions of the Special Conditions take precedence.

ARTICLE 02 PERMITS AND FEES

The Lexington Fayette Urban County Government (LFUCG) Sewer Tap Fee shall be secured and paid for by the Trade Contractor(s). The sewer tap fee is for all projects, regardless of type, is presently calculated by the LFUCG and is based on $1.56 per square foot. The total fee is anticipated to be $702,000, based on 450,000 Total Square Feet.

ARTICLE 03 (NOT USED)

ARTICLE 04 CONSULTANT

4.1 Wherever in these Contract Documents reference is made to the Consultant, it shall be understood to mean JRA Architects or their duly authorized representatives. (See Article 2 of the General Conditions.)

ARTICLE 05 GEOTECHNICAL REPORT

5.1 No subsurface or geotechnical survey information is available at this time.

ARTICLE 06 TIME FOR COMPLETION

6.1 The time for Substantial Completion as further defined in Article 1 of the General Conditions shall be 946 consecutive calendar days from the date of commencement as specified in the Work Order letter, and Final Completion shall be 30 days thereafter.

ARTICLE 07 LIQUIDATED DAMAGES

7.1 Should the Trade Contractor(s) fail to achieve Substantial Completion of the Work under this Contract on or before the date stipulated for Substantial Completion (or such later date as may result from extensions in the Contract Time granted by the Owner), he agrees that the Owner is entitled to, and shall pay the Owner as liquidated damages the sum of Two Thousand Eight Hundred Seventeen Dollars ($2,817.00) for each consecutive calendar day that Substantial Completion has not been met. See Article 3 of the Agreement.

7.2 Should the Trade Contractor(s) fail to achieve Final Completion of the Work under this Contract on or before the date stipulated for Final Completion (or such later date as may result from extensions in the Contract Time granted by the Owner), he agrees that the Owner is entitled to, and shall pay the Owner as liquidated damages the sum of One Thousand Seven Hundred Forty Eight Dollars ($1,748.00) for each consecutive calendar day until Final Completion is reached. See Article 3 of the Agreement.

ARTICLE 08 SUBMITTALS AND SHOP DRAWINGS

8.1 SUBMITTALS - GENERAL

8.1.1 The Trade Contractor(s) shall submit each set of Shop Drawings, product data, samples, and test and/or certification reports and samples as a separate item in UK E-Communication®. Projects not utilizing UK E-Communication® must submit all items electronically to the Consultant and the UK Project Manager and Administrative Coordinator.

8.1.2 All sample selections for color shall be submitted for approval at the same time. Color selections shall not be submitted individually.

8.1.3 Any deviation from the Contract Documents shall be noted on the transmittal form comment section.

8.1.4 All submittals are to be reviewed by the Construction Manager for compliance with the Contract Documents before submission for approval. All submittals are to be initiated by the Trade Contractor(s). Submittals made directly to the Consultant by sub-contractors, manufacturers or suppliers will not be accepted or reviewed.

8.1.5 Re-submittals shall conspicuously note all changes from earlier submissions. Special notation by the Trade Contractor(s) shall be made to any changes other than those made in response to the Consultant's review.

8.1.6 Manufacturers shall, when requested by the Consultant, submit test reports prepared by reputable firms or laboratories certifying as to performance, operation, construction, wearability, etc., to support claims made by the manufacturer of the equipment or materials proposed for inclusion in the Work. Trade Contractor(s) shall also submit a list of three (3) installations where said equipment or materials have been in service for a minimum of five (5) years.

8.2 SUBMISSIONS - REVIEW

8.2.1 Review of submittals is only for compliance with the design concept and the contract documents. THE CONSULTANT SHALL NOT BE RESPONSIBLE FOR CHECKING DEVIATIONS FROM CONTRACT DOCUMENT REQUIREMENTS OR CHANGES FROM EARLIER SUBMISSIONS NOT SPECIFICALLY NOTED.

8.2.2 The following shall be verified prior to making submittals:

Field Measurements, Field Construction Criteria, Catalog numbers and similar data, Quantities and Capacities, and Compliance with requirements, including verification of all dimensions,

8.2.3 Review Stamp designations shall be as follows:

8.2.3.1 “NET = No Exceptions Taken”: Proceed with the Work, no corrections needed.

8.2.3.2
"FC= Furnish as Corrected”: Proceed with the Work, noting the corrections/conditions of the approval.

8.2.3.3 "RR = Revise and Resubmit": Do not proceed with the Work, as the submittal does not comply with the Contract Documents. Revisions to the submittal are required for approval. On projects utilizing UK E-Communication, “Send Back a Step” is used in lieu of “Revise and Resubmit"

8.2.3.4 "R = rejected": Do not proceed with the Work, the submittal is rejected.

8.3 SUBMISSIONS - SPECIAL PROVISIONS

8.3.1 In making a submittal, the Trade Contractor(s) shall be deemed to be making the following representations:

8.3.1.1 The Trade Contractor(s) understands and agrees that he shall bear full responsibility for the products furnished. The Trade Contractor(s) expressly warrants that products described in the attached submittal will be usable and that they conform to the Contract requirements unless specifically noted otherwise.

8.3.1.2 The Trade Contractor(s) understands and agrees that, without assuming design responsibility, he expressly warrants that products described in the attached submittal are capable of being used in accordance with the intent of the design documents and that they conform to the Contract requirements unless specifically noted otherwise.

8.3.1.3 The Trade Contractor(s) acknowledges that the Owner will rely on the skill, judgment, and integrity of the Trade Contractor(s) as to conformance requirements and subsequent usability.

8.4 SHOP DRAWING AND PROCUREMENT SUBMITTAL LOG

8.4.1 The Construction Manager, within ten (10) days after the Pre-Construction meeting, shall begin uploading submittals using UK E-Communication®, to generate a log fixing the dates for submission of Shop Drawings, special order material items, certifications, guarantees, and any other items required to be submitted to the Consultant for review, approval or acceptance. Projects not utilizing UK E-Communication® will

submit a Shop Drawing Log provided by the Owner during the Pre-Construction Meeting.

8.4.2 The log shall track all submittals to date. The updated log shall then be reviewed and discussed at each progress meeting to determine items that may impact the construction schedule.

8.5 Shop Drawings

8.5.1 The Trade Contractor(s) shall review, approve, and submit Shop Drawings to the Construction Manager (and therefore the Consultant), in accordance with the Consultant's Shop Drawing & Procurement Submittal Log or UK E-Communication®, as herein detailed. By approving and submitting Shop Drawings, the Trade Contractor(s) represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

8.5.2 The Trade Contractor(s) shall submit Shop Drawings required for the Work and the Consultant will review and take appropriate action. The review and approval shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents. The approval of a separate item will not indicate approval of the assembly in which the item functions.

8.5.3 The Trade Contractor(s) shall make any corrections required by the Consultant for compliance to the Contract and shall return the required number of corrected copies of Shop Drawings and resubmit new samples until approved. The Trade Contractor(s) shall direct specific attention, in writing, or on resubmitted Shop Drawings, to revisions other than the corrections called for by the Consultant on previous submissions. The Trade Contractor(s) stamp of approval on any shop drawing or sample shall constitute a representation to Owner and Design Consultant that the Trade Contractor(s) has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar date, or he assumes full responsibility for doing so, and that he has reviewed or coordinated each shop drawing or sample with the requirements of the Work and the Contract Documents.

8.5.4 Where a shop drawing or sample submission is required by the specifications, no related Work shall be commenced until the submission has been approved by the Design Consultant. A copy of each approved shop drawing and each approved sample shall be kept in good order by the Construction Manager at the site and shall be available to the Consultant.

8.5.5 The Consultant's approval of Shop Drawings or samples shall not relieve the Trade Contractor(s) from his responsibility for any deviations from the requirements of the Contract Documents unless the Trade Contractor(s) has in writing called the Consultant's attention to such deviation at the time of submission and the Consultant has given written approval to the specific deviation. Any approval by the Consultant shall not relieve the Trade Contractor(s) from responsibility for errors or omissions in the Shop

Drawings.

8.5.6 All submittals are to be submitted electronically by the contractor. Shop Drawings submitted through UK E-Communication® shall be scanned and submitted in color. Mark-ups must be made using visible color when printed. Workflow in UK E-Communication® will be established during the workflow meeting. Each individual Shop Drawing shall have its respective specification number and description highlighted.

8.5.7 Where Shop Drawings include fire alarm, communication systems schematics, sprinkler systems, etc., a sepia of each drawing shall be submitted to the Consultant as part of the "Record" set of drawings.

8.6 SUBMISSIONS - SAMPLES

8.6.1 Office samples shall be of sufficient size and quantity to clearly illustrate functional characteristics of the product with integrally related parts and attachment devices, and full range of color, texture, and pattern.

8.6.2 Products shall not be used until the sample has been submitted to and approved by the Consultant.

8.6.3 A minimum of two (2) samples are required to be submitted to the Consultant for review and approval and will be distributed as follows:

a) One to be retained by the University;
b) One to be returned to the Design Consultant;
c) An additional sample or samples may be submitted, at the Trade Contractor(s) option, for distribution to a third party.

8.6.4 Field samples (block, brick, etc.) of materials to be constructed at the site shall be submitted for review as required by the individual section of the Contract Documents.

8.7 SUBMISSIONS - OPERATION AND MAINTENANCE MANUALS

8.7.1 The University requires a minimum of one (1) bound copies and one (1) digital copy of the final installation, training, operation, maintenance, and repair manuals to be turned over to the Owner's Project Manager and approved for content by the Consultant by or before the time construction is 75% complete. Projects utilizing e-Communication will create digital copy from the Document Library (Closeouts) in e-Communication. The Closeout Log must contain individual line items for each physical copy submitted with corresponding PDF attachments. Operation and maintenance manuals and materials, where specified, for mechanical and electrical equipment and for operating items other than mechanical and electrical equipment must be submitted in PDF format with a separate PDF file for each item. In the event the Trade Contractor(s) fails to provide these required electronic submittals prior to reaching seventy-five (75%) completion, it is agreed that the Owner at its sole discretion may deduct from the current and subsequent Applications for Payment an amount deemed by the Owner to be

sufficient to encourage prompt compliance with this contractual requirement, until such time as acceptable O&M manuals are received.

8.7.2 Manuals provided must be of sufficient detail to enable the Owner or others to install, calibrate, train, operate, maintain, service and repair every system, subsystem, and/or piece of equipment installed on or as part of this Contract. Manuals submitted through UK E-Communication® shall be scanned and submitted in color. Mark-ups must be made using visible color when printed. Each manual must contain:

8.7.2.1 Project Title, Project number, Location, dates of submittals, names, addresses and phone number for the Consultant, Construction Manager, and Construction Manager's Sub-contractors;

8.7.2.2 An Equipment Index that includes vendors' names, addresses, and telephone numbers for all equipment purchased on the Project;

8.7.2.3 Emergency instructions with phone numbers and names of contact persons on warranty items shall be uploaded to UK E-Communication®;

8.7.2.4 Copies of each system's air balancing record and each system's hydronic balancing record (1) physical copy and (1) digital copy in e-Communication;

8.7.2.5 Copy of valve tag list;

8.7.2.6 Copy of As-Built temperature control system drawings and components and sequence of operation;

8.7.2.7 Original copies of the following provided by the manufacturer:

Installation manuals	Instruction Manuals
Training manuals	Calibration manuals
Service Manual	Operation manuals
Parts list	Repair manuals
Reviewed Shop Drawings	Wire list
	Keying Bit List

8.7.2.8 Any Computer, Micro controller, and/or Microprocessor equipped equipment installed shall be provided with source code copies of all software and firmware (prom, e-prom, rom, other) supplied on this Contract; and

8.7.2.9 Copies of all inspection and guarantee certificates, manufacturers' warranties with the University of Kentucky listed as the Owner for all equipment provided and/or installed.

8.7.2.10 All manuals shall be as follows: Bound in hard cover three(3) ring (D-type) binder, 1", 1.5" or 2" maximum, indexed and in CSI format, tabbed (4,5,8 or 16th cut), no more than 80% binder fill, white vinyl, presentation type with clear vinyl view cover on front, back and spine and with pockets on front and back. Maximum drawing size in binder shall be folded 11"x17" and shall be hole punched and reinforcements added. Do not put drawings in pockets. Top of all drawings shall be at top or spine side of the manual. Complete drawings must be viewed without opening rings. Provide binders as manufactured by Universal Office Products, Des Plaines, IL. 1"(S# B2-20742), 1.5"(B2-20744), or 2"(B2-20746) or equal.

8.7.2.11 If the binder includes manuals from any one vendor covering several different model numbers, the model used on the Project must be highlighted.

8.7.2.12 Included in the front of the "Operation and Maintenance Manual" shall be a copy of the Interior and Exterior Finish plan and Schedule listing all finish materials, the manufacturer, the finish color, and the manufacturer's paint number.

8.7.2.13 Photograph album containing photos and negatives or digital images (.pdf format) showing buried utilities and concealed items shall be included.

8.8 SUBMISSIONS – AS - BUILT SET OF DRAWINGS

8.8.1 The Trade Contractor(s) shall submit one (1) electronic copy of As - Built set of drawings in PDF format indicating all deviations of construction as originallyspecified in the Contract Documents. These As-Built Drawings will compile information from the Construction Manager as well as all Sub-contractors. The Trade Contractor(s) shall provide a qualified representative to update the As - Built set of drawings as construction progresses. As-Builts submitted through UK E- Communication® shall be scanned and submitted in color. Mark-ups must be made using visible color when printed.

8.8.2 The Trade Contractor(s) shall provide and utilize a camera to photograph the installation of buried utilities and concealed items. The Trade Contractor(s) shall provide standard 3 1/2" x 5" photographs with negatives, or digital images (.jpeg format), which shall be submitted as part of the Operation and Maintenance Manuals submission. These photos should be mounted in a bound album with labeling as to subject of photo, date, and Project. Such album is to be kept at job site with the As - Built Set of Drawings until submittal of same.

8.8.3 Approval of the Final Payment request will be contingent upon compliance with these provisions. The Construction Manager's As – Built set of drawings shall be delivered to the Consultant at their completion so that the Consultant may make any changes on the original contract drawings.

8.9 SUBMISSIONS - SAP EQUIPMENT LIST

8.9.1 Trade Contractor(s) shall complete equipment list for use with SAP software in electronic spreadsheet format. Data is to be provided in Uniformat format with the information being provided for individual locations as noted in Attachment A – Uniformat Component List. Information is to be provided as follows (MCPPD or CPPD will provide blank Excel spreadsheets in electronic form for use in compiling the information, if desired)

8.9.2 All materials that require preventative maintenance (PM) are listed as in Attachment A. The equipment list is to be provided in Excel spreadsheet format and is to include the information listed in Attachment B

8.9.3 Required maintenance procedure listing each work task in Excel spreadsheet format as shown in Attachment C.

8.9.4 Required frequency of maintenance for the work tasks outlined in 8.9.3 above and included in the Attachment C spreadsheet

8.9.5 Listing of maintenance parts and items: i.e. filters, lubricants, etc. for each work task listed in 8.9.3 above.

8.10 SUBMISSIONS – MAINTENANCE MATERIALS

8.10.1 If specified, Maintenance/Replacement Materials, Spare Parts, and special maintenance tools for proper maintenance shall be provided by the CM at Risk.

ARTICLE 8.9 Attachment A – Uniformat Component List

SAP Object Type No.	Component Name
D5030.0232	Access Control Panel
D3050.0110	Air Conditioning Comp Rm Unit
D3030.0610	Air Conditioning Compressor
D3030.0620	Air Conditioning Condensing Unit
D3050.0120	Air Conditioning Pkg Rooftop Unit
D3050.0130	Air Conditioning Pkg Terminal Unt
D3030.0630	Air Conditioning Split System
D3050.0140	Air Conditioning Unit Package
D3050.0150	Air Conditioning Unit Window
D3050.0710	Air Curtain / Heater
D2090.0120	Air Dryer
D3010.0443	Air Eliminator
D3040.0110	Air Handling Unit
D5090.0220	Auto Transfer Switch - Electrical
	Automatic Door Operator
D2020.0330	Backflow Preventers
D3020.0110	Boiler, Steam System
D5030.0241	Camera
D5030.0231	Card Access System
D3030.0300	Chiller, Reciprocate
E1090.0250	Chutes & Collectors
D5010.0510	Circuit Breaker Panel
F1020.0230	Clean Rooms
F1020.0240	Cold Storage Rooms
D2090.0110	Compressor, Air
D3060.0250	Controls, Building System
E1090.0317	Cooler, Commercial
D3030.0510	Cooling Tower, Packaged
D2010.1300	Copper Silver Ion Equipment
D4090.0510	Dampers Fire
D4090.0500	Dampers Fire/Smoke
D4090.0520	Dampers Smoke
D3050.0400	Dehumidifiers
D2090.0200	Deionized Water System
E1090.0391	Dishwasher, Commercial
B2030.0160	Door, Auto Entrance
B2030.0100	Door, Exterior Entrance

C1020.0330	Door, Fire Separate
C1020.0320	Door, Smoke Partition
D2010.0800	Drinking Fountain
D5010.0350	Electric Switchboard
E1030.0310	Elevator, Dock Leveler
D1090.0120	Elevator, Dumbwait Electric
D1090.0130	Elevator, Dumbwait Hydraulic
D1010.0140	Elevator, Hydraulic Freight
D1010.0120	Elevator, Hydraulic Passenger
D1010.0230	Elevator, Platform Lift
D1010.0240	Elevator, Sidewalk Lift
D1010.0130	Elevator, Traction Freight
D1010.0110	Elevator, Traction Passenger
D1010.0220	Elevator, Wheelchair Lift
D2010.1100	Emergency Eyewash
D2010.1000	Emergency Eyewash/Shower
D5090.0810	Emergency Generator
D2010.1200	Emergency Shower
D3050.0600	Energy Recovery Unit
F1020.0260	Environmental Unit
D3040.0120	Fan
D3050.0520	Fan Coil Unit
D3040.0122	Fan, Axial
D3040.0121	Fan, Centrifugal
D3040.0410	Fan, Exhaust
D5030.0141	Fire Alarm Annunciator
D5030.0134	Fire Alarm AV Devices
D5030.0139	Fire Alarm Door Holder
D5030.0144	Fire Alarm Duct Detector
D5030.0133	Fire Alarm Heat Detectors
D5030.0136	Fire Alarm Horns
D5030.0131	Fire Alarm Panel
D5030.0135	Fire Alarm Pull Station
D5030.0137	Fire Alarm Signal Speaker
D5030.0132	Fire Alarm Smoke Detectors
D5030.0130	Fire Alarm System
D5030.0138	Fire Alarm Visual Signal Dev
D4030.0200	Fire Blanket & Cabinet
D4030.0100	Fire Extinguisher Cabinet
D4030.0300	Fire Extinguisher Wheeled
D4090.0300	Fire Extinguishing System, Clean

D4090.0200	Fire Extinguishing System, CO2
D4090.0400	Fire Extinguishing System, Dry Chemical
D4090.0100	Fire Extinguishing System, Foam
D4090.0000	Fire Extinguishing System, Other
G3010.0310	Fire Hydrant
E1090.0330	Food Cooking Equipment
E1090.0310	Food Stor/Prep Equipment
D2090.0400	Fuel Oil System
D3040.0460	Fume Hood System
D3020.0310	Furnaces
D2030.0260	Grease Trap
D3050.0580	Heat Exchanger
D2020.0260	Heater Domestic Water
D3050.0521	Heater, Cabinet Unit
D3050.0581	Heater, Cast Iron Radiator
D3050.0530	Heater, Fin Tube Radation
D3050.0540	Heater, Induction Unit
D3050.0560	Heater, Unit
D3050.0570	Heater, Unit Vent
F1040.0700	Heliport System
E1090.0340	Hood/Vent Equip
D3050.0300	Humidifier
E1090.0380	Ice Machines
D5020.0330	Light, Emergency Exterior
D5020.0230	Light, Emergency Interior
D5020.0231	Light, Exit
E1020.0831	Medical Air Compressor
E1020.0900	Medical Gas Alarm
E1020.1000	Medical Gas Area Alarm
E1020.0840	Medical Gas Auto Pressure Switch
E1020.0834	Medical Gas Manifold
E1020.0835	Medical Gas N2O
E1020.0839	Medical Gas Outlet
E1020.0837	Medical Gas Shut-off Valve
E1020.0830	Medical Gas System
E1020.0838	Medical Nitrogen
E1020.0810	Medical Sterilizer Equipment
E1020.0832	Medical Vacuum Pump
D5010.0711	Motor Control Center
D5010.0720	Motor, Electric
D5030.0431	Nurse Call System

E1090.0210	Packaged Incinerator
D3010.0550	Packaged Solar Equipment
D5030.0420	Paging Systems
C1010.0180	Partition Fire Rated
C1010.0190	Partition, Smoke
D1090.0141	Pneumatic Tube Blower
D1090.0142	Pneumatic Tube Station
D1090.0140	Pneumatic Tube System
D1090.0143	Pneumatic Tube Transfer Unit
D3010.0430	Pump
D3030.0710	Pump, Air Source Heat
D3010.0432	Pump, Chilled Water
D2020.0222	Pump, Domestic Hot Water Recirculation
D2020.0221	Pump, Domestic Water Booster
D4010.0111	Pump, Fire
D3010.0431	Pump, Heating Water
D4010.0112	Pump, Jockey Fire
D3030.0720	Pump, Rooftop Heat
D3010.0433	Pump, Steam
D2040.0270	Pump, Sump
D2030.0330	Pump, Waste
D2020.0220	Pump, Water Booster
D3030.0730	Pump, Water Heat
E1090.0315	Refrigerator/Freezer, Commercial
D3040.0123	Return Air Fan
D2090.1200	Reverse Osmosis System
D3030.0420	Scroll Chiller
D4010.0300	Sprinkler, Combo System
D4010.0400	Sprinkler, Deluge System
D4010.0200	Sprinkler, Dry-Pipe
D4020.0100	Sprinkler, Standpipe
D4010.0100	Sprinkler, Wet-Pipe
D3050.0310	Steam Generator
D5010.0840	Switchgear, Medium Voltage
D3010.0441	Tank, Expansion Compressor
D2020.0310	Tank, Expansion Domestic
D2020.0320	Tank, Expansion Reheat
D2090.0410	Tank, Fuel Oil
D3010.0444	Tank, Steam Flash
D5010.0210	Transformer, Low-Volt 2nd
D5010.0410	Transformer, Low-Volt Inter

D5010.0110	Transformer, Main
D3020.0150	Trap, Steam
D5090.0110	UPS - Computer
D5090.0120	UPS - Other
D2090.1310	Vacuum Pump
D3010.0435	VFD - Pump
D3040.0190	VFD HVAC
D5010.0850	VFD/VSD
E1090.0316	Walk-in-Refrigerator
D2090.0210	Water Softener Equipment
D3010.0490	Water Treatment Equipment

ARTICLE 8.7.3 Attachment B – Equipment List Spreadsheet Data Categories

Uniformat	
Component ID	
Component Name	
Description	
Name	
Equipment No.	MCPPD or CPPD will enter this data
Model No.	
Room Location	
Functional Location	MCPPD or CPPD will enter this data
Manufacturer	
Supplier	
Installing Contractor	
Serial No.	
Main Work Center	MCPPD or CPPD will enter this data
Comments(30 char's)	MCPPD or CPPD will enter this data
Critical	MCPPD or CPPD will enter this data
JCAH Code	MCPPD or CPPD will enter this data
Patient Room?	MCPPD or CPPD will enter this data
Vendor ID	MCPPD or CPPD will enter this data
Vendor Type	MCPPD or CPPD will enter this data
Vendor - Other Info	MCPPD or CPPD will enter this data
Equipment Life	MCPPD or CPPD will enter this data
Area Serviced	
Contains Lead?	
Contains Asbestos?	
Contains PCBs?	
Motor Frame	
Motor Style	
Motor HP	
Motor Phase	
Motor Volts	
Motor RPM	
Fan CFM	

Fan RPM	
Fan Static	
Fan Type	
Fan RPM 2	
Pump Head	
Pump Inlet	
Pump GPM	
Pump Outlet	
Motor Oper Amps	
Condition	MCPPD or CPPD will enter this data
Disconnect Location	
Motor FLA	
Belts	
Filters	

ARTICLE 8.7.3 Attachment C - Example Preventative Maintenance Procedures

Description	Name	Equipment No.	Frequency	Maintenance Procedure	Maintenance Parts & Items
Air Handling Unit	AHU-1	M-12345	Monthly	Check Belts	
Air Handling Unit	AHU-1	M-12345	Quarterly	Grease bearings	Grease type xyz
Air Handling Unit	AHU-1	M-12345	Annually	Replace Belts	Belt model abc-123
Air Handling Unit	AHU-2	M-98765	Monthly	Check Belts	

The blue highlighted column will be filled in by MCPPD or CPPD.

ARTICLE 09 PLANS, DRAWINGS, AND SPECIFICATIONS

9.1 The successful Construction Manager can purchase any number of sets of plans and specifications from Lynn Imaging, Lexington, Kentucky (http://www.ukplanroom.com/ or Phone Lynn Imaging @1.800.888.0693 or 859.255.1021). The Trade Contractor(s) will be required to pay Lynn Imaging for the cost of duplication for all sets required.

9.2 The University will provide two sets of the 'Official Contract Documents' book to the successful Construction Manager. One set is to be for his office and the other set is for the jobsite.

9.3 All drawings, specifications and copies, thereof, prepared by the Consultant, are the property of the University of Kentucky. They are not to be used on other Work.

ARTICLE 10 PROGRESS MEETINGS

10.1 In addition to specific coordination and pre-installation meetings for each element of Work, and other regular Project meetings held for other purposes, progress meetings will be held as outlined at the Preconstruction Meeting. Each entity then involved in planning, coordination or performance of Work shall be properly represented at each progress meeting. The following areas will be covered at each progress meeting: current status of work in place, CM's review of upcoming work (1 month look ahead), schedule status, upcoming outages, new outage requests, shop drawings due from contractors, shop drawings being reviewed, outstanding RFI's, outstanding proposed change orders, change orders, new business, As-Built updated, close-out documents status, defective work in place issues, review "pencil copy" of payment application, safety issues and new business or other issues not covered above.. With regard to schedule status, discuss whether each element of current work is ahead of schedule, on time, or behind schedule in relation with updated progress schedule; determine how behind-schedule Work will be expedited, and secure commitments from entities involved in doing so; discuss whether schedule revisions are required to ensure that current Work and subsequent Work will be completed within Contract Time; and review everything of significance which could affect the progress of the Work.

10.2 Construction Manager shall prepare and submit at each progress meeting an updated schedule indicating Work completed to date and any needed revisions.

10.3 With the express purpose of expediting construction and providing the opportunity for cooperation of affected parties, progress meetings will be held and attended by representatives of:

(1) The Owner's Project Manager
(2) The Consultant.
(3) Construction Manager.
(4) Subcontractors as requested.
(5) Others requested to attend (as deemed necessary by CPMD).
(6) Physical Plant Division Representative.

10.4 A location near the site will be designated where such progress meetings will be held. Participants will be notified of the dates and times of the meetings by the Consultant.

ARTICLE 11 CRITICAL PATH METHOD (CPM) SCHEDULE

11.1 Construction Manager shall prepare Critical Path Method (CPM) type schedules in accordance with General Conditions Article 32 with separate divisions for each major portion of the Work or operation. The schedules submitted for this Project shall be prepared using Primavera P6 scheduling software. If approved by the University, and at the sole discretion of the University, schedules submitted using earlier versions of Primavera scheduling software (Primavera SureTrak or Primavera P3) may be converted to Primavera P6 format by the University for review purposes. However, the University

will not be responsible for any inaccuracies that may result from such conversions. All schedule submittals shall include a copy in portable document (.pdf) format as well as a complete copy of the schedule in Primavera P6 electronic file (.xer) format.

11.1.1 CPM schedules shall be based on generally accepted good practices for the development of construction schedules including limited use of long activity durations, long total float values or relationships based on leads or lags. Schedules shall include all activities necessary for performance of the work showing logic (sequences, dependencies, etc.) and duration of each activity. The schedules shall provide information for all elements of the Work in sufficient detail to accurately demonstrate the relative importance of each activity to the successful completion of the Project including but not necessarily limited to the following.

a) Activities to be performed by the University or the Design Team.
b) Activities describing time sensitive submittals and submittal processing.
c) Activities describing fabrication and delivery of key materials or equipment.
d) Activities to identify equipment start-up and testing, system commissioning, and Owner training.
e) Activities to identify Owner Furnished /Contractor Installed and Owner Furnished / Owner Installed material or equipment.
f) Activities to denote all required inspections by the Owner or Design Team, and inspections by state or local agencies including receipt of necessary Certificate(s) of Occupancy.
g) Activities to identify all dates and durations for major utility outages requiring coordination with the Owner and the Owner's operations.
h) Activities to identify all contractually mandated constraints. Non-contractual constraints shall not be included in the Initial or Final Baseline schedules without explanation. Non-contractual constraints are for the convenience of the Trade Contractor(s), shall not be a basis for delay claims, and may be temporarily removed by the University when schedules and updates are reviewed.
i) Software coding of each activity to identify the applicable Phase; area and/or sub area where the work occurs; the trade subcontractor or party responsible for completion of the activity; whether the activity is a design activity, a bidding or procurement activity, a submittal activity, or a construction activity; and whether the activity is potentially weather dependent.
j) The University may, at its sole discretion, also require that each activity be coded to indicate the section of the Technical Specifications that applies to the work.

11.1.2 Schedules shall include divisions for Work to be accomplished remote from the central construction site, (for example, modular or prefabricated units to be constructed off-site, or utilities to the site from outside the construction site such as chilled water, steam, electrical, communications, and fire service). Such Work shall be scheduled so that disruption resulting from construction will be minimized. Start dates and completion dates for utility construction must be maintained and completed in the shortest reasonable time.

11.2 An Initial Baseline Schedules shall be submitted to the Consultant and to the Owner within thirty (30) calendar days after award of the first bid Package or trade

contract, and shall include detailed information regarding Work to be performed during the first ninety (90) days of the Project as well as milestone dates based on hammock or Level of Effort type activities that identify all major elements of the remainder of the Work. Any necessary revisions to the Initial Baseline Schedule shall be completed prior to submittal of the Final Baseline Schedule.

11.3 The Final Critical Path Baseline Schedule shall be submitted to the Consultant and to the Owner within seventy five (75) calendar days after award of the first bid Package or trade contract, shall be consistent with the information contained in the Initial Baseline Schedule prepared in accordance with Article 11.2 above, shall be a complete and comprehensive description of the Construction Manager's plan to complete the Work in accordance with the Contract, shall include all activities necessary to complete the Work, and shall show the complete sequence of construction by activity, with dates for beginning and completion of each element of construction as well as an indication of whether the activity might reasonably be delayed or impacted by bad weather. Sub-schedules shall be provided as may be necessary to define critical portions of the entire schedule.

11.3.1 If the Project is to be constructed in multiple phases or using multiple Bid Packages, the date for the start of work on each phase of the Project shall be the date on which the University approves the award of the first Trade Contract for work in that phase or Bid Package.

11.3.2 A separate schedule including decision dates for selection of finishes and delivery dates for Owner furnished items, if any, shall be provided showing submittal dates for Shop Drawings, product data, and material samples, as appropriate.

11.3.3 A separate schedule shall be provided identifying dates and durations for major utility outages requiring coordination with the Owner and the Owner's operations.

11.3.4 Activities, including Outages, which require action by or which are the responsibility of, the Owner or the Consultant under the terms of the Contract shall be properly indicated, and the responsible party shall be identified in the CPM schedule.

11.4 The Consultant will review schedules only for compliance with the intent of the Contract Documents. Such review shall not relieve the Trade Contractor(s) of any responsibility for compliance with the provisions of the Contract nor shall such review or any review comments constitute an amendment or modification of the Contract requirements. The Trade Contractor(s) shall be solely responsible for the means and methods to be employed to assure constructions proceeds in accordance with the submitted schedule and for identifying all necessary activities, establishing activity sequencing and assigning activity durations and relationships to assure that the CPM schedule is an accurate and comprehensive description of the plan for the Work.

11.5 Up-dated progress schedules shall be submitted to the Consultant and to the Owner concurrently with each Application for Payment to indicate progress on each remaining activity as of the last working day prior to the date of the submittal and the

projected completion date of each activity. Updated CPM schedules shall show the accumulated percentage of completion of each activity, and total percentage of Work completed, as of the data date of the update. Each submittal of an update to the schedule shall include a narrative report that identifies and explains activities modified since the previous submittal, major changes in scope and other identifiable changes, problem areas, anticipated delays and impact on the schedule, and shall describe corrective action taken or proposed, and its effect. Schedules will be uploaded in UK E-Communication®'s Schedules Item Log.

11.6. Submittals shall include a copy in portable document (.pdf) format as well as a complete copy of the schedule in Primavera P6 electronic file (.xer) format along with a transmittal letter and related narrative report.

11.7 Copies of updated CPM schedules are to be provided to the job site file and, as appropriate, to subcontractors, suppliers, and other concerned entities, including separate contractors. Recipients are to be instructed to promptly report, in writing, any problems anticipated in meeting the projected dates shown in the schedules.

11.8 The processing of all progress payments is contingent upon the submission of an updated CPM schedule. Only payment for bonds and limited Construction Manager mobilization costs will be approved for processing prior to receipt of the Initial and Final Baseline schedules

11.9 The processing of all change orders requesting a time extension to the contract is subject to the terms of Article 21 of the General Conditions to this Contract and is contingent upon the submission of a CPM schedule showing that the change order does indeed impact the contractually required completion dates for the Work. Time extensions for Change Orders that do not impact the contractually required completion dates for the Work will not be considered.

11.10 All time extensions shall be negotiated and made full, equitable and final, and incorporated in a revised CPM schedule at the time of Change Order issuance. No reservation of rights shall be allowed.

11.11 Float available in the schedule at any time shall not be considered for the exclusive use of either party to the contract, but will be a resource available to both the Owner and the Construction Manager. No time extensions will be granted for a delay unless the delay impacts the Project critical path as shown in the updated Project schedule most recently submitted to the Owner prior to the event, consumes all available float or contingency time, and extends the Work beyond the then current Contract completion date(s).

ARTICLE 12 WALK-THROUGH

12.1 After the "Work Order" is issued but before Work by the Construction Manager is started, a walk-through of the area is required to document the condition of the space, surfaces, or equipment. It is the responsibility of the Trade Contractor(s) to schedule the

walk-through with the Owner's Project Manager, the Consultant, and other interested parties.

12.2 During the walk-through, Trade Contractor(s) shall identify all damaged surfaces or other defective items that exist prior to construction.

12.3 The walk-through shall be attended by Owner's Project Manager, a Representative of the user of the facility, the Trade Contractor(s) and the Consultant

12.4 Written documentation of the walk-through is to be provided by the Consultant with copies distributed to all parties. Polaroid type color photographs are to be provided and labeled by Trade Contractor(s) and one (1) copy of such photographs are to be given to Consultant. (Digital photos in a .jpg format are acceptable if submitted on digital media storage) All parties attending the walk-through agree on the list of damages.

ARTICLE 13 OWNER'S CONSTRUCTION REPRESENTATIVE

13.1 The Owner may have full time personnel or representatives on this job. If so, the Construction Manager is to provide, at no additional cost to the Owner, an office for the duration of the Project specifically for the use of Owner personnel. The office should be furnished with all required utilities, including HVAC, and the following:

- **3** Desks
- **3** Desk chairs
- **3** Side chairs
- **3** 4-drawer filing cabinets
- **3** telephones
- **3** DSL / cable modem connections
- **1** Facsimile machine
- **1** Layout table
- **1** hanging plan rack

ARTICLE 14 FIELD OFFICE

14.1 Construction Manager shall make his own provision for field office for his own personnel and for incidental use by their Subcontractors. Quantity and location are subject to approval of the Consultant and the Owner's Project Manager.

14.2 Construction Manager is not required to provide a field office for use by the Owner or Consultant.

ARTICLE 15 TELEPHONE SERVICE

15.1 Trade Contractor(s) shall arrange through UKIT Communications and Network Systems for installation of on-site phone, internet and other communications services. Telephone service during the length of construction shall be paid for by the Trade Contractor(s) (Cell phone/Nextel service in lieu of UKIT Communications and Network Systems phone service may be utilized at Trade Contractor(s)'s option.)

ARTICLE 16 CONSTRUCTION FENCE

16.1 Construction fencing will be designed and erected around job sites where there is a possibility of injury to employees, students or the public. Special precautions must be taken to protect the visually impaired, disabled, children and others using the University facilities. During active excavation/trenching operations, fencing shall be erected to prevent unauthorized entry into the site. All fencing shall comply with the current requirements of the International Building Code except where the following requirements are more stringent.

16.1.1 All job site perimeter fencing within 5 feet of a walkway, street, plot line, or public right-of-way shall be 8 feet in height. Perimeter fencing that blocks sidewalks must include signs directing pedestrians to a safe walkway or crosswalk.
Signage may be attached to the fence, but may also be required to inform pedestrians of sidewalk closures and detours prior to arriving at the closed area. Construction Manager shall provide electrical pedestrian and general lighting along the top rail of the perimeter of the construction site fence to provide a minimum illumination level of 1.5 foot candles. Pedestrian and perimeter fence lighting shall be installed in conduit, raceway, and/or pathway system properly supported to the perimeter fence. Open or flexible cabling will not be acceptable.

16.1.2 All job site perimeter fencing more than 5 feet from a walkway, street, plot line, or public right-of-way shall be a minimum of 6 feet in height unless International Building Code requirements are more restrictive due to the height of the structure and setback.

16.1.3 All fencing shall be of a woven material such as chain link or a solid type fence. Fencing shall include gates required for construction operations. Gates shall be lockable with both the Construction Manager's lock, and a lock provided by the Owner. Lock by Owner shall be keyed for the University Best GA key core. All locks to be “daisy-chained” to provide access to the Owner.

16.1.4 It shall be the Trade Contractor(s)’s responsibility to determine the proper quality of materials and methods of installation of the fencing, with the understanding that it must be maintained in good condition, good appearance, rigid, plumb, and safe throughout the construction period. The fence does not have to be new material. The fence is to be erected on fence posts securely anchored in the ground. Provide a top bar or, with prior approval of the Owner, a wire shall be run through the top of the fence and attached to the end posts. A tension control device shall be installed as necessary. Use of sandbags, concrete weights, stakes, etc. to hold fence posts in place are not allowed. Penetrations in pavement or landscape walking surfaces may not be made without the approval of the Owner. Any damage caused by the fence installation shall be repaired in a manner satisfactory to the Owner. When fencing is to remain in place for 6 months or more a green fabric mesh must be provided for the full height and length of the fence. Fabric should be omitted for one section of fencing where blind corners occur or at pedestrian/vehicle intersections.

16.1.5 The Trade Contractor(s) shall be responsible for removing and replacing any fence sections and/or posts necessary for access to the site on a daily basis. The Trade Contractor(s) shall police such conditions to assure the fence and posts are reset in a timely manner and are specifically in place at the close of the working day.

16.1.6 If the Trade Contractor(s) fails to comply with the requirements of this Article 16, the Owner may proceed to have the work done and the Trade Contractor(s) shall be charged for the cost of the Work done by unilateral deductive change order.

16.1.7 Plastic construction fencing is not acceptable as a perimeter protection fence.

ARTICLE 17 PROJECT SIGN

17.1 The Trade Contractor(s) shall furnish, install and maintain a Project sign during this Project. This sign shall be 4' x 8' x 3/4" exterior grade plywood mounted on 4" x 4" posts. Design shall be as provided by the Owner at a later date and shall include the name of the Owner, Project, Consultant, and Construction Manager

17.2 No signs, except those attached to vehicles or equipment, may be displayed without permission from the Consultant and the Owner's Project Manager. No political signs will be permitted.

ARTICLE 18 PARKING

18.1 The University of Kentucky will make available for purchase by the Construction Manager of up to four (4) parking permits. The category of parking permit and location of parking is determined by the Director, Parking and Transportation Services, or a designee. Parking permits may be purchased by the Construction Manager to be used by the Construction Manager and/or the Construction Manager’s subcontractors and employees during the construction period. The cost of each permit is based on the pro-rata annual cost and may be purchased from Parking Services, 721 Press Avenue, after the Contract is executed. Necessary documents required to purchase the passes will be available at the Pre-Construction Conference.

18.2 The Director, Parking and Transportation Services, or a designee will determine if parking is available for employees of the Construction Manager and subcontractors in the K lots at Commonwealth Stadium or elsewhere on Campus. The Construction Manager will be given thirty (30) days’ notice should conditions change that will affect parking at the designated parking area and it is necessary to relocate parking or terminate parking privileges. If parking is available, permits may be purchased from Parking Services, 721 Press Avenue at the appropriate monthly cost.

ARTICLE 19 SANITARY FACILITIES

19.1 At the beginning of the Project, before any Work is started, the Trade Contractor(s) shall furnish, install and maintain ample sanitary facilities for the

workforce. Permanent toilets in the existing building shall not be used during construction of the Project. Drinking water shall be provided from an approved safe source, piped or transported as to be kept clean and fresh and served from single service containers or satisfactory types of sanitary drinking stands or fountains. All such facilities and services shall be furnished in strict accordance with existing governing health regulations.

ARTICLE 20 RULES OF MEASUREMENT

20.1 Rules of Measurement shall be established by the Consultant in the field. Actual measurement shall be taken in the field. These amounts shall become binding upon the Trade Contractor(s) and be adjusted as before mentioned.

20.2 The Trade Contractor(s) shall pay for and coordinate through the Consultant and/or the Owner's Project Manager all associated Work by utility companies including relocation of utility poles, installation of new street lights, relocation of overhead or underground lines, and any other Work called for on the Plans and in the Specifications.

ARTICLE 21 ALLOWANCES

21.1 As stated in the General Conditions to the Contract, the Trade Contractor(s) shall have included in the Contract Amount all costs necessary to complete the Work. Costs based on "allowances" shall be permitted only for objectively quantifiable items and only with the prior written approval of the Owner. No allowances shall have been included in the calculation of the Construction Manager's fixed fee quotation in par. 8.0 of the RFP.

21.2 Costs based on allowances may be included in Subcontract bid packages only with the prior written approval of the Owner, and only for objectively quantifiable material items.

21.3 Any allowance amounts included in a Subcontract bid package, but not expended for the approved task during the course of the work of that Subcontract, shall be deducted from the Trade Contractor(s) via the Construction Manager's contract by Change Order. Any additional amounts necessary to pay for additional cost of an allowance in a Subcontract bid package shall be funded from the Construction Contingency Fund.

21.4 The University of Kentucky has entered into a price contract agreement with SimplexGrinnell for procurement of fire alarm and security systems. SimplexGrinnell will provide an allowance for this project which may include Fire Alarm Equipment and Security Equipment, including all required cable/wire, labor to install cable and wire and terminations of SimplexGrinnell supplied devices and panels. SimplexGrinnell will be a sub-contractor under a trade contract.

21.4.1 The Construction Manager shall include an allowance of Zero ($0.00) for the work by SimplexGrinnell in the appropriate trade contractor's scope of work.

21.4.2 The electrical contractor is to provide and install conduits and back boxes/junction boxes. All conduits will include a pull string. SimplexGrinnell will furnish and install all fire alarm and security equipment and wiring. An allowance amount will be provided by JCI, in coordination with the MEP sub-consultant based on the unit price contract between the University and JCI.

ARTICLE 22 CONSTRUCTION CONTINGENCY FUNDS

22.1 The Owner shall include an amount in the Project construction budget not to exceed one percent (1%) of the total cost of the construction, including the Construction Manager's fixed fee, as a Construction Contingency Fund. The following are general / typical categories of changes to the Work that may, with the Owner's prior written specific approval, be funded from this source:

22.1.1 Reasonable errors & omissions in the Construction Manager's bidding and scoping processes;

22.1.2 Reasonable costs associated with schedule recovery that is not a direct result of the construction managers or a trade contractor's failure to perform;

22.1.3.Any costs or expenses incurred by the Construction Manager, for provision of management services necessary to complete the Project in an expeditious and economical manner consistent with the Contract for Construction and the best interests of Owner, that were not included in the Construction Manager's General Conditions Cost as submitted in the original fee proposal

22.1.4 Amounts necessary to fund cost overruns in approved allowance items within Subcontract bid packages, as described in Article 21.3, above.

ARTICLE 23 SEQUENCE OF CONSTRUCTION

23.1 (Not Used)

23.2 All materials and equipment are to be brought into the project site from the approved staging location and are not to be brought through the existing buildings or loading docks. Any and **all** exceptions shall be approved by, and closely coordinated with, the Owner's Project Manager in advance of scheduling or performing the work.

23.2.1 The Trade Contractor(s) shall coordinate any road and sidewalk closings, utility disruptions, etc. which will affect the use of the existing building(s) with the Construction Manager and Owner's Project Manager prior to commencing that Work.

23.3 The adjacent buildings and public areas will remain in use and the Owner shall have access to the existing building(s) throughout the duration of the Project. The Construction Manager shall coordinate construction activity to assure the safety of those who must cross the Project site and shall provide and maintain the necessary barriers and accommodations for a completely safe route of accessibility. The Trade Contractor(s) is to insure that all exits provide for free and unobstructed egress. If exits must be blocked,

then prior arrangements must be made with the Construction Manager and Owner's Project Manager.

23.4 The Trade Contractor(s) shall cooperate with the Owner in minimizing inconvenience to, or interference with normal use of existing buildings and grounds by staff, students, other Contractors, or the public. Trade Contractor(s) shall conduct operations to prevent damage to adjacent building structures and other facilities and in such a manner to protect the safety of building's occupants.

23.5 Special effort shall be made by the Trade Contractor(s) to prevent any employee from entering existing buildings for reasons except construction business. In particular, use of toilets, drinking fountains, vending machines, etc. is strictly prohibited.

ARTICLE 24 CRANE & MATERIAL HOIST OPERATIONS

24.1 Trade Contractor(s) shall provide appropriate barriers around crane and material hoist to protect pedestrian and vehicular traffic around operating area. When crane is operating or moving, flag men provided by Trade Contractor(s) shall be utilized to prevent pedestrian and vehicular traffic from crossing pathway of crane lift. Trade Contractor(s)'s flag men shall coordinate these activities with the appropriate security personnel.

24.2 Crane and material hoist shall be safely secured and inaccessible during non-operating hours. Trade Contractor(s) shall coordinate operation or erection of a crane or material hoist in the vicinity of the Medical Center with Medical Center Aeromedical Operations (Med-evac helicopter).

24.3 Any damage to trees, shrubs or plant material at the placement of crane or material hoist shall be repaired by tree surgery or replaced as directed by Consultant.

ARTICLE 25 UTILITIES

25.1 When the various building systems are energized and connected to Owner's utility systems, but prior to turnover to and occupancy by the Owner, the Trade Contractor(s) is responsible to reimburse the Owner for Owner furnished utilities. These utilities include but not limited to steam, chilled water, domestic water, and electricity, provided by the Owner up to the date of Substantial Completion. Reimbursement will be payable monthly via a deductive change order to the contract. Unit costs for campus are as follows:

25.1.1 Steam is $15.00/million BTU (1000 lb.) condensate measured through the building condensate meter (all condensate is to be returned).

25.1.2 Chilled Water is $11.00/million BTU (1000 lb.) measured through the building BTU meter.

25.1.3 Electricity is $0.08/KWH measured through the building electric meter.

25.1.4 Water is supplied by Kentucky American Water Company (KAWC). Trade Contractor(s) shall pay KAWC directly until the Owner's beneficial occupancy date. The Trade Contractor(s) shall pay KAWC directly for fire service.

25.1.5 Trade Contractor(s) shall furnish gas meter and Columbia Gas Company directly for service until the until the Owner's beneficial occupancy date.

25.1.6 Trade Contractor(s) shall obtain from and pay UKIT Communications and Network Systems for the use of telephone services.

25.2 UTILITY OUTAGES

25.2.1 Interruption of Utilities and Services: No utilities or services may be interrupted without full consent and prior scheduling of the Owner. Owner approval is required in writing for each disruption.

25.2.1.1 ENTIRE BUILDING OUTAGE. The Owner's Project Manager is the Trade Contractor(s) contact with the University via the Construction Manager for requesting Utility Outages. The Owner's Project Manager will contact the proper departments and divisions within the University and receive approval from those units prior to allowing a planned outage to occur. The established standard within the University Departments and Divisions of an entire building or group of buildings shall be three weeks written notice. The written notice shall include the type of utility to be interrupted, reason for outage, length of outage, what will be affected by the outage, and a statement of whether or not the materials are on hand to complete the Work. If a specific time is desired for the outage it should be included. The Owner's Project Manager will insure that all parties affected are contacted and that a time which is least disruptive to all parties is selected. At the appointed outage time, Work shall begin and proceed continuously with all required manpower until Work is complete at no added cost to the University. The Owner's Project Manager will then notify all affected departments or divisions.

25.2.1.2 SECTION OF A BUILDING OUTAGE. The Owner's Project Manager is the Construction Manager’s contact with the University for requesting Utility Outages. The Owner's Project Manager will contact the proper departments and divisions within the University and receive approval from those units prior to allowing a planned outage to occur. The established standard within the University Departments and Divisions of a section of a building shall be a written request one week prior to outage. The written request shall include the type of utility to be interrupted, when the outage is desired, reason for outage, length of outage, and what will be affected by the outage. The Owner's Project Manager will insure that all parties affected are contacted and that a time which is least disruptive to all parties is selected. At the appointed outage time Work shall begin and proceed continuously with all required manpower until Work is complete at no added cost to the University. The Owner's Project Manager will then notify all affected departments or divisions.

ARTICLE 26 CLEANING AND TRASH REMOVAL

26.1 The Trade Contractor(s) shall keep clean the entire area of new construction and shall keep streets used as access to and from the site free of mud and debris.

26.2 All exit ways, walks, drives, grass areas, and landscaping must be kept free from debris, materials, tools and vehicles at all times. Trim weeds and grass within the site area.

26.3 Upon completion of the Work, Trade Contractor(s) shall thoroughly clean and re-sod grass areas damaged to match existing areas.

26.4 All utility markings are to be made with water based marking paint with low Volatile Organic Compounds (VOC's) and high solids.

26.5 Upon Completion of the project, buried utility paint markings sprayed on walks and hardscapes are to be removed by non-destructive means such as pressure washing. Do not use chemicals. If a washed area is noticeable, the entire surface must be washed and or blended to match surrounding areas.

26.6 The Trade Contractor(s) shall be responsible for removal from the site of all liquid waste or other waste (i.e., hazardous, toxic, etc.) that requires special handling on a daily basis.

26.7 Dumpsters will be provided and maintained by the Trade Contractor(s).

26.8 During Work at the Project site, the Trade Contractor(s) shall clean and protect Work in progress and adjoining Work on a continuing basis. Trade Contractor(s) shall apply suitable protective covering on newly installed Work where needed to prevent damage or deterioration until the time of Substantial Completion. Trade Contractor(s) shall clean and perform maintenance on newly installed Work as frequently as necessary through remainder of construction period.

26.9 The Trade Contractor(s) shall be responsible for daily cleaning of spillage's and debris resulting from his and his Subcontractor's operations, (includes removal of dust and debris from wall cavities), and for providing closed, tight fitting (dustproof if required), waste receptacles to transport construction debris from the work area to the dumpster. Broom clean all floors no less than once a week. The Trade Contractor(s) shall empty such receptacles into the trash container when full or when directed to be emptied by the Consultant and/or Owner's Project Manager, but not less than weekly. The use of the Owner's waste and trash receptacles is strictly prohibited, except as otherwise provided by the Project specifications.

26.10 Failure to comply with the above requirements shall be cause for stopping work until the condition is corrected.

ARTICLE 27 BLASTING

27.1 There shall be no blasting under any conditions on University of Kentucky property unless specified in these Special Conditions.

ARTICLE 28 CUTTING AND PATCHING - NEW AND EXISTING WORK

28.1 New Work - Cutting and patching shall be done by craftsmen skilled and experienced in the trade or craft that installed or furnished the original Work. Repairs shall be equal in quality and appearance to similar adjacent Work and shall not be obviously apparent as a patch or repair. Work that cannot be satisfactorily repaired shall be removed and replaced.

28.2 Existing Construction - Refer to Architectural, Mechanical, and Electrical drawings for cutting and patching. All new Work shall be connected to the existing construction in a neat and workmanlike manner, presenting a minimum of contrast between old and new Work. Do all patching of the existing construction as may be required for the new construction to be completed. Necessary patching, closing of existing openings, repairing and touching up shall be included as required for a proper, neat and workmanlike finished appearance. Any existing item that is to remain and is damaged during construction shall be replaced at the Trade Contractor(s)'s expense.

ARTICLE 29 UNRELATED PROJECTS

29.1 Unrelated construction projects may be under way in the vicinity of this Project or the site utility work during the course of the Work related to this Project. The Trade Contractor(s) for this Project must coordinate with any other contractors regarding overlapping areas. See Article 42 - Separate Contracts of the General Conditions.

ARTICLE 30 OWNER SUPPLIED MATERIALS

30.1 Owner, in an effort to expedite this Project, has pre-ordered certain long lead time items. This list will be developed as approved by the UK Project Manager and Design Team at the completion of the Construction Documents / Phase 3 of design. The following is the list of material that has been pre-ordered:

1. **NONE**

30.2 All Pre-Ordered Material was specified to be shipped to the **Health Education Building**. It will be the Trade Contractor(s)'s responsibility to receive and off load the Pre-Ordered Material. If there is damage to the Pre-Ordered Material, then the Trade Contractor(s) is to notify the Owner's Project Manager via the Construction Manager immediately so that the Owner can seek replacement material.

ARTICLE 31 REMOVED ITEMS

31.1 The following is a list of items to be turned over to the Owner by the Trade Contractor(s) after removal by the Trade Contractor(s). If there are additional items listed in the drawings to be turned over to the Owner, but not listed here, it shall be construed as being listed here.

1. **NONE**

31.2 All items which are identified to be turned over to the Owner must be treated with the utmost of care and protected from damage during removal and transport.

31.3 Materials to be turned over to the Owner by the Trade Contractor(s) shall be delivered to a warehouse within a five (5) mile radius of the Project site.

ARTICLE 32 INTERIOR ENCLOSURE AND DUST ENCAPSULATION

32.1 Areas under construction or renovation shall be separated from occupied areas by suitable temporary enclosures furnished, erected and maintained by the Trade Contractor(s). Temporary enclosures shall be dust and smoke tight and constructed of non- combustible materials to prohibit dirt and air borne dust from entering occupied spaces. Trade Contractor(s) to review with Consultant via the Contruction Manager ways to provide ventilation for dust generated by demolition and fumes/vapors produced during installation of new materials.

32.2 Trade Contractor(s) is responsible for coordinating with the Owner's Project Manager via the Construction Manager any equipment to be turned off prior to erecting temporary enclosures.

32.3 Trade Contractor(s) shall protect all exhaust diffusers, equipment and electrical devices from the collection of dust. All areas shall be checked and cleaned prior to final acceptance of Work.

32.4 Dust and debris from Work operations shall be held to a minimum.

32.5 Trade Contractor(s) shall construct temporary dust partitions at locations and as detailed on drawings. Closures used for dust barricades shall be constructed of non-combustible materials, (metal studs and gypsum board or fire retardant plywood).

32.6 Trade Contractor(s) shall provide additional devices and materials as required to contain dust within Work area and protect personnel during course of Work.

32.7 Areas of minor renovation, consisting of the removal of doors and frames, blocking of openings, and other limited Work shall be separated by a dust partition of fire retarded polyethylene on studs.

32.8 Existing corridor doors may serve as dust barriers, except if removed for refinishing. In such cases, temporary wood doors must be substituted until original doors are replaced.

32.9 The Trade Contractor(s) may assume existing walls which extend full height of floor shall be deemed appropriate to contain air borne dust. Cover any voids or penetrations.

32.10 Doors or windows in the perimeter walls surrounding the project work area shall be sealed off with protective materials in a manner to prohibit dust from escaping the work area. These shall be left in place until all work creating dust is completed. Protective materials shall consist of fire retardant wood, metal studs, gypsum board or flame resistant plastic.

32.11 Entry passage to Work area shall be sealed off with zippered plastic opening, or other acceptable means which allows periodic entry and closure of barricade closure.

32.12 Install and maintain a “sticky mat” on the floor in locations where construction crews leave the construction area and prior to entering ANY existing space in the building.

32.13 Install and maintain a temporary floor covering in any and all elevators being utilized for this project.

ARTICLE 33 UKIT COMMUNICATIONS AND NETWORK SYSTEMS

33.1 The communications wiring is to be provided, installed and terminated by the Trade Contractor(s) using a certified and approved communications contractor. All work shall be done in compliance with the latest UKIT-Communications and Network Systems’ Standards, and closely coordinated with UKIT-Communications and Network Systems.

ARTICLE 34 EMERGENCY VEHICLE ACCESS

34.1 Emergency Vehicle Access must be maintained during construction. The Trade Contractor(s) shall coordinate with the local Fire and Emergency Medical Services department(s) that would respond to an emergency during the initial start up of construction to ensure a complete understanding of their requirements.

ARTICLE 35 SMOKE DETECTORS / FIRE ALARM SYSTEMS- EXISTING AND/OR NEW FACILITIES

35.1 Trade Contractor(s) shall protect all smoke detectors in Work areas to prevent false alarms. The Trade Contractor(s) will be responsible for any false alarm caused by dust created in their Work areas or dust traveling to areas beyond the Work, past inadequate protection barriers.

If there is a need for an existing or newly installed fire alarm system or parts of that system to be serviced, turned off, or disconnected, prior approval must be obtained from the Owner's Project Manager and notification given to the Campus Dispatch Office. The Trade Contractor(s) must follow the procedure outlined for Utility Outages and any documented costs charged by the responding fire department due to a false alarm shall be paid by the Trade Contractor(s). As soon as all Work is completed notification must be given to the Owner's Project Manager and to the Campus Dispatch Office prior to reactivation of the system. Prior to Final Payment to the Trade Contractor(s), all protected smoke detectors will be uncovered and tested.

35.2.1 When any fire alarm, detection or suppression system is impaired, a temporary system shall be provided. Trade Contractor(s) shall provide daily reports indicating the Superintendent has walked through the project at the end of each work period, to satisfy himself there are no present conditions that may result in an accidental fire. Portable fire extinguishers shall be on site during this time. The Trade Contractor(s) is responsible for inspecting and testing any temporary systems on a monthly basis.

ARTICLE 36 SURVEYS, RECORDS, and REPORTS

36.1 General: Working from lines and levels established by property survey, and as shown in relation to the Work, the Trade Contractor(s) will establish and maintain bench marks and other dependable markers to set lines and levels for Work at each area of construction and elsewhere on site as needed to properly locate each element of the entire Project. The Trade Contractor(s) shall calculate and measure from the bench marks and dependable markers required dimensions as shown (within recognized tolerances if not otherwise indicated), and shall not scale drawings to determine dimensions. Trade Contractor(s) shall advise Sub-contractors performing Work of marked lines and levels provided for their use in layout of Work.

36.2 Survey Procedures: The Trade Contractor(s) shall verify layout information shown on drawings, as required for his own Work. As Work proceeds, surveyor shall check every major element for line, level, and plumb (as applicable), and maintain an accurate Surveyor's log or Record Book of such checks available for Trade Contractor(s) or Design Consultant's reference at reasonable times. Surveyor shall record deviations from required lines and levels, and advise Design Consultant or Trade Contractor(s) promptly upon detection of deviations exceeding indicated or recognized tolerances. The Trade Contractor(s) shall record deviations which are accepted (not corrected) on Record Drawings.

ARTICLE 37 SMOKING IS PROHIBITED

37.1 For areas located within Fayette County, Kentucky, the use of all tobacco products is prohibited on all property that is owned, operated, leased, occupied, or controlled by the University. “Property” for purposes of this paragraph includes buildings and structures, grounds, parking structures, enclosed bridges and walkways, sidewalks, parking lots, and vehicles, as well as personal vehicles in these areas. To view the Lexington campus boundaries: http://www.uky.edu/TobaccoFree/files/map.pdf.

37.2 For areas not located within Fayette County, Kentucky, smoking is prohibited in all owned, operated, leased, or controlled University buildings and structures, parking structures, enclosed bridges and walkways, and vehicles. Smoking is also prohibited outside buildings and structures within 20 feet of entrances, exits, air intakes, and windows, unless further restricted by division policy.

37.3 Trade Contractor(s)'s employees violating this prohibition will be subject to dismissal from the Project.

37.4 For the full Administrative Regulation see University AR 6:5. http://www.uky.edu/Regs/files/ar/ar6-5.pdf

ARTICLE 38 ALTERNATES

38.1 Alternate(s) will be accepted in the sequence of the Alternates listed on the Bid Form, and the lowest Bid Sum will be computed on the basis of the sum of the base Bid and any alternates accepted, within the budgeted amount.

38.2 Schedule of Alternates:

This list will be developed as approved by the UK Project Manager and Design Team at the completion of the Construction Documents / Phase 3 of design.

ARTICLE 39 FIELD CONSTRUCTED MOCK UPS

39.1 Exterior Finishes

39.1.1 After sample selection but prior to ordering exterior finish materials, Trade Contractor(s) shall accumulate enough material samples to erect sample wall panels to further verify selection made for color and textural characteristics, and to represent completed Work for qualities of appearance, materials and construction including sample masonry units (face and back-up wythes, plus accessories), window units, roofing finish, etc. to provide a complete representation of the exterior facade for approval by the Consultant; build mock-ups to comply with the following requirements:

39.1.2 Build mock-ups well in advance of the time the finish materials will be needed for inclusion in the Work.

39.1.3 Locate mock-ups at location as reviewed and approved by the Architect and University’s Project Manager, generally within 10 feet of existing building, parallel to existing face of building, and exposed to sunlight during daylight hours. Mock-Up to be reviewed twice, one in direct sunlight and one in shade to confirm color characteristics of samples.

39.1.4 Mock-ups Size(s) for the following types shall be approximately 6' long by 4' high

by full thickness.

Each type of exposed Work.

39.1.5 Protect mock-ups from the elements with weather resistant membrane.

39.1.6 Retain mock-ups during construction as a standard for judging completed Work. When directed by the University's Project Manager or by the Consultant, demolish mock-ups and remove from the site.

39.2 Interior Finishes

39.2.1 After sample selection but prior to ordering interior finish materials, Trade Contractor(s) shall accumulate enough material samples to erect sample to further verify selection made for color and textural characteristics, and to represent completed Work for qualities of appearance, materials and construction; include samples of interior finishes, including paint, wood stain, vinyl wallcovering, flooring and ceiling materials to provide a complete representation for approval by the Consultant; build mock-ups to comply with the following requirements:

39.2.2 Build mock-ups well in advance of the time the finish materials will be needed for inclusion in the Work. Mock-ups may be on newly installed wall surfaces.

39.2.3 Locate mock-ups with adequate illumination for observation under intended light levels.

39.2.4 Retain mock-ups during construction as a standard for judging completed Work. When directed by the University's Project Manager or by the Consultant, remove mock-ups from site or incorporate into the completed work.

ARTICLE 40 PROJECT COORDINATION VIA COMPUTER

40.1 The Construction Manager and Subcontractors are required to have an active email account to facilitate coordination of the project during construction and warranty.

40.2 To facilitate project construction coordination between the Consultant, the Construction Manager, Subcontractors, and the University of Kentucky as the Owner, UK Capital Project Management Division (CPMD) is hosting an Internet/ Web-based Project Management System (WPMS) to help improve project communication and collaboration. The Consultant shall participate in the use of the WPMS (UK E-Communication® or other system at the Owner's discretion) providing collaboration between Owner, the Consultant and selected contractors.

40.2.1 Owner shall provide the Construction Manager and Subcontractors with user accounts and appropriate training for the web-based project management tool.

40.2.2 Utilization of, and training in the use of, the WPMS will be arranged for and

supervised by Owner.

40.2.3 Participation of Subcontractors and/or Trade Contractors is mandatory.

40.2.4 All participants are required to have access to the internet and the Microsoft Internet Explorer browser (version 5.0 or higher). A broadband connection to the internet (e.g. Cable modem, ISDN, DSL) is recommended, but not required.

40.2.5 The WPMS shall be utilized for the following functions, as a minimum: Posting Project Files, AE Amendments, Architect's Supplemental Information (ASI's), Closeouts, Consultant Invoices, Contracts, Defective Work in Place, Meeting Minutes, Payment Applications, Proposed Change Orders – Change Orders (PCO to CO's), Punch Lists, Reports (Contractor Daily Reports, Field Reports, Commissioning Reports), RFIs, SAP Equipment List, Schedules, and Submittals. The Document Library (Bid set Plans, Specifications and Addenda will be uploaded by Lynn Imaging.

40.2.6 Site camera monitors may be included at Owner's discretion.

40.2.7 Utilization of the WPMS shall be implemented by the Owner's representative.

40.2.8 Use of the system will provide consistent, real-time information for decision making. Additionally, all project data entered into the system will be archived to facilitate project record keeping. It is anticipated that proper use of the WPMS will improve efficiency of communications and reduce project related paperwork and clerical workload.

40.2.9 The Trade Contractor(s), Construction Manager, and Consultant shall submit complete close-out and submittal logs in E-Communication, or WPMS, including description of all deliverables to be submitted by the construction manager or trade contractors during Phase 3, Construction Documents Phase.

ARTICLE 41 HOT WORK PERMITS

41.1 All work involving open flames or producing heat and or sparks in occupied buildings on the University of Kentucky campus will require the Trade Contractor(s) to obtain approval to perform "Hot Work" on site. This includes, but is not limited to: brazing, Cutting, Grinding, Soldering, Thawing Pipe, Torch Applied Roofing, and Cad welding. A copy of the Hot Work Permit and the Hot Work Permit Procedure will be passed out at the Preconstruction Conference for the Trade Contractor(s)'s use.

ARTICLE 42 INSURANCE

42.1 Employers' Liability Insurance. Reference project CCIP manual and information

42.2.1 Commercial General Liability Insurance. If the work involved requires the use of helicopters, a separate aviation liability policy with limits of liability of $100,000,000 will be required. If cranes and rigging are involved, a separate inland marine policy with

liability limits of $20,000,000 will be required.

42.2.1.1 The limits of liability shall not be less than $10,000,000each occurrence combined single limits for bodily injury and property damage.

42.2.2 Comprehensive Automobile Liability Insurance. Policy limits shall not be less than $2,000,000 for combined single limits for bodily injury and property damage for each occurrence.

42.2.3 Excess or Umbrella Liability Insurance. This policy shall have a minimum of $10,000,000 combined single limits for bodily injury and property damage for each occurrence in excess of the applicable limits in the primary policies.

42.2.4 Workers' Compensation- Statutory Requirements (Kentucky). Reference project CCIP manual and information

ARTICLE 43 KEY ACCESS

43.1 If Construction Cores are NOT utilized, then one set of keys for access to the renovation project area will be provided to the Construction Manager/Vendor's Project Manager/Superintendent by the University's Project Manager. The Construction Manager/Vendor's holder of the key(s) assumes responsibility for the safekeeping of the key(s) and its use. When leaving the renovation area all doors must be secured.

43.2 All keys must be returned to the University's Project Manager upon completion of project work as one of the requirements for Final Payment. Failure to return the keys may require re-keying of all doors in the work area up to and including the entire building if master keys are issued. The cost of re-keying of the door(s) accessed by the key(s) will be subtracted from the remaining contract dollars including contract retainage.

43.3 All lost or stolen keys must be reported immediately to the University's Project Manager.

ARTICLE 44 CEILING CLEARANCE

44.1 Work above ceiling: All work above an area with lay-in ceiling must be coordinated and installed so there is a minimum of 4" between the top of the ceiling grid runners and bottom of the installation. Installation shall not obstruct equipment access space or equipment removal space. Also, conduit and pipe attached to the wall must be above the 4" minimum level.

44.2 Coordination Between Trades: Request and examine all drawings and specifications pertaining to the construction before installing above ceiling work. Cooperate with all other contractors in locating piping, ductwork, conduit, openings, chases, and equipment in order to avoid conflict with any other contractor's work. Give special attention to points where ducts or piping must cross other ducts and piping, and where ducts, piping and conduit must fur into the walls and columns. Make known to

other trades intended positioning of materials and intended order of work. Determine intended position of work of other trades and intended order of installation.

ARTICLE 45 METAL ANCHORS

45.1 All anchoring devices utilized to secure materials to the building shall be metal. Plastic or plastic expansion components shall not be used. This shall include all fasteners for mechanical/electrical hangers.

ARTICLE 46 LOADING DOCK (NOT USED)

ARTICLE 47 CONSTRUCTION PATH (NOT USED)

ARTICLE 48 HOSPITAL PROJECT PROCEDURE (NOT USED)

ARTICLE 49 WORKING HOURS/ACCESS: FOR MEDICAL CENTER/HOSPITAL (NOT USED)

ARTICLE 50 SECURITY BADGES AND MEDICAL CENTER SECURITY (NOT USED)

ARTICLE 51 HOSPITAL CONSTRUCTION CERTIFICATION (NOT USED)

ARTICLE 52 APPEARANCE (NOT USED)

ARTICLE 53 HIPAA (The Health Insurance Portability and Accountably Act) (NOT USED)

ARTICLE 54 SAFETY & FIRE PROCEDURES (NOT USED)

ARTICLE 55 INTERIM LIFE SAFETY MEASURES (ILSM) (NOT USED)

ARTICLE 56 TREE PROTECTION STANDARDS
Trade Contractor(s) will adhere to all provisions outlined in 010000S02 Tree Protection

Standards. **ARTICLE 57 CONTRACTOR/SUPERINTENDENT EXPERIENCE**

(NOT USED) ARTICLE 58 COVID-19 POLICY

Any and all companies/organizations working on the University of Kentucky's campus shall have in place for the period of the contract a COVID-19 policy that is consistent with the University of Kentucky's current COVID-19 policy.

This Agreement, made as of the **SDS** day of **SDS** in the year **SDS** by and between CONTRACTOR and **SDS** **(See Subcontract Data Sheet for this Item and all other Items marked SDS)** (hereinafter called the Subcontractor).

Witnesseth, that the Subcontractor and Contractor agree as follows:

Description of Work

ARTICLE I. The Subcontractor shall perform and furnish all the work, labor, services, materials, plant, equipment, tools, scaffolds, appliances and other things necessary for **SDS** (Hereinafter called the Work) for and at the **SDS** (Hereinafter called the Project), located on premises at **SDS** (Hereinafter called the Premises), as shown and described in and in strict accordance with the Plans, Specifications, General Conditions, Special Conditions and Addenda thereto prepared by **SDS** (Hereinafter called the Architect) and with the terms and provisions of the General Contract (hereinafter called the General Contract) between Contractor and **SDS** (Hereinafter called the Owner) dated **SDS** and in strict accordance with the Additional Provisions, page(s) **SDS** annexed hereto and made a part hereof.

Plans & Specifications

ARTICLE II. The Plans, Specifications, General Conditions, Special Conditions, Addenda and General Contract hereinabove mentioned, are available for examination by the Subcontractor at all reasonable times at the office of Contractor; all of the aforesaid, including this Agreement, being hereinafter sometimes referred to as the Contract Documents. The Subcontractor represents and agrees that it has carefully examined and understands this Agreement and the other Contract Documents, has investigated the nature, locality and site of the Work and the conditions and difficulties under which it is to be performed and that it enters into this Agreement on the basis of its own examination, investigation and evaluation of all such matters and not in reliance upon any opinions or representations of Contractor, or of the Owner, or of any of their respective officers, agents, servants, or employees.

Contract Documents

With respect to the Work to be performed and furnished by the Subcontractor hereunder, the Subcontractor agrees to be bound to Contractor by each and all of the terms and provisions of the General Contract and the other Contract Documents, and to assume toward Contractor all of the duties, obligations and responsibilities that Contractor by those Contract Documents assumes toward the Owner, and the Subcontractor agrees further that Contractor shall have the same rights and remedies as against the Subcontractor as the Owner under the terms and provisions of the General Contract and the other Contract Documents has against Contractor with the same force and effect as though every such duty, obligation, responsibility, right or remedy were set forth herein in full. The terms and provisions of this Agreement with respect to the Work to be performed and furnished by the Subcontractor hereunder are intended to be and shall be in addition to and not in substitution for any of the terms and provisions of the General Contract and the other Contract Documents.

This Subcontract Agreement, the provisions of the General Contract and the other Contract Documents are intended to supplement and complement each other and shall, where possible, be thus interpreted. If, however, any provision of this Subcontract Agreement irreconcilably conflicts with a provision of the General Contract and the other Contract Documents, the provision imposing the greater duty or obligation on the Subcontractor shall govern.

Contractor hereby advises, and the Subcontractor hereby acknowledges, that Contractor in administering this subcontract will be utilizing an information systems infrastructure to process, deliver, and share and/or, at times, to apply electronic signatures to execute certain project documentation through electronic means. As part of the implementation of this infrastructure, the Subcontractor will be given individual, secure log on codes to access the Contractor systems presenting this electronic information. The Subcontractor hereby agrees that such electronic access and the ability of the subcontractor to print out such electronic documents will be in lieu of requiring the delivery of the contents of such electronic documents on printed or paper based media directly to Subcontractor by Contractor or through means of outside third-party services. Delivery of such electronic documents to Subcontractor will be deemed to have occurred when access to the document is made available to Subcontractor in the infrastructure.

At times, Contractor may, through this electronic infrastructure system, initiate Subcontract Change Order documents that will require that the Subcontractor review and approve or reject each such document applying its electronic signature to the approved document on the Contractor software and thereafter, Contractor will apply the electronic signature of its authorized personnel to execute the approved document and electronically deliver the fully executed document to the Subcontractor. The Subcontractor agrees and acknowledges that granting its on-line approval and electronically executing a Subcontract Change Order also affixes the Subcontractor's electronic signature to such document and in so doing it is agreeing that each such document, when electronically countersigned by Contractor, are valid and authentic and enforceable obligations of both parties and to honor and be bound by such documents as if they had been prepared on hard copy and contained the manually applied autograph signatures of the Subcontractor's and Contractor's authorized personnel. Subcontractor hereby agrees to establish, continuously use and maintain a robust and effective Security System/ID and Passwords to protect its identity when addressing and/or signing any electronic contract related documentation issued or exchanged pursuant to this Article.

Optionally, Contractor may use paper documents, where the Subcontractor reviews the proposed paper document and, if it approves, it manually affixes its autograph signature to the paper document and physically returns the signed paper document to Contractor who completes the execution by applying either its autograph or electronic signature to the Subcontract Change Order and a copy of the executed Subcontract Change Order showing the presence of both signatures is physically delivered to the Subcontractor and such Subcontract Change Order shall likewise be deemed by both parties to be valid and authentic and enforceable obligations of both parties.

Contractor may from time to time issue policies or directives applicable to electronic communications, electronic infrastructure and electronic data and Subcontractor shall comply with such policies and directives whether issued as part of this Subcontract or hereafter, and the cost and expense of such compliance shall be borne by the Subcontractor.

Time of Performance & Completion

ARTICLE III. The Subcontractor shall commence the Work when notified to do so by Contractor and shall diligently and continuously prosecute and complete the Work and coordinate the Work with the other work being performed on the Project, in accordance with those project schedules as may be issued from time to time during the performance of the Work and any other scheduling requirements listed in this Agreement, so as not to delay, impede, obstruct, hinder or interfere with the commencement, progress or completion of the whole or any part of the Work or other work on the Project, and in such a manner as necessary or requested by Contractor from time to time to ensure that Contractor satisfies its obligations in a timely manner under the General Contract.

Planning & Scheduling

The Subcontractor shall participate and cooperate in the development of schedules and other efforts to achieve timely completion of the Work providing information for the scheduling of the times and sequence of operations required for its Work to meet Contractor's overall schedule requirements, shall continuously monitor the project schedule so as to be fully familiar with the timing, phasing and sequence of operations of the Work and of other work on the Project, and shall execute the Work in accordance with the requirements of the project schedule including any revisions thereto. Subcontractor shall abide by all requirements of the General Contract relating to the submission of schedule and other information related to the performance of Subcontractor's Work not less than 14 days prior to the time when Contractor is required to provide such materials to Owner under the General Contract, except where Contractor directs otherwise. Subcontractor shall, at no additional cost, provide updates, additional or further detailed schedules and other information as frequently and in whatever form Contractor may request, including but not limited to (1) manpower and cost loaded schedules; (2) information related to its operations as a whole, including but not limited to identifying lower tier subcontractors and suppliers and the status of payments to such subcontractors and suppliers; (3) unions and related benefit funds associated with labor used in the performance of the Work; (4) credit sources and banks providing financing or loans in connection with the performance of the Work or Subcontractor's operations as a whole and any covenants and requirements imposed upon Subcontractor in connection therewith and the status of Subcontractor's compliance with such covenants and requirements; and (5) the status of orders, fabrication and delivery of materials and arrangements for the provision of labor. The foregoing information shall include names and contact information, and Subcontractor acknowledges and agrees that Contractor may contact any persons or entities as it deems necessary to verify or obtain such information**.**

Subcontractor shall establish and maintain a reasonable accounting system by which records are kept that enable Contractor to readily identify all of Subcontractor's expenses, costs, payments (including to its workers, subcontractors and suppliers, unions, and benefit funds), obligations, budgets, and other financial information related to the Work or this Subcontract. Such records shall include, but not be limited to, all accounting records, written policies and procedures, subcontract files for all tiers, payment vouchers, ledgers, cancelled checks, contract amendments, change order information, insurance documents, and other similar information. Contractor shall have the right to audit, examine, and make copies of all such records (whether written, electronic or another format) as Contractor may determine, and Subcontractor shall facilitate and cooperate with Contractors efforts in this regard. Subcontractor shall impose similar obligations on its subcontractors and vendors to ensure that comparable records kept and Contractor has the right to audit, examine and copy those records.

Delays by Subcontractor

Should the progress of the Work or of the Project be delayed, disrupted, hindered, obstructed, or interfered with by any fault or neglect or act or failure to act of the Subcontractor or any of its officers, agents, servants, employees, subcontractors or suppliers so as to cause any additional cost, expense, liability or damage to Contractor including legal fees and disbursements incurred by Contractor (whether incurred in defending claims arising from such delay or in seeking reimbursement and indemnity from the Subcontractor and its surety hereunder or otherwise) or to the Owner or any damages or additional costs or expenses for which Contractor or the Owner may or shall become liable, the Subcontractor and its surety shall and does hereby agree to compensate Contractor and the Owner for and indemnify them against all such costs, expenses, damages and liability.

Overtime

If the progress of the Work or of the Project be delayed by any fault or neglect or act or failure to act of the Subcontractor or any of its officers, agents, servants, employees, subcontractors or suppliers, then the Subcontractor shall, in addition to all of the other obligations imposed by this Agreement upon the Subcontractor in such case, and at its own cost and expense, work such overtime as may be necessary to make up for all time lost in the completion of the Work and of the Project due to such delay. Should the Subcontractor fail to make up for the time lost by reason of such delay, Contractor shall have the right to cause other Subcontractors to work overtime and to take whatever other action it deems necessary to avoid delay in the completion of the Work and of the Project, and the cost and expense of such overtime and/or such other action shall be borne by the Subcontractor.

Contractor, if it deems necessary, may direct the Subcontractor to work overtime and, if so directed, the Subcontractor shall work said overtime and, provided that the Subcontractor is not in default under any of the terms or provisions of this Agreement or of any of the other Contract Documents and the direction to work overtime was not due in whole or in part to any fault or failure of Subcontractor, Contractor will pay the Subcontractor only for such actual additional wages paid, if any, at rates which have been approved by Contractor plus taxes imposed by law on such additional wages, plus workers' compensation insurance, liability insurance and levies on such additional wages if required to be paid by the Subcontractor to comply with Subcontractor's obligations under this Agreement. Subcontractor acknowledges that in the event that it may intend to pursue a claim of inefficiency, loss of productivity or other similar or related request for additional compensation, Subcontractor may rely only on evidence indicating the actual inefficiency, loss of productivity or other similar consequence as it occurred on the Project and agrees that no reports, analyses, data, industry or academic studies or any other evidence that do not exclusively rely on and pertain to the Work performed at the Project shall be used or in any way considered, in whole or in part, in connection with the resolution of such a claim, whether by Contractor or any forum for dispute resolution.

Price

ARTICLE IV. The sum to be paid by Contractor, out of funds received from the owner, to the Subcontractor for the satisfactory performance and completion of the Work and of all of the duties, obligations and responsibilities of the Subcontractor under this Agreement and the other Contract Documents shall be **SDS** (Hereinafter called the Price) subject to additions and deductions as herein provided.

The Price includes all Federal, State, County, Municipal and other taxes imposed by law and based upon labor, services, materials, equipment or other items acquired, performed, furnished or used for and in connection with the Work, including but not limited to sales, use and personal property taxes payable by or levied or assessed against the Owner, Contractor or the Subcontractor. Where the law requires any such taxes to be stated and charged separately, the total price of all items included in the Work plus the amount of such taxes shall not exceed the Price

Progress Payments

On or before the last day of each month the Subcontractor shall submit to Contractor, in the form required by Contractor, a written requisition for payment showing the proportionate value of the Work installed to that date, from which shall be deducted: a reserve of **SDS**; all previous payments; all amounts and claims against Subcontractor, by Contractor or any third party, for which Subcontractor is responsible hereunder; and all charges for services, materials, equipment and other items furnished by Contractor to or chargeable to the Subcontractor; and the balance of the amount of such requisition, as approved by Contractor and the Architect and for which payment has been received by Contractor from the Owner, shall be due and paid to the Subcontractor on or about the fifteenth (15th) day of the succeeding month or in accordance with the Contract Documents. Contractor shall have the right, at its sole discretion, to issue payments to Subcontractor by way of joint checks to Subcontractor

and suppliers and/or vendors of Subcontractor, and Subcontractor agrees to cooperate fully in facilitating the making of such joint payments.

Payments in General

The obligation of Contractor to make a payment under this Agreement, whether a progress or final payment, or for extras or change orders or delays to the Work, is subject to the express condition precedent of payment therefor by the Owner. In making payments to Subcontractor, Contractor will act as the agent of the Owner and not the Subcontractor, thereby acting as a conduit of such payments from the Owner to the Subcontractor. Given that Subcontractor is to be paid exclusively out of dollars paid by the Owner and only if such payment is made by Owner, Subcontractor understands and accepts the risk of non-payment by the Owner. If Contractor has provided payment or performance bonds or a combination payment and performance bond, the obligation of Contractor and its Surety under any of those bonds to make any payment (whether a progress payment or final payment) to a claimant on that bond is similarly subject to the express condition precedent of payment therefor by the Owner.

The Subcontractor shall submit with its first requisition for payment a detailed schedule showing the breakdown of the Price into its various parts for use only as a basis of checking the Subcontractor's monthly requisitions.

Contractor reserves the right to advance the date of any payment (including the final payment) under this Agreement if, in its sole judgment, it becomes desirable to do so.

The Subcontractor agrees that, if and when requested to do so by Contractor, it shall furnish such information, evidence and substantiation as Contractor may require with respect to the nature and extent of all obligations incurred by the Subcontractor for or in connection with the Work, all payments made by the Subcontractor thereon, and the amounts remaining unpaid, to whom and the reasons therefor.

Final Payment

Final payment to the Subcontractor shall be made only with funds received by Contractor from the Owner, the Construction Lender or the Owner's Agent as final payment for Work under the General Contract. Final payment to Contractor by the Owner shall be an express condition precedent that must occur before Contractor shall be obligated to make final payment to the Subcontractor. In addition, final payment by Contractor to the Subcontractor shall not become due and payable until the following other express conditions precedent have been met: (1) the completion and acceptance of the Work by Contractor and the Architect; (2) provision by the Subcontractor of evidence satisfactory to Contractor that there are no claims, obligations or liens outstanding or unsatisfied for labor, services, materials, equipment, taxes or other items performed, furnished, or incurred for or in connection with the Work; (3) execution and delivery by the Subcontractor, in a form satisfactory to Contractor of a general release running to and in favor of Contractor and the Owner; and (4) complete and full satisfaction of all claims, demands and disputes, and all obligations and responsibilities of Subcontractor, arising out of or related to the Subcontract, including those as between Contractor and Subcontractor as well as those between Subcontractor and any third party. Should there be any such claim, obligation or lien or unsatisfied obligation or responsibility whether before or after final payment is made, the Subcontractor shall pay, refund or deliver to Contractor (1) all monies that Contractor and/or the Owner shall pay in satisfying, discharging or defending against any such claim, obligation or lien or any action brought or judgment recovered thereon and all costs and expenses, including legal fees and disbursements, incurred in connection therewith; and (2) such amounts as Contractor or Owner shall, in their sole discretion, determine to be an amount sufficient to protect Contractor and Owner therefrom (in lieu of payment of such amounts, Subcontractor may, at Owner's and Contractor's sole discretion, deliver a bond satisfactory to Contractor and Owner). Such refund and payment shall be made within ten (10) days of request by Contractor to Subcontractor for same. The final payment shall be due within forty (40) days after all of these express conditions precedent have been met.

Liens by Others

If any claim or lien is made or filed with or against Contractor, the Owner, the Project, the Premises or the Project funds by any person claiming that the Subcontractor or any subcontractor or other person under subcontract to Subcontractor, or any person or entity employed or engaged by or through Subcontractor at any tier, has failed to make payment for any labor, services, materials, equipment, taxes or other items or obligations furnished or incurred for or in connection with the Work, or if any such claim or lien is filed or presented, or if Contractor, in good faith, believes that such a claim or lien may be filed or brought, or if at any time there shall be evidence of such nonpayment or of any claim or lien for which, if established, Contractor or the Owner might become liable and which is chargeable to the Subcontractor, or if the Subcontractor or any subcontractor or other person under subcontract to Subcontractor, or any person or entity employed or engaged by or through Subcontractor at any tier causes damage to the Work or to any other work on the Project, or if the Subcontractor fails to perform or is otherwise in default under any of the terms or provisions of this Agreement, Contractor shall have the right (A) to retain from any payment then due or thereafter to become due an amount which it deems sufficient to (1) satisfy, discharge and/or defend against any such claim or lien or any action which may be brought or judgment which may be recovered thereon, (2) make good any such nonpayment, damage, failure or default, and (3) compensate Contractor and the Owner for and indemnify and hold them harmless against any and all losses, liability, damages, costs and expenses, including legal fees and disbursements, which may be sustained or incurred by either or both of them in connection therewith ; and (B) to demand that Subcontractor provide, within ten (10) days of Contractor's request therefore, proof to the satisfaction of Contractor and Owner that such non-payment, claim or lien has been fully satisfied, dismissed and discharged. Upon the failure of Subcontractor to fulfill the requirements of a demand issued by Contractor pursuant to subsection (B) above, Contractor may, in such manner as Contractor may in its sole discretion determine, secure the satisfaction, dismissal and discharge of such claim, by payment or otherwise, and Subcontractor shall within ten (10) days of demand therefore, be liable for and pay to Contractor all amounts (including legal fees and disbursements) incurred or suffered by Contractor or Owner arising out of or related thereto. Contractor shall, in addition, have the right to apply and charge against the Subcontractor so much of the amount retained as may be required for the foregoing purposes. Subcontractor further agrees to indemnify, hold harmless and defend Contractor and Owner, upon demand, for any and all such claims, liens, and the costs, expenses (including legal fees and disbursements), damages and liabilities arising out of or related thereto. Subcontractor acknowledges (1) that discharge of such liens or claims by bond imposes liability upon a surety and Contractor, and (2) that Contractor is not required to discharge such lien or claims by bond when exercising its rights hereunder. Subcontractor agrees that should there be any amounts due or which may become due to Subcontractor in connection with any other subcontracts between Contractor and Subcontractor or other obligations that Contractor may have to Subcontractor, Contractor shall be entitled to withhold payment under such other subcontract or obligations to the extent that Contractor believes that the unpaid balance of this Subcontract may not be adequate to satisfy Subcontractor’s obligations to Contractor hereunder.

Effect of Payment

No payment (final or otherwise) made under or in connection with this Agreement shall be conclusive evidence of the performance of the Work or of this Agreement, in whole or in part, and no such payment shall be construed to be an acceptance of defective, faulty or improper work or materials nor shall it release the Subcontractor from any of its obligations under this Agreement; nor shall entrance and use by the Owner constitute acceptance of the Work or any part thereof. The failure of Subcontractor to fully perform and satisfy any or all obligations set forth in this Article IV shall constitute a default, entitling

Contractor to take action as described in Article XI.

Subcontractor acknowledges and agrees that to the extent that payments received by Subcontractor include amounts for Work performed by subcontractors to Subcontractor or services or materials provided to Subcontractor by suppliers, vendors, workers employed by or through Subcontractor, all such payments received by Subcontractor shall be deemed to have been received by Subcontractor as trustee with those entitled to receive payment from Subcontractor as beneficiaries of such amounts, and Subcontractor shall hold such funds separately and utilize such amounts only for the purpose of making payment to these beneficiaries. In the event that Subcontractor subsequently determines that a beneficiary is not entitled to receipt of payment, Subcontractor shall return such unpaid funds to Contractor.

Extension of Time & Delays

ARTICLE V. Should the Subcontractor be delayed, obstructed, hindered or interfered with in the commencement, prosecution or completion of the Work by any cause including but not limited to any act, omission, neglect, negligence or default of Contractor or of anyone employed by Contractor or by any other contractor or subcontractor on the Project, or by the Architect, the Owner or their contractors, subcontractors, agents or consultants, or by damage caused by fire or other casualty or by the combined action of workers or by governmental directive or order in no way chargeable to the Subcontractor, or by any extraordinary conditions arising out of war or government regulations, or by any other cause beyond the control of and not due to any fault, neglect, act or omission of the Subcontractor, its officers, agents, employees, subcontractors or suppliers, then except where the General Contract has specific requirements at variance with the foregoing, in which case the requirements of the General Contract shall govern, the Subcontractor shall be entitled to an extension of time for a period equivalent to the time lost by reason of any and all of the aforesaid causes; provided, however, that the Subcontractor shall not be entitled to any such extension of time unless the Subcontractor (1) notifies Contractor in writing of the cause or causes of such delay, obstruction, hindrance or interference within forty eight (48) hours of the commencement thereof and (2) demonstrates that it could not have anticipated or avoided such delay, obstruction, hindrance or interference and has used all available means to minimize the consequences thereof. Subcontractor acknowledges that provision of such notice is an essential condition precedent to Subcontractor's rights in connection with any such delays, obstructive hindrances or interferences to Contractor's ability to fully identify, and expeditiously, address and avoid such cause or causes, and, accordingly, Subcontractor expressly waives all rights with respect to any such cause or causes for which notice hereunder was not provided. Notwithstanding the foregoing, if the General Contract is at variance with granting such time extension, then the provisions of the General Contract shall control.

The Subcontractor agrees that it shall not be entitled to nor claim any cost reimbursement, compensation or damages for any delay, obstruction, hindrance or interference to the Work except to the limited extent that Contractor has actually recovered corresponding cost reimbursement, compensation or damages from the Owner under the Contract Documents for such delay, obstruction, hindrance or interference, and then only to the extent of the amount, if any, which Contractor on behalf of the Subcontractor, actually received from the Owner on account of such delay, obstruction, hindrance or interference. Notwithstanding any term or provision herein to the contrary, Subcontractor expressly waives and releases all claims or rights to recover lost profit (except for profit on work actually performed), recovery of overhead (including home office overhead), and any other indirect damages, costs or expenses in any way arising out of or related to the Agreement, including the breach thereof by Contractor, delays, charges, acceleration, loss of efficiency or productivity disruptions and interferences with the performance of the work.

It shall be an express condition precedent to any obligation on the part of Contractor to make payment of any such cost, reimbursement, compensation or damages to the Subcontractor hereunder that Contractor shall first be determined to be entitled to such compensation on behalf of the Subcontractor and then receive such payment from Owner, and Subcontractor expressly acknowledges that Contractor is not obligated or required to pursue Subcontractor claims as against Owner if Contractor, in its sole discretion, after review of Subcontractor's claim, has deemed the claim to lack merit in whole or in part.

The Subcontractor agrees that it shall contribute a fair and proportionate share of the costs of advancing the claims of the Subcontractor for delay, including but not limited to legal and other professional fees.

Freight Charges & Shipments

ARTICLE VI. The Subcontractor in making or ordering shipments shall not consign or have consigned materials, equipment or any other items in the name of Contractor. Contractor is under no obligation to make payment for charges on shipments made by or to the Subcontractor but may, at its option, pay such charges, in which case the Subcontractor shall reimburse Contractor for the amount of such payments plus a service charge of twenty-five percent (25%) of the amount so paid.

Dimensions

ARTICLE VII. Notwithstanding the dimensions on the Plans, Specifications and other Contract Documents it shall be the obligation and responsibility of the Subcontractor to take such measurements as will ensure the proper matching and fitting of the Work covered by this Agreement with contiguous work.

Shop Drawings

The Subcontractor shall prepare and submit to Contractor such shop drawings as may be necessary to describe completely the details and construction of the Work. Approval of such shop drawings by Contractor and/or the Architect shall not relieve the Subcontractor of its obligation to perform the Work in strict accordance with the Plans, Specifications, the Additional Provisions hereof and the other Contract Documents, nor of its responsibility for the proper matching and fitting of the Work with contiguous work and the coordination of the Work with other work being performed on the site, which obligation and responsibility shall continue until completion of the Work.

The Subcontractor’s submission of a shop drawing to Contractor shall constitute the Subcontractor’s representation, upon which Contractor may rely, that the Subcontractor has reviewed the submission for accuracy and compliance with all Contract Documents and that wherever engineering is required to be performed, same has been performed by a qualified and licensed engineer. Furthermore, the review of the Shop Drawing by Contractor shall not constitute an undertaking by Contractor to identify deficiencies in the submission, that being an undertaking within the sole responsibility of the Subcontractor.

Contiguous Work

Should the proper and accurate performance of the Work hereunder depend upon the proper and accurate performance of other work not covered by this Agreement, the Subcontractor shall carefully examine such other work, determine whether it is in fit, ready and suitable condition for the proper and accurate performance of the Work hereunder, use all means necessary to discover any defects in such other work, and before proceeding with the Work hereunder, report promptly any such improper conditions and defects to Contractor in writing and allow Contractor a reasonable time to have such improper conditions and defects remedied. Should Subcontractor fail to comply with the requirements of this Article, Subcontractor shall bear all costs incurred by Contractor, Owner and other subcontractors, and shall not be entitled to extensions of time and adjustments in Price, that could have been avoided by Subcontractor’s compliance with the requirements of this Article.

Interpretation of Plans & Specifications

ARTICLE VIII. The Work hereunder is to be performed and furnished under the direction and to the satisfaction of both the Architect and Contractor. The decision of the Architect as to the true construction, meaning and intent of the Plans and Specifications shall be final and binding upon the parties hereto. Contractor will furnish to the Subcontractor such additional information and Plans as may be prepared by the Architect to further describe the Work to be performed and furnished by the Subcontractor and the Subcontractor shall conform to and abide by the same.

The Subcontractor shall not make any changes, additions and/or omissions in the Work except upon written order of Contractor as provided in Article IX hereof.

Change Orders, Additions & Deductions

ARTICLE IX. Contractor reserves the right, from time to time, whether the Work or any part thereof shall or shall not have been completed, to make changes, additions and/or omissions in the Work as it may deem necessary, upon written order to the Subcontractor. The value of the work to be changed, added or omitted shall be stated in said written order and shall be added to or deducted from the Price.

The value of the work to be changed, added or omitted shall be determined by the lump sum or unit prices, if any, stipulated herein for such work. If no such prices are stipulated, such value shall be determined by whichever of the following methods or combination thereof Contractor may elect:

(a) By adding or deducting a lump sum or an amount determined by a unit price agreed upon between the parties hereto.

(b) By adding (1) the actual net cost to the Subcontractor of labor in accordance with the established rates, including required union benefits, premiums the Subcontractor is required to pay for workmen's compensation and liability insurance, and payroll taxes on such labor, (2) the actual cost to the Subcontractor of materials and equipment and such other direct costs as may be approved by Contractor less all savings, discounts, rebates and credits, (3) an allowance of **SDS** for overhead on items (1) and (2) above, and (4) an allowance of **SDS** for profit on items (1), (2) and (3) above.

Should the parties hereto be unable to agree as to the value of the work to be changed, added or omitted, the Subcontractor shall proceed with the work promptly under the written order of Contractor from which order the stated value of the work shall be omitted, and the determination of the value of the work, if not resolved in the normal course, shall be addressed pursuant to the dispute resolution procedures in accordance with Article XIX.

In the case of omitted work Contractor shall have the right to withhold from payments due or to become due to the Subcontractor an amount which, in Contractor's opinion, is equal to the value of such work until such time as the value thereof is determined by agreement or by the Architect as hereinabove provided.

All changes, additions or omissions in the Work ordered in writing by Contractor shall be deemed to be a part of the Work hereunder and shall be performed and furnished in strict accordance with all of the terms and provisions of this Agreement and the other Contract Documents. Subcontractor accepts the responsibility to keep its surety informed of all such modifications to its contract. The obligations of Subcontractor and Subcontractor's Surety shall not be reduced, waived or adversely affected by the issuance of such change orders, additions or deductions even if Subcontractor fails to inform Surety of same and Contractor shall not be required to obtain consent of the Surety to such modifications.

Subcontractor shall provide Contractor with written notice of any circumstance or direction given by Contractor which Subcontractor may regard as a change, addition and/or omission or which may otherwise serve as the basis for a request for an increase in Price or extension of time within 5 days of the receipt of the direction or the occurrence of the event giving rise to such a request. Such written notice shall provide a full explanation of the circumstances or direction and the extent of the increase and extension sought, including a detailed breakdown and analysis supporting such request. Failure of the Subcontractor to provide such written notice shall constitute a waiver of Subcontractor's right to any such increase or extension.

Subcontractor acknowledges that the General Contract may include provisions whereby Contractor is required to provide notice, information, reports and analyses in the event that Contractor intends to pursues or which may affect Contractor's right's to an extension of time or increase in Contractor's price to the Owner, whether by way of change order or otherwise, and that the failure to provide such notice, information, reports and analyses may result in a waiver or forfeiture of the right to such an extension or increase. Accordingly, Subcontractor agrees that Subcontractor shall provide all such notices, information, reports and analyses to Contractor, in the same form, content and manner as Contractor is required to provide to Owner under the General Contract in the event that Subcontractor intends to pursue an extension of time or increase in Price. Subcontractor shall provide all such notices, information, reports and analyses to Contractor not later than 3 business days prior to the time by which Contractor must submit corresponding notice, information, reports and analyses to Owner so that Contractor can pursue like extensions and /or increases in Contractor's price from the Owner. Subcontractor acknowledges that its failure to comply with the terms of this paragraph may result in the loss of or prejudice to Contractor's ability to receive adjustments and extensions time from Owner. Subcontractor therefore agrees that it shall be deemed to have waived and forfeited all such rights in the event that it fails to provide notice, information, reports and analyses to Contractor as required by this Article. The terms and provisions of the paragraph are neither intended to relieve Subcontractor of the obligation to provide timely notices, information, reports and analyses, nor to extend shorter durations, required by the Contract Documents.

Notwithstanding the forgoing, the Subcontractor agrees that it shall not be entitled to nor claim any cost reimbursement, compensation, damages or extensions of time attributable to any changes, additions and/or omissions directed by Contractor except to the limited extent that Contractor has actually recovered corresponding cost reimbursement, compensation, damages or extensions of time from the Owner under the Contract Documents for such changes, additions and/or omissions and then only to the extent of the amount, if any, which Contractor on behalf of the Subcontractor, actually received from the Owner on account of such delay, obstruction, hindrance or interference. The preceding sentence shall not apply in a situation in which Contractor directed the performance of changes, additions and/or omissions by Subcontractor notwithstanding express language in the General Contract clearly indicating that Contractor is not entitled to recover a corresponding cost reimbursement, compensation, damages or extensions of time from the Owner.

Inspection & Defective Work

ARTICLE X. The Subcontractor shall at all times provide sufficient, safe and proper facilities for the inspection of the Work by Contractor, the Architect, and their authorized representatives in the field, at shops or at any other place where materials or equipment for the Work are in the course of preparation, manufacture, treatment or storage. The Subcontractor shall, within twenty-four (24) hours after receiving written notice from Contractor to that effect, proceed to take down all portions of the Work and remove from the premises all materials whether worked or unworked, which the Architect, Contractor, Owner or any of its design consultants shall condemn as unsound, defective or improper or as in any way failing to conform to this Agreement or the Plans, Specifications or other Contract Documents, and the Subcontractor, at its own cost and expense, shall replace the same with proper and satisfactory work and materials and make good all work damaged or destroyed by or as a result of such unsound, defective, improper or nonconforming work or materials or by the taking down, removal or replacement thereof.

Failure to Prosecute, etc.

ARTICLE XI. Should the Subcontractor at any time, whether before or after final payment or completion of the Work, refuse or neglect to supply a sufficiency of skilled workers or materials of the proper quality and quantity, or fail in any respect to prosecute the Work with promptness and diligence, or cause by any act or omission the stoppage, impede, obstruct, hinder or delay of or interference with or damage to the work of Contractor or of any other contractors or subcontractors on the Project, or fail in the performance of any of the terms and provisions of this Agreement or of the other Contract Documents, or should the Architect, Contractor, Owner or any of its design consultants, determine that the Work or any portion thereof is not being performed in accordance with the Contract Documents, or should there be filed by or against the Subcontractor a petition in bankruptcy or for an arrangement or reorganization, or should the Subcontractor become insolvent or be adjudicated a bankrupt or go into liquidation or dissolution, either voluntarily or involuntarily or under a court order, or make a general assignment for the benefit of creditors, or otherwise acknowledge insolvency, then in any of such events, each of which shall constitute a default hereunder on the Subcontractor's part, Contractor shall have the right, in addition to any other rights and remedies provided by this Agreement and the other Contract Documents or by law, at one time or in phases at Contractor's discretion, after three (3) days written notice to the Subcontractor mailed or delivered to the last known address of the latter, (a) to perform and furnish through itself or through others any such labor or materials for all or any portion of the Work and to deduct the cost thereof from any monies due or to become due to the Subcontractor under this Agreement, (b) to terminate the employment of the Subcontractor for all or any portion of the Work, and/or (c) enter upon the premises and take possession, for the purpose of completing all or any portion of the Work,, of all materials, equipment, scaffolds, tools, appliances and other items thereon as Contractor may select, all of which the Subcontractor hereby authorizes Contractor to employ and/or communicate with any person or persons in connection with the completion of the Work and/or to provide all the labor, services, materials, equipment and other items required therefor. In case of Contractor taking action under this Article, including termination of the employment of the Subcontractor, the Subcontractor shall not be entitled to receive any further payment under this Agreement until the Work shall be wholly completed to the satisfaction of Contractor, Owner and the Architect and shall have been accepted by them, at which time, if the unpaid balance of the amount to be paid under this Agreement shall exceed the cost and expense incurred by Contractor in completing the Work, such excess shall be paid by Contractor to the Subcontractor; but if such cost and expense shall exceed such unpaid balance, then the Subcontractor and its surety, if any, shall pay the difference to Contractor. Such cost and expense shall include, not only the cost of completing the Work to the satisfaction of Contractor and the Architect and of performing and furnishing all labor, services, materials, equipment, and other items required therefore, but also all losses, damages, costs and expenses, (including legal fees and disbursements incurred in connection with reprocurement, in defending claims arising from such default and in seeking recovery of all such cost and expense from the Subcontractor and/or its surety), and disbursements sustained, incurred or suffered by reason of or resulting from the Subcontractor's default. Should Contractor take action by effectuating the provisions of this paragraph, and should it subsequently be determined that such action, including a termination effectuated by the terms of this Article, was improper, such termination shall be treated as a termination for convenience pursuant to Article XXI below. Subcontractor hereby transfers and assigns to Contractor the all rights under agreements that Subcontractor may have with subcontractors to Subcontractor, suppliers and vendors in connection with the Work or the Project, which transfers and assignments may be accepted at Contractor's sole discretion in the event that Contractor has taken action under this Article. Subcontractor agrees to fully cooperate with Contractor in pursuing Contractor's rights hereunder and that Contractor shall not be required to defer or delay action taken pursuant to this Article during the pendency of any review, investigation, evaluation or assessment by Subcontractor or its surety.

It is recognized that if the Subcontractor institutes or has instituted against it a case under Title 11 of the United States Code (Bankruptcy Code), such event could impair or frustrate the Subcontractor's performance of this Agreement. Accordingly, it is agreed that upon the occurrence of any such event, Contractor shall be entitled to request of Subcontractor or its trustee or other successor adequate assurances of future performance. Failure to comply with such request within ten (10) days of delivery of the request shall entitle Contractor, in addition to any other rights and remedies provided by this Agreement or by law, to terminate this Agreement. Pending receipt of adequate assurances of performance and actual performance in accordance herewith, Contractor shall be entitled to perform and furnish through itself or through others any such labor, materials or equipment for the Work as may be necessary to maintain the progress of the Work and to deduct the cost thereof from any monies due or to become due to the Subcontractor under this Agreement. In the event of such bankruptcy proceedings, this Agreement shall terminate if the Subcontractor rejects this Agreement or if there has been a default and the Subcontractor is unable to give adequate assurance that it will perform as provided in this Agreement or otherwise is unable to comply with the requirements for assuming this Agreement under the applicable provisions of the Bankruptcy Code.

Subcontractor, in addition to any other rights available to Contractor hereunder, agrees to indemnify, hold harmless and defend Contractor from and against any and all claims, demands, suits, damages, judgments, liabilities, costs and expenses (including legal fees and disbursements) arising out of or related to Subcontractor's breach of any term of the Agreement.

Loss or Damage to Work

ARTICLE XII. Contractor shall not be responsible for any loss or damage to the Work to be performed and furnished under this Agreement, however caused, until after final acceptance thereof by Contractor and the Architect, nor shall Contractor be responsible for loss of or damage to materials, tools, equipment, appliances or other personal property owned, rented or used by the Subcontractor or anyone employed by it in the performance of the Work, however caused.

Builder's Risk Insurance

Contractor or Owner shall effect and maintain All-Risk Builder's Risk insurance in accordance with the Contract Documents upon all Work, materials and equipment incorporated in the Project and all materials and equipment on or about the Premises intended for permanent use or incorporation in the Project or incident to the construction thereof, the capital value of which is included in the cost of the Work, but not including any contractors' machinery, tools, equipment or other personal property owned, rented or used by the Subcontractor or anyone employed by it in the performance of the Work.

A loss insured under Contractor or the Owner's All-Risk Builder's Risk insurance shall be adjusted by the Contractor or the Owner as fiduciary and made payable to Contractor or the Owner as fiduciary for the Insureds, as their interests may appear. Contractor or the Owner shall pay Subcontractors their just shares of insurance proceeds received by Contractor or the Owner, and by appropriate agreements, written where legally required for validity, and shall require Subcontractors to make payments to their subcontractors in a similar manner.

Cleaning Up

ARTICLE XIII. The Subcontractor shall, at its own cost and expense, (1) keep the Premises free at all times from all waste materials, packaging materials and other rubbish accumulated in connection with the execution of its Work by collecting and depositing said materials and rubbish in locations or containers as designated by Contractor from which it shall be removed by Contractor from the Premises without charge, (2) clean and remove from its own Work and from all contiguous work of others any soiling, staining, mortar, plaster, concrete or dirt caused by the execution of its Work and make good all defects resulting therefrom (3) at the completion of its Work in each area, perform such cleaning as may be required to leave the area "broom clean", and (4) at the entire completion of its Work, remove all of its tools, equipment, scaffolds, shanties and surplus materials. Should the Subcontractor fail to perform any of the foregoing to Contractor's satisfaction, Contractor shall have the right to perform and complete such work itself or through others and charge the cost thereof to the Subcontractor.

Ethics & Compliance

ARTICLE XIV. The Subcontractor shall obtain and pay for all necessary permits and licenses pertaining to the Work and shall comply with all Federal, State, Municipal and local laws, ordinances, codes, rules, regulations, standards, orders, notices and requirements, including but not limited to those relating to safety, storm water management, discrimination in employment, fair employment practices, immigration laws or equal employment opportunity, and whether or not provided for by the Plans, Specifications, General Conditions, or other Contract Documents, without additional charge or expense to Contractor and shall also be responsible for and correct, at its own cost and expense, any violations thereof resulting from or in connection with the performance of its Work. Each requisition for payment shall constitute a representation and warranty that Subcontractor is in compliance with applicable law.

The Subcontractor shall at any time upon demand furnish such proof as Contractor may require showing such compliance and the correction of such violations. The Subcontractor agrees to save harmless and indemnify Contractor from and against any and all loss, injury, claims, actions, proceedings, liability, damages, fines, penalties, costs and expenses, including legal fees and disbursements, caused or occasioned directly or indirectly by the Subcontractor's failure to comply with any of said laws, ordinances, rules, regulations, standards, orders, notices or requirements or to correct such violations therefore resulting from or in connection with the performance of Work.

The Immigration and Nationality Act as amended by the Immigration Reform and Control Act of 1986 (IRCA) makes it illegal for employers to knowingly hire persons who are not authorized to work in the United States. For all employees, employers are required to complete an Employment Eligibility Verification form I-9 which requires the prospective employee to produce documentation that establishes identity and employment eligibility. For more information visit www.uscis.gov, or speak to your attorney. Each subcontractor is solely responsible for properly completing Employment Eligibility Verifications for their own employees.

Subcontractor acknowledges represents and warrants that Subcontractor is aware of and understands IRCA, that Subcontractor is in compliance with IRCA, and that Subcontractor is not knowingly employing workers who are not authorized to work in the United States. Subcontractor agrees that Subcontractor will not employ any worker under this subcontract for whom Subcontractor has not completed and maintained I-9 verification. Subcontractor agrees that if Subcontractor acquires knowledge (constructive or otherwise, including receipt of a "no match" letter from Social Security Administration) indicating that one of Subcontractor's workers on this project may not be authorized to work in the United States, despite Subcontractor having conducted a facially valid I-9 verification, that Subcontractor will exercise due diligence as required by law to confirm authorization status and take appropriate action which may include termination of employment. Subcontractor represents and warrants that they will not subcontract to or utilize labor sources that it knows or has reason to know violate IRCA.

Contractor has a longstanding reputation for honesty and integrity in its business dealings and for its corporate policies promoting lawful and ethical behavior. Contractor is committed to upholding that reputation and has adopted a Standard of Business Conduct Policy Statement which governs the actions of all of its employees. Pursuant to that Policy Statement, Contractor employees are prohibited from accepting bribes or kickbacks in any form and, further, are prohibited from accepting goods or services provided by a subcontractor, supplier or vendor for the personal benefit of the employee, his or her relatives, or any entity in which the employee or his or her relatives has a personal interest. This prohibition includes, but is not limited to; work performed on an employee's residence and applies regardless of whether the beneficiary of the goods or services pays for them. Therefore, if the Subcontractor offers or provides a bribe or kickback to any employee, or offers or provides goods or services to any employee, his or her relatives, or any entity in which the employee or his or her relatives has a financial interest, the Subcontractor will be considered to be in material breach of this Subcontract. Subcontractor undertakes the commitment to advise Contractor of any action by any entity or person associated with the project that Subcontractor believes violates any applicable law, rule or regulation. Subcontractor's violation of any of the foregoing shall be considered as Subcontractor's failure to perform its obligations under the terms and conditions of this Agreement. Such failure shall be considered adequate and justifiable grounds for Contractor to effectuate its rights and remedies under the provisions of Article XI of this Agreement.

The provisions of this Article must be incorporated into any subcontract Subcontractor enters into in connection with the performance of the Work.

Harassment

ARTICLE XV. It is the goal of Contractor to promote a work environment at the Project that is free from harassment of any kind. Contractor has ZERO TOLERANCE for harassment, including harassment on the basis of race, sex, gender, gender identity, gender expression, transgender status, sexual orientation, pregnancy, childbirth and other pregnancy-related conditions, color, national origin, ancestry, age, religious creed, citizenship, marital status (including registered domestic partners), parental

status, physical disability, mental disability, medical condition, genetic information, military or veteran status (including protected veteran status), or any other characteristic or status protected by law. Subcontractor agrees to be bound by the Policy Statement on Harassment referenced in Article XXIII below, and any violation or suspected violation of such policy by Subcontractor or any of its officers, agents, servants, employees, subcontractors or suppliers shall be considered as Subcontractor's failure to perform its obligations under the terms and conditions of this Agreement. Such failure shall be considered adequate and justifiable grounds for Contractor to effectuate its rights and remedies under the provisions of Article XI of this Agreement. Subcontractor shall actively promote a harassment-free work environment among its officers, agents, servants, employees, subcontractors, and suppliers.

Labor to be Employed

ARTICLE XVI. The Subcontractor shall not employ workers, means, materials or equipment or assign work in any manner which may cause strikes, work stoppages or any disturbances by workers employed by the Subcontractor, Contractor or other contractors or subcontractors on or in connection with the Work or the Project or the location thereof. The Subcontractor agrees that all disputes as to jurisdiction of trades shall be adjusted in the manner or by a process that Contractor may require, including, if Contractor so requires, in accordance with any plan for the settlement of jurisdictional disputes to which Contractor may be bound in connection with the Project which may be in effect either nationally or in the locality in which the Work is being done. Subcontractor agrees that it shall assign work consistent with any such plan and shall be bound and abide by all such adjustments and settlements of jurisdictional disputes, provided that the provisions of this Article shall not be in violation of or in conflict with any provisions of law applicable to the settlement of such disputes. Should the Subcontractor fail to carry out or comply with any of the foregoing provisions, Contractor shall have the right, in addition to any other rights and remedies provided by this Agreement or the other Contract Documents or by law, after three (3) days written notice mailed or delivered to the last known address of the Subcontractor, to terminate this Agreement or any part thereof or the employment of the Subcontractor for all or any portion of the Work, and, for the purpose of completing the Work, to enter upon the Premises and take possession, in the same manner, to the same extent and upon the same terms and conditions as set forth in Article XI of this Agreement.

The Project or General Contract may be subject to Federal prevailing wage requirements, such as the Davis-Bacon Act or the Walsh-Healy Act, or other similar laws, statutes or requirements at a state or local level. Subcontractor shall strictly comply with all applicable prevailing wage laws, statutes or requirements and shall maintain such records as necessary to establish the amount of wages and other compensation paid to workers in connection with the Project and shall submit to Turner, as a condition for payment, certified payrolls in the form prescribed by any such laws, regulations or requirements. Subcontractor expressly agrees that the indemnification obligations set forth in this Agreement shall apply to any violations by Subcontractor of any such laws, statutes or regulations and the failure to maintain records as required herein.

Taxes & Contributions

ARTICLE XVII. The Subcontractor for the Price herein provided, hereby accepts and assumes exclusive liability for and shall indemnify, protect and save harmless Contractor and the Owner from and against the payment of:

1. All contributions, taxes or premiums (including interest and penalties thereon) which may be payable under the Unemployment Insurance Law of any State, Federal Social Security Act, Federal, State, County and/or Municipal Tax Withholding Laws, or any other law, measured upon the payroll of or required to be withheld from employees, by whomsoever employed, engaged in the Work to be performed and furnished under this Agreement.
2. All sales, use, personal property and other taxes (including interest and penalties thereon) required by any Federal, State, County, Municipal or other law to be paid or collected by the Subcontractor or any of its subcontractors or vendors or any other person or persons acting for, through or under it or any of them, by reason of the performance of the Work or the acquisition, ownership, furnishing or use of any materials, equipment, supplies, labor, services or other items for or in connection with the Work.
3. All pension, welfare, vacation, annuity and other union benefit contributions payable under or in connection with labor agreements with respect to all persons, by whomsoever employed, engaged in the Work to be performed and furnished under this Agreement.

In furtherance of, and in addition to the agreements, duties obligations and responsibilities of the Subcontractor with respect to the payment of sales, use, personal property and other taxes set forth in Articles IV and XVII of this Agreement, the Subcontractor agrees to reimburse and otherwise indemnify Contractor and the Owner for any expenses, including legal fees and litigation arising from, or related to the Subcontractor's failure to pay any sales, use, personal property or other taxes based upon labor, services, materials, equipment or other items acquired, performed, furnished or used for or in connection with the Work.

Patents

ARTICLE XVIII. The Subcontractor hereby agrees to indemnify, protect and save harmless Contractor and the Owner from and against any and all liability, loss or damage and to reimburse Contractor and the Owner for any expenses, including legal fees and disbursements, to which Contractor and the Owner may be put because of claims or litigation on account of infringement or alleged infringement of any letters patent or patent rights by reason of the Work or materials, equipment or other items used by the Subcontractor in its performance.

Disputes

ARTICLE XIX. The parties recognize that problems and disputes between them may occur and that it is preferable for them to reach an amicable resolution of same without the need to resort to formal dispute resolution procedures. In that regard, they each pledge to participate in good faith in voluntary and non-binding Alternate Dispute Resolution (ADR) procedures in the form of a mediation conducted by a neutral mediator, or such other form as the parties otherwise agree, as a condition precedent to addressing the dispute in any other forum unless Contractor agrees in writing to waive this condition precedent. The procedure for requesting such an ADR shall begin with a written notice of request for ADR delivered by one party hereto to the other. Within 14 days following the receipt of such notice, lead representatives of Subcontractor and Contractor shall meet in an effort to resolve the dispute. In the event that the dispute remains unresolved after the lead representatives meeting, a meeting shall take place between the President of Subcontractor and the General Manager or Operations Manager of Contractor within 20 days thereafter. In the event that the dispute remains unresolved after the President/Manager meeting, the parties shall proceed with ADR procedures described in the Article. However, in the event that such disputes are not resolved by mediation or another ADR procedure as Contractor and the Subcontractor may agree then such disputes shall be resolved any of following forums selected at Contractor's sole discretion either (1) the forum pursuant to which disputes between the Owner and Contractor are to be resolved under the terms of the General Contract, (2) arbitration administered by the American Arbitration Association under the rules pertinent to construction disputes then applicable or (3) in litigation. Furthermore, the Subcontractor agrees that Contractor shall have the exclusive right to join the Subcontractor as a party in any dispute resolution procedure (including without limitation ADR procedures, binding arbitration or other judicial or non-judicial proceeding) in which Contractor may be involved arising out of

or in connection with the Project, together with such other subcontractors or parties as may be appropriate, where in the judgment of Contractor the issues in dispute are related to the work or performance of the Subcontractor. In the event that relevant law limits or precludes Contractor's sole discretion in selecting the forum, then the dispute shall be resolved in litigation, unless the Subcontractor is to be joined by Contractor in a proceeding with Owner, in which case the forum shall be as stated in the General Contract. Furthermore, the Subcontractor expressly agrees to waive its right to trial by jury in any dispute involving Contractor and or Contractor's surety. Subcontractor further agrees that in the event that it suffers damages, cost or expenses or otherwise intends to pursue a recovery that arises out of or relates to the performance of work by another subcontractor to or under Contractor, Subcontractor's sole remedy shall be as against that responsible subcontractor and Subcontractor shall not pursue a remedy from Contractor.

Subcontractor shall continue with the diligent performance of Work pursuant to this Subcontract and follow and abide by directions and instructions issued by Contractor during the pendency of any dispute, including dispute resolution procedures, ADR procedures, arbitration or litigation.

All claims, suit or demands by Subcontractor as against Contractor or Owner shall be brought within the earlier of one year following Subcontractor's achieving substantial completion for the Subcontractor's Work or within one year of Contractor's notice of default in the event that Contractor has taken any action in accordance with Article XI, and Subcontractor hereby agrees that all relevant statutes of limitations shall be deemed reduced to such time period, to the fullest extent permitted by law.

Mechanics' Liens & Claims

If any subcontractor, laborer, materialman or supplier of the Subcontractor or any other person directly or indirectly acting for, through or under it or any of them files or maintains a lien or claim, whether a mechanics' lien or an attested account or otherwise, a mechanic's lien or claim against the Project or Premises or any part thereof or any interests therein or any improvements thereon or against any monies due or to become due from the Owner to Contractor or from Contractor to the Subcontractor, for or on account of any work, labor, services, materials, supplies, equipment or other items performed or furnished for or in connection with the Work or under any change order or supplemental agreement for extra or additional work in connection with the Project, the Subcontractor agrees to cause such liens and claims to be satisfied, removed or discharged at its own expense by bond, payment or otherwise within ten (10) days from the date of the filing thereof, and upon its failure to do so Contractor shall have the right, in addition to all other rights and remedies provided under this Agreement and the other Contract Documents or by law, to cause such liens or claims to be satisfied, removed or discharged by whatever means Contractor chooses, at the entire cost and expense of the Subcontractor (such cost and expense to include legal fees and disbursements). The Subcontractor agrees to indemnify, protect and save harmless Contractor and the Owner from and against any and all such liens and claims and actions brought or judgments rendered thereon, and from and against any and all loss, damages, liability, costs and expenses, including legal fees and disbursements, which Contractor and/or the Owner may sustain or incur in connection therewith.

Assignment & Subletting

ARTICLE XX. To the fullest extent permitted by law, Subcontractor agrees that it shall not assign, sell, transfer, delegate or encumber any rights, duties or obligations arising under this Agreement including, but not limited to, any right to receive payments hereunder, without the prior written consent of Contractor in its sole discretion and the giving of any such consent to a particular assignment shall not dispense with the necessity of such consent to any further or other assignments. In the event Subcontractor assigns, sells, encumbers or otherwise transfers its right to any monies due or to become due under this Agreement as security for any loan, financing or other indebtedness (hereafter "Assignment"), notification to Contractor of such Assignment must be sent by certified mail, return receipt requested, to the Procurement Manager in charge of the business unit responsible for the construction of the Project and the Assignment shall not be effective as against Contractor until Contractor provides its written consent to such Assignment. Subcontractor agrees that any such Assignment shall not relieve the Subcontractor of any of its agreements, duties, responsibilities or obligations under this Agreement and the other Contract Documents and shall not create a contractual relationship or a third party beneficiary relationship of any kind between Contractor and such assignee or transferee. Subcontractor further agrees that all of Contractor's defenses and claims arising out of this Agreement with respect to such Assignment are reserved unless expressly waived in writing by a duly authorized corporate officer. Subcontractor hereby agrees to indemnify and hold harmless Contractor from and against any and all loss, cost, expense or damages Contractor or Owner has or may sustain or incur in connection with such Assignment.

Termination for Convenience

ARTICLE XXI. Contractor shall have the right at any time and for any reason, by written notice to the Subcontractor, to terminate this Agreement without cause and require the Subcontractor to cease work hereunder. In the event of such a termination for convenience, the Subcontractor shall be entitled to payment pursuant to the terms of the Agreement only for all Work performed as of the date of termination, together with reasonable costs of demobilization and such other reasonable costs as may be encountered by the Subcontractor and directly attributable to such termination provided that such amount shall be reduced by all amounts for which Subcontractor is liable or responsible hereunder. However, the Subcontractor shall only be entitled to profit on that portion of the Work actually performed and approved for payment to the date of termination together with retainages held upon payments made prior thereto. Subcontractor waives any claim for loss of anticipated profits or other damages in the event Contractor exercises this clause.

Guarantees

ARTICLE XXII. The Subcontractor hereby guarantees the Work to the full extent provided in the Plans, Specifications, General Conditions, Special Conditions and other Contract Documents.

The Subcontractor shall expeditiously remove, replace and/or repair at its own expense and at the convenience of the Owner any faulty, defective or improper Work, materials or equipment existing or discovered within one (1) year from the date of the acceptance of the Project as a whole by the Architect and the Owner or for such longer period as may be provided in the Plans, Specifications, General Conditions, Special Conditions or other Contract Documents.

Without limiting the generality of the foregoing, the Subcontractor warrants to the Owner, the Architect and Contractor, and each of them, that all materials and equipment furnished under this Agreement will be of first class quality and new, unless otherwise required or permitted by the other Contract Documents, that the Work performed pursuant to this Agreement will be free from defects and that the Work will strictly conform with the requirements of the Contract Documents. Work not conforming to such requirements, including substitutions not properly approved and authorized, shall be considered defective. All warranties contained in this Agreement and in the Contract Documents shall be in addition to and not in limitation of all other warranties or remedies required and/or arising pursuant to applicable law. Failure of Subcontractor to honor and satisfy the foregoing and any other warranties or guarantees required of the Subcontractor under the Contract Documents, shall constitute a default by Subcontractor.

Accident Prevention & Other Policies

ARTICLE XXIII. The Subcontractor agrees that the prevention of accidents to workmen and property engaged upon or in the vicinity of the Work is its responsibility. The Subcontractor agrees to comply with all Federal, State, Municipal and local laws, ordinances, rules, regulations, codes, standards, orders, notices and requirements concerning safety as shall be applicable to the Work, including, among others, the Federal Occupational Safety and Health Act of 1970, and the Clean Water Act, as amended, and all standards, rules, regulations and orders which have been or shall be adopted or issued thereunder, and with the safety standards established or imposed during the progress of the Work by Contractor. When so ordered, the Subcontractor shall stop any part of the Work which Contractor deems potentially unsafe, noncompliant or in violation until corrective measures satisfactory to Contractor have been taken, and the Subcontractor agrees that it shall not have nor make any claim for damages growing out of such stoppages. Should the Subcontractor neglect to take such corrective measures, Contractor may do so at the cost and expense of the Subcontractor and may deduct the cost thereof from any payments due or to become due to the Subcontractor. Failure on the part of Contractor to stop unsafe practices shall in no way relieve the Subcontractor of its responsibility therefor.

This Subcontractor acknowledges the receipt of Contractor's "Corporate Safety, Health and Environmental Policy", “Substance Abuse Policy”, "Equal Employment Opportunity" policy and “Policy Statement on Harassment.” Subject to applicable law this Subcontractor further agrees to be bound to these policies as a part of the supplemental and special conditions to the contract for construction of the project, including any amendments or modifications of such policies that Contractor may issue at any time. Subcontractor further acknowledges that Contractor endeavors to employ on its projects robust programs with respect to safety and storm water management, as well as compliance with relevant laws and regulations, including, without limitation, OSHA and the Clean Water Act. Such programs may include aggressive measures and requirements, such as reporting, training of personnel and inspections that may be considerably above and beyond minimum standards. Subcontractor agrees to comply with any and all requirements Contractor may impose in connection with such programs and policies, whether as part of this Subcontract or hereafter, and the cost and expense of such compliance shall be borne by the Subcontractor.

In the event that hazardous substances of a type of which an employer is required by law to notify its employees are being used or stored on the site by the Subcontractor, the Subcontractor’s subcontractors and anyone directly or indirectly employed or otherwise retained by them or either of them, the Subcontractor shall immediately provide written notice of the chemical composition thereof (including, without limitation, a copy of the applicable Material Safety Data Sheet) to Contractor in sufficient time to permit compliance with such laws by Contractor, other subcontractors and other employers on the site. In the event that the Subcontractor encounters on the site material reasonably believed to be hazardous substances (including, without limitation, asbestos or polychlorinated biphenyl) which has not been rendered harmless, the Subcontractor shall immediately stop Work in the area affected and immediately report the condition to Contractor in writing. Work in the affected area shall resume when such hazardous substances have been rendered harmless or removed as determined by Contractor in its sole and absolute discretion. To the extent of Subcontractor’s responsibilities hereunder, Subcontractor does indemnify and save harmless Contractor from and against any and all loss, injury, claims, actions, proceedings, liability, damages, fines, penalties, cost and expenses, including legal fees and disbursements, caused or occasioned directly or indirectly by the Subcontractor in regard to such hazardous substances.

Assumption of Liability & Indemnity

ARTICLE XXIV. Throughout this Agreement, the “Indemnified Party (ies)” means Contractor, the Owner, any party required to be indemnified pursuant to the General Contract, and any of their respective officers, agents, servants, or employees, and affiliates, parents and subsidiaries. Except as otherwise provided below, the Subcontractor hereby assumes the entire responsibility and liability for any and all actual or potential damage or injury of any kind or nature whatsoever (including death, business interruption or loss of use resulting therefrom) to all persons and entities, whether employees of the Subcontractor, or any tier of the Subcontractor or otherwise, or to all property or as a result of a perceived risk of such damage or injury (including actions taken to avoid or contain such actual or potential damage or injury, whether required or incurred by a public authority or otherwise); caused by, resulting from, arising out of or occurring in connection with the execution of the Work, or in preparation for the Work, or any extension, modification, or amendment to the Work by change order or otherwise. Should any claims for such actual or potential damage or injury (including death resulting therefrom) be made or asserted, whether or not such claims are based upon an Indemnified Party’s alleged active or passive negligence or participation in the wrong or upon any alleged breach of any statutory duty or obligation on the part of an Indemnified Party, the Subcontractor agrees to indemnify and save harmless the Indemnified Party from and against any and all such claims and further from and against any and all loss, cost, expense, liability, damage, penalties, fines or injury, including legal fees and disbursements, that the Indemnified Party may directly or indirectly sustain, suffer or incur as a result thereof. However, this Article shall not be construed in any way to require the Subcontractor, its agents, and its employees to indemnify the Indemnified Party for damages because of property damage or bodily injury caused by or resulting from the Indemnified Party’s own negligence. When the Subcontractor has the obligation to indemnify the Indemnified Party, the Subcontractor agrees to and does hereby assume, on behalf of the Indemnified Party, the defense of any action at law or in equity which may be brought against the Indemnified Party upon or by reason of such claims and to pay on behalf of the Indemnified Party, upon demand, the amount of any judgment that may be entered against the Indemnified Party in any such action. In the event that any such claims, loss, cost, expense, liability, damage, penalties, fines or injury arise or are made, asserted or threatened against the Indemnified Party, Contractor shall have the right to withhold from any payments due or to become due to the Subcontractor an amount sufficient in its judgment to protect and indemnify the Indemnified Party from and against any and all such claims, loss, cost, expense, liability, damage, penalties, fines or injury, including legal fees and disbursements, or Contractor in its discretion may require the Subcontractor to furnish a surety bond satisfactory to Contractor guaranteeing such protection, which bond shall be furnished by the Subcontractor within five (5) days after written demand has been made therefor.

In furtherance to but not in limitation of the indemnity provisions in this Agreement, Subcontractor hereby expressly and specifically agrees that its obligation to indemnify, defend and save harmless as provided in this Agreement shall not in any way be affected or diminished by any statutory or constitutional immunity it enjoys from suits by its own employees or from limitations of liability or recovery under worker’s compensation laws, and Subcontractor expressly waives such constitutional and statutory immunity to the extent necessary to give effect to Subcontractor’s indemnity obligations hereunder.

IN THE EVENT THAT THE LAW OF THE STATE IN WHICH THE PROJECT IS LOCATED (OR OTHER APPLICABLE LAW) LIMITS THE INDEMNITY OBLIGATIONS OF THE SUBCONTRACTOR, THEN THE INDEMNITY OBLIGATIONS OF THE SUBCONTRACTOR SHALL BE ENFORCED TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, AND THIS ARTICLE SHALL BE CONSTRUED TO CONFORM TO SUCH LAW.

Insurance

ARTICLE XXV. Insurance.

A. Required Insurance

Before commencing the Work, the following insurance coverages from insurance companies satisfactory to Contractor shall be in place and maintained until completion and final acceptance of the Work:

1. WORKERS' COMPENSATION in accordance with laws of the State in which the Work is situated, and EMPLOYERS' LIABILITY INSURANCE in the amount of $1,000,000.

2. COMMERCIAL GENERAL LIABILITY INSURANCE INCLUDING COMPLETED OPERATIONS, CONTRACTUAL LIABILITY INSURANCE AGAINST THE LIABILITY ASSUMED HEREINABOVE, and including INDEPENDENT CONTRACTOR'S LIABILITY INSURANCE if the Subcontractor sublets to another all or any portion of the Work, Personal Injury Liability, Broad Form Property Damage (including completed operations), and Explosion, Collapse and Underground Hazards, with the following minimum limits:(Coverage shall be equivalent to current ISO Occurrence Form). No exclusions or restrictions for Crane usage will be permitted.

   $ **SDS** /Occurrence

   $ **SDS** General Aggregate

Subcontractor has elected to obtain the above insurance coverages set forth in paragraphs 1 and 2 above in the manner set forth in the Subcontractor Election A, B or C (with Subcontractor Election B having a further coverage option that is stated in, and may be elected by checking, Sub-Part B-1) that is checked below (Note: only one of Subcontractor Election A, B or C is to be selected, however Subpart B-1 may also be selected but only if Subcontractor Election B is selected):

SDS Subcontractor Election A). The above insurance coverages shall be provided by insurance companies selected by the Subcontractor. Contractor shall have the right, without limitation, to reject any insurance company selected by Subcontractor that has an A.M. Best rating of less than A or Standard and Poor's rating of less than AA or a Moody's rating of less than Aa. This insurance coverage shall include Products and Completed Operations coverage which Subcontractor agrees to maintain for a period equal to the statute of repose in the state in which the project is located. Subcontractor further agrees that it shall require each of its sub-subcontractors to provide the above insurance coverages subject to the terms and conditions set forth below. All costs are included in the Price and are to be paid by the Subcontractor.

or

SDS Subcontractor Election B). The above insurance coverages shall be provided through a consolidated insurance program that insures Subcontractor and its eligible lower tier subcontractors, which program has been made available to Subcontractor by Contractor, as described and with limits of liability, terms and conditions set forth in the Contract Documents, including, but not limited to, the CCIP Manual, and Subcontractor agrees to all terms and conditions therein, and makes all representations and warranties, associated therewith. Subcontractor acknowledges and agrees i) that insurance costs will be incurred to provide the above insurance coverages under the consolidated program; ii) that as opposed to Subcontractor including such insurance costs in the Price and paying such costs directly, the Price does not include insurance costs for the above insurance coverages, iii) that it is more convenient and efficient for Contractor to pay such insurance costs on Subcontractor's and Subcontractor's eligible lower tier subcontractor's behalf, and iv) that Contractor is authorized by Subcontractor to pay such insurance premiums on Subcontractor's behalf and Subcontractor's eligible lower tier subcontractor's behalf.

SDS Sub-Part B-1 to Subcontractor Election B. By checking this further election, Subcontractor agrees that it has selected Subcontractor Election B with respect to providing the above insurance coverages for eligible lower tier subcontractors engaged by or through Subcontractor to the extent permitted by the Contract Documents (including the CCIP Manual), however, Subcontractor agrees that as to Subcontractor itself, the above insurances will be provided by Subcontractor in accordance with the terms and conditions of Subcontractor Election A above. Accordingly, Subcontractor itself shall be deemed an "Excluded Party" with respect to the consolidated insurance program as described in the Contract Documents (including the CCIP Manual). Any other "Excluded Party" lower tier subcontractors (if applicable) with respect to the consolidated insurance program arranged by Contractor shall be required to procure their own insurance coverages at their expense. For Subcontractor's lower tier subcontractors that are not an "Excluded Party", the above insurance coverages shall be provided through the consolidated insurance program as described in Subcontractor Election B to the extent permitted by the Contract Documents (including the CCIP Manual).

Subcontractor represents and warrants that all amounts, information and data that Subcontractor and its lower tier subcontractors has provided or will provide in connection with CCIP applications and other related forms and documents, including estimated payroll and insurance costs, are, or shall be when submitted, true and accurate. Subcontractor represents and warrants that the amount of estimated unburdened payroll (payroll without benefits or overtime, unless the overtime portion is included as

required by the regulations of the State in which the project is located) actually used by Subcontractor and its eligible lower tier subcontractors in calculating the Price is $ **SDS** ("Initial Payroll Estimate" or "Estimated On-Site Payroll") (if Sub-Part B-1 is elected, this amount only pertains to Subcontractor's eligible lower tier subcontractors). Subcontractor further agrees that all such amounts, data and information, including the estimated unburdened payroll amount used to calculate the Price, shall be to subject to audit and verification if Contractor or the CCIP Administrator elects to do so and Subcontractor agrees to cooperate fully and provide documents and other records requested in connection with such audit and verification and to cause its lower tier subcontractors to do the same. Subcontractor acknowledges that such amounts, information and data or such other amounts as verified in accordance with the CCIP Manual or through audit may be used to calculate final and interim cost adjustments to the Price and/or payments to Subcontractor (at Contractor's discretion) as described in the CCIP Manual. Contractor and the CCIP Administrator shall not be required to use any amount greater than the foregoing "Estimated On-Site Payroll" as the unburdened payroll amount when calculating such adjustments for Subcontractor and its lower tier subcontractors as described in the CCIP Manual.

or

SDS Subcontractor Election C). The above insurance coverages shall be provided through an Owner Controlled Insurance Program (OCIP) as described and with limits of liability set forth in the Contract Documents and Subcontractor agrees to all terms, and makes all representations and warranties, associated therewith.

Subcontractor acknowledges that if any of the above insurance coverages are provided through a consolidated program arranged pursuant to Subcontractor Election B, Subcontractor Election B-1 or Subcontractor Election C, such coverage will not apply to any operations off of the premises (as defined in the CCIP Policy or Manual or OCIP Policy or Manual) and Subcontractor shall provide and maintain the above insurance coverages with respect to off-premises operations. Subcontractor further agrees that in the event that the insurance coverage provided by a consolidated insurance program (Subcontractor Election B or C) is cancelled prior to the completion of the Work, subcontractor shall provide the insurance coverage (set forth in paragraphs 1 and 2). Subcontractor further acknowledges and represents i) that it was not required to select any particular election provided for above and was free to choose Subcontractor Election A if it preferred to apply for and obtain insurance itself, ii) that Subcontractor has reviewed the other Subcontractor Elections available for this Project and has chosen the election selected above, and iii) that Subcontractor has satisfied itself that the Subcontractor Election checked above is preferable to Subcontractor for reasons of convenience, economics and/or coverage afforded.

3. COMMERCIAL AUTOMOBILE LIABILITY INSURANCE covering all owned, non-owned and hired automobiles used in connection with the Work, with the following minimum limits:

   Combined Single Limit $ **SDS** /accident

4. ALL RISK CONTRACTOR'S EQUIPMENT INSURANCE COVERAGE shall be provided by all Subcontractors utilizing a crane or other equipment in connection with the performance of the Work and insured to the full value of equipment.

B. Insurance Conditions

The following terms and conditions are applicable to all insurance:

Before commencing the Work, the Subcontractor shall furnish a certificate(s), satisfactory to Contractor from each insurance company showing that the above insurances (1, 2 Subcontractor Election A, 3 and CGL operations off of the premises under 2 Subcontractor Election B and C, and 4) are in force, stating policy numbers, dates of expiration, and limits of liability thereunder, and further providing that should any of the described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions. Subcontractor shall advise Contractor of the amount of any Deductible or Self-Insured Retention that exists on any policies of insurance on the face of the certificates provided. Subcontractor shall be responsible for and agrees to pay and/or reimburse Contractor for any such Deductible or Self-Insured Retention.

The Subcontractor shall name the Indemnified Parties and such other entities as may be reasonably requested as additional insureds under the policies of insurance listed in paragraph A maintained by the Subcontractor (with the exception of Workers Compensation insurance), whether during the performance of the Work or any time thereafter. The coverage to be provided to the additional insureds shall be for all liability arising out of the Work. Subcontractor will submit a certificate of insurance and a copy of endorsements to the insurance policies listing all parties required to be named by Subcontractor as additional insureds. Subcontractor hereby waives all rights of recovery from Contractor and the Indemnified Parties, including but not limited to rights of subrogation, with respect to any matter, claim or suit that is required to be covered by insurance to be maintained by Subcontractor pursuant to the Contract Documents.

It is expressly agreed by and between Subcontractor and Contractor that all insurance, whether issued on a primary or excess basis, afforded the additional insureds shall be primary insurance to any other insurance available to the additional insureds and that any other insurance carried by the additional insureds shall be excess of all other insurance carried by the Subcontractor and shall not contribute with the Subcontractor's insurance. Subcontractor further agrees that the amount of insurance available to Contractor and the additional insureds shall be for the full amount of the loss up to policy limits of liability and shall not be limited to the minimum requirements of this Subcontract. Subcontractor further agrees to provide endorsements on its insurance policies that shall state the foregoing; however, Subcontractor's failure to provide such endorsement shall not affect Subcontractor's agreement hereunder.

If the Subcontractor fails to procure and maintain such insurance, if required, Contractor shall have the right, but not the obligation, to procure and maintain said insurance for and in the name of the Subcontractor and the Subcontractor shall pay the cost thereof and shall furnish all necessary information to make effective and maintain such insurance or at Contractor's option, Contractor may offset the cost incurred by Contractor against amounts otherwise payable to Subcontractor hereunder. Subcontractor further agrees that in the event of such failure to procure and maintain such insurance, Subcontractor shall be liable

for all amounts which would have been payable pursuant to the insurance required by this Subcontract. If, in Contractor's discretion, Contractor is concerned that any insurance company selected by Subcontractor has, at any time, faced diminished financial strength or that the insurance company may no longer provide the same level of financial strength (such as a decline in an A. M. Best, Standard and Poor's or Moody's rating), Contractor may require that Subcontractor provide replacement insurance coverage through an insurance company satisfactory to Contractor.

IN THE EVENT THAT THE LAW OF THE STATE IN WHICH THE PROJECT IS LOCATED (OR OTHER APPLICABLE LAW) LIMITS THE ADDITIONAL INSURED COVERAGE THAT CONTRACTOR MAY REQUIRE FROM SUBCONTRACTOR, THEN SUBCONTRACTOR SHALL BE REQUIRED TO OBTAIN ADDITIONAL INSURED COVERAGE TO THE FULLEST EXTENT OF COVERAGE AND LIMITS ALLOWED BY APPLICABLE LAW AND THIS CONTRACT SHALL BE READ TO CONFORM TO SUCH LAW.

Bonds

ARTICLE XXVI. The Subcontractor shall furnish to Contractor a performance bond in the amount of $ **SDS** and a separate payment bond in the amount of $ **SDS** the form and contents of such bonds and the Surety or Sureties thereon to be satisfactory to Contractor. Such bonds shall be furnished to Contractor within ten (10) calendar days after Subcontractor has executed this Agreement or within such other time period agreed to by Contractor in writing. In the event Subcontractor fails to furnish such bonds to Contractor within the time period as hereinabove provided, such failure shall constitute a default under this Agreement in which event Contractor shall have all of the rights and remedies provided in Article XI hereof with respect to default on the part of Subcontractor including, without limitation, the right to terminate this Agreement.

Without limiting the responsibilities of Subcontractor and its Surety under the terms of this Agreement, Subcontractor and its Surety hereby agree to promptly pay all lawful claims of subcontractors, materialmen, laborers, persons, firms or corporations for labor or services performed or materials, supplies, machinery equipment, rentals, fuels, oils, tools, appliances, insurance and other items furnished, used or consumed in connection with the prosecution of the Work provided for in said Subcontract and any and all modifications thereof, and shall indemnify and save harmless Contractor of and from all liability loss, damage and expense, including interest, costs and attorney fees, which Contractor and/or its Surety may sustain by reason of Subcontractor's or its Surety's failure to do so.

Subcontractor and its Surety hereby agree to execute and deliver to Contractor when requested in connection with the issuance of change orders under this Agreement, Rider "A" amendments (or other documents as Contractor may require) increasing the amount (Penal Sum) of the Payment and Performance Bonds furnished by the Subcontractor. The reasonable premiums or other charges paid by the Subcontractor for the procurement of the Rider "A" amendments will be paid as a change to this Agreement.

Severability

ARTICLE XXVII. In the event that any provision or any part of a provision of this Agreement shall be finally determined to be superseded, invalid, illegal or otherwise unenforceable pursuant to applicable laws by an authority having jurisdiction, such determination shall not impair or otherwise affect the validity, legality, or enforceability of the remaining provisions or parts of provisions of this Agreement, which shall remain in full force and effect as if the unenforceable provision or part were deleted.

Business Enterprise Compliance

ARTICLE XXVIII. In the event that the Project or General Contract is subject to any federal, state, or local program(s) requiring Contractor or its subcontractors to meet certain goals or commitments with regard to the award of subcontracts or supply contracts to small and/or disadvantaged businesses, including but not limited to minority owned, woman owned, veteran owned and local businesses, then the provisions of this Article shall apply. Subcontractor acknowledges that: a) the Federal Small Business Program applies if the General Contract is a direct federal government contracts (*i.e.*, contracts awarded by a federal executive agency); b) the Disadvantaged Business Enterprise Program applies to projects that are funded in whole or in part with federal funds, including those funded through a grant awarded to the Owner; c) there are state and local programs that may apply to public projects that are funded by a state or local government; and d) these programs have different eligibility requirements as well as different methods of counting small business, minority, and other designated categories of participation at all subcontracting levels. Subcontractor agrees that it shall fully understand and comply with the rules and regulations of all such programs to the fullest extent applicable to the General Contract, Subcontract or this Agreement.

A. If Subcontractor is or otherwise satisfies the qualifications or requirements of any of the following, or if Subcontractor has in any way represented or given Contractor reason to believe that such is the case: (a) a small business under the Federal Small Business Program (*i.e.*, a small business, a small disadvantaged business (SDB), a HUBZone small business, a service-disabled veteran-owned small business (SDVOSB), a veteran-owned small business (VOSB), or a women-owned small business (WOSB)) (hereinafter collectively referred to as an "SBE"); (b) a Disadvantaged Business Enterprise (DBE), Minority Owned Business Enterprise (MBE), or Woman Owned Business Enterprise (WBE), or the functional equivalent under federal, state, or local law (hereinafter collectively referred to as a "DBE"); or (c) a category or status designated by state or local authorities which otherwise classifies or designates certain business entities, collectively referred to as Local Business Enterprises (LBEs); then Subcontractor acknowledges, represents, agrees and warrants that: (i)Subcontractor in fact has such status and has obtained all required federal, state, or local certifications of such status; (ii) Contractor is relying upon such representation and status to fulfill any and all SBE, DBE or LBE goals or commitments Contractor has made to the Owner and/or a government agency or as otherwise required of Contractor; (iii) Subcontractor shall maintain its status as an SBE, DBE or LBE throughout the performance of the subcontract or purchase order; (iv) Subcontractor immediately shall notify Contractor if there is a change in Subcontractor's status as an SBE, DBE or LBE; (v) Contractor has engaged Subcontractor based on Subcontractor's representation that Subcontractor shall perform in such a manner that 100% of Subcontractor's Work and 100% of the Subcontract value shall be eligible for credit towards Contractor's goals and commitments with regard to the award of subcontracts to SBEs, DBEs and/or LBEs; (vi) Subcontractor shall perform in such a manner that Contractor shall be eligible to receive credit towards Contractor's goals and commitments regarding the award of subcontracts to SBEs, DBEs, and/or LBEs for 100% of the Subcontract value; (vii) Subcontractor will not engage in any effort or take any action that would prevent Contractor from receiving 100% credit; (viii) Subcontractor shall engage in a genuine commercially useful function as defined by law and shall not act as a pass-through to sub-subcontractors, suppliers, or vendors who are not SBEs, DBEs or LBEs; (ix) Subcontractor will not engage in any effort to create the appearance of SBE, DBE or LBE legitimacy or participation when in fact it does not exist; and (x) if Subcontractor awards any of its work through sub-subcontract, purchase order, or otherwise, to an SBE, DBE or LBE, then Subcontractor will do so only in a manner that does not affect the ability to receive credit as described above for 100% of the Subcontract value, including awarding same only to SBE, DBE or LBE sub-subcontractors, suppliers, or vendors if and to the extent necessary to achieve this result.

B. If Subpart A. of this Article is not applicable to Subcontractor, then Subcontractor acknowledges and agrees that the obligations and commitments assumed by Contractor with regard to the award of subcontracts to SBEs, DBEs and/or LBEs, have likewise been assumed by Subcontractor pursuant to this Agreement, including but not limited to meeting or exceeding the same percentage or other requirements or goals for each separate category of SBE, DBE and/or LBE employment in connection with the performance of the Work and satisfying all obligations and responsibilities with respect to reporting and documenting same.

C. The provisions of this Subparagraph C. shall be applicable to all Subcontractors. If or when Subcontractor awards any of its work through sub-subcontract, purchase order, or otherwise, to an SBE, DBE or LBE, to the extent permitted or required by this Agreement, then Subcontractor further acknowledges, represents, agrees and warrants that Subcontractor shall: (i) verify that such SBE, DBE or LBE has such status and has obtained all required federal, state, or local certification of such status; (ii) require its SBE, DBE or LBE sub-subcontractors, suppliers, or vendors to maintain their status as an SBE, DBE or LBE throughout the performance of their sub-subcontract, purchase order, or other agreement; (iii) immediately notify Contractor if there is a change in a sub-subcontractor's, supplier's, or vendor's status as an SBE, DBE or LBE; (iv) require all SBE, DBE or LBE sub-subcontractors, suppliers, or vendors to engage in a genuine commercially useful function as defined by law; (v) ensure that all SBE, DBE or LBE sub-subcontractors, suppliers, or vendors are not acting as a pass-through to another sub-subcontractor, supplier, or vendor who is not a SBE, DBE or LBE; and (vi) not permit a sub-subcontractor, supplier, or vendor to engage in any effort to create the appearance of SBE, DBE or LBE legitimacy or participation when in fact it does not exist.

Subcontractor agrees that: (i) Contractor, or its authorized representative, shall have access to and the right to examine and audit all of Subcontractor's records relating to Subcontractor's Work under this Agreement including, but not limited to, lower-tier subcontracts, equipment leases, purchase orders, and other agreements with third parties; (ii) Subcontractor and its sub-subcontractors, vendors and suppliers shall submit any forms, certifications or documents required by Contractor relating to participation on the Project, regardless of whether such forms or documents have been requested or required by the Owner; (iii) failure to honor and comply with any of the terms or conditions of this Article and/or its failure to comply with any applicable law relating to the award of subcontracts to SBEs, DBEs and/or LBEs shall constitute a material breach of this Agreement; (iv) submission by Subcontractor of a monthly requisition for payment or invoice shall constitute a certification by Subcontractor that each and every representation and warranty set forth in this Article is and remains truthful, accurate, and complete, and that Subcontractor is in full compliance with the terms and conditions of this Article, as of the date such requisition or invoice is submitted to Contractor; (v) Contractor may rely on these certifications in making payment to Subcontractor and in making like representations to others; (vi) Contractor shall have the right to withhold payment from Subcontractor if Contractor has reasonable grounds to believe that Subcontractor is not in full compliance with its obligations set forth in this Article; and (vii) that Subcontractor shall include a provision in all agreements with its sub-subcontractors, vendors and suppliers, whereby such sub-subcontractors, vendors and suppliers acknowledge and agree to conduct their operations and affairs in a manner that ensures that Subcontractor is not in violation of any provision in this Article and to provide forms, certifications and documents as required by Contractor or this Article.

U.S. Government Prime Contract

ARTICLE XXIX. In the event that the General Contract under which this Subcontract is being issued is a General Contract between Contractor and the United States Government or an agency thereof, additional Federal Acquisition Regulation ("FAR") and agency FAR supplemental provisions are applicable to this Agreement. Such FAR and agency FAR supplemental provisions are contained on the attached document entitled "Federal Supplement" and such provisions are hereby incorporated by reference herein as if set forth at length herein. Subcontractor hereby ratifies and re-affirms its Subcontractor Certifications and Disclosures that Subcontractor signed and submitted with its proposal submitted earlier to Contractor and such Certifications and Disclosures are hereby incorporated herein by reference as if set forth at length herein.

ARTICLE XXX. This Agreement constitutes the entire agreement between the parties hereto. No oral representations or other agreements have been made by Contractor except as stated in the Agreement. This Agreement may not be changed in any way except as herein provided, and no term or provision hereof may be waived by Contractor except in writing signed by its duly authorized officer or agent. Subcontractor acknowledges and represents that it has completed and submitted to Contractor a prequalification questionnaire, that all statements therein and in the attachments to such questionnaire were true, accurate and complete, and remain true, accurate and complete, and that Contractor has relied on truthfulness, accuracy and completeness of such statements and the contents of the attachments thereto in deciding to enter into this Agreement. The marginal descriptions of any term or provision of this Agreement are for convenience only and shall not be deemed to limit, restrict or alter the content, meaning or effect thereof.

Entire Agreement

The said parties, for themselves, their heirs, executors, administrators, successors and assigns, do hereby agree to the full performance of all of the terms and provisions herein contained.

In Witness Whereof the parties to these presents have hereunto set their hands as of the day and year first above written.

SUBCONTRACTOR		**CONTRACTOR**	
By:	SDS	**By:**	SDS
Official title:	SDS		Vice-President

EARLY SUBCONTRACTOR INVOLVEMENT SUBCONTRACT RIDER (LUMP SUM EARLY SUBCONTRACTOR INVOLVEMENT CONTRACT)
REV 01.21.22

The provisions set forth in this Early Subcontractor Involvement Subcontract Rider are part of the Subcontract Agreement made as of the _____ day of _____, _____ by and between _____, ("Subcontractor") and Turner Construction Company ("Contractor") and shall in all respects be binding upon Subcontractor and its surety.

Subcontractor shall work diligently with Contractor and _____, the Architect and their consultants (collectively, the "Architect") , for the _____ Work, to provide Early Subcontractor Involvement (ESI) input including attending regular meetings and conference calls as required during the design phase, to provide guidance to the design team as may be needed, to allow the Architect to develop the final design within the lump sum Price and other requirements set by the Owner. ESI input is defined as evaluations of safety, quality, resource and logistical requirements, cost, constructability, providing alternate design suggestions, alternate manufacturers' product suggestions and/or equipment vendors, and scheduling assistance. Subcontractor has included sufficient monies in the lump sum Price for full participation during the design process, including preparation of detailed written estimates and evaluations of the documents concurrently with the Architect.

It is understood that the Contract Documents, as they relate to the Work, are not complete. However, the Work of this Agreement includes input to accommodate a complete and functioning system including all items inferable and necessary to complete the Work in accordance with all applicable codes, standards, authorities having jurisdiction ("AHJ"), and the Contract Documents. Additionally, the Subcontractor recognizes that the Contractor has relied upon the lump sum Price in its acceptance of its obligations under the General Contract and it is the Subcontractor's express obligation to maintain the lump sum Price through ESI services and recommendations as the design is further developed by the Contractor and its designers. Without limiting the requirements of Article IX of the Form 36, the lump sum Price shall not be increased during the development of the design unless the Owner has modified the design criteria under the General Contract.

The Subcontractor represents it has expertise in projects of this nature and its staff has the experience and training necessary to fulfill the requirements of this Agreement. Additionally, this Subcontractor represents that it has reviewed the Contract Documents, fully understands the intent, and has included all necessary work items not specifically indicated, detailed, or specified.

Building L.I.F.E

Living Injury Free Everyday

MESSAGE FROM THE PRESIDENT

We think of our workplace as "our house." In our house, we foster a caring environment. We want every person at Turner and every person who steps onto a Turner site to truly believe that they are contributing to, and have a sense of belonging to, something extraordinary. We are focused on maintaining and sustaining the Right Environment where people feel included, engaged, empowered, and connected.

Turner's safety culture is reflected in the principle of Building L.I.F.E.® (Living Injury Free Every Day) with an expectation that all projects provide the safest workplace possible for our employees, trade partners, clients, and members of the communities in which we work.

Turner's Building L.I.F.E.® safety program is a continuous improvement process with a focus on upstream risk avoidance and the activities which produce risk. The Building L.I.F.E.® process seeks to increase frontline worker engagement in the safety and planning processes through engaging those closest to the risk in the decision-making process. Building L.I.F.E.® is anchored by a focus on positive reinforcement and feedback on safe behaviors by everyone involved in the delivery of the project.

The Building L.I.F.E.® vision creates and sustains a culture which promotes an incident-free environment and provides the safest workplace possible to live injury free every day.

Building L.I.F.E.® Guiding Principles
- Injuries are preventable
- We will coach and practice safe behavior to live injury free every day
- We will take the necessary time to engage and properly plan work, to perform tasks safely
- We will perform a job only if it is safe
- We will look out for each other and speak up if there is a safer way to perform a task
- We will intervene and stop work when an unsafe action or condition is observed

Let's be relentless and keep each other accountable by making sure we pre-plan and discuss risk every day and that we continue to actively care. Thank you for your support and help maintaining a workplace that promotes the Building L.I.F.E.® culture. Together, we will continue to improve our performance and make our projects the safest possible.

Peter J. Davoren
President and Chief Executive Officer
Turner Construction Company

PROJECT DESCRIPTION

KEY PROJECT STAFF

A. Project Executive –
B. Environmental, Health and Safety Director –
C. Project Manager –
D. Sr. Superintendent –
E. Project Superintendent –
F. Project Safety Manager –
G. Procurement Manager –
H. Project Engineer –

RESPONSIBLITIES

Trade Partner Safety Manager

Trade Partner Safety Manager must have completed an OSHA 30-hour for construction class. One person must be certified for all contracts under $5M, and two people must be certified for contracts over $5M. The 30-hour certified person(s) must be on-site 100% of the time. This OSHA 30- hour certification must be updated through Turner's Safety Update Training every two years through Turner University.

- The Trade Partner's Safety Manager must be identified before start of their work. If the trade partner's contract value is $5M or greater and/or the trade partner will have 25 employees or more on site, including sub tiers, for more than two weeks, they must provide a full-time Safety Manager who:
    1. Is qualified to recognize safety hazards; and
    2. Has the authority to take corrective action; and
    3. Possesses current certifications in First Aid, CPR and AED; and
    4. Possesses a recent OSHA 30-hour Construction card (within the last two years or has taken Turner's Safety Refresher); and
    5. Has an academic degree in safety, ASP, CHST, or CSP designation; or
    6. Has a minimum three (3) years of prior work history as a full-time construction safety manager.

Turner reserves the right to approve or deny the trade partner's full-time safety representative for the project.

At a minimum the Trade Partner Safety Manager will be requested to:

- Ensure their employees attend jobsite orientation before start of work on the project.
- Take the lead in recognition and abatement of hazardous situations.
- Effectively utilize and train employees in pre-planning, recognition, and remediation of hazards.
- Conduct a daily Safety Huddle which includes the following:
    1. Daily Worker Check-In & End of Day Check-Out.
    2. Daily Pre-Task Plan is completed for each task and reviewed with each crew.
    3. Control of work permits completed. (Hot Work, Confined Space, etc...).
    4. Stretch-n-Flex conducted prior to start of work.
- Perform and document weekly safety inspections (1 per week at minimum).
- Conduct at least one monthly safety tour with the Trade Partner's Safety Director and submit findings to Turner.
- Conduct, document, and submit toolbox meetings on a weekly basis.
- Attend and actively participate in project safety meetings.
- Enforce disciplinary measures when needs arise for their employees.
- Ensure that Competent Persons submit, at a minimum, the below listed safety inspections at the designated frequency to the Turner Project Superintendent or Safety Manager. Note: An OSHA 30-hour Construction card alone does not satisfy OSHA requirements for a competent person.

Inspection	**Frequency**
Fall Protection	Before Each Shift
Excavations	Before Each Shift
Scaffold	Before Each Shift
Crane Inspections	Before Each Shift
Confined Space	Before Each Shift
Hot Work	Before Each Shift
Heavy Equipment	Before Each Shift
GFCI	Weekly
Personnel Hoist	Per OSHA Reqs.
Surface Penetration Permit	Prior to penetrating the ground, walls, or slabs at any depth
Tool Box Talks	Weekly

GENERAL REQUIREMENTS

EMPLOYEE / VISITOR ACCESS

All visitors must sign a visitor release at the project site office or into the visitor logbook when visiting an office.

All visitors must be escorted while on site and must adhere to Turner Project Safety Program and be 18 years of age or older.

SAFETY MEETINGS

Onsite employees shall attend safety meetings as scheduled by the owner or Turner Construction Company and the time and cost will be the responsibility of the worker's employer.

PRE-PLANNING

Job Hazard Analysis (JHA)

Every trade partner will prepare a JHA for each phase of work to identify the following:

- Safety and Health Considerations
- Description of Steps to be Performed
- Hazards Associated with Each Step
- Required Action to Eliminate or Control the Hazard
- Supervision Sign-off

Work shall not begin until the JHA for the work activity has been reviewed by Turner and discussed with all engaged in the activity, including the trade partner, trade partner(s), and other affected on-site representatives at safety pre-construction meetings.

Pre-Task Plan (PTP)

The PTP is a formal daily work plan. Each supervisor should meet with their crew, preferably at the place of the work or task, to discuss the tasks to be accomplished and the steps that need to take place to work safely. All workers should review and sign the relevant PTP for their assigned work before beginning the tasks. When the scope of work or conditions change, the PTP should be revised and resubmitted.

For each task of work a PTP will be completed to identify the following:

- Evaluating the work area.
- What permits and proof of training may be required.
- Potential hazard checklist.
- Description of steps to be performed.
- Hazards associated with each step.
- Required actions to eliminate or control the hazard(s).
- All PPE requirements for the activity, keep in mind that PPE is the last resort.
- Crew sign-off.
- In accordance with Building L.I.F.E., plan out steps and controls to minimize risk using the Hierarchy of Controls, as well as by reducing frequency, likelihood, and severity.

Work shall not begin until the PTP for the work activity has been discussed with all engaged in the activity, including the trade partner, trade partner(s), and other affected on-site representatives at a safety pre-construction meeting or daily huddle. A copy of the PTP shall be kept near the work location.

The information the supervisors are relaying to the workers is the same that was developed in the JHA however, the PTP will more greatly define the plan for the phase of work that is occurring that day.

Pre-Task Planning is also accomplished on a daily and pre-shift basis through the pre-shift safety huddles. Each crew leader is responsible for ensuring the crew holds a safety huddle prior to the beginning of the shift, and as necessary during the shift, to develop and revise a PTP for that day's work. The huddle should be collaborative with input from multiple members of the crew. The hazard analysis is typically captured on a dry-erase board laid out like a JHA/PTP (steps, hazards, controls). Workers sign an attendance record showing they participated.

A copy of the PTP and/or a photo of each huddle board shall be kept near the work location and will be submitted to Turner daily. Some states and local municipalities have requirements pertaining to pre-task planning, whichever is more stringent must be followed.

HAZARD COMMUNICATION

Trade partners are responsible for developing a Hazard Communications Program and training their employees.

Safety Data Sheets (SDSs) are to be provided to Turner before the start of work and referenced as a part of pre-planning. Trade partners are responsible for maintaining an updated binder of their respective SDSs on the project and will make them immediately available for review upon employee, Turner, or any other request.

All chemicals and equipment containing chemicals must be stored in approved areas.

Trade partners are responsible for properly labeling and maintenance of said labels on all chemical containers.

SILICA

Each employer that has employees exposed to crystalline silica must prepare and implement a written site-specific Exposure Control Plan (ECP) that identifies tasks that involve exposure and the methods used to protect workers, to include procedures to restrict access to work areas with high exposures. A competent person from each exposing employer shall be designated to implement the exposure control plan and will be provided to Turner before work begins.

FALL PROTECTION

All work performed at or above 6 feet will be done in conjunction with positive fall protection 100% of the time, including but not limited to, loading and unloading trailers and the leading edge of excavations.

Each trade partner, with employees exposed to a fall greater than 6', must submit a written fall prevention plan to Turner prior to beginning work on site. The trade partner must conduct a weekly inspection of their system.

At no time shall a Safety Monitor be used as a means of fall prevention.

All conditions that will require personal fall protection shall be discussed and documented in the daily Pre-Task Plan and reviewed in the field by the crew leader.

Each trade partner is responsible for protecting its own employees by using conventional means of fall protection such as standard guardrails or perimeter cables. The ongoing maintenance and daily inspection of this protection is also required.

If warning lines are used it must be maintained at least 15 feet from the leading edge, including trenches and excavations.

Employees must be trained in the use of fall protection. Trade partners shall provide Turner with their own project-specific Fall Prevention Plan which should include training records. describes the methods they intend to use to provide adequate fall protection for each specific operation and to comply with OSHA Subpart M, and Turner's six-foot rule.

Turner has a "No Gaps" policy to prevent the potential of falling materials. All working platforms or edge protection must be constructed to ensure there are no gaps which material could fall through. Employees must be protected from falling objects by the installation of toe boards, barricades, safety nets, or canopy structures.

All floor openings exceeding 2 inches in diameter shall be covered, barricaded, or otherwise protected. Covers shall be designed to withstand twice the weight of workers, equipment, and materials. Covers shall be secured against displacement horizontally and vertically. All covers must be clearly marked with the words "HOLE" or "COVER" and beveled or flush to reduce trip hazards. The trade partner creating the hole or opening is responsible for the protection or cover. Turner recommends that holes greater than 18" x 18" be protected by a guardrail system.

Where a risk of materials falling or being dropped, including during a lifting operation, an exclusion zone must be established. The exclusion zone should be constructed with physical barriers such as wood or metal guardrail systems, cable wire rope or chain or flagging. Danger and Caution tape will not be accepted for use in exclusion zone construction. The exclusion zone must be secured from tipping and signed. The size of the exclusion zone must consider deflection or arc of the falling material.

All tools, materials or equipment which have the potential to breach the perimeter protection must be positively secured back to the worker or structure through the use of tool lanyards or synthetic rope of line (natural fiber rope is not permitted). Lanyards or ropes must be appropriately sized for the weight of the tool, material or equipment. Anchorages must be snap-hook, carabineer, shackle, or similar device that provides positive locking. The use of knots to secure lanyards is not permitted. Trade partners must evaluate the size and weight of any object which will be secured to a worker's wrist, belt, etc. to ensure it will not cause injury in the event it is dropped. Tethering also applies when there is falling object exposure for employees in the vicinity of elevated work, even when "exclusion zones" are used.

GUARDRAILS

Perimeter cable may be ½" steel cable, but in no situation may they be less than 3/8" steel cable. The cable must be flagged at 6' intervals and must be terminated with three wire rope clips, "Crosby clips" on each end & deflect no more than 3". The cable rail cannot deflect below 39". When using cables for perimeter guarding closed turnbuckles are to be used for every 3 bays or 100 feet, whichever is less. Open eye turnbuckles are not permitted.

Guardrail systems must be able to withstand a force of 200 lbs. in all directions, without failure, and be smooth surfaced to prevent hand injuries. The use of metal studs or similar is prohibited.

PPE

Trade partners must provide their employees with all necessary Personal Protection Equipment (PPE) and tools and enforce their use as required by the Safety Program, as well as Federal, State, and local codes and regulations.

SAFETY HELMETS

Each trade partner shall enforce the wearing of ANSI-approved type II or EN12492-rated helmets with a 4-point chin strap tightly attached and secured (two-finger tight). Helmets are also required when welding.

SAFETY GLASSES AND FACE PROTECTION

Safety glasses (minimum eye protection)

Safety glasses that comply with ANSI Z87.1 must be worn. Dark lenses are not to be worn inside of buildings, in enclosed areas, or at night. Prescription eyeglasses and sunglasses that do not comply with ANSI Z87.1 are prohibited.

Goggles or spoggles

Goggles or spoggles must be worn (instead of safety glasses) when working above shoulder and when falling debris is expected. Examples of these type of activities include installing ceiling tile, pulling wire, etc. Goggles are required for all abrasive actions in which dust can enter the eye.

Clamp-on full face shield plus unvented goggles or spoggles

A full-face shield that clamps tightly onto the brim of the helmet and unvented safety goggles or spoggles that fit snuggly against the skin must be worn when demoing, drilling, cutting, grinding, or performing above shoulder activities that may create flying debris.

*For all scenarios above, please refer to equipment or tool manufacturer and / or Safety Data Sheet (SDS) for more specific eye and face protection requirements.

HI-VIS

High visual, safety vests, shirts, or jackets shall be worn as the outermost apparel by all employees, 100% of the time. ANSI-rated Class 2 (0-44 MPH) and Class 3 (45 MPH or more) reflective outerwear must be worn whenever working on or near (within 10 feet) of a roadway.

FOOT PROTECTION

Sturdy work boots, at a minimum, are required. Metatarsal guards must be worn when using jackhammers, tampers or similar equipment which could be dropped or landed on a worker's toes / feet. ANSI-approved safety-toed boots must also be worn by masons, drillers, pile driving, steel erectors, and riggers due to the hazards inherent with their work.

HAND AND ARM PROTECTION

Anyone entering the project is required to wear at a minimum cut resistant level 4 protective gloves 100% of the time, unless the trade partner's competent person can demonstrate to Turner that wearing gloves for a particular task creates a greater hazard. If agreed upon with Turner, the deviation to not wear gloves must be identified on the PTP, reviewed, and acknowledged. Refer to ANSI cut levels for determining the correct glove. Additional hand protection may be required depending on the hazard assessment.

Cut level 5 gloves (at minimum) must be worn when using box cutters and utility knives.

Appropriate arm protection is required during operations where the arms are exposed to potential cut hazards (i.e., Kevlar, Dyneema sleeves, etc.). Examples of these activities are working around metal studs and pull boxes, tight confines such as between wall studs or above ceiling, and all demo activities.

HEARING PROTECTION

Where an employee could be exposed to noise in excess of 85 dBA, their employer will provide hearing protection, which will reduce the noise to an acceptable level. If the noise levels are determined to cause

and 8-hour TWA exposure greater than 85 dBA, the trade partner must submit a detailed hearing conservation program to Turner. This program must be approved prior to beginning work.

RESPIRATORY PROTECTION

Employees exposed to dust, fumes, and/or gases shall be provided with proper respiratory protection designed to protect against the substance encountered. Each trade partner is solely responsible for the proper testing and training per OSHA standards, and to provide the appropriate equipment for their employees.

FIRST AID, CPR and AED

Each trade partner must have their own adequate first aid kit and at least one qualified First Aid, CPR and AED-trained employee onsite full time. The name of this person, along with copies of their current certification cards, shall be submitted to Turner prior to beginning any work.

LOCK OUT / TAG OUT (LOTO)

A Lock Out / Tag Out program must be submitted by trade partners per OSHA standards. The procedure shall identify the minimum steps necessary to verify a "zero energy state" before any work begins.

The trade partner is responsible for assuring all workers involved and affected by lockout / tagout are trained and that a person competent in lockout / tagout is provided and onsite to provide oversight of the work. The competent person is responsible for maintaining a current Lockout / Tagout Log that identifies the project name, location of energy source, date, scope of work being performed under energy isolation, list of energy isolating devices, live-dead-live verification by the competent person, and trade partner name.

NOTHING HITS THE GROUND

Fabrication

- All material fabrication shall be performed at a work station between 30 and 39 inches off the floor.
- Workstations shall be mobile and include a fire stop directly behind all chop saws.
- Rubbish containers shall be mobile and located directly adjacent to the workstation.
- The trade partner is to furnish all mobile rubbish containers for their work.

Housekeeping

- All rubbish shall be disposed of as it is generated and be immediately placed in trade partner-provided mobile rubbish containers. Debris is not allowed to be consolidated on the floor.
- The trade partner is required to elevate all power cords to minimize tripping hazards on walking/working surfaces. Cords, hoses and welding leads must be kept off the floor at least 8 feet high, or as high as practical, in walkways, aisles, stairs and access points. Suspension of cords will be by non-conductive means only such as plastic S-hangers or wooden cord trees.
- Material which may be dislodged by wind and that could create a hazard when left in an open area shall be secured.

Material Handling and Storage

- Materials may not be stored within 10 feet of the building perimeter or adjacent to shafts or stairwells.
- All tools and materials must be tethered where there is a risk of materials falling or being dropped, including during a lifting operation, unless the project team determines an exclusion zone must be established. The exclusion zone must be constructed of hard barriers such as wood or metal guardrail systems, cable wire rope or chain, red plastic chain, or similar material. Danger and caution tape will

not be accepted for use in exclusion zone construction. Exclusion zone must be maintained during work and have legible Danger signage posted along the perimeter. The size of the exclusion zone must consider deflection or arc of the falling material. All tools, materials, or equipment which have the potential to breach the perimeter protection must be positively secured back to the worker or structure using tool lanyards or synthetic rope (natural fiber rope is not permitted). Lanyards or ropes must be appropriately sized for the weight of the tool, material, or equipment. Anchorages must be snap-hook, carabineer, shackle, or similar device that provides positive locking. The use of knots to secure lanyards is not permitted. Trade partners must evaluate the size and weight of any object which will be secured to a worker's wrist, belt, etc. to ensure it will not cause injury in the event it is dropped.

- Material must be stored to promote mobility of material. Pipes, conduits, metal fabrications and steel framing are to be stored on rolling racks or similar means of conveyance. Bulk material must be palletized to allow for easy mobility.
- "Just in Time" delivery is required to minimize clutter.
- Heavy material such as glass and drywall must be loaded so as not to overload the structure. The trade partner is required to do a floor loading analysis.

STEEL ERECTION

A site-specific erection plan must be developed by a qualified person and submitted prior to start of erection.

The area below steel erection activities must be barricaded to prevent access by unauthorized personnel.

Tag lines must be used to control loads.

Multiple lift rigging ("Christmas Treeing") may be used when limited to a maximum of three (3) members.

Tools and containers for rivets, bolts or welding rods must be secured to prevent falling.

Steel erection activities such as connecting, bolting and welding are to be accomplished from aerial or scissor-lifts to the extent feasible.

Structural steel erection is not to be done using forklifts.

- Small miscellaneous pieces may be lifted if a lift plan is prepared and Turner's Safety Manager (or superintendent if a Safety Manager is not present) allows the lift, the piece does not exceed 70% of the forklift's capacity as configured and is allowed by the load chart.
- The lift must be made with an attachment designed and/or approved by the forklift manufacturer.
- Turner's Business Unit EHS Director must review all plans, prior to lifting, if a trade partner intends to use a forklift for lifting small, miscellaneous, pieces of steel.

CONFINED SPACE

Before beginning work at a project site, each trade partner must ensure that a competent person identifies all confined spaces in which one or more of the employees it directs may work and identifies each space through consideration and evaluation of the elements of that space, including continuous testing as necessary. All confined spaces that an employee will enter must be classified as either a "permit-required space," a "non-permit space," or an "alternate-entry space." Classification of each type of space must be accomplished using the Turner Confined Space Entry Permit, regardless of classification.

EXCAVATIONS

Utility locating services must be contacted prior to any surface penetrations. If utilities are identified, daylighting those utilities is required, by hand-digging or hydro-excavating. No known utilities will be uncovered or excavated using heavy equipment.

A Surface Penetration Permit must be utilized when there are plans to penetrate the ground at any depth. This should be filled out and utilized for cutting into slabs and coring walls as well.

Excavations greater than 4 feet in depth shall always utilize protective systems (i.e., trench shields, sloping, benching, or shoring) to protect employees against potential cave-ins.

All excavations, regardless of depth, shall be protected by safety fence or guardrails.

People walking or working adjacent to an excavation greater than 6 feet in depth must be protected from fall hazards in accordance with Turner's 100% Fall Protection Policy.

All hydraulic shoring fluid must be environmentally friendly.

GROUND FAULT CIRCUIT INTERRUPTERS (GFCI)

All 120-volt single phase 15 & 20-ampere receptacles shall have approved GFCI's.

The electrical trade partner shall test each power receptacle for proper installation including polarity, grounding, etc. and conduct and document monthly tests after the initial installation.

TEMPORARY LIGHTING

All temporary lighting shall be run with sheathed multi-conduction wire. No single strand wiring is allowed. Temporary lighting must never be put on the same circuit as temporary or permanent receptacles; temporary lights must be on a dedicated circuit.

The minimum illumination level through the project is:

- 5 footcandles in areas where no work is being performed but employees may travel;
- 10 footcandles in work areas;
- 15 footcandles in electrical or mechanical rooms; and
- 50 footcandles where first aid and other health or wellness stations are located.

The electrical trade partner is to provide LED temp lighting and is responsible for maintenance of temporary lighting, with at least the minimum lighting levels described above, until permanent lighting is provided. Installation of temporary lighting should anticipate the future placement of ductwork, piping, etc. that may block or reduce light.

GENERAL

Where discrepancies exist between this program, and other regulations, standards, safety plans and contract documents, the more protective requirement will apply.

No one under the age of 18 is allowed to work on the project property / construction site.

Turner offices and projects are tobacco-free zones. This includes e-cigs and all forms of tobacco.

No animals are allowed on Turner property. Please contact Headquarters EHS and Human Resources if you are requesting to bring a service animal on Turner property.

No walking or driving on projects while talking or texting on phone or walkie-talkie.

All personnel are empowered and encouraged to stop unsafe acts, identify unsafe conditions, and to escort non-construction personnel out of the work areas. Please care for your project teammates.

No headphones, iPods, radios, etc. are permitted on the job. No streaming of music from the internet. No walking or driving on projects while talking or texting on phone or walkie-talkie.

A fluent interpreter must be provided and on site for any crew that has one or more non-English speaking workers.

The list of behaviors below, while not inclusive, provides examples of conduct that is prohibited:

- Causing physical injury to another person.
- Making threatening remarks, verbal abuse, derogatory remarks, racial or bias motivated statements (verbal or in writing).
- Aggressive or hostile behavior that creates a reasonable fear of injury to another person or subjects another individual to emotional distress.
- Intentionally damaging employer property or property of another employee.

To the maximum extent permitted by applicable law, the possession on Company premises or while on duty of firearms, clubs, explosives, or other weapons that could be used to cause harm to personnel or property, other than that used to perform specific construction activities, is not permitted. This would include Turner projects and client-owned buildings and facilities we work in, project-provided parking areas, and while in the execution of work duties.

Employees must:

- Perform their work to prevent accidents to themselves, fellow workers, and property.
- Use Personnel Protection Equipment as required, to meet all Turner, federal, state, and local requirements.
- Alert supervisors to dangerous situations.
- Cooperate with principles of the Project Site Specific Safety Program.
- Utilize all tools and equipment in a safe manner and in accordance with manufacturer's recommendations.
- Complete project safety orientation before starting work on the jobsite.
- Acknowledge and abide by the project enforcement rules.

All visitors must sign a visitor release at the project site office or into the visitor logbook when visiting an office. All visitors must be escorted while on site and must adhere to Turner Project Safety Program and be 18 years of age or older.

All trade partner vehicles within the project site fence (including, but not limited to, transportation and construction equipment, delivery trucks and personal or company trucks) shall not idle.

The only allowable exceptions to the standard are as follows:

- Ambient air temperature exceeds 85°F or falls below 32°F (or as defined by local or regional temperature limits, whichever is stricter)
- Engine idling is required for the function of auxiliary equipment (i.e., cranes, concrete pumps, etc.)

PUBLIC AREAS

All work performed in or adjacent to public spaces will be required to have barricades separating the public from the work.

Public protection should be a minimum of 6' tall and installed in a manner that does not create an additional hazard such as tripping, and capable of sustaining, without failure, high winds, and wind gusts.

Warning signs must be posted approximately every 100' of linear fence to inform the public of hazards.

All public areas are to be always kept clean and clear of debris.

HAND AND POWER TOOLS

- Employees must be trained on each hand and power tool to be used.
- All hand and power tools and similar equipment, whether furnished by the employer or the employee, shall be maintained in a safe condition, per the manufacturer's guidelines.
- Tools should only be used for their intended purpose.
- If the tool is designed to accommodate a guard or handlebar, the guard or handlebar must be in place while the tool is being used.
- Each connection on a pneumatic tool and air hose must be secured with a "whip-check" or similar device.
- Operators of powder-actuated tools must be authorized, must possess valid credentials, and wear proper personnel protective equipment.
- All hammer-drills and rotary hammers must have integrated technology, such as a "safety clutch," that will stop drill-bit rotation should the bit bind up in the hole. An example of this is Hilti's Anti-torque control (ATC) technology.

LADDERS

Ladder use on Turner Construction projects will be allowed only when it has been determined that it is unfeasible to use all other options to complete the task.

If it is determined that a ladder is the only means of performing the job at elevated height, a ladder permit must be submitted prior to starting work. At no time will a ladder be on site without a current permit and safety checklist.

For repetitive work, allow for the use of a "multi-day" permit to be issued in lieu of a daily permit. Daily inspections would still occur, but the permit/tag would be modified.

Use of job-built ladders is prohibited on Turner Construction projects. Temporary stair towers or prefabricated stairs shall be used to access different building levels.

When working at a height greater than four (4) feet, 100% fall protection is required. A retractable is the only option in this case.

When extension ladders are used to access upper landings, the side rails must extend at least 3 feet above the landing, and secure at the top. Install an overhead fall protection anchor point, where feasible, to allow for the use of PFASs while ascending/descending.

CONCRETE AND MASONRY

Each trade partner working on a Turner project will comply with 29 CFR 1926, Construction Industry Regulations, Subpart Q – Concrete and Masonry Construction, in addition to the following guidelines.

Unless otherwise stated in the contract, the concrete or masonry trade partner must provide at least two covered entrances into each building or structure during perimeter work. They must also cordon off other means of access/egress.

No load may be placed on a concrete structure unless a qualified person, knowledgeable in structural design, determines that the structure is capable of supporting the load.

Protruding reinforced steel, onto which employees could fall or fall into, must be protected to eliminate the hazard of impalement. The use of mushroom caps is not permitted for impalement hazards.

No worker, except those involved in post tensioning operations, shall be permitted to be behind the jack during tensioning operations. Signs and barricades shall be erected to limit access to the area.

No worker shall be permitted to walk under concrete buckets while it is being elevated or lowered into position.

No worker shall be permitted to apply cement, sand, and water mixture through a pneumatic hose unless the employee is wearing the proper PPE including face protection.

The trade partner shall provide an eye wash station with at least 15 minutes of eye wash solution within 75 feet of any concrete, painting, or masonry work.

Equipment and Tool Requirements

> Powered and rotating concrete troweling machines must have a switch that automatically shuts off power whenever the hands of the operator are removed from the machine.

Cast-In-Place Concrete Requirements

> Formwork must be designed, fabricated, erected, supported, braced and maintained so it is capable of supporting all lateral and vertical loads anticipated to be applied to it.

All shoring equipment must be inspected prior to erection to determine if it meets the requirements specified in the formwork drawings.

Erected shoring equipment must be inspected immediately prior to, during and after concrete placement.

An inspection of the shoring prior to, during, and after the concrete pour is an OSHA requirement.

The concrete trade partner is to determine their means and methods for inspection without placing any person directly under a live concrete pour.

A Controlled Access Zone must be established around the live pour so no one can enter. If an individual is assigned to inspect the shoring, they will be positioned outside of the controlled access zone of the concrete being placed and the previous bay where concrete was placed. This type of inspection of a live pour can also be completed with the use of technology. How the inspection is to be completed will be determined in the preconstruction meeting and will be detailed in the JHA and reviewed with all workers prior to the concrete pour. The location of the person inspecting shoring and performing tasks during concrete placement will be detailed on the project-specific Job Hazard Analysis (JHA) and daily Pre-Task Plan. The placement sequence will also be noted in the JHA.

A qualified designer must prepare the design of the shoring and reshoring. A third-party engineer qualified (certified, registered engineer) in structural design shall review the design of the shoring.

The designer of the shoring must inspect the (initial) erected shoring to ensure it is installed per design prior to concrete pour. Assignment and training of a minimum of one competent person that must be always on site to inspect shoring prior to any concrete pour by the installing trade partner. Any change of formwork should be inspected by designer.

Forms and shores must not be removed until the employer determines that the concrete has gained sufficient strength.

100% Fall protection will always be required while accessing or working on temporary outrigger platform systems. Any anchors for outrigger platforms must be cast in place.

At building perimeters where the decking steps down to allow for a beam pour, the height of the rails shall be increased accordingly.

Areas where form stripping is to be performed must be properly barricaded with tape or fence and signage must be posted on all sides. This should include areas below stripping.

Protruding nails should be removed or bent immediately.

Where employees must walk across rebar, temporary walkways must be installed to prevent trip hazards.

Outrigger platforms used for material movement in and out of the building via a crane or forklift must be designed by an engineer and incorporate 100% fall protection systems.

Authorization to Strip Formwork

When given Authorization that the concrete has reached strength in accordance with project specifications by the Structural Engineer of the Project, the written notification from said engineer (third party that does break strength testing) will be forwarded to the structural concrete trade and Turner. Stripping activities regarding formwork and work platforms will not proceed prior to receiving the authorization.

If any change in conditions occurs while stripping a work platform or shoring, all work must be stopped. A written notification must be sent by the Structural Concrete trade partner to Turner

Management staff and a review meeting held to assess the change. A revised risk mitigationplan will be stablished and reviewed with all workers prior to work restarting.

Use of Proper Barricades and Signage on the Formwork

The use of fixed, physical barricades in lieu of Caution / Danger Tape, where appropriate, to further inform and protect employees from changes in elevation must be utilized.

The use of fixed, physical barricades to further inform and protect employees whenever there is a fall hazard must be utilized. Caution / Danger Tape can never be used to barricade for a fall hazard.

Additional warning signage that contains the appropriate contact information for the trade partner which has installed the barricade must be installed on the barricade.

Masonry Requirements

A limited access zone (LAZ) must be established prior to the start of any masonry work.

The zone must be equal to the height of the wall, plus four feet for the entire length of the wall.

All masonry walls over 8 feet in height shall be adequately braced and remain in place until the permanent supporting elements of the structure are in place.

For overhand bricklaying from a scaffold, fall protection is required if the working side of the scaffold has a gap greater than 12" between the scaffold and structure.

SCAFFOLDS

Scaffolds must be erected under the supervision of a competent person. The competent person shall be designated with credentials submitted to Turner prior to the start of work.

A Personal Fall Arrest System or a guardrail system must be in place on all scaffolds exceeding 6' in height.

Mobile scaffolds require guardrails at 4 foot in height. When rails cannot be installed, utilize a Personal Fall Arrest System (PFAS) anchored overhead.

The use of fall prevention devices is required during the erection or dismantling of a scaffold.

The area below a working scaffold must be barricaded to protect employees from a falling object hazard.

The Competent Person shall inspect scaffolds daily. The competent person will "tag" the scaffold "in service" or "out of service" prior to employee use.

Frame and system type scaffolds, including but not limited to masonry and tube & coupler, must be accessed via scaffold stair attachments.

Mobile scaffolding wheels must be locked when in use.

Cross bracing shall not be used as guardrails.

Scaffolding, such as swing stages, pump jack scaffold, boatswain (bos'n) chairs, floats, and needle beams, requires special approval by Turner's Business Unit EHS Director before use.

SIGNS, SIGNALS, AND BARRICADES

At locations where potential hazards exist, trade partner personnel shall be responsible for posting, installing, and maintaining signs, signals, and barricades to detour the passage of persons or vehicles.

Where areas may require additional awareness or present unique danger, the use of warning barrier may be necessary.

- The warning barrier should have a sign with the nature of the hazard, the trade partner who installed the barrier with a contact number, and the duration the barrier will be in place.
- The intent of the warning barrier is to notify of hazards that may arise during construction activities. Every effort should be made to correct these situations with permanent solutions in a timely fashion.

Turner prefers hard barricades with appropriate signage is to be used in situations where entry is prohibited or requires special permission.

Trade partners installing danger or caution tape are responsible for maintaining it for the duration of their work, or if the hazard exists, and removing immediately after.

Danger signs are to be posted to communicate a potentially dangerous, DO NOT ENTER situation. Caution signs are to be posted in areas where entry is allowed but caution must be followed.

Tape, of any kind, is not permitted for use as fall protection nor swing radius delineation. The swing radius of cranes and other equipment must be a hard material such as red-colored, plastic chain.

INDUSTRIAL VEHICLES

Trade partners must provide for proper equipment selection, inspection, and operation of industrial vehicles, including but not limited to, All Terrain Vehicles (ATV) or Quads, Three-Wheeler, Four-Wheeler, Gators, Mules, and all other similar vehicles.

Only vehicles that have previously been approved by the Operations Manager and Business Unit EHS Director may be utilized.

All authorized drivers must complete training that follows manufacturer requirements (as coordinated through the dealership of the equipment) for the safe operation of the vehicle including use of personal protective equipment, authorized surfaces for operation of the vehicle, weight restrictions, and other safe operational conditions.

Vehicles must have legible name plates and markings that indicate load limits.

Jobsite speed limits and other regulatory signs must be obeyed.

Pedestrians always have the right of way.

Seatbelts must be always worn when riding in a vehicle equipped with seatbelts.

All vehicles used during a project for contract activities must have reverse signal alarms.

HEAVY EQUIPMENT

All operations requiring the use of heavy equipment will require a pre-planning meeting to coordinate and prevent injuries to workers and the public.

All trade partners delivering or receiving material and equipment to the project are required to complete a risk assessment and pre task plan prior to any loading/unloading activities to establish safe work procedures for working around trucks and to protect workers and the public.

Establish a restricted access zone around the truck to prohibit entry into the load/unload area. High visibility "do not enter" tape should be used. "Do not enter" tape is intended to prohibit access and should only be used as a substitute for physical barricades.

- No worker, except those involved in the load/unload operations shall be permitted to be behind the "Do not enter" area. Signs and barricades shall be erected to restrict access to the area.
- The zone must be equal to the area needed to load/unload plus ten feet around the entire truck area.
- All designated personnel within the zone must be clear of the load during all loading or unloading operations by at least 30 feet.
- A qualified "spotter", wearing an ANSI approved high visibility traffic vest, must be utilized during the loading/unloading operation.
- Vehicles must never back "blind" on a Turner project.
- Workers on the ground within the zone should never be on the opposite side of a truck from a forklift / telehandler while it is loading or unloading material.

The driver must be in full view to a forklift / telehandler operator. All loading or unloading activity must stop if the driver cannot be seen or needs to enter the exclusion zone to inspect a load. Alternatively, if it is safe to do so, the operation can allow the driver to stay in the truck cab during loading and unloading.

All motor vehicles and material handling equipment, with an obstructed view to the rear, must have a reverse signal alarm audible above the surrounding noise.

Spotters must be provided for vehicles in congested areas and when backing up.

Heavy equipment (i.e. dozers, scrapers, back hoes, etc.) shall be inspected by the operator prior to each shift. A completed Equipment Inspection Form shall be submitted to the Project Superintendent daily.

CRANES

No crane shall be placed in service on a Turner project until an annual certification, a third-party inspection and supplemental reports are submitted to Turner indicating that the crane meets the manufacturer's inspection criteria.

A daily crane inspection, performed by a competent person, is to be documented. Those are reports are to be provided to Turner when requested.

Any crane that is altered, repaired, "jumped", or modified in a similar manner onsite must be re-inspected by an independent third-party inspection company. Any crane after assembly must be inspected by an independent third-party inspection company.

Crane operators are required to verify the weight of each load prior to hoisting.

The trade partner shall supply a qualified signal person who, through training by a qualified evaluator, deems the person qualified on the standard methods for signals (hand and radio).

Cranes, hoists, boom trucks and derricks shall not be installed or operated within 20' of a power line unless they follow 1926.1408 (a) (2).

The use of a personnel basket must be approved by Turner's BUSINESS UNIT EHS Director after the trade partner has proven there is no other practical safer means.

Outrigger pads should be at least 3 times the dimension of the crane float. The outrigger pads are to be pre-manufactured.

Due diligence is required to determine firm and stable ground loads for outrigger placement. This can be accomplished with Ground Penetrating Radar (GPR) or X-ray.

RIGGING

Any trade partner performing rigging must have a qualified rigger. The qualifications of the rigger must be submitted to Turner for review, prior to start of work.

The qualified rigger shall inspect all rigging prior to each use.

Do not leave unsecured or unattended suspended loads.

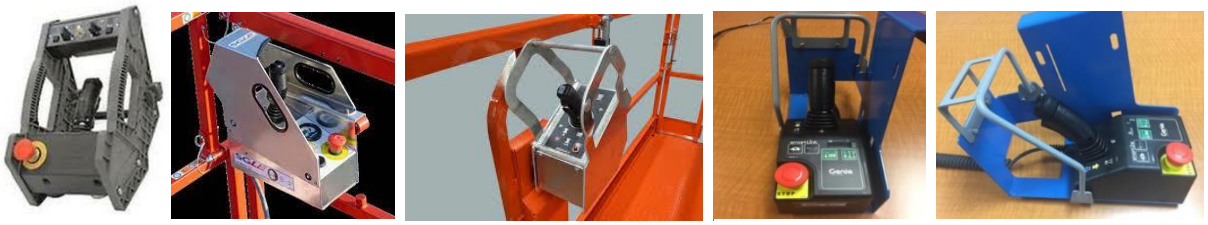
The forks of a forklift or telehandler cannot be used for free rigging.

MOBILE ELEVATED WORK PLATFORMS (MEWPS)

All scissorlifts and boom lifts shall have a shroud or guard over the joystick/controls. Scissorlifts require a three-sided joystick guard. Scissorlifts should also have a timeout feature on the lift/lower and drive selector, which disables the lift/lower and drive functions after several seconds of inactivity. Moreover, boom lifts must be delivered with anti-crush or secondary-guard technology.

Please see below for examples of approved guards and shrouds for lift controls on Turner projects.

Note: In addition to joystick guard/shrouds, clear messages, proportional lift and drive controls, and symbol-based function selection buttons are required for easy training and operation of lifts.



Trade partners are required to complete a daily inspection sheet for all mobile elevated work platforms. The inspection includes operational and physical parameters for operation of the equipment being inspected. The inspection form must be posted in a visible location during operations and a copy made available to Turner upon request.

Only trained and authorized individuals may operate aerial lifts.

When a lift is delivered to the project, the rental company or the owner of the lift shall inspect the lift & provide documentation the lift is safe to operate onsite. The lift shall be free from any physical defects in new or like new condition with all the safety placards present. The operator's manual and inspection documentation shall be included.

Employees must use personal fall arrest systems (PFAS) when working from boom platforms. Employees shall follow the manufacturer's recommendations for the type of (PFAS) when working from an aerial lift. At a minimum, employees shall follow the manufacturer's recommendations for the type of fall arrest/restraint when working from a scissors lift. If scissorlifts are equipped with an attachment point provided by the manufacturer for a restraint system, they are to be used. The intent of this protection is to keep workers within the confines of the passive protective system (rails) so the shortest length of lanyard that allows the task to be completed and keep the worker confined to the walking/working surface is required. Note: These attachment points are not designed as fall protection anchorages.

Never climb above the work platform. Employees must keep both feet on the floor of the basket and not stand on the railing or toe board during operation. If it has been determined by the trade partner's competent person that there are no feasible means to access an area without leaving the basket of a scissor lift, a modified Pre-Task Plan must be completed as well as a Fall Protection Plan. This plan must be completed by the competent person with details of the anchorage point outside the scissor lift and above the employee's head. Any worker engaged in the activity should be active in the preplanning of the modified plan. All workers involved must review and sign off on the plan. This must be reviewed with Turner's Superintendent. Each work activity and area will require their own PTP and Fall Protection Plan.

When the manufacturer provides pre-engineered fall protection add-on devices on mobile elevated work platforms, and a person exits the platform while being connected, a person trained in the operation of the mobile platform must remain on the ground, near the machine base controls, to prevent unauthorized use and to prevent the machine from being operated while used as a fall arrest anchor. Trade partners must specify this protocol within their daily PTP.

A dedicated spotter is required any time a scissor lift must be moved in an elevated state or when operated in congested areas. Spotters will be responsible for ensuring that the area around the MEWP and the travel path are free of obstruction and clear of equipment and personnel.

Mobile Elevated Work Platform Use in High Lift Situations (applies to boom lifts with an operating platform height of 30' and above) require the following:

A dedicated JHA shall be developed for each activity operating a MEWP above 30'.

A system for managing the affected area below the basket and movement of the MEWP's is necessary to decrease the risk of struck-by hazards.

If any of the workers in the Aerial Boom Lifts are incapacitated and incapable of descending, a rescue may be required. Due to the nature of this type of work, it is prudent to establish an emergency response plan which has redundancy built into it.

A dedicated ground spotter (with no other collateral duties) shall be in place whose duties are as follows:

- Visually verify and communicate via two-way radio that all obstructions are clear of the path of travel at the ground level.
- Visually verify that all obstructions are clear while basket is moving.
- The ground spotter shall be responsible for no more than 1 Controlled Access Zone (CAZ).
- Additional spotters will be required if MEWP's will need to be operated/relocated simultaneously within 1 CAZ (Approximate size and dimension of CAZ is below).

Spotter Logistics:

- If 2 or more lifts are required to operate simultaneously, each operator/spotter team will utilize their own dedicated radio channel.
- The Spotter shall not use a cell phone, headphones or other devices which may distract them from their duties.
- The Spotter shall have stop work authority.
- The spotter shall wear, at a minimum, a Class II high visibility vest, shirt, or jacket.
- The Spotter/operator team shall perform a "radio" check prior to the commencement of the activity and every 30 minutes thereafter if no communications occur during that time frame.
- Operation of MEWP from the basket is prohibited without prior communication with the spotter and an "All Clear" is given.

Other Traffic at base of operating MEWP:

- A Controlled Access Zone (CAZ) will be established in the affected areas of the MEWP operation to include the base and working zone beneath the platform.
- The CAZ should be constructed with physical barriers such cable, wire rope or chain, or flagging. Danger, Caution tape and spray-painted lines will not be accepted.
- The CAZ must be secured from tipping and signed every 30'. The size of the CAZ must consider deflection or arc of the falling material.
- Each CAZ will be adequately sized to have a 15' buffer zone on each side of the MEWP to include under the platform.
- Each CAZ will hold no more than 3 boom lifts.
- No other equipment or vehicle will be allowed to operate within a dedicated CAZ.

A 30' wide dedicated path of travel for vehicles and other equipment shall be established using rope, traffic cones, delineators or other clear markings which safely guide other equipment and vehicles around the MEWP CAZ.

Any changes in the path of travel must be approved by the Turner Superintendent.

Boom lifts shall not operate within or over the traffic zone.

The Spotter shall monitor vehicle traffic and shall have authority to stop work and or vehicle traffic.

Emergency Response

There shall be, at a minimum, (2) two MEWP's on site when working in excess of 85 vertical feet. This is to ensure that one could assist another which has the capability to reach the basket in the event of an emergency. Exceptions include when there is a means of safely reaching the platform via catwalk or other elevated surface, or when there is a means to reach the platform from above via rope, slings or other climbing type equipment.

The Spotter shall be trained on how to safely use the ground controls. The ground controls shall be tested prior to work occurring each day and/or shift.

The Local Fire Department Shall be invited to the project site to review conditions and site activities which may have the potential for a "Vertical Rescue" in the event of an emergency.

The emergency response number shall be conspicuously posted.

Turner, the fire department and dispatch shall determine a key phrase or word which indicates that a "Vertical Rescue Team" is required. (These teams have specialized training and equipment to respond to high rescue conditions.)

Workers on the ground shall stay out of the CAZ and communicate with the spotter if entrance is needed.

A Stop Work must immediately be called when any deviations are observed with fall protection.

Identify and discuss task which have the potential for falling tools, materials and/or debris. Do not start work until procedures are in place to prevent the loss of tools or equipment (tethering or other means) and/or a Controlled Access Zone is established.

Workers should avoid positioning themselves, and their equipment, in a line of fire where they could be struck by falling, flying, or moving objects from the overhead platform.

Utilize tag lines to maintain positive control of objects being removed or hoisted to ensure the object does not encounter the lift.

DRONES

Turner's policy on drone use is they should only be used as a last resort. If there are other means available to inspect, survey and document jobsite conditions, they should be used in lieu of a drone.

All drones must be operated by a third party who is licensed by the FAA and insured per Turner's insurance policy guidelines.

Drone use can be obtained by submitting a Drone Use Approval Request Form. The form must be submitted for review and approval by Turner's Operations Manager and Business Unit EHS Director.

HOUSEKEEPING

Clean-as-you-go practices are required. All rubbish shall be disposed of as it is generated and be immediately placed in a mobile rubbish container provided by the trade partner.

Each trade partner is responsible for maintaining clear paths to move materials and facilitate emergency egress.

Housekeeping methods will be specified within the trade partner JHA and PTP.

INCIDENT REPORTING REQUIREMENTS

All incidents resulting in injury or property damage are to be reported at the time of occurrence to the Turner Project Superintendent and/or Project Safety Manager.

For any incident involving personal injury, the trade partner will complete their own incident investigation report form and submit it to Turner as soon as reasonably possible (same work shift) but no later than eight (8) hours after the incident occurred.

Copies of all Workers' Compensation reports involving trade partner employees shall be promptly forwarded to Turner Construction Company.

Trade partners will be individually responsible for notifying Federal, State, and local authorities when required.

FIRE PREVENTION

Temporary offices, storage and break areas, or other temp structures, when located inside of a building under construction, must be constructed of fire-retardant materials.

Shanties:

- Each shanty shall have at least one (1) 20# ABC fire extinguisher.
- No oily clothes, oily rags, nor fuels shall be stored in shanties.
- Each trade partner is responsible for installing and maintaining a smoke and carbon monoxide detector in their shanty.
- Electric heaters, if permitted on the project, must be equipped with hi temp shut down and tip-over protection. Electric heaters are not permitted to be operated while unattended.

Trade partners installing tarps, blankets, and poly that may be exposed to sparks are required to utilize fire-retardant material.

Onsite fuel tanks must be double walled, be protected from construction vehicle traffic and have a spill containment system capable of holding all contents of the tank in the event of a leak.

Fire extinguishers shall be a minimum of 20# ABC type and placed and maintained on the job in conspicuous locations according to OSHA requirements. Fire extinguishers must be affixed in a location to prevent damage from water or other materials. These fire extinguishers shall not be moved or discharged except for fighting a fire.

Liquid Propane Gas must never be stored inside buildings.

Cylinder storage must be stored upright and properly secured. When not in use, disconnect hose/gauge assemblies and cap the cylinder. Stored cylinders must have a ½ hour fire rated barrier 5 feet tall or be stored 20 feet apart.

All "Hot Work" requires a permit and approval from Turner's Project Superintendent. Hot work procedures must be followed including Fire Watch.

- Fire Watch will be provided during and for at least 30 minutes after work and during any coffee or lunch breaks.
- Fire Watch is supplied with suitable extinguishers (20-pound, dry chemical, type ABC unless otherwise specified due to project hazards).
- Fire Watch is trained in use of this equipment, in sounding alarm and in emergency evacuation procedures.
- Fire Watch persons must be designated by a red safety vest when acting as a Fire Watch.

Considerations for temporary heating must be evaluated and approved by the Senior Operations Lead and Business Unit EHS Director. Temporary heating devices require a Hot Work Permit.

BUILDING L.I.F.E.

Building L.I.F.E. (Living Injury Free Everyday)® is a continuous improvement process with an upstream focus on risk and the systems which produce risk. The program endeavors to produce a bottom-up safety culture driven by increased worker engagement in safety and planning processes. Building L.I.F.E.® (BL) places an emphasis on optimizing human performance, anchored by a focus on observation & feedback. The outcome of implementing the BL Model is a culture-shift in worker attitudes toward teamwork and proactive safety involvement. Below are the three primary goals associated with BL and the processes supporting each goal:

1. Systems Focused Approach – Integrate the BL "systems model" into key processes such as pre-planning, performance evaluation and incident analysis. Move preplanning farther upstream. Sharpen our focus on risk analysis and reduction. Involving those "closest to the risk" in preplanning.

    a. BL JHA - The JHA has been the standard Turner pre-planning tool thus far. With BL, the JHA has evolved into the BL JHA which places a focus on risk & the system factors which drive that risk. Trade partners complete the form ahead of the pre-construction meeting and submit to Turner. The Turner project team (safety & operations) reviews the quality of the BL JHA and push back if the assessment is not deemed to be of adequate quality. At the pre-construction meeting, Turner will review the final BL JHA and facilitate a discussion with the trade partner to see if risk can be further reduced (with additional controls). As an option, this may include a Turner facilitated Residual Risk Reduction (R3) step which involves quantified risk assessment. Again, the main difference between standard Turner JHAs and the BL JHA is the focus on reducing risk (frequency, likelihood, severity), and the systems which drive that risk (environment, capability, motivation).
    b. Pre-Task Plans (PTP) – This is traditional and effective Turner short-range planning tool is that is supplemented with the Daily Huddle. PTP frequency can be locally determined as either daily or weekly. If weekly is the option selected, and the risk changes during the course of the week, a new PTP is required.
    a. Rapid Improvement Events - Conduct Rapid Improvement Event analysis with front line workers at regular intervals, where they have an opportunity to (using the BL JHA as a starting point) examine work process and look for improvements (risk, efficiency or quality).
    c. Daily Huddles – The Daily Huddles are designed for each trade partner to conduct a meaningful, two-way discussion of anticipated risk & planned controls on a daily basis. The pattern of Huddle dialog (bottom-up) should be – What are our key activities today? What are the key risks we need to be thinking about? What controls do we need in place to protect? Note – those controls need to include physical safeguards, training/procedural safeguards, and required actions (behavior) to keep the task safe.
    d. BL Root Cause - In short, we're looking to incorporate the three systems circles (environment, capability, motivation) into our root cause analysis, whether we're looking at an incident, a near miss, or even an "at-risk" observation.
    e. BIM/Safety Integration – Where BIM Models are available, the project team should work with the BIM engineer recognize and analyze risk and to pre-plan for safety. BIM should be used to develop safety and logistics plans.

2. Engage the Workers – To facilitate a culture-change at our projects toward partnering and proactive safety engagement, the project team, including trade partner supervision, needs to continuously seek out opportunities for front line workers to participate in, and contribute to, the

safety process. Each trade partner should feel free to add creative opportunities, but the primary opportunities are:

a. BL JHA & PTP Review – Once mobilization ramps up, each trade partner should have the frontline workers review the JHA (could be done in a toolbox talk format), and ask them to add missing pieces, contribute new ideas, etc. The key is participation. The same holds true for PTPs – getting the workers involved in the process.
b. Daily Huddles – This is the primary opportunity for front-line workers to be part of the safety process. An effective two-way daily discussion of risk & control plans will be essential to successful Building L.I.F.E.®. Huddles supplement the PTP process.
c. 5-Worker Lunches - Provides another venue for workers to be involved and have a voice into safety management.
d. Rapid Improvement Events – Great opportunities to get front line workers involved in the work process (not just safety), at regular intervals.
e. Safety Perception Surveys and Safety Observation and Recognition (SOAR) stations allow the workforce to provide us a "report card" on what's working and what's not.

3. Optimizing Human Performance – In order to help optimize (safety) performance, the Building L.I.F.E.® process employs several tools to achieve continual improvement.

a. Coaching Training – This is aimed at Turner and trade partner leadership and is designed to help them become better safety coaches during their planned & unplanned observation opportunities. Training will include how to better understand what drives better safety performance (behavior), and how to conduct meaningful safety observations.

SUBSTANCE ABUSE POLICY

Trade partners are required to comply with all elements of the Substance Abuse Policy contained within Turner Construction Company's Environmental Health and Safety Policy.

STRETCH AND FLEX

All trade partner employees are required to participate in a Stretch and Flex Program on this project. A stretch and flex will be facilitated by each trade partner's foreman or designee at a central location, every morning, prior to start of work. All employees are required to participate but only to their level of comfort.

SUMMARY

Turner reserves the right to add or change this Program, as deemed necessary, to protect people, property, and the environment.

The Project Safety Program is designed to proactively manage, control, and eliminate incidents throughout the construction process.

This Program is to be used in conjunction with Turner Construction Company's Environmental Health and Safety Policy as well as the Trade Partner's Safety Program(s). The more stringent elements within each program shall supersede the other and will be followed unless otherwise directed by Turner.

Turner Construction Company expects full cooperation from all trade partners, regardless of tier, in monitoring, supervising, and enforcing the Project Safety Program.

All trade partners, regardless of tier, engaged in work on this project, shall comply with Turner's Project Safety Program, as well as Federal, State, and local safety codes and regulations.

Each trade partner is responsible to follow the Turner Construction Company's Substance Abuse Program.

All trade partners are responsible for training their employees in the recognition of hazards which could result in an illness or injury. Training must include procedures for proper elimination or control of unsafe conditions.

Good safety practices carried out on this project will produce a safe and healthful workplace for all employees.

Neglecting safety is neglecting job responsibilities.

TRADE PARTNER AGREEMENT & SIGNATURE

We are in receipt of and will cooperate and comply with all elements contained within this Project Safety Program and Turner Construction Company's Environmental Health and Safety Policy, adhering to the most stringent rules between the two.

A copy of the Project Safety Program will be provided and discussed with all assigned project personnel, prior to starting work on this project.

Company Name: _____

Company Representative's Name (please print): _____

Company Representative's Signature: _____

Company Representative's Title: _____

Today's Date: _____

ATTACHMENT "P"

PROFESSIONAL LIABILITY INSURANCE REQUIREMENTS
FOR
DESIGN-BUILD /PERFORMANCE CRITERIA

The following Additional Provisions set forth in this Attachment "P" are included as part of the Subcontract Agreement made as of the _____ day of _____**, 2024** by and between TURNER CONSTRUCTION COMPANY ("Turner") and _____. ("Subcontractor") and shall in all respects be binding upon Subcontractor's surety (for bonded subs):

ADD TO ARTICLE XXIII OF Subcontract Agreement, following paragraphs defining insurance limits

4) Subcontractor will provide PRACTICE (OFFICE) PROFESSIONAL LIABILITY INSURANCE (E&0) for protection from claims arising out of the performance of any design or engineering services performed or furnished in connection with the Work caused by any negligent act error or omission for which Subcontractor and/or the Subcontractor's Architect(s) and/or Engineer(s) may become legally liable. Such professional liability insurance shall provide for coverage as follows:

a. Limit of liability $ **3,000,000**

b. Deductible Amount $ Per Policy
Paid by Policy Holder

c. Subcontractor agrees that he will maintain this Professional Liability coverage for 5 years after substantial completion of the Project, will notify Turner of any changes in the policy in subsequent years and will ensure that the policy will not provide less limits or coverage than the current policy."

d. Sixty (60) days prior written notice to Turner of cancellation of such insurance or any material change with respect thereof.

Such professional liability insurance shall be in a form and from a company(s) acceptable to Turner and policy(s) shall be available for review by Turner as requested. Turner will not be an Additional Insured on this policy.

****PLEASE FILL OUT THE INFORMATION BELOW WHILE EXECUTING YOUR SUBCONTRACT AGREEMENT:****

Firm(s) performing Engineering Services under this Subcontract:

Name: _____
Address: _____
Contact: _____
Phone: _____
Fax: _____
Email: _____

Name: _____
Address: _____
Contact: _____
Phone: _____
Fax: _____
Email: _____

November 14, 2023

Re: University of Kentucky – Health & Education Building
Contract No. 231053
Lexington KY

To Whom It May Concern:

Please find enclosed the billing package for the Interventional project. This package contains the following:

- Billing Schedule
- Application/Waiver for Billings (to be submitted via Textura)
- AIA G703 Application Continuation Sheet (submitted via Textura)
- JCC2 Waiver/JCC3 Waiver/JCC4 Waiver (tier subs/suppliers due by the 30th of each month, available on request)
- Bill of Sale/Deed of Lease (for offsite Stored Materials, available on request)
- Loss Payable Endorsement (for offsite Stored Materials, available on request)
- W-9

Your Schedule of Values on Form G703 shall be sent to the Project Manager/Superintendent at the jobsite for approval prior to submission of the first application. All pencil copies shall also be submitted via Textura per the attached billing schedule. These dates will be subject to change monthly depending upon Pencil Review meeting dates with Owner/Architect. You will be notified via Textura/email on when to submit. **Please be advised that there will be no grace period honored submission of billings. If payment applications are not submitted via Textura on or before the dates on the Billing Schedule (subject to change monthly), payment will not be processed for that month. These will need to be billed the following month. In the current economic conditions, Turner will not delay payments to all subcontractors as a result of late submissions from a few. Please help us get you paid!** Waivers of Lien are also needed from any and all second and subsequent tier subcontractors and/or materialmen. Please note that some forms require to be notarized.

If you are not a current vendor of ours then the W-9 form needs to be completed and returned to me on or before the date of your first application for payment.

All payments shall be in accordance with the terms of your subcontract and deposited via wire thru Textura.

Turner may from time to time to contact your lower tier subs for payment verification.

Please complete and return a signed copy of this letter to the address shown below, and provide an accounting contact and phone number so we will know whom to contact concerning billing matters.

If you have any questions regarding the above, please contract me at (513) 721-4224.

Very truly yours,
TURNER CONSTRUCTION COMPANY

Sherry L. Macht
Accounting Manager

Received by: _____ **Date:** ____/____/_____
Subcontractor Company: _____
Accounting Contact: _____
Telephone Number: _____ Fax Number: _____

SUBCONTRACTOR APPLICATION FOR PAYMENT

DATE: _____

TO: **TURNER CONSTRUCTION COMPANY**
250 West Court Street, Suite 300W
Cincinnati, Ohio 45202
PH: (513)721-4224 ; Fax: (513) 721-2561

FROM: (Subcontractor) _____

Telephone No.: _____

Invoice No.: _____

PROJECT: University of Kentucky
PAV A 5th Floor Fit Up

Contract No. 200763

PROJECT LOCATION: _____

Original Subcontract Sum	$ $0.00	**Total Completed & Stored to Date**	$ $0.00
Approved Change Orders to Date	$ $0.00	**Less Retainage at _____%**	$ $0.00
(Through Change Order #_____)		**Total Earned Less Retainage**	$ $0.00
Subcontract Sum to Date	$ $0.00	**Less Previous Certificates for Payment**	$ $0.00
		Current Payment Due	$ $0.00
		Balance to Finish (Including retainage)	$ $0.00

The undersigned certifies that is has performed labor and has furnished all material, machinery, fuel and equipment covered by this Application for Payment in accord with the subcontract documents. It has paid all amounts due for work covered by previous Applications, and the current payment due to the undersigned will be utilized to fund and pay all of its subcontractors, materialmen, and labor for work in connection with the project described above within 10 days of receipt of the "Current Payment Due."

The undersigned acknowledges that TURNER CONSTRUCTION COMPANY will make payment hereunder in reliance upon the representations made in this application.

Subcontractor: _____ Date: _____

By: _____ Title: _____

Subscribed and sworn to before me this _____ day of _____, 200 .

Notary Public: My Commission Expires:

WAIVER OF LIEN

The undersigned, for and in consideration of payment made to the undersigned as a result of this Application, does hereby waive, release and surrender any and all lien or claim or right to lien, to the date of this waiver, for labor, material and/or services furnished in connection with the above described Project.

Subcontractor: _____ Date: _____

By: _____ Title: _____

Subscribed and sworn to before me this _____ day of _____, 200 .

Notary Public: My Commission Expires:

CONTINUATION SHEET

AIA DOCUMENT G703 (Instructions on reverse side) PAGE OF PAGES

AIA Document G702, APPLICATION AND CERTIFICATE FOR PAYMENT, containing
Contractor's signed Certification is attached
In tabulations below, amounts are stated to the nearest dollar
Use Column I on Contracts where variable retainage for line items may apply

APPLICATION NUMBER: 0
APPLICATION DATE: 10/6/2011
PERIOD TO: 10/31/2011
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED FROM PREVIOUS APPLICATION (D + E)	WORK COMPLETED THIS PERIOD	MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D + E + F)	% (G / C)	BALANCE TO FINISH (C - G)	RETAINAGE
1		$0		$0	$0	$0	#DIV/0!	$0.00	0
2		$0		$0	$0	$0	#DIV/0!	$0.00	0
3		$0		$0	$0	$0	#DIV/0!	$0.00	0
4		$0		$0	$0	$0	#DIV/0!	$0.00	0
5		$0		$0	$0	$0	#DIV/0!	$0.00	0
6		$0		$0	$0	$0	#DIV/0!	$0.00	0
7		$0		$0	$0	$0	#DIV/0!	$0.00	0
8		$0		$0	$0	$0	#DIV/0!	$0.00	0
9		$0		$0	$0	$0	#DIV/0!	$0.00	0
10		$0		$0	$0	$0	#DIV/0!	$0.00	0
11		$0		$0	$0	$0	#DIV/0!	$0.00	0
12		$0		$0	$0	$0	#DIV/0!	$0.00	0
13		$0		$0	$0	$0	#DIV/0!	$0.00	0
14		$0		$0	$0	$0	#DIV/0!	$0.00	0
16		$0		$0	$0	$0	#DIV/0!	$0.00	0
17		$0		$0	$0	$0	#DIV/0!	$0.00	0
18		$0		$0	$0	$0	#DIV/0!	$0.00	0
19		$0		$0	$0	$0	#DIV/0!	$0.00	0
20		$0		$0	$0	$0	#DIV/0!	$0.00	0
21		$0		$0	$0	$0	#DIV/0!	$0.00	0
22		$0		$0	$0	$0	#DIV/0!	$0.00	0
23		$0		$0	$0	$0	#DIV/0!	$0.00	0
24		$0		$0	$0	$0	#DIV/0!	$0.00	0
25		$0		$0	$0	$0	#DIV/0!	$0.00	0
26		$0		$0	$0	$0	#DIV/0!	$0.00	0
27		$0		$0	$0	$0	#DIV/0!	$0.00	0
28		$0		$0	$0	$0	#DIV/0!	$0.00	0
29		$0		$0	$0	$0	#DIV/0!	$0.00	0
30		$0		$0	$0	$0	#DIV/0!	$0.00	0
31		$0		$0	$0	$0	#DIV/0!	$0.00	0
32		$0		$0	$0	$0	#DIV/0!	$0.00	0
33		$0		$0	$0	$0	#DIV/0!	$0.00	0
34		$0		$0	$0	$0	#DIV/0!	$0.00	0
35		$0		$0	$0	$0	#DIV/0!	$0.00	0
34		$0		$0	$0	$0	#DIV/0!	$0.00	0
35		$0		$0	$0	$0	#DIV/0!	$0.00	0
		$0	$0	$0	$0	$0		$0.00	

University of Kentucky
CONTRACT NO. 231053

2023-2024 CONTRACTOR BILLING SCHEDULE

Pay Apps Due via Textura	Pay App Review w/ Owner & Arch.
November 15, 2023	November 22, 2023
December 15, 2023	December 22, 2023
January 16, 2024	January 24, 2024
February 14, 2024	February 21, 2024
March 19, 2024	March 27, 2024
April 17, 2024	April 24, 2024
May 15, 2024	May 22, 2024
June 18, 2024	June 26, 2024
July 16, 2024	July 24, 2024
August 21, 2024	August 28, 2024
September 17, 2024	September 25, 2024
October 23, 2024	October 30, 2024
November 13, 2024	November 20, 2024

Note….these dates are subject to change depending upon pencil meeting with the owner/architect.
You will be notified via Textura email when the draw is open and when it will close.

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ Go to *www.irs.gov/FormW9* for instructions and the latest information.

Give Form to the requester. Do not send to the IRS.

Print or type. See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is not disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

		–							

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here | **Signature of U.S. person** ▶ | **Date** ▶

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),

2. Certify that you are not subject to backup withholding, or

3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and

4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting,* later, for further information.

Note: If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States.

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Pub. 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items.

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 24% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,

2. You do not certify your TIN when required (see the instructions for Part II for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code,* later, and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships,* earlier.

What is FATCA Reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code,* later, and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account (other than an account maintained by a foreign financial institution (FFI)), list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9. If you are providing Form W-9 to an FFI to document a joint account, each holder of the account that is a U.S. person must provide a Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note: ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C corporation, or S corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

Line 3

Check the appropriate box on line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box on line 3.

IF the entity/person on line 1 is a(n) . . .	THEN check the box for . . .
• Corporation	Corporation
• Individual • Sole proprietorship, or • Single-member limited liability company (LLC) owned by an individual and disregarded for U.S. federal tax purposes.	Individual/sole proprietor or single-member LLC
• LLC treated as a partnership for U.S. federal tax purposes, • LLC that has filed Form 8832 or 2553 to be taxed as a corporation, or • LLC that is disregarded as an entity separate from its owner but the owner is another LLC that is not disregarded for U.S. federal tax purposes.	Limited liability company and enter the appropriate tax classification. (P= Partnership; C= C corporation; or S= S corporation)
• Partnership	Partnership
• Trust/estate	Trust/estate

Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space on line 4 any code(s) that may apply to you.

Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)

2—The United States or any of its agencies or instrumentalities

3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

4—A foreign government or any of its political subdivisions, agencies, or instrumentalities

5—A corporation

6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession

7—A futures commission merchant registered with the Commodity Futures Trading Commission

8—A real estate investment trust

9—An entity registered at all times during the tax year under the Investment Company Act of 1940

10—A common trust fund operated by a bank under section 584(a)

11—A financial institution

12—A middleman known in the investment community as a nominee or custodian

13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over $600 required to be reported and direct sales over $5,000[1]	Generally, exempt payees 1 through 5[2]
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.

[2] However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)

B—The United States or any of its agencies or instrumentalities

C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state

G—A real estate investment trust

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940

I—A common trust fund as defined in section 584(a)

J—A bank as defined in section 581

K—A broker

L—A trust exempt from tax under section 664 or described in section 4947(a)(1)

M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

Note: You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns. If this address differs from the one the requester already has on file, write NEW at the top. If a new address is provided, there is still a chance the old address will be used until the payor changes your address in their records.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN.

If you are a single-member LLC that is disregarded as an entity separate from its owner, enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note: See *What Name and Number To Give the Requester*, later, for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at *www.SSA.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/Businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. Go to *www.irs.gov/Forms* to view, download, or print Form W-7 and/or Form SS-4. Or, you can go to *www.irs.gov/OrderForms* to place an order and have Form W-7 and/or SS-4 mailed to you within 10 business days.

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note: Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if item 1, 4, or 5 below indicates otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code*, earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), ABLE accounts (under section 529A), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account) other than an account maintained by an FFI	The actual owner of the account or, if combined funds, the first individual on the account[1]
3. Two or more U.S. persons (joint account maintained by an FFI)	Each holder of the account
4. Custodial account of a minor (Uniform Gift to Minors Act)	The minor[2]
5. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee[1]
b. So-called trust account that is not a legal or valid trust under state law	The actual owner[1]
6. Sole proprietorship or disregarded entity owned by an individual	The owner[3]
7. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))	The grantor*
For this type of account:	**Give name and EIN of:**
8. Disregarded entity not owned by an individual	The owner
9. A valid trust, estate, or pension trust	Legal entity[4]
10. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
11. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
12. Partnership or multi-member LLC	The partnership
13. A broker or registered nominee	The broker or nominee
14. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
15. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B))	The trust

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

[4] List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships*, earlier.

*Note: The grantor also must provide a Form W-9 to trustee of trust.

Note: If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records From Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Pub. 5027, Identity Theft Information for Taxpayers.

Victims of identity theft who are experiencing economic harm or a systemic problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to *phishing@irs.gov*. You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at *spam@uce.gov* or report them at *www.ftc.gov/complaint*. You can contact the FTC at *www.ftc.gov/idtheft* or 877-IDTHEFT (877-438-4338). If you have been the victim of identity theft, see *www.IdentityTheft.gov* and Pub. 5027.

Visit *www.irs.gov/IdentityTheft* to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

ATTACHMENT "F"
Percentage Markup and Procedures Applicable to Work
Added to or Deleted from the Original Contract Requirements

LUMP SUM

Predetermined Lump Sum additions and/or omissions to the Agreement are to be based upon the estimated "Net Actual Cost", plus the following maximum %'s for Overhead and Profit. The percentages for Overhead and Profit will be negotiated and may vary according to the nature, extent and complexity of the work involved. Not more than three percentage calculations each not to exceed the maximum percentages shown below, will be allowed regardless of the number of tiers of subcontractors. That is, the markup on work subcontracted by a subcontractor will be limited to one overhead and profit percentage in addition to the prime contractor's overhead and profit percentage. On proposals for decreases in the amount of the contract, the overhead and profit will be added to the "Net Actual Cost", thereby increasing the credit that would be deducted from the price of this agreement:

	LABOR & MATERIAL	SUBLET WORK
Additions:	OH & P 10%	OH & P 10%
Omissions/Credits:	OH & P 10%	OH & P 10%

TIME AND MATERIAL

Contract Work, authorized by Turner in advance to be performed on a Time and Material Basis, is to be based upon the "Net Actual Cost" plus the following Percentages for Overhead and Profit:

	LABOR & MATERIAL	SUBLET WORK
Additions:	OH & P 10%	OH & P 10%

GENERAL

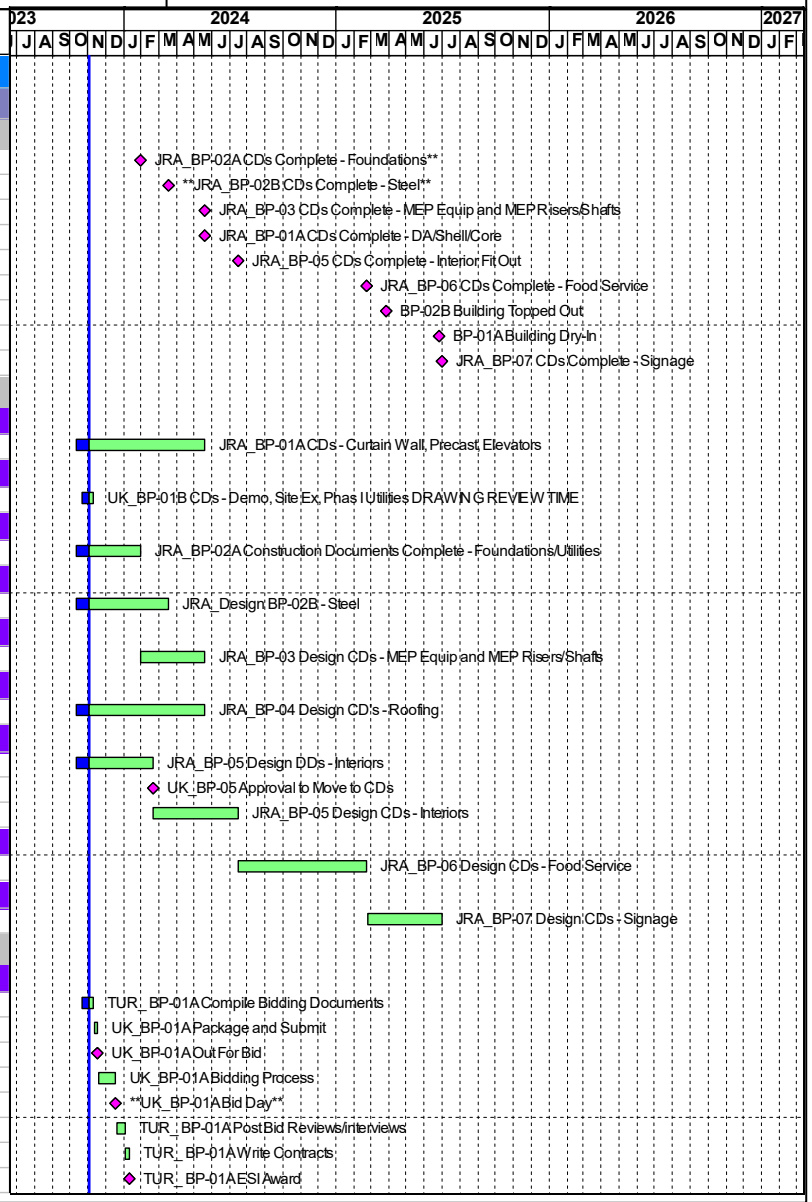
1. Submission of estimates and costs shall be itemized in a form satisfactory to Turner to permit ready analysis and evaluation. On time and material work, daily reports (in duplicate and showing all field and shop labor expended and/or material delivered) shall be submitted to Turner. Invoices shall be submitted monthly.
2. No overhead and profit will be permitted on premium time.
3. Percentages shall apply to net differences in quantities for adds and deducts in any one change.
4. Percentages applied by sub-subcontractors shall not exceed those of this subcontractor.
5. Net Actual Cost
   - **A. Labor:**
     1. Wages of labor, including foremen, engaged in work and directly on the Subcontractor's payroll.
     2. Engineering and drafting performed at the Site with Turner's prior written approval.
     3. Fringe Benefits established by governing trade organizations.
     4. Federal Old Age Benefits, Federal and State Unemployment Taxes.
     5. Net actual premium paid for Public Liability, Workers' Compensation, Property Damage, and any other forms of insurance required by Turner.
   - **B. Material:**
     1. Net cost of construction materials and supplies (FOB Job Site, where applicable) including applicable Sales and/or Use taxes if allowed by contract, trade and cash discounts.
     2. Costs of a special nature, approved in advance by Turner, such as for riggers, labor, transportation, equipment rentals, royalties, permits, and other expenses of this general nature.
   - **C. Sublet Work:**
     1. Net cost to the Subcontractor of work sublet by him.
6. Percentages shall include the following overhead costs:
   - A. Supervision (Including Field) and executive expenses.
   - B. Small tools, scaffolding, blocking, shores, appliances, etc. and the expense of maintaining same.
   - C. Administrative expenses, clerical, etc., both at the Job Site and in the Subcontractor's Office.
   - D. Taxes and any bonds required to be paid by the Subcontractor, but not included under the aforementioned Net Actual Costs.

7. Percentage markup for overhead and profit for Sub Subcontractors shall be limited to the above listed percentages also.
8. Percentages shall include all profit.
9. The Subcontractor will be at risk if adherence to these procedures is not followed.

Initial

Turner _____ Subcontractor _____

Activity ID	Activity Name	Orig Dur	Rem Dur	Start	Finish
Total		823	807	12-Oct-23 A	11-Jan-27
Attachment G ESI Package 01A Bid Schedule		823	807	12-Oct-23 A	11-Jan-27
Milestones		362	362	29-Jan-24	30-Jun-25
A170	JRA_BP-02A CDs Complete - Foundations**	0	0		29-Jan-24
CTR390	**JRA_BP-02B CDs Complete - Steel**	0	0		18-Mar-24
CTR1030	JRA_BP-03 CDs Complete - MEP Equip and MEP Risers/Shafts	0	0		20-May-24
01A1250	JRA_BP-01A CDs Complete - DA/Shell/Core	0	0		20-May-24
CTR470	JRA_BP-05 CDs Complete - Interior Fit Out	0	0		15-Jul-24
CTR520	JRA_BP-06 CDs Complete - Food Service	0	0		21-Feb-25
CTR1070	BP-02B Building Topped Out	0	0		26-Mar-25
01A1260	BP-01A Building Dry-In	0	0		26-Jun-25
CTR580	JRA_BP-07 CDs Complete - Signage	0	0		30-Jun-25
Pre-Construction/Design		436	420	12-Oct-23 A	30-Jun-25
BP-01A DA Curtain Wall, Precast, Elevators		154	138	12-Oct-23 A	20-May-24
CTR970	JRA_BP-01A CDs - Curtain Wall, Precast, Elevators	154	138	12-Oct-23 A	20-May-24
BP-01B Demo, Site Ex., Phase I Utilities		5	6	23-Oct-23 A	10-Nov-23
A220	UK_BP-01B CDs - Demo, Site Ex, Phas I Utilities DRAWING REVIEW TIME	5	6	23-Oct-23 A	10-Nov-23
BP-02A Phase II Utilities and Foundations		74	58	12-Oct-23 A	29-Jan-24
CTR690	JRA_BP-02A Construction Documents Complete - Foundations/Utilities	74	58	12-Oct-23 A	29-Jan-24
BP-02B Structural Steel		109	93	12-Oct-23 A	18-Mar-24
CTR960	JRA_Design BP-02B - Steel	109	93	12-Oct-23 A	18-Mar-24
BP-03 MEP Equip and MEP Risers/Shafts		80	80	30-Jan-24	20-May-24
PRE650	JRA_BP-03 Design CDs - MEP Equip and MEP Risers/Shafts	80	80	30-Jan-24	20-May-24
BP-04 Shell/Core - Roofing		154	138	12-Oct-23 A	20-May-24
A110	JRA_BP-04 Design CD's - Roofing	154	138	12-Oct-23 A	20-May-24
BP-05 Arch. Interior, MEP systems, AV, Hardscap/Landscape		192	176	12-Oct-23 A	15-Jul-24
PRE110	JRA_BP-05 Design DDs - Interiors	90	74	12-Oct-23 A	20-Feb-24
PRE150	UK_BP-05 Approval to Move to CDs	0	0		20-Feb-24
PRE120	JRA_BP-05 Design CDs - Interiors	102	102	21-Feb-24	15-Jul-24
BP-06 Food Service		154	154	16-Jul-24	21-Feb-25
CTR560	JRA_BP-06 Design CDs - Food Service	154	154	16-Jul-24	21-Feb-25
BP-07 Signage		90	90	24-Feb-25	30-Jun-25
CTR570	JRA_BP-07 Design CDs - Signage	90	90	24-Feb-25	30-Jun-25
Contracting		494	485	23-Oct-23 A	02-Oct-25
BP-01A ESI Curtain Wall, Precast, Elevators		55	46	23-Oct-23 A	12-Jan-24
01A1010	TUR_BP-01A Compile Bidding Documents	5	6	23-Oct-23 A	10-Nov-23
01A1020	UK_BP-01A Package and Submit	5	5	13-Nov-23	17-Nov-23
01A1030	UK_BP-01A Out For Bid	0	0		17-Nov-23
01A1040	UK_BP-01A Bidding Process	20	20	20-Nov-23	19-Dec-23
01A1050	**UK_BP-01A Bid Day**	0	0		19-Dec-23
01A1060	TUR_BP-01A Post Bid Reviews/interviews	10	10	20-Dec-23	04-Jan-24
01A1070	TUR_BP-01A Write Contracts	5	5	05-Jan-24	11-Jan-24
01A1080	TUR_BP-01A ESI Award	0	0	12-Jan-24	



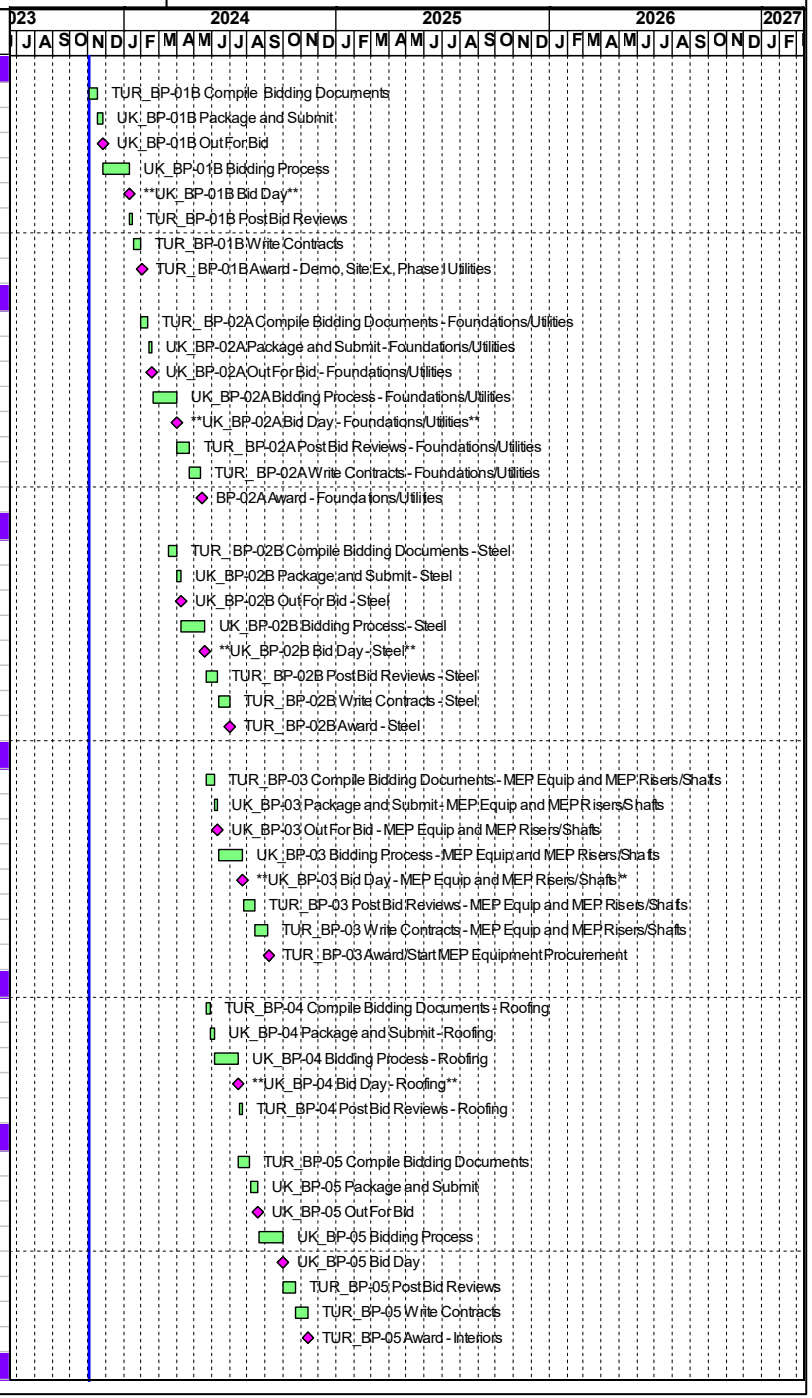
Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work
Critical Remaining Work

Attachment G ESI Package 01A Bid Schedule
Data Date 03-Nov-23

Turner

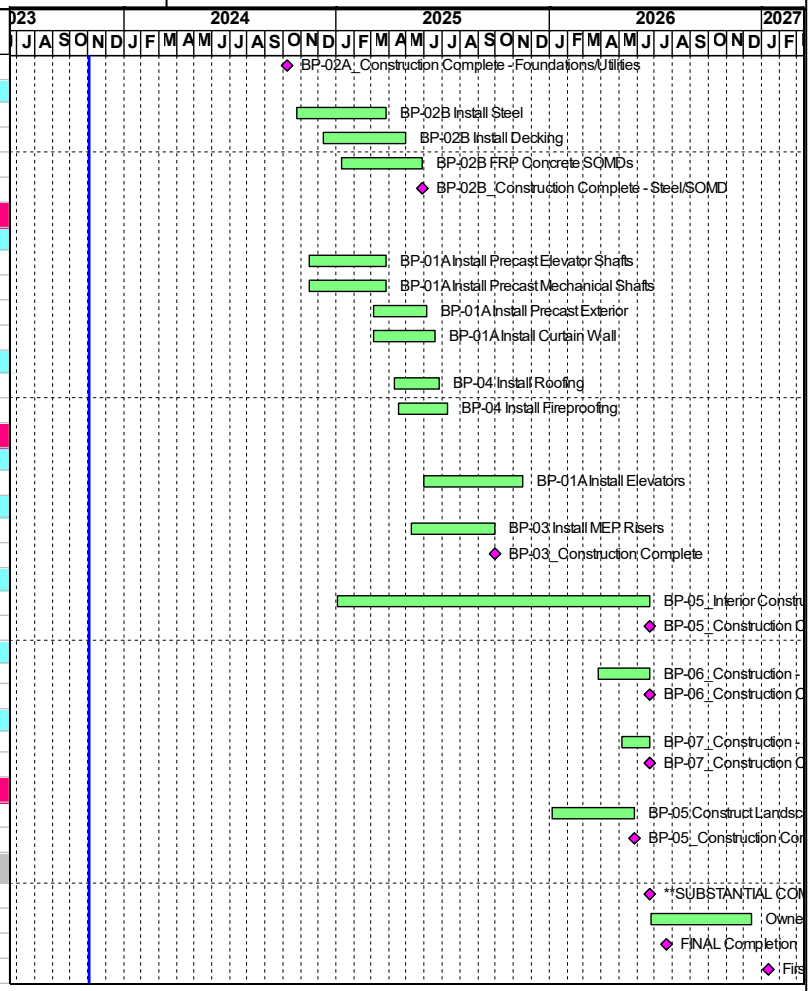
Start Date 29-Jun-23
Finish Date 11-Jan-27
Data Date 03-Nov-23

Activity ID	Activity Name	Orig Dur	Rem Dur	Start	Finish
BP-01B Demo, Site Ex., Phase I Utilities		60	60	03-Nov-23	01-Feb-24
PRE190	TUR_BP-01B Compile Bidding Documents	10	10	03-Nov-23	16-Nov-23
PRE200	UK_BP-01B Package and Submit	5	5	17-Nov-23	27-Nov-23
PRE210	UK_BP-01B Out For Bid	0	0		27-Nov-23
PRE220	UK_BP-01B Bidding Process	30	30	28-Nov-23	10-Jan-24
PRE230	**UK_BP-01B Bid Day**	0	0		10-Jan-24
CTR310	TUR_BP-01B Post Bid Reviews	5	5	11-Jan-24	17-Jan-24
CTR320	TUR_BP-01B Write Contracts	10	10	18-Jan-24	31-Jan-24
CTR330	TUR_BP-01B Award - Demo, Site Ex., Phase I Utilities	0	0	01-Feb-24	
BP-02A Phase II Utilities and Foundations		75	75	30-Jan-24	14-May-24
PRE490	TUR_BP-02A Compile Bidding Documents - Foundations/Utilities	10	10	30-Jan-24	12-Feb-24
PRE500	UK_BP-02A Package and Submit - Foundations/Utilities	5	5	13-Feb-24	19-Feb-24
01A1190	UK_BP-02A Out For Bid - Foundations/Utilities	0	0		19-Feb-24
01A1200	UK_BP-02A Bidding Process - Foundations/Utilities	30	30	20-Feb-24	01-Apr-24
PRE510	**UK_BP-02A Bid Day - Foundations/Utilities**	0	0		01-Apr-24
01A1210	TUR_BP-02A Post Bid Reviews - Foundations/Utilities	15	15	02-Apr-24	22-Apr-24
01A1220	TUR_BP-02A Write Contracts - Foundations/Utilities	15	15	23-Apr-24	13-May-24
01A1230	BP-02A Award - Foundations/Utilities	0	0	14-May-24	
BP-02B Structural Steel		75	75	19-Mar-24	03-Jul-24
PRE240	TUR_BP-02B Compile Bidding Documents - Steel	10	10	19-Mar-24	01-Apr-24
PRE250	UK_BP-02B Package and Submit - Steel	5	5	02-Apr-24	08-Apr-24
PRE260	UK_BP-02B Out For Bid - Steel	0	0		08-Apr-24
PRE270	UK_BP-02B Bidding Process - Steel	30	30	09-Apr-24	20-May-24
PRE280	**UK_BP-02B Bid Day - Steel**	0	0		20-May-24
CTR400	TUR_BP-02B Post Bid Reviews - Steel	15	15	21-May-24	11-Jun-24
CTR410	TUR_BP-02B Write Contracts - Steel	15	15	12-Jun-24	02-Jul-24
CTR420	TUR_BP-02B Award - Steel	0	0	03-Jul-24	
BP-03 MEP Equip and MEP Risers/Shafts		75	75	21-May-24	06-Sep-24
PRE540	TUR_BP-03 Compile Bidding Documents - MEP Equip and MEP Risers/Shafts	10	10	21-May-24	04-Jun-24
PRE550	UK_BP-03 Package and Submit - MEP Equip and MEP Risers/Shafts	5	5	05-Jun-24	11-Jun-24
PRE560	UK_BP-03 Out For Bid - MEP Equip and MEP Risers/Shafts	0	0		11-Jun-24
PRE570	UK_BP-03 Bidding Process - MEP Equip and MEP Risers/Shafts	30	30	12-Jun-24	24-Jul-24
PRE580	**UK_BP-03 Bid Day - MEP Equip and MEP Risers/Shafts**	0	0		24-Jul-24
CTR980	TUR_BP-03 Post Bid Reviews - MEP Equip and MEP Risers/Shafts	15	15	25-Jul-24	14-Aug-24
CTR990	TUR_BP-03 Write Contracts - MEP Equip and MEP Risers/Shafts	15	15	15-Aug-24	05-Sep-24
CTR1040	TUR_BP-03 Award/Start MEP Equipment Procurement	0	0	06-Sep-24	
BP-04 Shell/Core - Roofing		45	45	21-May-24	24-Jul-24
A120	TUR_BP-04 Compile Bidding Documents - Roofing	5	5	21-May-24	28-May-24
A130	UK_BP-04 Package and Submit - Roofing	5	5	29-May-24	04-Jun-24
A140	UK_BP-04 Bidding Process - Roofing	30	30	05-Jun-24	17-Jul-24
A160	**UK_BP-04 Bid Day - Roofing**	0	0		17-Jul-24
A150	TUR_BP-04 Post Bid Reviews - Roofing	5	5	18-Jul-24	24-Jul-24
BP-05 Arch. Interior, MEP systems, AV, Hardscap/Landscape		85	85	16-Jul-24	13-Nov-24
PRE340	TUR_BP-05 Compile Bidding Documents	15	15	16-Jul-24	05-Aug-24
PRE350	UK_BP-05 Package and Submit	10	10	06-Aug-24	19-Aug-24
PRE360	UK_BP-05 Out For Bid	0	0		19-Aug-24
PRE370	UK_BP-05 Bidding Process	30	30	20-Aug-24	01-Oct-24
PRE380	UK_BP-05 Bid Day	0	0		01-Oct-24
CTR480	TUR_BP-05 Post Bid Reviews	15	15	02-Oct-24	22-Oct-24
CTR490	TUR_BP-05 Write Contracts	15	15	23-Oct-24	12-Nov-24
CTR500	TUR_BP-05 Award - Interiors	0	0	13-Nov-24	
BP-06 Food Service		60	60	24-Feb-25	19-May-25



Activity ID	Activity Name	Orig Dur	Rem Dur	Start	Finish
PRE390	TUR_BP-06 Compile Bidding Documents	10	10	24-Feb-25	07-Mar-25
PRE400	UK_BP-06 Package and Submit	5	5	10-Mar-25	14-Mar-25
PRE410	UK_BP-06 Out For Bid	0	0		14-Mar-25
PRE420	UK_BP-06 Bidding Process	30	30	17-Mar-25	25-Apr-25
PRE430	**UK_BP-06 Bid Day**	0	0		25-Apr-25
CTR530	TUR_BP-06 Post Bid Reviews	7	7	28-Apr-25	06-May-25
CTR540	TUR_BP-06 Write Contracts	8	8	07-May-25	16-May-25
CTR550	TUR_BP-06 Award - Food Services	0	0	19-May-25	
BP-07 Signage		65	65	01-Jul-25	02-Oct-25
PRE440	TUR_BP-07 Compile Bidding Documents - Signage	10	10	01-Jul-25	15-Jul-25
PRE450	UK_BP-07 Package and Submit - Signage	5	5	16-Jul-25	22-Jul-25
PRE460	UK_BP-07 Out For Bid - Signage	0	0		22-Jul-25
PRE470	UK_BP-07 Bidding Process - Signage	30	30	23-Jul-25	03-Sep-25
PRE480	UK_BP-07 Bid Day - Signage	0	0		03-Sep-25
CTR590	TUR_BP-07 Post Bid Reviews - Signage	10	10	04-Sep-25	17-Sep-25
CTR600	TUR_BP-07 Write Contracts -Signage	10	10	18-Sep-25	01-Oct-25
CTR610	TUR_BP-07 Award - Signage	0	0	02-Oct-25	
Submittals		225	225	30-Jan-24	16-Dec-24
01A1110	BP-01A Curtain Wall Design/Shop Drawings	80	80	30-Jan-24	20-May-24
01A1100	BP-01A Precast Exterior Design/Shop Drawings	80	80	30-Jan-24	20-May-24
CTR680	BP-01A Elevator Shop Drawings	60	60	27-Feb-24	20-May-24
01A1090	BP-01A Precast Shafts Design/Shop Drawings	60	60	27-Feb-24	20-May-24
01A1240	BP-02 Rebar Shop Drawings	20	20	30-Apr-24	28-May-24
CTR630	BP-02 Steel Shop Drawings	40	40	03-Jul-24	28-Aug-24
CTR1050	BP-03_MEP Equipment Submittals	60	60	06-Sep-24	02-Dec-24
CTR720	BP-03 MEP Shop Drawings	20	20	15-Nov-24	16-Dec-24
Fabrication & Delivery		385	385	21-May-24	24-Nov-25
CTR760	BP-03 Fabricate and Deliver Elevators	60	60	21-May-24	14-Aug-24
01A1120	BP-01A Fabricate and Deliver Precast Shafts	60	60	21-May-24	14-Aug-24
01A1140	BP-01A Fabricate and Deliver Curtain Wall	90	90	21-May-24	26-Sep-24
01A1130	BP-01A Fabricate and Deliver Precast Exterior	90	90	21-May-24	26-Sep-24
CTR700	BP-02A Fabricate and Deliver Rebar	20	20	29-May-24	25-Jun-24
CTR640	BP-02B Fabricate and Deliver Steel	100	100	15-Aug-24	08-Jan-25
CTR1060	BP-03_MEP Equipment Fabrication and Delivery	250	250	03-Dec-24	24-Nov-25
CTR750	BP-03 Fabricate and Deliver MEP Risers	20	20	17-Dec-24	15-Jan-25
VDC / BIM		50	50	06-Sep-24	14-Nov-24
CTR710	BP-03 MEP Riser BIM Coordination	50	50	06-Sep-24	14-Nov-24
Construction		609	609	01-Feb-24	23-Jun-26
Sitework		138	138	01-Feb-24	14-Aug-24
BP-01B Demo, Exc., Phase I Utilities		138	138	01-Feb-24	14-Aug-24
CTR360	BP-01B Set Up Site Fence	10	10	01-Feb-24	14-Feb-24
CTR340	BP-01B Demo Kelley Building	15	15	15-Feb-24	06-Mar-24
CTR350	BP-01B Demo Med Center Annex #5	10	10	07-Mar-24	20-Mar-24
CTR370	BP-01B Demo Existing Utilities	20	20	21-Mar-24	17-Apr-24
CTR510	BP-01B Excavate For Foundation & Shore Ductbank	60	60	28-Mar-24	20-Jun-24
CTR380	BP-02A Install New Site Utilites	50	50	05-Jun-24	14-Aug-24
CTR910	**BP-01B_Construction Complete**	0	0		20-Jun-24
Building		509	509	21-Jun-24	23-Jun-26
Structure		238	238	21-Jun-24	29-May-25
BP-02A Foundations		75	75	21-Jun-24	07-Oct-24
CTR620	BP-02A Construct Foundations	75	75	21-Jun-24	07-Oct-24

Activity ID	Activity Name	Orig Dur	Rem Dur	Start	Finish
CTR430	BP-02A_Construction Complete - Foundations/Utilities	0	0		07-Oct-24
BP-02B Structural Steel		150	150	25-Oct-24	29-May-25
CTR650	BP-02B Install Steel	105	105	25-Oct-24	26-Mar-25
CTR660	BP-02B Install Decking	100	100	10-Dec-24	30-Apr-25
CTR670	BP-02B FRP Concrete SOMDs	100	100	09-Jan-25	29-May-25
CTR900	BP-02B_Construction Complete - Steel/SOMD	0	0		29-May-25
Envelope		165	165	15-Nov-24	11-Jul-25
BP-01A ESI Curtain Wall, Precast		150	150	15-Nov-24	19-Jun-25
01A1150	BP-01A Install Precast Elevator Shafts	90	90	15-Nov-24	26-Mar-25
01A1160	BP-01A Install Precast Mechanical Shafts	90	90	15-Nov-24	26-Mar-25
01A1180	BP-01A Install Precast Exterior	65	65	06-Mar-25	05-Jun-25
01A1170	BP-01A Install Curtain Wall	75	75	06-Mar-25	19-Jun-25
BP-04 Shell/Core - Roofing		65	65	10-Apr-25	11-Jul-25
A180	BP-04 Install Roofing	55	55	10-Apr-25	26-Jun-25
A190	BP-04 Install Fireproofing	60	60	17-Apr-25	11-Jul-25
Interiors		376	376	02-Jan-25	23-Jun-26
BP-01A DA Elevators		120	120	30-May-25	17-Nov-25
CTR810	BP-01A Install Elevators	120	120	30-May-25	17-Nov-25
BP-03 MEP Equip and MEP Risers/Shafts		100	100	08-May-25	29-Sep-25
CTR820	BP-03 Install MEP Risers	100	100	08-May-25	29-Sep-25
CTR890	BP-03_Construction Complete	0	0		29-Sep-25
BP-05 Arch. Interior, MEP systems, AV		376	376	02-Jan-25	23-Jun-26
CTR830	BP-05_Interior Construction	376	376	02-Jan-25	23-Jun-26
CTR880	BP-05_Construction Complete - Interiors	0	0		23-Jun-26
BP-06 Food Service		63	63	26-Mar-26	23-Jun-26
CTR850	BP-06_Construction - Food Services	63	63	26-Mar-26	23-Jun-26
CTR870	BP-06_Construction Complete - Food Services	0	0		23-Jun-26
BP-07 Signage		35	35	05-May-26	23-Jun-26
CTR840	BP-07_Construction - Signage	35	35	05-May-26	23-Jun-26
CTR860	BP-07_Construction Complete - Signage	0	0		23-Jun-26
Hardscape/Landscape		99	99	07-Jan-26	27-May-26
A200	BP-05 Construct Landscape/Hardscape	99	99	07-Jan-26	27-May-26
A210	BP-05_Construction Complete - Landscape/Hardscape	0	0		27-May-26
Turnover		138	138	23-Jun-26	11-Jan-27
MS150	**SUBSTANTIAL COMPLETION**	0	0		23-Jun-26*
TUR3030	Owner Move-In	120	120	24-Jun-26	14-Dec-26
MS160	FINAL Completion	0	0		22-Jul-26
MS170	First Day of Class	0	0		11-Jan-27*



ATTACHMENT "L"
Lean Construction
ATTACHMENT TO THE SUBCONTRACT AGREEMENT BETWEEN TURNER AND SUBCONTRACTOR

Lean focuses on maximizing customer value while eliminating waste through continuous improvement and respect for people. Turner expects that all subcontractors and suppliers will focus on continuous improvement of the construction process. Turner, subcontractors, and suppliers shall in good faith collaboratively participate in learning, planning, control processes, and strategies to achieve the goal of greatest productivity for the project; maximizing the value delivered to the customer. Maximizing value requires elimination of waste in all processes and implementing improvements at every opportunity. Subcontractors and suppliers will assign on-site leadership whose behaviors support collaboration with the project team.

Turner may utilize some or all of the approaches and tools listed below to reduce waste. Subcontractors and suppliers will coordinate with Turner in implementing these activities. The project team may research, develop, and implement other approaches and tools for the betterment of the project.

5S Methodology

5S is a system to optimize productivity and safety through maintaining an orderly workplace and using visual cues to achieve more consistent operational results.

1. **Sort** – Eliminate all unnecessary tools, parts, materials. Keep only essential items, eliminate what is not required, prioritize things per schedules/requirements and keeping them in easily accessible places.
2. **Straighten (Set in Order for Flow)** – Arrange the work, workers, equipment, parts, and instructions in such a way that work flows free of waste through value added tasks. Identify locations where items will be used and place those items close. Organize and communicate the location for items needed in the area.
3. **Shine (Systematic Cleaning)** – Clean the workspace, jobsite, and all equipment, and keep it clean, tidy and organized. At the end of each shift, clean the work area and be sure everything is restored to its place. Remove crates, pallets, dunnage, packing materials, etc., immediately – preferably before entering the building footprint. Create elevated workstations for ergonomic working and more efficient cleanup. Employ a 'Nothing Hits the Ground' mentality to keep the project clean and free of waste.
4. **Standardize –** Develop cleaning schedules and cleanliness standards to maintain the first 3S's. Employ visual management to reveal abnormalities and variations.
5. **Sustain –** Ensure disciplined adherence to rules and procedures to prevent backsliding.

Last Planner® System: Production System Planning

Subcontractors shall participate in weekly coordination meetings and shall provide updated weekly work plans on a weekly basis throughout the scheduled installation period. All subcontractors pledge to cooperate with each other and coordinate their work for the overall good of the project. Turner reserves the right to adjust and update the overall project schedule based on project conditions, actual performance of the work, and detailed schedule information obtained from subcontractors. This update is intended to be for the betterment of the project as a whole, not for advantage of the parts. At Turner's discretion, it may utilize The Last Planner® System (LPS) for developing additional coordination details over the life of the project—this process is part of the Bid Packages as described herein.

Overview: LPS provides principles to improve coordination and create flow between contract milestone dates in the contract (or master) schedule. When production planning becomes reliable and people fulfill their commitments, workflow, performance, and productivity are improved. Turner may require Subcontractor

Foremen, Superintendents and Project Manager to attend orientation and training sessions to prepare for the implementation of LPS. When utilizing LPS, project teams will develop a specific workflow for its completion, detailing requirements for plan submissions and meeting schedule.

Application: LPS differs from traditional construction methods because it decentralizes hierarchical decision-making. With LPS, those closest to the work (On Site Foremen/Field Supervisors—the "Last Planners") must have the authority to make decisions and plan the work.

The project will utilize six key procedures in the implementation of LPS. These steps require the input of the onsite Foremen/Field Supervisors for the subcontractors performing the work. As such, these leaders are required to participate in all the steps that are the LPS and be able to commit to perform work they know can be made ready for their crews and to collaborate with the team to ensure this work can be started and completed without interruption. The Last Planner for your crew must be involved before you mobilize to the project in order to attend these Phase Production Planning meetings.

Pull Planning – This represents the team's specific plan for how they intend to reach the milestone dates in the contract schedule. Pull plans must meet the contract schedule requirements, and teams must work together to achieve these project milestones. Turner requires team members to make and keep commitments based on their confidence that prerequisite work, design information, materials, labor, and equipment will be ready so they can start and complete installations meeting their commitments to reach milestones in the contract schedule.

Production Planning – This is simply the future weeks (typically six weeks) of the pull plans, updated with actual information weekly. Constraints preventing these activities in the next six weeks are identified and added to the constraint log. The Production Plan is prepared by Turner and distributed to the project team based upon the information collected in the pull-planning sessions and by actual weekly production results.

Constraint Log – The constraint log is maintained by Turner and used to aid the team in managing the Production Plan. A constraint is any information, material, equipment or resource needed to start and/or complete a specific task on the project, except prerequisite work. The constraint log is used to visualize and communicate information regarding constraints as well as to track and record commitments from individuals to remove the constraints.

Weekly Work Plans (WWP) –The WWP is a detailed day-by-day, one week production plan created by each trade foremen to plan the next week's work, based on the project's production plan. WWP's are due weekly at a time established by Turner for the work to be performed the following week. Turner will establish the format for WWP's and the method of delivery, typically in Microsoft Excel.

Percent Plan Complete (PPC) – PPC is a calculation of the team's planning reliability. This is done to identify trends preventing the reliability of commitments. The PPC represents the percentage of tasks completed as planned compared to the total number of tasks planned within the week.

Daily Production Huddle – Subcontractor foremen and Turner will meet for daily discussion with their peers from other trades and Turner field staff to assess the day's performance and discuss any new issues discovered. Turner's project superintendent will identify the time and place of the daily huddle.

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Digital Data Licensing Agreement

AGREEMENT made as of the day of in the year
(In words, indicate day, month, and year.)

BETWEEN the Party transmitting Digital Data ("Transmitting Party"):
(Name, address, and contact information, including electronic addresses)

JRA Architects
3225 Summit Square Place Ste. 200
Lexington, KY 40509

and the Party receiving the Digital Data ("Receiving Party"):
(Name, address, and contact information, including electronic addresses)

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

for the following Project:
(Name and location or address of the Project)

UK Health Education Building
Lexington, KY

for the following Digital Data ("Digital Data"):
(Identify below, in detail, the information created or stored in digital form that the Parties intend to be subject to this Agreement.)

The Transmitting Party and Receiving Party agree as follows.

TABLE OF ARTICLES

1 GENERAL PROVISIONS

2 TRANSMISSION OF DIGITAL DATA

3 LICENSE CONDITIONS

4 LICENSING FEE OR OTHER COMPENSATION

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User Notes:
(946417763)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 The purpose of this Agreement is to grant a license from the Transmitting Party to the Receiving Party for the Receiving Party's use of Digital Data and to set forth the license terms.

§ 1.2 This Agreement is the entire and integrated agreement between the Parties. Except as specifically set forth herein, this Agreement does not create any other contractual relationship between the Parties.

§ 1.3 Confidential Digital Data is Digital Data containing confidential or business proprietary information that the Transmitting Party designates as "confidential."

ARTICLE 2 TRANSMISSION OF DIGITAL DATA

§ 2.1 The Transmitting Party grants to the Receiving Party a nonexclusive limited license to use the Digital Data solely and exclusively for the uses, and in accordance with the terms, set forth in Article 3.

§ 2.2 Only the Receiving Party is permitted to access and use the Digital Data. Unlicensed and unauthorized access or use by third parties is strictly prohibited except as set forth in Section 2.4.1.

§ 2.3 The transmission of Digital Data constitutes a warranty by the Transmitting Party to the Receiving Party that the Transmitting Party is the copyright owner of the Digital Data or otherwise has permission to transmit the Digital Data to the Receiving Party for its use on the Project in accordance with the terms and conditions of this Agreement.

§ 2.4 Where the Transmitting Party has designated information furnished pursuant to this Agreement as "confidential," the Receiving Party shall keep the information confidential and shall not disclose it to any other person or entity except as set forth in Section 2.4.1.

§ 2.4.1 The Receiving Party may disclose Confidential Digital Data after seven (7) days' notice to the Transmitting Party where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Receiving Party may also disclose Confidential Digital Data to its employees, consultants, sureties, subcontractors and their employees, sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.5 By transmitting Digital Data, the Transmitting Party does not convey any ownership right in the Digital Data or in the software used to generate the Digital Data. Unless otherwise granted in a separate license, the Receiving Party's right to use, modify, or further transmit Digital Data is specifically limited to those uses, and in accordance with the terms, set forth in Article 3, and nothing contained in this Agreement conveys any other right to use the Digital Data.

§ 2.6 To the fullest extent permitted by law, the Receiving Party shall indemnify and defend the Transmitting Party from and against all claims arising from or related to the Receiving Party's modification to, or unlicensed use of, the Digital Data.

§ 2.7 Transmission of the Digital Data does not abridge or extinguish the Transmitting Party's rights, including, to the extent applicable, exclusive ownership interest, in such information under all applicable state, federal, and international laws including, without limitation, laws governing the protection of copyrights and intellectual property.

§ 2.8 The provisions of this Article 2 shall survive the termination of this Agreement.

ARTICLE 3 LICENSE CONDITIONS

§ 3.1 The Receiving Party may use and rely upon the Digital Data to the extent set forth in this Article 3.
(Choose only one option below.)

[ ] **§ 3.1.1** The Digital Data is transmitted solely for the Receiving Party's information. Receiving Party acknowledges that any use of the Digital Data shall be at Receiving Party's sole risk. The Receiving Party accepts the Digital Data "as is" without any warranty or representations from the Transmitting Party as to whether the Digital Data is accurate, complete, or fit for use as intended by the Receiving Party. The Receiving Party is solely responsible for verifying whether the Digital Data is accurate, complete, or fit for the Receiving Party's intended use.

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[ ] § 3.1.2 Other:
(Identify terms, permitted uses, or other conditions related to the Digital Data.)

§ 3.2 If no specific terms or uses are selected or set forth in Section 3.1, then the Receiving Party may use the Digital Data at its sole risk pursuant to the terms and conditions set forth in Section 3.1.1.

ARTICLE 4 LICENSING FEE OR OTHER COMPENSATION

The Receiving Party agrees to pay the Transmitting Party the following fee or other compensation for the Receiving Party's use of the Digital Data:
(State the fee, in dollars, or other method by which the Receiving Party will compensate the Transmitting Party for the Receiving Party's use of the Digital Data.)

None

This Agreement is entered into as of the day and year first written above and terminates one year from said date, except as set forth below.
(Indicate when this Agreement will terminate, if other than one year from the date it was entered into, and other conditions related to termination.)

None

TRANSMITTING PARTY *(Signature)*	**RECEIVING PARTY** *(Signature)*
D. Robert Deal, AIA, President	
(Printed name and title)	*(Printed name and title)*

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PAGE 1

JRA Architects
3225 Summit Square Place Ste. 200
Lexington, KY 40509

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UK Health Education Building
Lexington, KY
PAGE 3

None

...

None

...

D. Robert Deal, AIA, President

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Certification of Document's Authenticity

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I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 14:41:13 ET on 11/13/2023 under Order No. 4104239914 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document C106™ – 2022, Digital Data Licensing Agreement, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

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TSIB®

UK Health Education Building

Lexington, Kentucky

Turner

Contractor Controlled Insurance Program Manual

Manual Date: November 15, 2023

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Section 1

CCIP Overview

Welcome to the Turner Contractor Controlled Insurance Program (CCIP). Turner Construction Company (Turner) has purchased the coverage and is therefore the Sponsor of the CCIP. A CCIP is a coordinated insurance program where Turner provides specified coverage for enrolled contractors performing work at the project site. Turner Surety and Insurance Brokerage (TSIB) is the administrator for the CCIP.

Bid Instructions

You are required to prepare your bid to exclude the cost of your insurance for onsite Workers' Compensation, Employer's Liability, and Primary & Excess General Liability. You must calculate the cost of insurance to be removed from your bid based on your current insurance rates at the time of bid. Turner may modify bidding and insurance cost identification procedures as necessary based on the specific project requirements.

Conflicts

In the event of a conflict, the provisions of the Subcontract Agreement and any other related Subcontract Agreements shall supersede the provisions of this Manual. Likewise, in cases of conflict regarding CCIP Coverage, the provisions of the policies supersede the provisions of this Manual.

Project Definitions

The following list includes key CCIP definitions:

CCIP

Contractor Controlled Insurance Program.

CCIP Coverage

Workers' Compensation and Employer's Liability Insurance, General Liability Insurance, and Excess Liability Insurance as detailed in the CCIP Insurance policies for the benefit of Turner and Enrolled Parties performing work at the Project Site.

CCIP Administrator

The party that provides Administration Services for the CCIP. Turner Surety & Insurance Brokerage, Inc. (TSIB) is the CCIP Administrator for this project.

CCIP Insurer

The insurance company(s) named on a policy or Certificate of Insurance (COI).

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CCIP Sponsor

The party that purchases the CCIP. On this project, Turner Construction Company (Turner or Turner Construction) is the Sponsor of the CCIP.

California Affirmation Audit

The California Workers' Compensation Insurance Rating Bureau (WCIRB) routinely audits insurers use of limiting and restricting endorsements to ensure compliance with CA regulations. Title 10 of the California Code of Regulations requires insurers to obtain written documentation from the policyholder confirming that other coverage is in place (or is lawfully uninsured/self-insured) for the employees, operations, and locations excluded by a limiting and restricting endorsement. The California WCIRB completes affirmation audits to ensure compliance with Title 10.

California Limiting & Restricting Endorsements

A limiting and restricting endorsement is defined under the California Code as "an endorsement that excludes from coverage some portion of Workers' Compensation Liability for which the Employer is required to secure payment pursuant to the Labor Code." They include officer, operations, and location exclusions. For Enrolled Contractors, this applies to offsite operations.

Contract Agreement

A written agreement between Contractors of any tier.

Contractor

General Contractor and Subcontractor of any tier.

Eligible Parties

Contractors performing labor or services at the CCIP Project Site. Sponsor reserves the right to enroll or exclude any party at its sole discretion.

Enrolled Parties

Those Eligible Parties who have submitted all necessary enrollment information, have been accepted and enrolled into the CCIP, and who have received a Welcome Letter and Certificate of Insurance as evidence of enrollment.

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Excluded Parties

At the discretion of Turner, or subject to state regulations, the following parties are excluded (not eligible) from enrollment in the CCIP:

1. Hazardous materials remediation, removal and/or transport companies and their consultants;
2. Any Subcontractor performing structural demolition which is the moving or relocating of load bearing beams, columns, or walls;
3. Architects, engineers, soil testing engineers, surveyors, and their consultants;
4. Vendors, suppliers, fabricators, material dealers, truckers, haulers, drivers and others who merely transport, pickup, deliver, or carry materials, personnel, parts or equipment or any other items or persons to or from the Project Site;
5. Subcontractors, and any of their respective Sub-subcontractors, who do not perform any actual labor on the Project Site;
6. Building implosion Subcontractors of any tier, or Subcontractors of any tier involved with blasting or the use of explosives;
7. Window washing systems (davit type systems or equivalent).
8. Any Subcontractor of any tier involved with Exterior Insulation Finishing Systems (EIFS)
9. Any other Subcontractor of any tier which Turner, at its sole discretion (and as permitted by law), chooses to exclude from enrollment.

Project Site

The project location designated by the “Sponsor” and on file with the Insurer and as defined as the “Project” in your Contract. Any adjacent or nearby areas as defined in the project documents where incidental operations are performed, excluding permanent locations of any insured party.

Work Description

520,000 sqft 9 story new building with a basement. The building will consist of classrooms, laboratories, auditoriums, and offices.

Wrapworks

The RMIS system used by all Contractors to manage their requirements for the CCIP. wrapup.vuewrapup.com/contractorportal

wrapworks®

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Section 2

CCIP Project Directory

Below are the contacts you will need while you are Enrolled in the CCIP.

TSIB Administration Team	
Program Manager	Name: Brian Larocque Phone: 347-839-0294 Email: blarocque@tsibinc.com
Wrap Administrator	Name: Joe Whelan Phone: 203.945.1752 Email: twhelan@tsibinc.com

Turner Construction Project Team	
Project Manager	Name: Benton Stegman Phone: 513-309-1315 Email: astegman@tcco.com
Site Safety Manager	Name: Tim Sanford Phone: 513-516-0264 Email: tsanford@tcco.com
Project Superintendent	Name: Chad Denny Phone: 513-383-5109 Email: cdenny@tcco.com
Project Engineer	Name: Mason Thompson Phone: 513-835-6851 Email: msthompson@tcco.com
GL Claim Coordinator	Name: Kori Trotter Phone: 463-279-3568 Email: ktrotter@stratusinc.com
WC Claim Coordinator	Name: Bryant Bechtel Phone: 380-258-0068 / Mobile: 614-448-6973 Email: bbechtel@tcco.com
CCIP Coordinator	Name: Pat Glass Phone: 469-992-5560 Email: pglass@stratusinc.com

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Section 3

CCIP Insurance Coverage Summary

This Section provides a brief description of coverage provided by the CCIP. Participants should refer to the actual CCIP insurance policies for details about coverage, exclusions, and limitations.

Disclaimer
Neither Turner nor TSIB assumes any obligation to provide insurance other than what is specified in this Manual and the CCIP insurance policies. Turner's arranging of CCIP coverages shall in no way relieve or limit, or be construed to relieve or limit, Subcontractor or any of its Sub-subcontractors of any responsibility, liability, or obligation imposed by the Contract Agreement or by law, including without limitation any indemnification obligations which Subcontractor or any of its Sub-subcontractors to Turner or any other designated entity thereunder. Turner reserves the right at its option, without obligation to do so, to arrange other insurance coverage of various types and limits provided that such coverage is not less than that specified in the Contract Agreement.

Overview

As the CCIP Sponsor, Turner has arranged with TSIB for this Project to be insured under Turner's CCIP. Eligible Parties performing labor or services at the Project Site are eligible to enroll in the CCIP unless they are an Excluded Party. The CCIP provides Workers' Compensation and Employer's Liability, General Liability, and Excess Liability insurance for the benefit of Enrolled Parties, as summarily described below, in connection with the performance of the Work. CCIP Coverage shall cover only Enrolled Parties. Enrolled Parties are:

- Turner
- Eligible Contractors of any tier
- Any persons or entities that Turner at its sole discretion may designate to enroll in the CCIP

Each Enrolled Party is provided a Welcome Letter and Certificate of Insurance (COI) as evidence of enrollment.

Excluded Parties

Excluded Parties are not granted any insurance coverage under the CCIP. Excluded Parties must meet the insurance requirements in their Contract Agreement and provide evidence of their insurance coverage to both Turner and TSIB.

Excluded Parties shall require each of its Sub-Subcontractors to obtain and maintain the insurance coverage specified in the Contract Agreement. Excluded Contractors are to confirm there **are no Wrap-Up Exclusions on their policies**. Should there be a Wrap-Up Exclusion, a copy must be provided for review.

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Section 3

Evidence of CCIP Coverage

The Wrap Administrator will provide a COI evidencing CCIP Coverage to include Workers' Compensation, General Liability, and Excess Liability insurance to each Enrolled Party. Each Enrolled Party will be included as a Named Insured to the CCIP General Liability and Excess Liability policies. A copy of the primary General Liability policy can be obtained upon a Contractor's written request to the Wrap Administrator.

Description of CCIP Coverage

The summary descriptions of the CCIP Coverage in this Manual are not intended to alter or amend the actual CCIP Coverage. Rather, the CCIP Coverage and Exclusions summarized in this Manual are set forth in full detail in their respective insurance policy forms. In the event any provision of this Manual conflicts with the CCIP insurance policies, the provisions of the actual CCIP insurance policies shall govern.

CCIP Coverage shall apply only to Enrolled Parties and only for those operations or activities performed at the Project Site in connection with the Work.

CCIP Coverage Summary

Turner will provide the following CCIP Coverage to Enrolled Parties performing Work at the Project Site.

Workers' Compensation & Employer's Liability

A separate Workers' Compensation policy or an endorsement will be issued to each Enrolled Party.

Coverage	Limits
Part One	
Workers' Compensation	Statutory Limit
	Annual Limits
Part Two *(per Enrolled Party)*	
Employer's Liability	
Bodily injury by Accident, each accident	$2,000,000
Bodily injury by disease, each employee	$2,000,000
Bodily injury by disease, policy limit	$2,000,000

Notes:

- This does not cover the offsite operations of any Enrolled Party.
- Primary insurance for all covered occurrences at the Project Site.

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Section 3

General Liability

A single General Liability policy will be issued for all Enrolled Parties. Each Enrolled Party will be a Named Insured on the CCIP General Liability policy.

Coverage: Third Party Bodily Injury, Property Damage Liability, and Personal & Advertising Liability per the policy terms, conditions, and exclusions.

Primary Policy	Limits
General Aggregate Per Project	$10,000,000
Completed Operations Aggregate Per Project	$10,000,000
Each Occurrence Limit	$5,000,000
Fire Damage Legal Liability (any one fire)	$100,000
Medical Expense Limit (any one person)	$5,000

Terms:

- The General Liability limits are shared amongst all Enrolled Parties.
- General Liability insurance should be issued on an Insurance Services Office (ISO) form or its equivalent.
- Provides primary coverage for all covered occurrences at the Project Site.
- Does not provide coverage to any Insured Party, Vendor, Supplier, offsite Fabricator, Material Dealer, or other party, for any product manufactured, assembled, or otherwise worked on away from the Project Site.
- Does not cover offsite operations or activities of any Enrolled Party.
- Completed Operations coverage is extended with a single non-reinstated aggregate limit for the period beginning from the earliest occurrence of:
    i. when the Project is put to its intended use
    ii. project completion, or
    iii. CCIP policy termination, and ending after the earlier occurrence of
        a. Ten (10) years or
        b. The expiration of the applicable statute of repose established per the civil code or statute of the state where the Project is located. Consult your Insurance Broker and/or legal counsel for additional information regarding the statute of repose for the state where the Project is located.

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Excess Liability

A tower of Excess Liability coverage will be issued, covering all Enrolled Parties.

Coverage	Limits
Each Occurrence Limit (Combined Single Limit)	$100,000,000
Completed Operations Aggregate Per Project	$100,000,000
Annual General Aggregate Limit Per Project	$100,000,000

Coverage NOT provided by the CCIP

The CCIP does not provide Enrolled Parties all of the required coverage that may be needed for their Work at the Project Site. Notably, the CCIP does not provide Automobile Liability, Professional Liability, Pollution Liability, or coverage for any Enrolled Party's rented, owned, leased or borrowed equipment, or materials not included for inclusion in the project. Enrolled Parties should consult with their Broker/Agent to arrange any coverage that may be needed in addition to the CCIP.

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Section 4

Contractor Obligations & Insurance Requirements

Contractors of any tier are required to provide and maintain coverage to protect against losses that occur away from the Project Site or that are otherwise not covered under the CCIP. All COI's must be submitted to the Wrap Administrator prior to start of Work at the Project Site.

The required coverage must protect the Project Owner, Turner, the Subcontractor, and all others as required by the Contract Agreement. Liability may arise from the Subcontractor of any tier's operations performed away from the Project Site, performed by Excluded Parties, or activities not covered by the CCIP. Insurance coverage must be maintained for the duration defined in the Contract Agreement.

Contractor's CCIP Obligations

Subcontractor shall:

1. Incorporate the terms of this Manual in all Contract Agreements.
2. Within five (5) days of execution of the Contract Agreement, or no less than thirty (30) days before Mobilization onsite:
    - Enroll in the CCIP
    - Maintain enrollment in the CCIP
    - Ensure that Subcontractor's eligible Sub-Subcontractors enroll in the CCIP
3. Comply with all of the administrative, safety, claims management, insurance, and other requirements contained in this Manual, the CCIP insurance policies, and the Contract Agreement.
4. Provide each of its Sub-Subcontractors with a copy of this Manual and ensure Sub-Subcontractor compliance with the provisions of this Manual, the CCIP insurance policies, and the Contract Agreement. The failure of
    - Turner to include this Manual in the bid documents, or
    - Subcontractor to provide each of its eligible Sub-Subcontractors with a copy of it,

    Shall not relieve the Subcontractor or any of its Sub-Subcontractors from any of the obligations contained therein.
5. Provide evidence of required insurance to Turner and the Wrap Administrator at the time of enrollment and/or within 5 business days from the requested notification.
6. Subcontractor shall access Wrapworks and upload copies of their Rate Pages/Declaration Pages for:
    - Workers' Compensation
    - General Liability
    - Excess or Umbrella
    - Deductible Endorsement (if applicable)
    - Other requirements set forth in Section 6 to verify the Insurance Cost calculation.

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7. Be solely responsible for the recovery of any Sub-Subcontractor Insurance Cost attributable to such Sub-Subcontractors' eligibility for participation in the CCIP. If unit pricing is the basis for the Subcontract price, Turner may, at its option, apply a "per unit" Subcontractor Insurance Cost where appropriate.
8. Notify the Wrap Administrator and Turner's Designated Person of all Sub-subcontracts awarded (first tier and subsequent tiers). Accordingly, the Subcontractor shall require all Sub-Subcontractors to submit an online Application for Enrollment and all documents required to verify their Insurance Cost.
9. Provide the estimated onsite payroll amount for their Work and their enrolled Sub-Subcontractors for its Work. Subsequently identify estimated onsite payroll for each Change Order request.
10. Require all of its Sub-Subcontractors to acknowledge in writing, that Turner and TSIB are not the CCIP Insurer nor are they Agents, Partners, or Guarantors of the insurance companies providing coverage under the CCIP and that Turner and TSIB are not responsible for any claims or disputes between or among Subcontractor, its Sub-Subcontractors, and any CCIP Insurer(s). Any type of insurance coverage or limits of liability in addition to the CCIP coverages that Subcontractor or any Sub-Subcontractor requires for its or their own protection, or that is required by applicable laws or regulations, shall be the Subcontractor's or its Sub-Subcontractor's sole responsibility and expense and shall not be billed to Turner, TSIB or the Owner.
11. Cooperate fully with the TSIB and the CCIP Insurers, as applicable, in their administration of the CCIP.
12. Notify the Wrap Administrator immediately of any insurance cancellation or non-renewal of Subcontractor's and Sub-Subcontractor's required insurance and any subsequent reinstatement of coverage.
13. At Turner's discretion**,** Subcontractors may be required to pay a sum of up to $5,000 of each occurrence, including court costs, attorney's fees and costs of defense for Bodily Injury or Property Damage to the extent losses payable under the CCIP General Liability Policy are attributable to Subcontractor's Work, acts or omissions, or the Work, acts or omissions of any of any other entity or party for whom Subcontractor may be contractually or legally responsible.
14. Acknowledge that Turner shall pay the costs of premiums for the CCIP coverages on behalf of all Enrolled Parties and will receive or pay, as the case may be, all adjustments to such costs, whether by way of dividends, retroactive adjustments, return premiums, other moneys due, audits or otherwise. Accordingly, each Subcontractor and each of its Sub-Subcontractors agrees to assign to Turner the right to receive all such adjustments.
15. Subcontractors are required within 24 hours to report a claim or incident to the Turner Site Designated Person; failure to do so may result in a $5,000 penalty.

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Section 4

Enrollment Procedures

The application for Enrollment is required to be completed online via Wrapworks. Section 2 of this Manual provides the Project's Wrap Administrator's contact information should you require or need assistance. It's important to note that **Enrollment is NOT automatic.**

Each Subcontractor and Sub-Subcontractor shall provide details about its Sub-Subcontractors as necessary during the CCIP enrollment. The information requested on the online application for Enrollment is mandatory for Enrollment. The online application must be completed through Wrapworks and CCIP coverage subsequently confirmed by the Wrap Administrator, prior to mobilization or the start of Work to obtain CCIP Coverage.

A separate online application for Enrollment is required for each eligible Sub-Subcontractor of any tier that performs Work at the Project Site.

The Wrap Administrator will issue each Enrolled Party a Welcome Letter and a CCIP Certificate of Insurance acknowledging acceptance of the applicant into the CCIP.

Late Enrollments/Late Reports

Should the insurance carrier(s) or any regulatory agency assess a fine or penalty for late enrollment and/or late reporting, Turner reserves the right to assess these fines to the Subcontractor. This reservation of rights applies whether fines and/or penalties are due to a Subcontractor or any of its Sub-Subcontractors. If a fine or penalty is assessed to a Sub-Subcontractor, the Prime Tier Subcontractor is solely responsible for recovering the fine or penalty amount from its Sub-Subcontractor(s).

Identifying and Verifying Insurance Costs

Under the CCIP, Turner provides certain insurance (CCIP Coverage) for Enrolled Parties for Work performed at the Project Site and pays the premium for the CCIP Coverage. Accordingly each Enrolled Party will be required to identify their amount of insurance costs that were removed from their bid and submit copies of their policy documents to the Wrap Administrator for verification. The Wrap Administrator will provide the Enrolled Party with the insurance cost calculation once all documents have been provided. This is done by uploading all the required documents to Wrapworks.

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As part of the enrollment process eligible Subcontractors of any tier are required to upload insurance policy pages that document their coverage and insurance rates using Wrapworks. Required documentation includes the following pages from the Workers' Compensation, General Liability, and Excess or Umbrella policies:

- Declaration or Information Page
- Rate Page(s)
- Experience Modification Verification (Workers' Compensation only)

If the Subcontractor is "Self-Insured," and carries a deductible or declares a dividend credit for its Workers' Compensation and/or General Liability program, then the following must also be provided:

- Deductible Page(s)
- Summary- Five (5) Years of loss history for entities that retain losses
- Summary- Five (5) Years of audited payroll by annual total

Until each Subcontractor or Sub-Subcontractor submits all required documentation to enable verification and calculation of the Subcontractor of any tier's Insurance Cost, an Insurance Cost of up to but not greater than 10% of the contract value may be assigned by Turner. Failure to submit the required documentation may result in a higher Final Insurance Cost Adjustment (if applicable).

Payroll Reports

Each Enrolled Party is required to submit payroll and work hour information each month using Wrapworks. Enrolled Parties must report payroll expended at the Project Site for each applicable Workers' Compensation classification that was included in the Subcontractor's application for Enrollment.

A monthly payroll report must be submitted for each month, including months where there was zero payroll or work hours, until completion of the Work under each Subcontract. For those Subcontractors performing Work under multiple Contract Agreements, a separate monthly payroll report is required for each Subcontract.

The monthly payroll report should include reportable payroll for all CCIP qualified employees, including onsite supervisors and onsite clerical personnel. Please follow the required Statutory Guidelines in the state the project is located as to what is reportable.

This is in addition to any Federal, State or Local requirements for the project (i.e. LCP Tracker, Certified Payroll Reports, etc.).

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All payrolls submitted for this project should be excluded from the payroll submitted to your corporate insurance carrier(s) to avoid paying premiums for exposures covered by the Turner CCIP. The COI issued to you for coverage can be used to provide evidence of your enrollment in the Turner CCIP to your corporate insurance carriers.

Insurance Company Payroll Audit

Each Enrolled Party is required to maintain payroll records for each Subcontract. Such records must allocate payroll by Workers' Compensation classification(s). Please follow the required Statutory Guidelines in which the project is located. It is important that you properly classify payrolls, as these are reported to the Rating Bureau for promulgation of future experience modifiers for your firm.

All Enrolled Parties shall make available their:

- Books
- Vouchers
- Contracts
- Documents
- Payroll Records
- Prior Loss History Information
- Safety Records or History
- Certified Copies of Insurance Coverages
- Declaration Pages of Coverages
- Certificates of Insurance
- Underwriting Data
- Insurance Cost Information
- OSHA Citations

Or any other data/information as Turner, TSIB, CCIP Insurers including the CCIP Insurer Auditors, or other Turner Representatives may request in the administration or payroll audit of the CCIP, or as required by this Manual. Availability of records must be for a reasonable time during the policy period, any extension, or during a final audit period as required by the insurance policies.

Withholding of Payments

In the event a Turner audit of a Subcontractor's (of any tier) records reveal a discrepancy in the insurance, payroll, safety, or any other information required by the Contract Agreement, or reveals the inclusion of any Insurance Cost in any payment for the Work, Turner shall have the right to withhold or deduct from the Subcontract price all such Insurance Cost amounts. If the Subcontractor or its Sub-Subcontractor fail to timely comply with the provisions of this Manual, Turner may withhold any payments due Subcontractor and its Sub-Subcontractors until such time as they have met the requirements of the CCIP as outlined this Manual.

Failure to submit any information required by the CCIP may result in the withholding of payments by Turner until required documentation is received.

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Section 4

Insurance Requirements

A sample COI that includes the requirements for Waiver of Subrogation, Primary and Non-Contributory language, and Additional Insured status is provided at the end of this section of this CCIP Insurance Manual.

The additional insured endorsement utilized for the General Liability policy must provide coverage as broad as that available under the ISO CG 20 10 and CG 20 37 or their equivalent endorsement(s). The insurance obtained by the Subcontractors of all tiers shall not contain any Wrap-Up Exclusion or Wrap-Up Excess Endorsement that would bar or limit available coverage where the Subcontractor is not enrolled in the CCIP, or in instances where liability arises out of Work performed by an Enrolled Subcontractor away from the CCIP jobsite (i.e. offsite activities).

In the event that the law of the state in which the project is located (or another applicable law) limits the indemnity obligations of the Subcontractor, then the indemnity obligations of the Subcontractor shall be enforced to the fullest extent permitted by applicable law, and this Manual shall be read to conform to such law.

Insurance Requirements for Activities/Operations Not Insured Under the CCIP

Refer to your Contract Agreement for limits and coverages.

Workers' Compensation & Employer's Liability

Enrolled Parties will provide evidence of Workers' Compensation insurance coverage for all activities away from the Project Site.

Excluded Parties will provide evidence of Workers' Compensation insurance coverage for all activities at and away from the Project Site.

Coverage	Limits
Part One	
Workers' Compensation	Statutory Limit
Part Two	
Employer's Liability	Annual Limits
Bodily injury by Accident, each accident	$1,000,000
Bodily injury by disease, each employee	$1,000,000
Bodily injury by disease, policy limit	$1,000,000

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California Projects

The California Workers' Compensation Insurance Rating Bureau (WCIRB) routinely audits the insurers' use of limiting and restricting endorsements to ensure compliance with CA regulations. Title 10 of the California Code of Regulations requires insurers to obtain written documentation from the policyholder confirming that other coverage is in place (or is lawfully Uninsured/Self-Insured) for the employees, operations, and locations excluded by a limiting and restricting endorsement. The California WCIRB completes affirmation audits to ensure compliance with Title 10.

A limiting and restricting endorsement is defined under the California Code as *"an endorsement that excludes from coverage some portion of Workers' Compensation Liability for which the employer is required to secure payment pursuant to the Labor Code."* They include officer, operations, and location exclusions. For Enrolled Contractors, this is coverage away from the project site.

In order to comply with Title 10 of the California Code, if Enrolled, you must confirm existence of Workers' Compensation away from the Project Site by entering your current Workers' Compensation coverage information and checking the affirmation box in Wrapworks. If exempt, you must also check the affirmation box to verify you are lawfully Uninsured/Self-Insured.

General Liability/Umbrella or Excess Liability

Enrolled Parties shall provide evidence of General Liability insurance for offsite activities with Turner and other required parties named as Additional Insured (ISO CG 20 10 and CG 20 37 or their equivalent) to the policy. Coverage will apply away from the Project Site.

Excluded Parties shall provide evidence of General Liability insurance applicable to this Project Site and must name Turner and other required parties named as Additional Insured (ISO CG 20 10 and CG 20 37 or their equivalent) to their policy. Coverage will apply both onsite and offsite.

The required General Liability insurance shall include:

- Completed operations,
- Contractual liability insuring against the liability assumed herein
- Personal injury liability
- Broad form property damage (including completed operations), and explosion
- Collapse and underground hazards

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With the following minimum limits:

Primary Policy	Limits
Combined Single Limit	As stipulated in Article XXIV of the Contract Agreement, in the Invitation to Bid, or as otherwise instructed by Turner or your hiring Contractor.

Automobile Liability

Any Auto $1,000,000 Combined Single Limit (CSL).

Property Insurance

The CCIP does not provide coverage for Subcontractor's or Sub-Subcontractor's personal property. Subcontractors of any tier must provide their own insurance for owned, leased, rented and borrowed equipment, whether such equipment is located at a Project Site or in transit. Subcontractors of any tier are solely responsible for any loss or damage to their personal property including, without limitation, property or materials created or provided under the Contract Agreement or Sub-Contract Agreement until installed at the Project Site, Subcontractor tools and equipment, scaffolding and temporary structures.

Other Insurance

Refer to your Contract Agreement for any other project-specific insurance, such as, but not limited to:

- Watercraft and Aircraft Liability
- Professional Liability
- Pollution Liability

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Section 5

Claims Procedures

Please direct all claims related questions to the Turner Claims Coordinator/Claims Manager or Program Manager listed in Section 2.

General Procedures

Subcontractors and Sub-Subcontractors (of any tier) must immediately report, within 24 hours, all accidents and occurrences of any type, including near misses, to the Site Designated Person.
While all injuries and property damage must be reported immediately, the following list identifies losses which could represent substantial exposure. It is essential that the Site Designated Person be notified immediately of the following events so that a comprehensive investigation can be initiated at once:

- Any injury for which an ambulance is called
- Injury to head or neck
- Possible injury to back or spinal cord
- Unconscious employee
- Possible blindness
- Amputation of limbs
- Fatality
- Heart attack or stroke
- Hospitalization
- Property damage estimated over $1,000
- Near Misses

Subcontractors may be assessed a $5,000 penalty for any claim not reported immediately or within 24 hours of occurrence.

Any involved party should not voluntarily admit liability or responsibility and should cooperate with Turner and the CCIP Insurer Representatives in the accident investigation. The accident should not be discussed with anyone other than Turner Personnel, CCIP Insurer Representatives, or Legal Counsel retained on Turner's and/or the Enrolled Party's behalf.

Turner's Return to Work Program

For information regarding Turner's Return to Work Program, specific claim forms, accident investigation forms, and the Authorization for the Release of Protected Health Information, please refer to the Project's Site Specific Safety Manual for further details.

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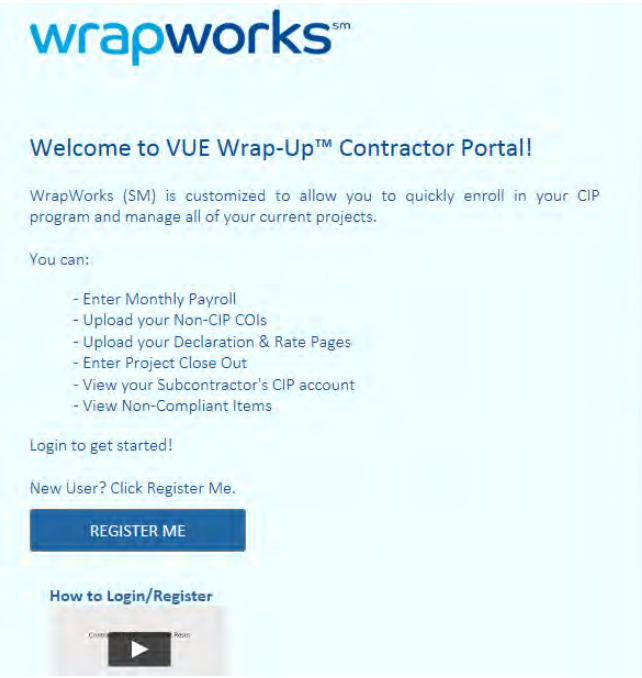
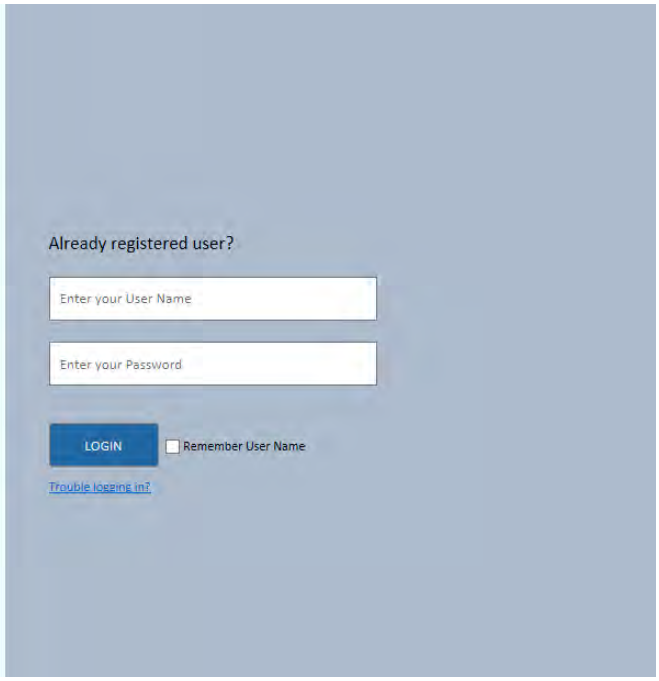
Contractor Portal Instructions

Wrapworks, the Contractor Portal Web Address is: https://wrapup.vuewrapup.com/contractorportal

Notes:

- Everything **must be uploaded**.
- Please have your documents in hand and ready to upload - This will speed up the process. This includes your:
  - Rate Pages from your Workers' Compensation, General Liability, and Excess/Umbrella Policies
  - Deductible Endorsement (if applicable)
  - Non-CCIP Certificate of Insurance (offsite COI)
  - Required Endorsements
- If you know your User ID and Password, then please proceed.
- If you do not have one, then click on **"Register Me".**
  - You will need to know your Federal ID (with the dash).
  - Your User ID and Password information will be emailed to you.





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Section 6

CCIP Workflow Steps

Enrollment into the CCIP Program is NOT automatic.

1
- General Contractor (GC) distributes the CCIP Manual to the Prime Contractor (Prime Tier) as a Contract Document.
- GC enters Prime Tier's Notice of Award (NOA) information into Wrapworks.

2
- Prime Tier logs into Wrapworks & completes the online Enrollment. Excluded Contractors skip to upload Non-CCIP COI with endosements.
- Enrolled Prime Tiers need to upload all required documents (including Rate Pages & Non-CCIP COI).
- Going forward, Prime Tiers submits monthly payroll reports.

3
- Prime Tiers then enter all of their Subcontractors' (Lower Tier) contract information into Wrapworks, including correct FEIN and contact information.
- Lower Tier completes Enrollment, uploads required documents (including Rate Pages).
- Going forward, Lower Tier submits monthly payroll reports.

4
- All Lower Tiers (of any tier) follow the same procedures as the Prime Tier.

5
- Once TSIB confirms the Enrollment, a Welcome Letter & COI providing Proof of Coverage under the CCIP is sent to the Enrolled Party.
- Enrolled Parties shold advise their Broker/Agent of the coverages that are being provided by the CCIP.
- TSIB will verify the Insurance Costs and Non CCIP COI (if applicable).
- TSIB will monitor each Enrolled Party's CCIP contract for compliance and notify the Enrolled Contractor of any missing information.

6
- Once your work is complete, please submit the close out data & sign via Wrapworks.

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Sample- Certificate of Insurance

Upload to Wrapworks or Email to COI@wrapworks.net.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:
Insurance Agency's/Brokerage's Name And Address	PHONE (A/C, No, Ext): / FAX (A/C, No):
	E-MAIL ADDRESS:
	PRODUCER CUSTOMER ID #:
INSURED	INSURER(S) AFFORDING COVERAGE / NAIC #
Subcontractor's Name and Address	INSURER A:
	INSURER B:
	INSURER C:
	INSURER D:
	INSURER E:

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	X COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE	
	CLAIMS-MADE X OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	As required by Agreement
	GEN'L AGGREGATE LIMIT APPLIES PER:	A	A	Policy Number			MED EXP (Any one person)	
	POLICY X PROJECT LOC						PERSONAL & ADV INJURY	
	OTHER						GENERAL AGGREGATE	
							PRODUCTS - COMP/OP AGG	
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$1,000,000
	X ANY AUTO						BODILY INJURY (Per person)	
	X OWNED AUTOS ONLY SCHEDULED AUTOS	X	X	Policy Number			BODILY INJURY (Per accident)	
	X HIRED AUTOS ONLY X NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per Accident)	
	X UMBRELLA LIAB OCCUR						EACH OCCURRENCE	As required by Agreement
	EXCESS LIAB CLAIMS-MADE	X	X	Policy Number			AGGREGATE	
	DED RETENTION $						PRODUCTS - COMP/OP AGG	
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y/N						X PER STATUTE X OTH ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? N	N/A	X	Policy Number			E.L. EACH ACCIDENT	$1,000,000
	(Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE EACH EMPLOYEE	$1,000,000
							E.L. DISEASE POLICY LIMIT	$1,000,000
	OTHER: EQUIPMENT FLOATER			Policy Number			Limit equal to Full Coverage of Subcontractor's owned or rented machinery, equipment, tools, & temporary structures not designed to become a permanent part of the Work	

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach Additional Remarks Schedule if more space is required):

All projects involving Turner Construction Company, its wholly owned subsidiaries or parent organization. Additional Insureds include: Turner Construction Company and all other parties as required by any written agreement. In the event that the project is a CCIP in which we are enrolled, then Workers' Compensation and General Liability shall apply only to offsite operations.

Additional Insureds are on a Primary and Non-contributing basis on the General Liability (ISO endorsement CG 20 10 07 04 and CG 20 37 07 04 or their equivalent), Automobile and Excess/Umbrella Liability Policies. Waiver of Subrogation in favor of Additional Insureds applies to all policies.

CERTIFICATE HOLDER	CANCELLATION
Turner Construction Company c/o Turner Surety and Insurance Brokerage, Inc. EMAIL TO: COI@WRAPWORKS.NET Attention: Wrap Administrator	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE

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Sample- Endorsements

Below are examples of Additional Insured Endorsements for General Liability:

- The first is the CG 20 10, which provides coverage during your time on the Project Site.
- The second is the CG 20 37, which provides coverage after your work has been completed.

POLICY NUMBER:

COMMERCIAL GENERAL LIABILITY
CG 20 10 07 04

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – SCHEDULED PERSON OR ORGANIZATION

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s):	Location(s) Of Covered Operations
As required by contract	As required by contract
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. Section II – Who Is An Insured is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by:

1. Your acts or omissions; or
2. The acts or omissions of those acting on your behalf.

POLICY NUMBER:

COMMERCIAL GENERAL LIABILITY
CG 20 37 07 04

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – COMPLETED OPERATIONS

This endorsement modifies insurance provided under the following

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s):	Location And Description Of Completed Operations
As required by contract	As required by contract
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

Section II – Who Is An Insured is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury" or "property damage" caused, in whole or in part, by "your work"

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Sample- Rate Pages

Below are examples of Rate Pages or Declarations Pages from various policies. **Please make sure that all premiums, modifiers, and exposure bases are clearly defined and left on the pages.** This also includes if your Excess or Umbrella Policy is a flat rate.

Workers' Compensation

NCCI Co. No. [redacted] | From 03/09/2020 To 12/15/2020 12:01 am Standard Time at Insured's Mailing Address

Workers Compensation and Employers Liability Insurance Policy Information Page

EXTENSION OF INFORMATION PAGE State: KENTUCKY

ITEM 4 The premium for this policy will be determined by our Manuals of Rules, Classifications, Rates and Rating Plans. All information required below is subject to verification and change by audit.

Classifications	Code No.	Premium Basis - Total Estimated Annual Remuneration	Rate per $100 of Remuneration	Estimated Annual Premium
Machinery Or Equipment Erection Or Repair NOC & Drivers	3724	10,000.00	5.03	
Premium for Increased Limits Part Two	9812		1.1000	
Total Subject Premium				
Premium Modified to Reflect Experience Mod. Of	9898		.740	
Total Estimated Annual Standard Premium				
Expense Constant	0900			
Terrorism	9740	10,000.00	.02	
Catastrophe (Other than Certified Acts of Terror.)	9741	10,000.00	.02	
Total Estimated Annual Premium				
Assessment (KY)	0935		6.4100	
Total Estimated Cost				

General Liability

COMMON POLICY DECLARATIONS

Renewal of Number: [redacted]

Underwritten by: Scottsdale Insurance Company
Home Office:
One Nationwide Plaza • Columbus, Ohio 43215
Administrative Office:
8877 North Gainey Center Drive • Scottsdale, Arizona 85258
1-800-423-7675 • A Stock Company

Policy Number: [redacted]

ITEM 1. NAMED INSURED AND MAILING ADDRESS
[redacted]

AGENT NAME AND ADDRESS
[redacted]

Agent No.: [redacted] Program No.: NONE

ITEM 2. POLICY PERIOD From: 01-01-2020 to: 01-01-2021 Term: 1 Year
12:01 A.M., Standard Time at the mailing address shown in ITEM 1.

Business Description: MILLWRIGHT OPERATIONS

In return for the payment of the premium, and subject to all the terms of this policy, we agree with you to provide the insurance as stated in this policy. This policy consists of the following coverage parts for which a premium is indicated. Where no premium is shown, there is no coverage. This premium may be subject to adjustment.

Coverage Part(s)	Premium Summary
Commercial General Liability Coverage Part	$ [redacted]

COMPOSITE RATE ENDORSEMENT

The advance premium for the following coverage(s) ALL COVERAGES is an estimated premium subject to audit. Upon termination of this policy, the earned premium, subject to the minimum policy premium, shall be computed as follows:

Code No.	Rate	Premium Basis	Advance Premium
97222	[redacted]	PER $1,000 RECEIPTS	$ INCLUDED
			$

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Excess Liability

DECLARATIONS
COMMERCIAL EXCESS LIABILITY POLICY

[redacted] Renewal of Number

SCOTTSDALE INSURANCE COMPANY*
Home Office:
One Nationwide Plaza Columbus, Ohio 43215
Administrative Office:
8877 North Gainey Center Drive Scottsdale, Arizona 85258
1-800-423-7675
A STOCK COMPANY

Policy Number: [redacted]

ITEM 1. NAMED INSURED AND MAILING ADDRESS: [redacted]

AGENT NAME AND ADDRESS: [redacted]

[redacted] No. NONE

ITEM 2. POLICY PERIOD: From 01-01-2020 To 01-01-2021
12:01 A.M. Standard Time at your mailing address.

In return for the payment of the premium, and subject to all the terms of this policy, we agree to provide you with the insurance as stated in this policy.

ITEM 3. THE NAMED INSURED IS: [ ] Individual [ ] Partnership [X] Corporation [ ] Joint Venture [ ] Other

ITEM 4. LIMIT OF INSURANCE:

A. Each Occurrence $ 1,000,000

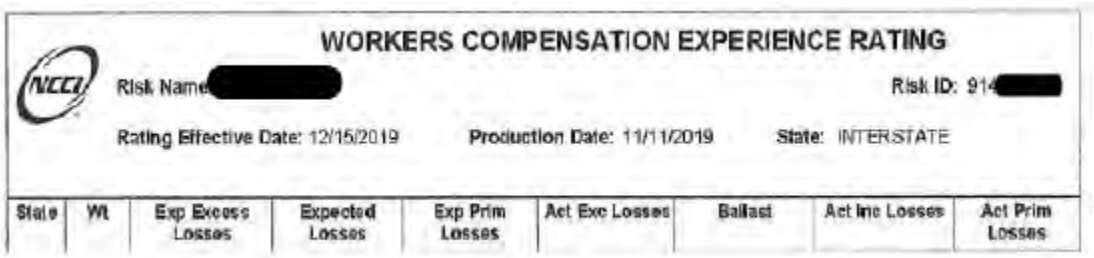
B. Aggregate $ 3,000,000

ITEM 5. SCHEDULE OF CONTROLLING UNDERLYING INSURANCE:
See Schedule of Controlling Underlying Insurance

ITEM 6. PREMIUM COMPUTATION:
[redacted] 1.50 / 1000 of 1st $ [redacted]
Subject to Adjustment
Estimated Deposit Premium $ $5,000

Sample- Risk ID

A Risk ID is a number that is given to you by a Rating Bureau. The anniversary rating date is the end of your Workers' Compensation policy term. Examples of Rating Bureaus are: NCCI, Ohio Bureau WC, WCIRB, NJCrib, etc.



WORKERS COMPENSATION EXPERIENCE RATING

Risk Name [redacted] Risk ID: 914[redacted]

Rating Effective Date: 12/15/2019 Production Date: 11/11/2019 State: INTERSTATE

State	Wt	Exp Excess Losses	Expected Losses	Exp Prim Losses	Act Exc Losses	Ballast	Act Inc Losses	Act Prim Losses

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Section 7

Online Resources

TSIB has created a variety of online materials if you need further assistance.

Tutorial Videos

Click each link below to view a step-by-step video to help navigate TSIB's Contractor Portal, Wrapworks:

- How to Submit CCIP Payroll
- How to Close Out of your CCIP Contract

wrapworks®

If you have additional questions, please reach out to the Project's Wrap Administrator listed on pg. 4.

FAQ

To view the Frequently Asked Questions, click here.

Blogs

What You Need To Know About Risk ID
3 Questions To Ask On A Wrap-Up
4 Tips About Wrap-Up Payroll
Why is Off-Site Coverage Required on Wrap-Up?
Why is an Excess Credit Taken on a Wrap-Up?
The Differences between Certified Payroll and Wrap-Up Payroll
3 Reasons Why Wrap-Up Programs Benefit Trade Contractors

Additional Resources

A General Guide to Surety Bonds
Employee Benefits Programs for Contractors
How A Captive Can Benefit Your Business

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University of Kentucky

Tree Protection Standards

010000S02 Tree Protection Standards

Dated: 05/2017
Applies to: All Projects
University of Kentucky

Article 56 is in addition to, and takes precedence over the provisions of the Special Conditions for the Project.

ARTICLE 56
PART 1 –GENERAL

56.1.1 SUMMARY

A. The scope of work includes all labor, materials, tools, equipment, facilities, transportation and services necessary for, and incidental to performing all operations in connection with protection of existing trees and other plants as shown on the drawings and as specified herein.

1. Provide preconstruction evaluations and Arborist Report.
2. Provide tree and plant protection fencing.
3. Provide protection of root zones and above ground tree parts and plants.
4. Provide pruning of existing trees and plants.
5. Provide all insect and disease control.
6. Provide maintenance of existing trees and plants including irrigation during the construction period as recommended by the Arborist Report.
7. Provide maintenance of existing trees and plants including irrigation during the post construction plant maintenance period.
8. Remove tree protection fencing and other protection from around and under trees and plants.
9. Clean up and disposal of all excess and surplus material.

56.1.2 CONTRACT DOCUMENTS

A. Shall consist of specifications, general conditions and the drawings. The intent of these documents is to include all labor, materials, and services necessary for the proper execution of the work. The documents are to be considered as one. Whatever is called for by any parts shall be as binding as if called for in all parts.

B. It is the intent of this section that the requirements apply to all sections of the project specification such that any trade contractor must comply with the restrictions on work within designated Tree and Plant Protection Areas.

56.1.3 RELATED DOCUMENTS AND REFERENCES

A. Related Documents:

1. Drawings and general provisions of contract including general and supplementary conditions and Division I specifications apply to work of this section.
2. Section -Planting Soil
3. Section -Irrigation
4. Section -Planting
5. Section –Lawn

B. References: The following specifications and standards of the organizations and documents listed in this paragraph form a part of the specification to the extent required by the references thereto. In the event that the requirements of the following referenced standards and specification conflict with this specification section the requirements of this specification shall prevail. In the event that requirements of any of the following referenced standards and specifications conflict with each other the more stringent requirement shall prevail.

1. ANSI A 300 (Part 5) – Standard Practices for Tree, Shrub and other Woody Plant Maintenance, Management of Trees & Shrubs During Site Planning, Site Development & Construction. Most current editions.
2. ANSI A 300 (Part 1) – Standard Practices for Tree, Shrub and other Woody Plant Maintenance, Pruning. Most current editions.
3. ANSI Z133 Safety Requirements for Arboricultural Operations.
4. Glossary of Arboricultural Terms, International Society of Arboriculture, Champaign IL, most current edition.

56.1.4 VERIFICATION

A. All scaled dimensions on the drawings are approximate. Before proceeding with any work, the Trade Contractor shall carefully check and verify all dimensions and quantities, and shall immediately inform the Owner's Representative of any discrepancies between the information on the drawings and the actual conditions, refraining from doing any work in said areas until given approval to do so by the Owner's Representative.

56.1.5 PERMITS AND REGULATIONS

A. The Trade Contractor shall obtain and pay for all permits related to this section of the work unless previously excluded under provision of the contract or general conditions. The Trade Contractor shall comply with all laws and ordinances bearing on the operation or conduct of the work as drawn and specified. If the Trade Contractor observes that a conflict exists between permit requirements and the work outlined in the contract documents, the Trade Contractor shall promptly notify the Owner's Representative in writing including a description of any necessary changes and changes to the contract price resulting from changes in the work.

B. Wherever references are made to standards or codes in accordance with which work is to be performed or tested, the edition or revision of the standards and codes current on the effective date of this contract shall apply, unless otherwise expressly set forth.

C. In case of conflict among any referenced standards or codes or between any referenced standards and codes and the specifications, the more restrictive standard shall apply or Owner's Representative shall determine which shall govern.

56.1.6 PROTECTION OF WORK, PROPERTY AND PERSON

A. The Trade Contractor shall protect the work, adjacent property, and the public, and shall be responsible for any damages or injury due to his/her actions.

56.1.7 CHANGES IN THE WORK

A. The Owner's Representative may order changes in the work, and the contract sum should be adjusted accordingly. All such orders and adjustments plus claims by the Trade Contractor for extra compensation must be made and approved in writing before executing the work involved.

56.1.8 DEFINITIONS

All terms in this specification shall be as defined in the "Glossary of Arboricultural Terms" or as modified below.

A. Owner's Representative: The person appointed by the Owner to represent their interest in the Tree and Plant Protection and approval of the work and to serve as the contracting authority with the Trade Contractor. The Owner's Representative may appoint other persons to review and approve any aspects of the work.

B. Reasonable and Reasonably: When used in this specification is intended to mean that the conditions cited will not affect the establishment or long term stability, health or growth of the plant. This specification recognizes that plants are not free of defects, and that plant conditions change with time. This specification also recognizes that some decisions cannot be totally based on measured findings and that professional judgment is required. In cases of differing opinion, the Owner's Representative expert shall determine when conditions within the plant are judged as reasonable.

C. Shrub: Woody plants with mature height approximately less than 25 feet.

D. Tree and Plant Protection Area: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and defined by a circle centered on the trunk with each tree with a radius equal to the crown dripline unless otherwise indicated by the owner's representative.

E. Tree: Single and multi-stemmed plants with anticipated mature height approximately greater than 25 feet or any plant identified on the plans as a tree.

56.1.9 SUBMITTALS

A. ARBORIST REPORT: Prior to the start of construction, submit, for approval by the Owner's Representative, the report of a consulting arborist who is a Registered Consulting Arborist® (RCA) with American Society of Consulting Arborists or an ISA Board Certified Master Arborist, which details the following information for all trees to remain within the area designated on the drawings as the Tree and Plant Protection Area. The report shall include the following:

1. A description of each tree to protect indicating the following:
    a. Genus and species
    b. Condition including any visible damage to the root system or soil within the root zone
    c. Tree diameter at 4.5 feet above grade
    d. Tree height
    e. Crown width
    f. Any visible disease and/or insect infestations
    g. Branch and/or trunk structural deficiencies.
    h. Appraisal of value
    i. Appraisal of benefits (storm water interception, heating/cooling, carbon sequestration)
2. The report shall note all trees or parts of trees, which are considered a hazard or significant or extreme risk level. Include the International Society of Arboriculture Tree Risk Assessment evaluation sheet for each tree, which may reasonably be identified as a potential hazard tree.
3. Recommendations as to treatment of all insect, disease and structural problems encountered.
4. Recommendations for fertilizer treatments, if any.
5. A plan of the site showing the location of all trees included in the report.

B. PRODUCT DATA: Submit manufacturer product data and literature describing all products required by this section to the Owner's Representative for approval. Provide submittal four weeks before the start of any work at the site.

C. QUALIFICATIONS SUBMITTAL: For each applicable person expected to work on the project, provide copies of the qualifications and experience of the Consulting Arborist, proof of either the registered Consulting Arborist® (RCA) with American Society of Consulting Arborists or an ISA Board Certified Master Arborist and any required Herbicide/Pesticide license to the Owner's Representative, for review prior to the start of work.

56.1.10 OBSERVATION OF THE WORK

A. The Owner's Representative may inspect the work at any time.

56.1.11 PRE-CONSTRUCTION CONFERENCE

A. Schedule a pre-construction meeting with the Owner's Representative at least seven (7) days before beginning work to review any questions the Trade Contractor may have regarding the work, administrative procedures during construction and project work schedule.

1. The following Contractors shall attend the preconstruction conference:

a. Construction Manager.

b. Consulting Arborist.

c. Trade contractor assigned to install Tree and Plant Protection measures.

d. Earthwork trade contractor.

e. All site utility trade contractors that may be required to dig or trench into the soil.

f. Landscape trade contractor.

g. Irrigation trade contractor

B. Prior to this meeting, mark all trees and plants to remain and or be removed as described in this specification for review and approval by the Owner's Representative.

56.1.12 QUALITY ASSURANCE

A. Contractor qualifications:

1. All pruning, branch tie back, tree removal, root pruning, and fertilizing required by this section shall be performed by or under the direct supervision of an ISA Certified Arborist. Submit aforementioned individual's qualifications for approval by the Owner's Representative.

2. All applications of pesticide or herbicide shall be performed by a person maintaining a current state license to apply chemical pesticides valid in the jurisdiction of the project. Submit copies of all required state licensing certificates including applicable chemical applicator licenses.

56.1.13 DAMAGE OR LOSS TO EXISTING PLANTS TO REMAIN

A. Specimen trees within or adjacent to construction areas will be identified by the Owner's Representative and the Architect, and marked with green tags. Loss of any of these trees will result in fines assessed at a minimum of $10,000 (or higher appraised amount that may be determined by the University prior to construction) per tree. Damage to all other trees on the property will be assessed at the rate of $200 per diameter inch of the tree measured 4.5' above grade.

B. Any trees or plants designated to remain and which are damaged by the Trade Contractor

shall be replaced in kind by the Trade Contractor at their own expense in addition to fines and penalties.

Tree(s) shall be replaced with a tree(s) of similar species and equivalent trunk diameter to the tree(s) being replaced. For example, if a 20" diameter tree is to be replaced, the Trade Contractor can provide ten (10) two inch diameter trees. Depending on site accommodations and landscape design, the replacement trees may be installed outside of the project site as directed by the Owner's Representative. Shrubs shall be replaced with a plant of similar species and equal size or the largest size plants reasonably available whichever is less. Where replacement plants are to be less than the size of the plant that is damaged, the Owner's Representative shall approve the size and quality of the replacement plant.

1. All trees and plants shall be installed per the requirements of Specification Section Planting.

C. Plants that are damaged shall be considered as requiring replacement or appraisal in the event that the damage affects more than 25 % of the crown, 25% of the trunk circumference, or root protection area, or the tree is damaged in such a manner that the tree could develop into a potential hazard. Trees and shrubs to be replaced shall be removed by the Trade Contractor at his own expense.
    1. The Owner's Representative may engage an independent arborist to assess any tree or plant that appears to have been damaged to determine their health or condition.
D. Any tree that is determined to be dead, damaged or potentially hazardous by the Owner's arborist and upon the request of the Owner's Representative shall be immediately removed by the Trade Contractor at no additional expense to the owner. Tree removal shall include all clean-up of all wood parts and grinding of the stump to a depth sufficient to plant the replacement tree or plant, removal of all chips from the stump site and filling the resulting hole with topsoil.
E. Any remedial work on damaged existing plants recommended by the Consulting Arborist shall be completed by the Trade Contractor at no cost to the owner. Remedial work shall include but is not limited to: soil compaction remediation and vertical mulching, pruning and or cabling, insect and disease control including injections, compensatory watering, additional mulching, and could include application tree growth regulators (TGR). Any remedial work is to be performed by an ISA Certified Arborist, ISA Board Certified Master Arborist or a Registered Consulting Arborist.
F. Remedial work may extend up to two years following the completion of construction to allow for any requirements of multiple applications or the need to undertake applications at required seasons of the year.

56.1.14 LOSS OF TREES DUE TO CONSTRUCTION FOOT PRINT

A. Any trees or plants designated as removals to accommodate construction shall be replaced. Tree(s) shall be replaced with a tree(s) of similar species and equivalent trunk diameter to the tree(s) removed. For example, if a 20" diameter tree is removed, the Trade Contractor can provide ten (10) two inch diameter trees. Depending on site accommodations and landscape design, the replacement trees may be installed outside of the project site as

directed by the Owner's Representative. Shrubs shall be replaced with a plant of similar species and equal size or the largest size plants reasonably available whichever is less.

PART 2 –PRODUCTS

56.2.1 MULCH

The coarse grade Mulch specified here is considered superior for its water retention and soil building properties in areas of tree and shrub roots when irrigation is drip, bubblers or flood methods.

A. Mulch shall be coarse, ground, from tree and woody brush sources. The minimum range of fine particles shall be 3/8 inch or less in size and a maximum size of individual pieces shall be approximately 1 to 1-1/2 inch in diameter and maximum length of approximately 4 to 8 inches. No more that 25% of the total volume shall be fine particles and no more than 20% of total volume be large pieces. Mulch will be applied to a depth of 3 to 5 inches. Mulch shall not come into contact with the tree trunk.

1. It is understood that Mulch quality will vary significantly from supplier to supplier and region to region. The above requirements may be modified to conform to the source material from locally reliable suppliers as approved by the Owner's Representative.

B. Submit supplier's product data that product meets the requirements and two-gallon sample for approval.

56.2.2 WOOD CHIPS

A. Wood Chips from an arborist chipping operation with less than 20% by volume green leaves. Chips stockpiled from the tree removal process may be used. Mulch will be applied to a depth of 5 to 8 inches. Mulch shall not come into contact with the tree trunk.

56.2.3 TREE PROTECTION FENCING

A. Chain link fencing shall be installed around all existing trees to remain. Fencing shall be 6' tall galvanized nine gauge, with 3" end and line post and 1" minimum top rails, and bottom tension wire a maximum of 3" off the ground. Post shall be driven into the ground and spacing shall not exceed 8 feet.

6 feet tall metal chain link fence set in metal frame panels on movable core drilled concrete blocks of sufficient size to hold the fence erect in areas of existing paving to remain.

B. Orange plastic fencing shall be installed on the outside of the chain link fencing to provide high visibility.

C. GATES: For each fence type and in each separate fenced area, provide a minimum of one 3-foot-wide gate. Gates shall be lockable. The location of the gates shall be approved by the Owner's Representative.

D. Submit supplier's product data that product meets the requirements for approval.

56.2.4 TREE PROTECTION SIGN

A. Heavy-duty laminated or all weather signs, 11 inches x 17 inches, white colored background with black 2 inch high or larger block letters. The signs shall be attached to the tree protection fence every 50 feet. The tree protection sign shall read:

"Tree Protection Area - Keep Out"

The following information shall also be included on the sign:

i. Genus and species
ii. Tree diameter
iii. Tree height
iv. Appraised value of tree
v. Benefits provided
    1. Storm water interception in gallons
    2. Carbon sequestration in pounds
    3. Energy Savings

56.2.5 TREE (Plant) GROWTH REGULATOR (TGR/PGR)

A. Active ingredient Paclobutrazol i.e. (ShortStop, Cambistat 25C, Profile 2SC or other)

B. Submit supplier's product data that product meets the requirements for approval.

56.2.6 SOIL & ROOT PROTECTION

On projects where the tree protection fencing cannot be installed to create the desired protection zone.

A. Matting for vehicle and work protection shall be heavy duty matting designed for vehicle loading over tree roots, Alturnamats as manufactured by Alturnamats, Inc. Franklin, PA 16323 or approved equal.

B. 1/2"Steel plates - Following the recommendations of the project arborist steel plates shall be installed to protect the roots from Construction activities.

C. Submit suppliers' product data that product meets the requirements for approval.

56.2.7 GEOGRID

A. Geogrid shall be woven polyester fabric with PVC coating, Uni-axial or biaxial geogrid, inert to biological degradation, resistant to naturally occurring chemicals, alkalis, acids.

Manufacturers: GSE Environmental, TenCate, Terram

B. Submit suppliers' product data that product meets the requirements for approval.

56.2.8 GEOTEXTILE

A. Geotextile shall be nonwoven polypropylene fibers, inert to biological degradation and resistant of naturally occurring chemicals, alkalis and acids.

Manufacturers: GSE Environmental, TenCate, Terram

B. Submit supplier's product data that product meets the requirements for approval.

PART 3 –EXECUTION

56.3.1 SITE EXAMINATION

A. Examine the site, tree, plant and soil conditions. Notify the Owner's Representative in writing of any conditions that may impact the successful Tree and Plant Protections that is the intent of this section.

56.3.2 COORDINATION WITH PROJECT WORK

A. The Trade Contractor shall coordinate with all other work that may impact the completion of the work.

B. Prior to the start of Work, prepare a detailed schedule of the work for coordination with other trades.

C. Coordinate the relocation of any irrigation lines currently present on the irrigation plan, heads or the conduits of other utility lines or structures that are in conflict with tree locations. Root balls shall not be altered to fit around lines. Notify the Owner's Representative of any conflicts encountered.

56.3.3 TREE AND PLANT PROTECTION AREA

A. The Tree and Plant Protection Area is defined as all areas indicated on the tree protection plan. Where no limit of the Tree and Plant Protection area is defined on the drawings, the limit shall be the drip line (outer edge of the branch spread) of each tree.

56.3.4 PREPARATION

A. Prior to the preconstruction meeting, layout the limits of the Tree and Plant Protection Area and then alignments of required Tree and Plant Protection Fencing and root pruning. Obtain the Owner's Representative's approval of the limits of the protection area and the alignment of all fencing and root pruning.

B. Flag all trees and shrubs to be removed by wrapping blue plastic ribbon around the trunk and obtain the Owner's Representative's approval of all trees and shrubs to be removed prior to the start of tree and shrub removal. After approval, mark all trees and shrubs to be removed with blue paint in a band completely around the base of the shrub(s) and around the trunk of the tree(s) 4.5 feet above the ground.

C. Flag all trees and shrubs to remain with green plastic ribbon tied completely around the trunk or each tree and on a prominent branch for each shrub. Obtain the Owner's Representative's approval of all trees and shrubs to remain prior to the start of tree and shrub removal.

D. Prior to any construction activity at the site including utility work, grading, storage of materials, or installation of temporary construction facilities, install all tree protection fencing, Geotextile Fabric, silt fence, tree protection signs, Geogrid, Mulch and or Wood Chips as shown on the drawing.

56.3.5 SOIL MOISTURE

A. Volumetric soil moisture level, in all soils within the Tree and Plant Protection Area shall be maintained above permanent wilt point to a depth of at least 8 inches. No soil work or other activity shall be permitted within the Tree and Plant Protection Area when the volumetric soil moisture is above field capacity. The permanent wilt point and field capacity for each type of soil texture shall be defined as follows (numbers indicate percentage volumetric soil moisture).

Soil Type	Permanent wilt point v/v	Field Capacity v/v
Sand, Loamy sand, Sandy Loam	5-8%	12-18%
Loam, Sandy clay, Sandy clay loam	14-25%	27-36%
Clay loam, Silt loam	11-22%	31-36%
Silty clay, Silty clay loam	22-27%	38-41%

1. Volumetric soil moisture shall be measured with a digital, electric conductivity meter. The meter shall be the Digital Soil Moisture Meter, DSMM500 by General Specialty Tools and Instruments, or approved equivalent meter.

B. The Trade Contractor shall confirm the soil moisture levels with a moisture meter. If the moisture is too high, suspend operations until the soil moisture drains to below field capacity.

56. 3.6 ROOT PRUNING

A. Prior to any excavating into the existing soil grade within 25 feet of the limit of the Tree and Plant Protection Area or trees to remain, root prune all existing trees to a depth of 24 inches below existing grade in alignments following the edges of the Tree and Plant Protection Area or as directed by the Owner's Representative. Root pruning shall be in conformance with ANSI A300 Root Management Standard (part 8) latest edition.

1. Using an air excavation tool to expose roots within 2 feet of the limit of grading.

2. After completion of excavation, make clean cuts with a lopper, saw or pruner to sever roots so they will not be torn, ripped or damaged by the excavation, and backfill the trench immediately with existing soil, filling all voids.

56.3.7 INSTALLATION OF GEOGRIDS, GEOTEXTILE FABRICS, MATTING, WOOD CHIPS AND OR MULCH

A. Install geogrids, geotextile fabric, matting, wood chips and or mulch in areas and depths shown on the plans and details or as directed by the Owner's representative. In general, it is the intent of this specification to provide the following levels of protection:

1. All areas within the Tree and Plant Protection area provide a minimum of 5 inches of wood chips or mulch.

2. Areas where foot traffic or storage of lightweight materials is anticipated to be unavoidable provide a layer of Filter Fabric under the 5 inches of wood chips or mulch.

3. Areas where occasional light vehicle traffic is anticipated to be unavoidable, provide approved matting or a layer of geogrids under 8 inches of wood chips or mulch.

4. Areas where heavy vehicle traffic is unavoidable provide approved matting or a layer of geogrids under 8 -12 inches of wood chips or mulch and a layer of matting over the wood chips or mulch.

B. The Owner's Representative shall approve the appropriate level of protection.

C. In the above requirements, light vehicle is defined as a track skid steer with a ground pressure of 4 psi or lighter. A heavy vehicle is any vehicle with a tire or track pressure of greater than 4 psi. Lightweight materials are any packaged materials that can be physically moved by hand into the location. Bulk materials such as soil, or aggregate shall never be stored within the Tree and Plant Protection Area.

56.3.8 PROTECTION

A. Protect the Tree and Plant Protection Area at all times from compaction of the soil; damage of any kind to trunks, bark, branches, leaves and roots of all plants; and contamination of the soil, bark or leaves with construction materials, debris, silt, fuels, oils, and any chemicals substance. Notify the Owner’s Representative of any spills, compaction or damage and take corrective action immediately using methods approved by the Owner’s Representative.

56.3.9 GENERAL REQUIREMENTSAND LIMITATIONS FOR OPERATIONS WITHIN THE TREE AND PLANT PROTECTION AREA:

A. The Trade Contractor shall not engage in any construction activity within the Tree and Plant Protection Area without the approval of the Owner's Representative including: operating, moving or storing equipment; storing supplies or materials; locating temporary facilities including trailers or portable toilets and shall not permit employees to traverse the area to access adjacent areas of the project or use the area for lunch or any other work breaks. Permitted activity, if any, within the Tree and Plant Protection Area may be indicated on the drawings along with any required remedial activity as listed below.

B. In the event that construction activity is unavoidable within the Tree and Plant Protection Area, notify the Owner's Representative and submit a detailed written plan of action for approval. The plan shall include: a statement detailing the reason for the activity including why other areas are not suited; a description of the proposed activity; the time period for the activity, and a list of remedial actions that will reduce the impact on the Tree and Plant Protection Area from the activity. Remedial actions shall include but shall not be limited to the following:

1. In general, demolition and excavation within the drip line of trees and shrubs shall proceed with extreme care either by the use of hand tools, directional boring and or air excavation where indicated or with other low impact equipment that will not cause damage to the tree, roots or soil.

2. When encountered, exposed roots, 1 inches and larger in diameter shall be worked around in a manner that does not break the outer layer of the root surface (bark). These roots shall be covered in Wood Chips and shall be maintained above permanent wilt point at all times. Roots one inch and larger in diameter shall not be cut without the approval of the Owner's Representative. Excavation shall be tunneled under these roots without cutting them. In the areas where roots are encountered, work shall be performed and scheduled to close excavations as quickly as possible over exposed roots.

3. Tree branches that interfere with the construction may be tied back or pruned to clear only to the point necessary to complete the work. Other branches shall only be removed when specifically indicated by the Owner's Representative. Tying back or trimming of all branches and the cutting of roots shall be in accordance with accepted arboricultural practices (ANSI A300, parts 1 and 8) and be performed by or direct under supervision of an ISA Certified Arborist.

4. Matting: Install temporary matting over the Wood Chips or Mulch to the extent indicated. Do not permit foot traffic, scaffolding or the storage of materials within the Tree and Plant Protection Area to occur off of the temporary matting.

5. Trunk Protection: Protect the trunk of each tree to remain by covering it with a ring of 8-foot-long 2-inch x 6 -inch planks loosely banded onto the tree with 3 steel bands.

Staple the bands to the planks as necessary to hold them securely in place. Trunk protection may be kept in place no longer than 12 months. If construction requires work near a particular tree to continue longer than 12 months, the steel bands shall be inspected every six months and loosened if they are found to have become tight.

6. Air Excavation Tool: If excavation for footings or utilities is required within the Tree and Plant Protection Area, air excavation tool techniques shall be used where practical or as designed on the drawings.

a. Remove the Wood Chips from an area approximately 18 inches beyond the limits of the hole or trench to be excavated. Cover the Wood Chips for a distance of not less than 15 feet around the limit of the excavation area with Filter Fabric, tarp plastic sheeting to protect the Wood Chips from silt. Mound the Wood Chips so that the plastic slopes towards the excavation.

b. Using a sprinkler or soaker hose, apply water slowly to the area of the excavation for a period of at least 4 hours, approximately 12 hours prior to the work so that the ground water level is at or near field capacity at the beginning of the work. For excavations that go beyond the damp soil, rewet the soil as necessary to keep soil moisture near field capacity.

c. Using an air excavation tool specifically designed and manufactured for the intended purpose, and at pressures recommended by the manufacturer of the equipment, fracture the existing soil to the shape and the depths required. Work at rates and using techniques that do not harm tree roots. Air pressure shall be a maximum of 90-100 psi.

i. The air excavation tool shall be either the “Air-Spade” as manufactured by Division of Guardair Corporation 47 Veterans Drive Chicopee, MA 01022 (800)-482-7324, or Supersonic Air Knife as manufactured by Easy Use Air Tools, Inc. Allison Park, Pa (866) 328-5723 or approved equal.

d. Using a commercial, high-powered vacuum truck if required, remove the soil from the excavation produced by the Air Knife excavation. The vacuum truck should generally operate simultaneously with the hose operator, such that the soil produced is picked up from the excavation hole, and the exposed roots can be observed and not damaged by the ongoing operation. Do not drive the vacuum truck into the Tree and Plant Protection Area unless the area is protected from compaction as approved in advance by the Owner’s Representative.

e. Remove all excavated soil and excavated wood chips, and contaminated soil at the end of the excavation.

f. Schedule the work so that foundations or utility work is completed immediately after the excavation. Do not let the roots dry out. Mist the roots several times during the day. If the excavated area must remain open overnight, mist the roots and cover the excavation with black plastic.

g. Dispose of all soil in a manner that meets local laws and regulations.

h. Restore soil within the trench as soon as the work is completed. Utilize soil of similar texture to the removed soil and lightly compact with hand tools. Leave soil mounded over the trench to a height of approximately 10% of the trench depth to account for settlement.

i. Restore any geogrids, filter fabric, wood chips or mulch and or matting that was required for the area.

56.3.10 GRADING AND FILLING AROUND TREES

A. Maintain existing grade within drip line of trees. Any variance to this will be executed only after consultation and recommendation from the Campus Arborist.

B. Where existing grade is above new finish grade shown around trees, carefully hand excavate within drip line to new grade. Cut exposed roots approximately 3" below elevation of new finish grade. Engage an ISA certified Arborist to recommend procedures to compensate for loss of roots and to provide initial services such as pruning of branches and stimulation of root growth. Provide subsequent maintenance during contract period as recommended by the arborist. Provide Grounds Superintendent with typed instructions for recommended long range maintenance procedures to be followed after completion of construction operations.

C. For minor fills where the existing grade is 4" or less below elevation of finish grade shown, use a topsoil type fill material rich in organic matter and loamy in texture. Place in single layers not more than two inches at a time and do not compact.

D. Fills greater than four inches shall only be attempted after consultation with the Campus Arborist. Detailed shop drawings of proposed work shall be submitted and approved by the Campus Arborist prior to any work. A progress schedule shall be established to monitor the work.

56.3.11 TREE REMOVAL:

A. Tree removals shall be performed by ISA Certified Arborists and companies shall have appropriate licenses and insurance for tree removal operations.

B. Remove all trees indicated by the drawings and specifications, as requiring removal, in a manner that will not damage adjacent trees or structures or compacts the soil.

C. Remove trees that are adjacent to trees or structures to remain, in sections, to limit the opportunity of damage to adjacent crowns, trunks, ground plane elements and structures.

D. Do not drop trees with a single cut unless the tree will fall in an area not included in the Tree and Plant Protection Area and there are no underground utilities that may be damaged. No tree to be removed within 50 feet of the Tree and Plant Protection Area shall be pushed over or up-rooted using a piece of grading equipment.

E. Protect adjacent paving, soil, trees, shrubs, ground cover plantings and understory plants to remain from damage during all tree removal operations, and from construction operations. Protection shall include the root system, trunk, limbs, and crown from breakage or scarring, and the soil from compaction.

F. Remove stumps and immediate root plate from existing trees to be removed. Grind trunk bases and large buttress roots to a depth of the largest buttress root or at least 18 inches below the top most roots whichever is less and over the area of three times the diameter of the trunk (DBH).

1. For trees where the stump will fall under new paved areas, grind roots to a total depth of 18 inches below the existing grade. If the sides of the stump hole still have greater than approximately 20% wood visible, continue grinding operation deeper and or wider until the resulting hole has less than 20% wood. Remove all wood chips produced by the grinding operation and back fill in 8 inch layers with controlled fill of a quality acceptable to the site engineer for fill material under structures, compacted to 95% of the maximum dry density standard proctor. The Owner's Representative shall approve each hole at the end of the grinding operation.

2. In areas where the tree location is to be a planting bed or lawn, remove all woodchips and backfill stump holes with planting soil as defined in Specification Section Planting Soil, in maximum of 12 inch layers and compact to 80-85% of the maximum dry density standard proctor.

G. Wood salvaged for up cycling will be identified by the Owner's Representative.

1. Sections of salvaged wood shall have a clean, flat cut across both ends.

2. Ends of wood sections shall be sealed with AnchorSeal after being cut and before being loaded. Branch cuts on the length of wood sections shall be sealed with AnchorSeal.

3. Care shall be taken when loading wood and logs not to damage the bark connection to the wood.

4. Wood and logs shall be stored so there is no contact with the ground. Wood and logs should be elevated from the ground by placing on cross beams of wood, concrete or steel. Wood and logs may also be stored on a gravel, concrete or asphalt pad.

56.3.12 PRUNING:

A. Within six months of the estimated date of substantial completion, prune all dead or hazardous branches larger than 2 inch in diameter from all trees to remain.

B. Implement all pruning recommendations found in the Arborist Report.

C. Prune any low, hanging branches and vines from existing trees and shrubs that overhang walks, streets and drives, or parking areas as follows:

1. Walks - within 7 feet vertically of the proposed walk elevation.

2. Parking areas - within 10 feet vertically of the proposed parking surface elevation.

3. Streets and drives - within 12 feet vertically of the proposed driving surface elevation.

D. All pruning shall be done in accordance with ANSI A300 (part 1), ISA BMP Tree Pruning (latest edition, and the "Structural Pruning: A Guide for the Green Industry", Edward Gilman, Brian Kempf, Nelda Matheny and Jim Clark, 2013 Urban Tree Foundation, Visalia CA.

E. Perform other pruning task as indicated on the drawings or requested by the Owner's Representative.

F. Where tree specific disease vectors require, sterilize all pruning tools between the work in individual trees.

56.3.13 TREE (Plant) GROWTH REGULATOR APPLICATION (TGR/PGR)

A. At the start of, or prior to, the construction contract period, treat all trees indicated on the Plan with Tree Growth Regulator at the recommended rates, time of year and methods indicated by the product distributor.

56.3.14 WATERING

A. The Trade Contractor shall be fully responsible to ensure that adequate water is provided to all plants to be preserved during the entire construction period. Adequate water is defined to be maintaining soil moisture above the permanent wilt point to a depth of 8 inches or greater.

B. The Trade Contractor shall adjust the automatic irrigation system, if available, and apply additional water, using hoses or water tanks as required.

C. Periodically test the moisture content in the soil within the root zone to determine the water content.

56.3.15 TURF AND WEED MAINTENANCE

A. Turf areas within the Tree and Plant Protection area shall be maintained in a manner that is consistent with University turf maintenance standards. This includes mowing, weed eating,

edging, fertilization, weed control and leaf collection.

B. During the construction period, control any plants that seed in and around the fenced Tree and Plant Protection area at least three times a year.

1. All plants that are not shown on the planting plan or on the Tree and Plant Protection Plan to remain shall be considered as weeds.

C. At the end of the construction period provide one final mowing and weeding of the Tree and Plant Protection Area.

56.3.16 INSECT AND DISEASE CONTROL

A. Monitor all plants to remain for disease and insect infestations during the entire construction period. Provide all disease and insect control required to keep the plants in a healthy state using the principles of Integrated Plant Management (IPM). All pesticides shall be applied by a certified pesticide applicator.

56.3.17 CLEAN-UP

A. During tree and plant protection work, keep the site free of trash, pavements reasonably clean and work area in an orderly condition at the end of each day. Remove trash and debris in containers from the site no less than once a week.

1. Immediately clean up any spilled or tracked soil, fuel, oil, trash or debris deposited by the Trade Contractor from all surfaces within the project or on public right of ways and neighboring property.

B. Once tree protection work is complete, wash all soil from pavements and other structures. Ensure that Mulch is confined to planting beds.

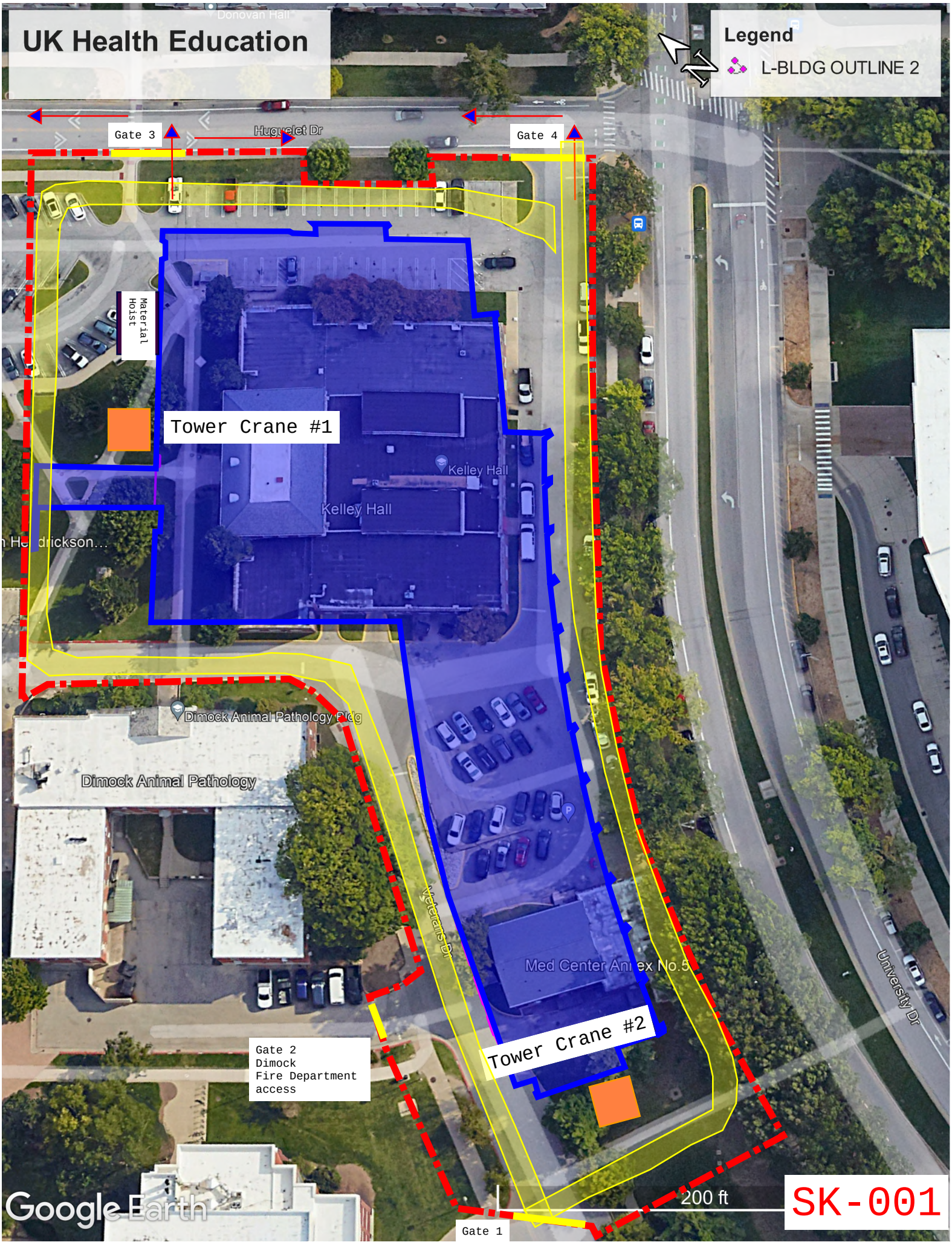
C. Make all repairs to grades, ruts, and damage to the work or other work at the site.

D. Remove and dispose of all excess Mulch, Wood Chips, packaging, and other material brought to the site by the Trade Contractor.

56.3.18 REMOVAL OF FENCING AND OTHER TREE AND PLANT PROTECTION

A. At the end of the construction period or when requested by the Owner's Representative remove all fencing, Wood Chips or Mulch, Geogrids and Geotextile Fabric, trunk protection and or any other Tree and Plant Protection material.

END OF SECTION

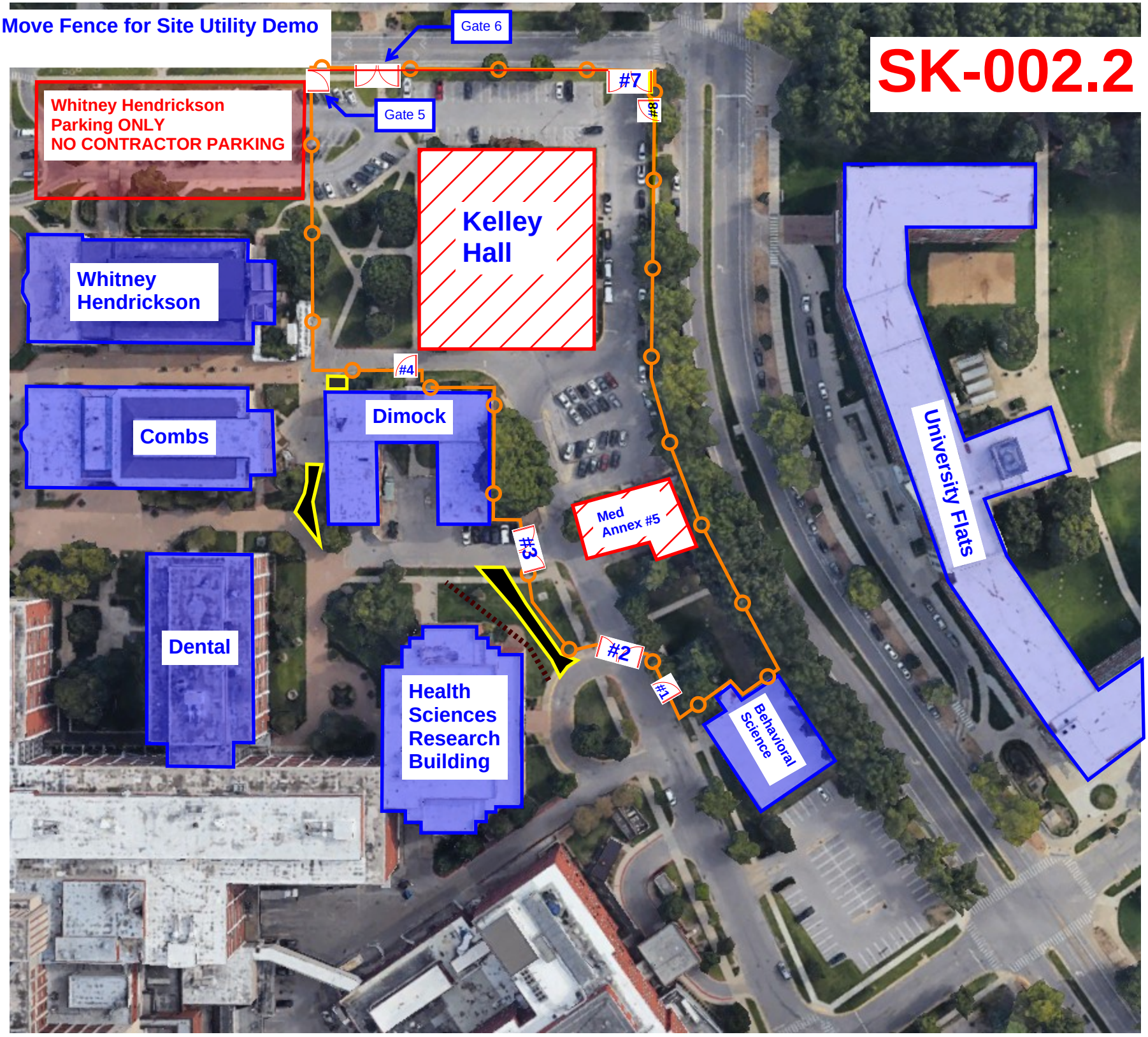

UK Health Education
Legend
L-BLDG OUTLINE 2
Gate 3
Huguelet Dr
Gate 4
Material Hoist
Tower Crane #1
Kelley Hall
Kelley Hall
Dimock Animal Pathology Bldg
Dimock Animal Pathology
Veterans Dr
Med Center Annex No.5
University Dr
Tower Crane #2
Gate 2
Dimock
Fire Department
access
Gate 1
Google Earth
200 ft
SK-001

Phase 1: Demo of Kelly and Med Annex #5
~2/1/24-4/1/24

SK-002.1

Phase 2: Move Fence for Site Utility Demo
~4/1/24

SK-002.2

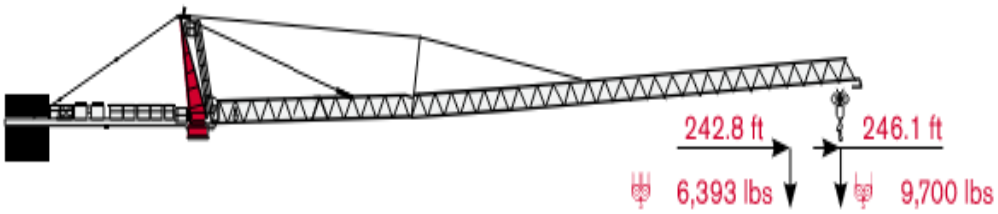


Early Site Logistics

SK-002.3

Tower Crane #1

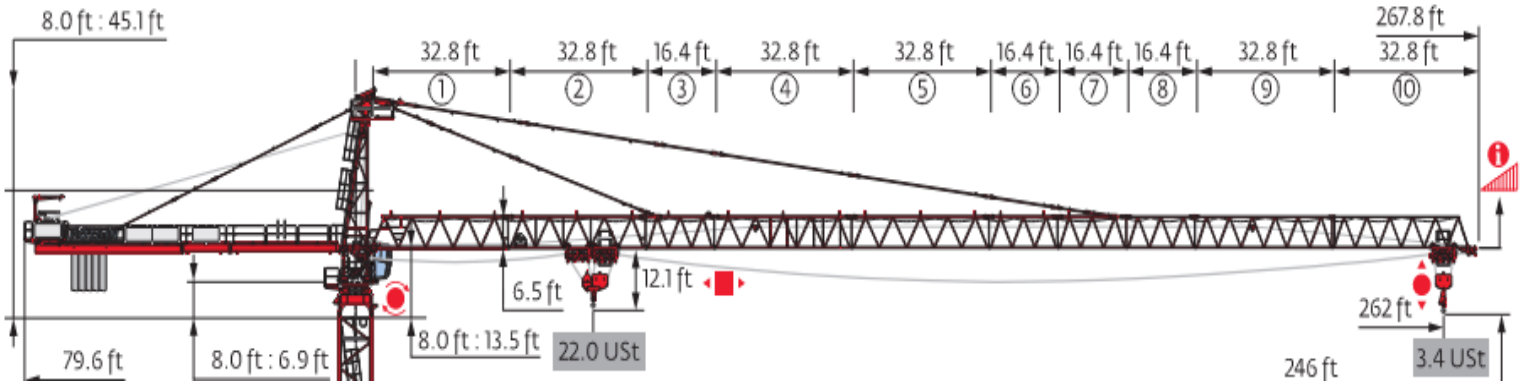
	BG (6,834 lbs)	BG (3,197 lbs)
SR WB 102 -160/4F	9	1



			65.6 ft	82 ft	98.4 ft	114.8 ft	131.2 ft	147.6 ft	164.1 ft	180.5 ft	196.9 ft	213.3 ft	229.7 ft	242.8 ft	246.1 ft
35,274 lbs→	87.6 ft	lbs	35,274	35,274	30,865	25,794	22,046	18,960	16,755	14,771	13,228	11,905	10,803		9,700
70,548 lbs→	46.6 ft	lbs	46,297	35,054	27,778	22,487	19,401	16,094	13,669	11,685	10,141	8,598	7,496	6,393	

Tower Crane #2

ASCE 7-10



Load charts

262 ft	12	▶	57	66	72	82	89	98	99	108	115	121	131	148	164	180	197	213	230	246	262	ft
			22.0	18.5	16.4	14	12.7	11.1	11.0	11.0	10.3	9.6	8.7	7.5	6.6	5.8	5.2	4.6	4.2	3.7	3.4	USt

SK-002.4

UK Project 2564.0 Health Education Building
Question and Response Log for RFPs UK-2564.0-1-24, UK-2564.0-2-24, UK-2564.0-3-24
Question Deadline 12/22/2023

#	Question	Response
1	08 4413 Glazed Aluminum CW - request to use proprietary unitized glazing system	Please provide details, spec, and performance of proposed pre-tested system for approval.
2	08 8000 request to pursue pricing from Viracon for matches to low-e coatings, frits, etc.	Viracon VRE35-4725 and VNE35-53 are possible alternates pending mockup review
3	Can the architect provide some detailing of the parapets located at the main curtain wall and lantern curtain wall? Currently it does not look like any substrate is behind the curtain wall that runs past the roof slab. Drawings and rendering attached	Arch. Dtls not yet developed - steel backup with CFMF infill to support the roofing membrane system. Coping attched to backup system. See BK response showing backup steel on sheets S-410-S-413
4	It is difficult findin the expansin joints that occur with in the curtain wall and/or from the curtain wall to other substrates. We believe there is 2 location son the building per the attached elevations. Can the architect cofnirm that this is correct as well as advise if there are any other locations?	Expansion joint locations are shown on Structural Sheets for Area A and B. Currently, the expansion joint is expected to be 6” wide. This joint dimension will be finalized with issuance of the structural steel package. BK. See enlarged elevations A/A-213 and A/A-218 for expansion joints in the curtainwall; See structural framing plans for plan locations. HOK
5	Also, internally it was discussed that we additional information on top of what we asked for. What is the width of the expansion joint as it only scales to 8" wide?	See above.
6	The lantern (CW-02) does not show in intermediate horizontals and glass heights at the 2nd and 9th floors will exceed what manufacturers can provide. Should an intermediate horizontal be introduced to achieve glass sizes that can be fabricated	an intermediate horizontal will be added at level 2 lantern glazing dividing the glass into aproximately 14' and 7' heights; and intermediate horizontal will be added to level 9 as well.
7	Also, how is GSI to assume fire safing between slab edge and back of curtain wall at the lantern area? Currently there is only a single horizontal stack joint at the slab edge, and this would not be enough to space to hold the fire safing	Hilti vision firestop design - HI/BPF 120-11 and a modified version for the mullion above the slab edge EJ 338954a; If this is not acheivable please provide alternate detail for review
8	At the basket weave curtain wall loctions it is shown that the lower 36" is to be glazed with glass typ eGL-04 and then GL-01/GL02 above. The section cuts do not show any type of intermediate horizontal. Should we proceed with having an intermediate horizontal at the transition beween glass types? Reference attached elevation and section cut for reference.	Do not add intermediate mullion. The intent is that there is a single piece of glass with a frit pattern added to the lower 36"
9	Can we give an alternate erecting our own precast panels for the shaft walls before the steel erection? We believe there is a significant cost and schedule saving possible by resequencing.	See Addendum #3 for alternate #4 language
10	Do you only want a design assist number on both the precast shafts and exterior precast by Jan 5th or are you looking for design assist, products, installation, caulk on the architectural precast as well?	We need an all-in number on the deadline.

11	Who is qualifying the structural steel contractor to erect the precast? Any idea what company that will be?	We don't know who the steel erector will be yet. That is a subsequent trade package
12	What is the capacity of the tower crane, and its location?	I believe this is in the front ends and attachments.
13	On the architectural precast, do you want integrated color? In the bid package there are no specs for the architectural precast or shaft walls that I could find.	Yes, Integral color should be used in the face mix.
14	Is it a requirement to use white cement on any of the panels? If so would you consider an alternate for gray?	If the desired natural limestone look can be achieved using gray cement it will be accepted at time of approved samples
15	Are there specific architectural PCI certifications the plant manufacturing the architectural products must have or simply follow the regulations when fabricating these architectural panels?	PCI certification required
16	It looks like there is integrated color in the architectural panels but I do not see the white cement called out. Two questions: a. Would you be ok with gray concrete with integrated color? b. Are the brick panels a form liner that is then painted or will there be actual thin brick in the panels? If it is a form liner with paint that would explain there is no white cement called out.	a. See response to question #14 b. Actual thin bricks should be used in the brick panels
17	1. There a appears to be conflicting information on erection time for the shaft walls and architectural panels. Please confirm when you'd prefer shaft wall erection to begin and when you'd like architectural wall erection to begin. When would you both to be finished erecting?	Reference Attachment G
18	2. It appears arch walls will be erected during 2nd shift but shaft wall can be erected during normal business hours. Please confirm. Please specify what hours are considered 2nd shift for this project.	Confirmed. 12:30pm to 8:30pm will be considered 2nd shift. Note that there will be overlap with other contractors. Reference ADD #3
19	3. We believe there is significant savings if we build larger panels for the shaft walls and erect the with a crawler crane. Please confirm you are ok with this approach. With the limits of the tower crane we believe the shaft wall pieces would be very small and limit the ability to erect the shafts before the steel structure. We plan to erect the shafts full height and be demobilized before steel erection starts.	See Addendum #3 for alternate #4 language
20	4. We plan on taking pictures of the brick on the Gatton Building and proposing a brick that is similar. Is this acceptable. Please provide the brick pattern number from Belden that is an acceptable match to the Gatton Building.	Belden no longer manufactures the blended brick used on Gatton. We are working with Kenny Cox at Clay Ingels in Lexington to find the best match.
21	5. Is there a mix design for the concrete you'd like to see on the shaft walls or architectural walls? Is there a specific aggregate you'd prefer on the honed precast walls where the aggregate will be exposed?	Refer to Structural Precast Concrete Specification for mix design requirements for shaft walls. BK. Aggregate for honed precast has not been selected but is intended to be light in color with little color variation from the limestone look above. HOK
22	6. Is there a specific mix for mortar joint on the architectural walls? We plan on achieving the mortar joint look required by coloring our 3" face mix and using a form liner to give you the preferred joint type.	The specific mix has not been developed. We are looking for a basic gray mortar look.
23	7. Are the backs of arch panel exposed or will they be furred out with metal studs? Does the inside face need to be painted? Can the inside face of the arch panel be structural grey?	All Architectural Precast will have furring so the structural wythe of the sandwich panel can be generic/most cost effective material
24	8. Clarify - Provide 200 Journeyman hours and $5,000 worth of material for additional temp openings in the architectural precast assemblies to be used at the discretion of the CM. What is this for?	This is for temporary openings/leave out that are above and beyond what is listed in the documents to be used at the discretion of the CM.

25	9. Cast in electrical? If yes, box count? Are we to only assume block outs for utility penetrations or will we need conduit running the length of our panels?	blocks outs are assumed for utility penetrations.
26	10. Please let us know if we will have access for a crawler crane for erection of the shaft wall panels and the architectural panels. What streets can be shutdown.	Reference SK-001 (ADD-2) for site constraints, unrestricted flow of work around the site, and the bid documents for building structures and trees to remain and be protected. Note that there is less than 17' along the East of the building and the North of the building between the earth retention wall and existing tree drip line(s). Assume no streets will be able to be shutdown greater than 60 hour period over a weekend pending coordination with the University and sporting activities.
27	11. How many mobilizations are you expecting for the precast erection of shafts and architectural panels?	Include as many as necessary to complete the work. Reference Attachment G.
28	12. Can we exclude street cleaning? We typically see this being covered by the GC as multiple trades will be using the street.	RFP response should include street cleaning.
29	13. We would like to exclude 2.14 Thin Brick Facings/C and D if that is ok and achieve the same look with our face mix and form liner.	Not acceptable
30	14. Clarify pattern in brick as shown on 1/A-216. A detail would help as this will add cost to the architectural precast number.	Refer to Detail 3/A-531.
31	15. Second shift hours for erecting is only for architectural correct?	Correct.
32	16. What do you recommend for the additional financial commitment to the University of Kentucky?	This has been removed from all 3 RFPs
33	17. Please clarify what class A finish is for the 10" thick solid shaft panels at the clinical center 3rd floor area.	All surface blemishes shall be repaired and/or filled with the exception of air holes 1/16-inch in width or smaller and form marks where the deviation is than 1/16-inch. “Parge” coating or “rub” finishing this particular wall will not be allowed (the wall will be subject to routine impact). The as-cast concrete finish must meet the Class A requirement listed on the drawing. Also, take note that the panel thickness was revised to 8-inches and panel height reduced in addendum issued sheet S-113A-PC. BK. The panel will be painted. The panels should be smooth architectural precast with any voids filled and ready to receive a paint finish. HOK
34	18. Is there a PLA in place.	UK has no project labor agreement (PLA).
35	19. If we shut down streets, who is responsible for flagmen and street closing permits. Will the GC handle that or do we include that in our number?	The trade contractor is responsible for all flagging, signage and necessary permits. Assume no streets will be able to be shutdown greater than 60 hour period over a weekend pending coordination with the University and sporting activities.
36	1. Alternate #1 – Substitute Standard Curtain Wall in lieu of basket weave. a. Is it intended that the inboard curtain wall (LVL 3 & 5) be extended out to meet the same vertical surface as levels 2, 4, & 6?	Assume the edges of slab will be in plane from levels 2-8.

37	1. Alternate #2 – Delete PCS-02 and install thin brick on unitized frame. The below detail represents the alternate option requested . Would the design team / owner be opposed to having the think brick system align with the adjacent glass in the punched openings? The below detail shows the face of the of brick to be roughly 5” proud of the adjacent glass. This adds costs and requires a custom solution where the brick terminations / returns at the curtain wall openings	See detail 1 on A-502 CW-04 at brick and punched opening. Detail similar with metal fin was thought to be used instead of brick return. 5" set back of the face of glass to the brick panel should remain
38	What is the estimated delivery date for precast shaft walls and precast architectural walls?	Reference Attachment G
39	Please confirm. Precast shafts will be erected by steel erector. Precaster has the option to erect the exterior architectural precast walls using a crawler crane that the precaster is to provide.	Confired that precast shafts will be erected by steel contractor. See ADD #3 for Alternate #4 language. It is inteded that the architectural precast will be set with the tower crane(s).
40	Is there a bid bond required for RFP submissions	No. A bid bond is not required for RFP submissions.

Autodesk Docs://202170 - UK Health Education Building/2564.UKHEB_ARCH.rvt

JRA architects

UK PROJECT # 2564.0

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING

1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

CONCEPT RENDERING

PACKAGE

BP-01A & BP-01B

10.20.23

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C-101 EROSION CONTROL DETAILS
C-200 SITE DEMOLITION PLAN
C-300 MASS EXCAVATION PLAN
C-400 UTILITY PLAN

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A-128B DIMENSION PLAN - EIGHTH FLOOR - AREA B
A-128C DIMENSION PLAN - EIGHTH FLOOR - AREA C
A-129A DIMENSION PLAN - NINTH FLOOR - AREA A
A-129B DIMENSION PLAN - NINTH FLOOR - AREA B
A-129P DIMENSION PLAN - PENTHOUSE - AREA A

ARCHITECTURAL
A-201 BUILDING ELEVATIONS - EAST AND WEST
A-202 BUILDING ELEVATIONS - NORTH AND SOUTH
A-203 BUILDING AXONS
A-204 BUILDING RENDERINGS
A-205 BUILDING RENDERINGS
A-210 BUILDING ENLARGED ELEVATIONS - EAST
A-211 BUILDING ENLARGED ELEVATIONS - EAST
A-213 BUILDING ENLARGED ELEVATIONS - SOUTH
A-214 BUILDING ENLARGED ELEVATIONS - SOUTH
A-215 BUILDING ENLARGED ELEVATIONS - WEST
A-216 BUILDING ENLARGED ELEVATIONS - WEST
A-217 BUILDING ENLARGED ELEVATIONS - NORTH
A-218 BUILDING ENLARGED ELEVATIONS - NORTH
A-301 BUILDING SECTIONS
A-302 BUILDING SECTIONS
A-351 WALL SECTIONS
A-352 WALL SECTIONS
A-353 WALL SECTIONS
A-501 EXTERIOR ASSEMBLIES
A-502 EXTERIOR CURTAIN WALL GLAZING AND FRAME TYPES
A-503 ISOMETRIC DETAILS
A-521 PLAN DETAILS
A-522 PLAN DETAILS
A-531 ENLARGED SECTION DETAILS
A-532 ENLARGED SECTION DETAILS
A-541 EXTERIOR MOCKUP
A-542 EXTERIOR MOCKUP

SITE UTILITIES
MU-100 SITE MECHANICAL
MU-101 SITE MECHANICAL DEMOLITION PLAN
MU-201 SITE MECHANICAL NEW WORK PLAN
MU-301 BASEMENT PLUMBING DEMOLITION PLAN
MU-401 BASEMENT PLUMBING NEW WORK PLAN
MU-501 DETAILS AND SCHEMATICS
MU-601 OVERALL PLUMBING RISER

SITE UTILITIES
EU001 ELECTRICAL SITE LEGEND
EU101 SITE UTILITY PLAN AREA A - MEP DEMOLITION
EU102 SITE UTILITY PLAN AREA B - MEP DEMOLITION
EU201 SITE UTILITY PLAN AREA A - MEP NEW WORK
EU202 SITE UTILITY PLAN AREA B - MEP NEW WORK
EU500 ELECTRICAL SITE DETAILS
EU501 ELECTRICAL SITE DETAILS
EU601 SITE UTILITY SCHEMATICS

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JRA, INC. REGISTERED NO. 5994-5449 5463 ARCHITECT COMMONWEALTH OF KENTUCKY REGISTERED ARCHITECT

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BP-01A & BP-01B

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

GENERAL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

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COVER SHEET

G-001

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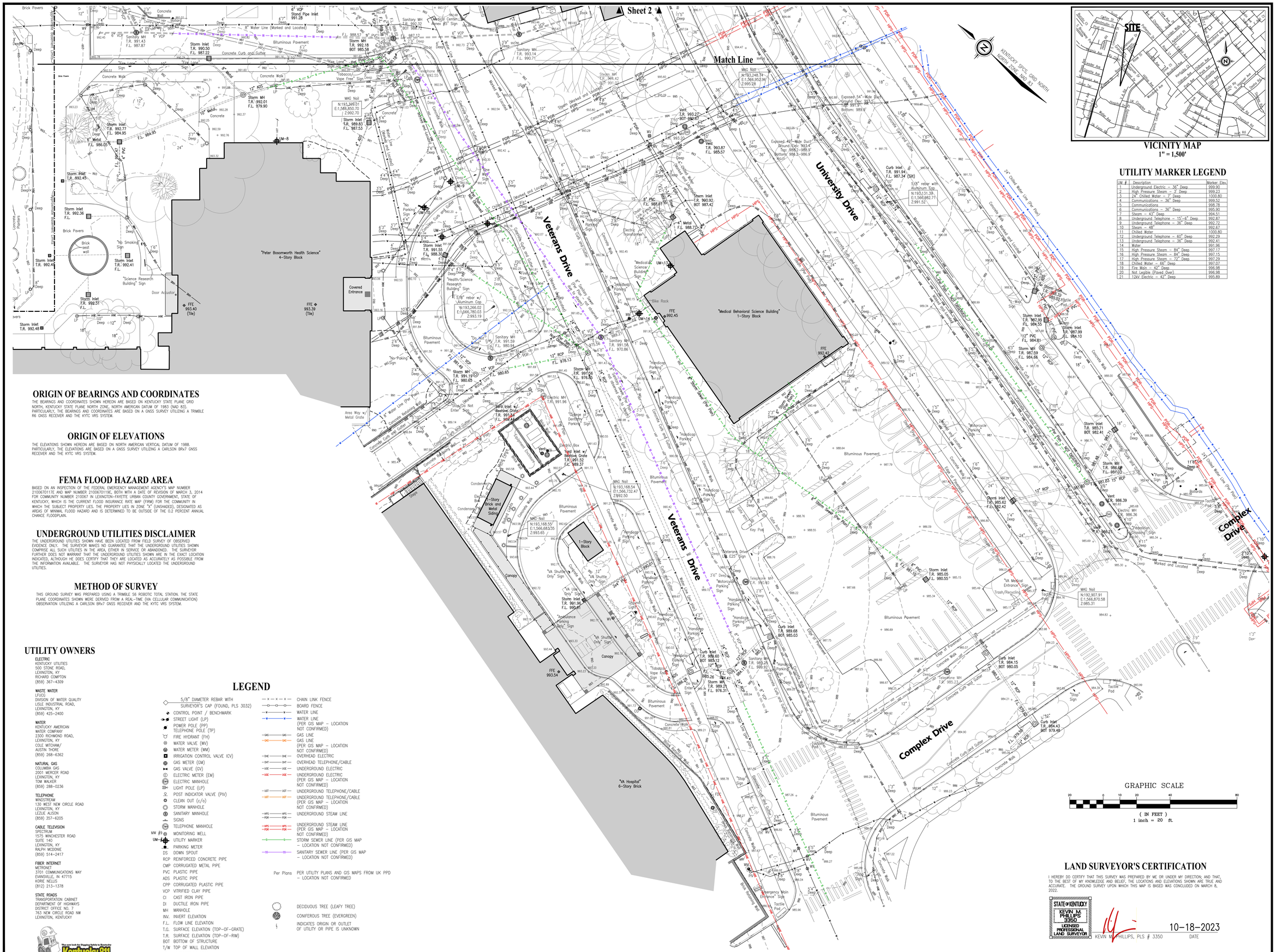

Sheet 2
Match Line
Veterans Drive
University Drive
Complex Drive
"Peter Bosomworth Health Science" 4-Story Block
"Medical Behavioral Science Building" 1-Story Block
"Medical & Science Building" Sign
"Health/Science Research Building" Sign
"Science Research Building" Sign
Covered Entrance
FFE 993.39 (Tile)
FFE 992.45
FFE 992.42
FFE 993.40 (Tile)
FFE 993.54
Bike Rack
Motorcycle Parking Sign
Handicap Parking Sign
"No Smoking" Sign
"Tobacco, Vape Free" Sign
"Stop" Sign
"Do Not Enter" Sign
"No Parking" Sign
"Fire Lane" Sign
"VA Shuttle Only" Sign
"VA Lite Only" Sign
"Ambulance Parking Only" Sign
"VA Medical Entrance" Sign
"Trash/Recycling"
"VA Hospital" 6-Story Brick
1-Story Block
Canopy
Gazebo
Flag Pole
Brick seat wall
Concrete Planters
Brick Pavers
Area Way w/ Metal Grate
Veterans Drive Sanitary Sewer Gravity Line (Per Plan)
Complex Drive Sanitary Sewer Gravity Line (Per Plan)
Veterans Drive Storm Sewer (Per Plan)
Complex Drive Storm Sewer (Per Plan)
Veterans Drive Water Line (Per Plan)
Complex Drive Water Line (Per Plan)
Veterans Drive 12" Chilled Water Line (Per Plan)
Complex Drive 12" Chilled Water Line (Per Plan)
Veterans Drive 8" Steam Line (Per Plan)
Complex Drive 8" Steam Line (Per Plan)
Veterans Drive HPS
Complex Drive HPS
Veterans Drive PDR
Complex Drive PDR
Veterans Drive UGE
Complex Drive UGE
Veterans Drive UGT
Complex Drive UGT
Veterans Drive Concrete Curb and Gutter
Complex Drive Concrete Curb and Gutter
Veterans Drive Concrete Walk
Complex Drive Concrete Walk
Veterans Drive Bituminous Pavement
Complex Drive Bituminous Pavement
Veterans Drive Concrete Retaining Wall
Complex Drive Concrete Retaining Wall
Veterans Drive Brick Retaining Wall
Complex Drive Brick Retaining Wall
Veterans Drive Concrete Curb Cut
Complex Drive Concrete Curb Cut
Veterans Drive Concrete Curb and Gutter
Complex Drive Concrete Curb and Gutter
Veterans Drive Concrete Steps
Complex Drive Concrete Steps
Veterans Drive Concrete Slope
Complex Drive Concrete Slope
Veterans Drive Concrete Curb Cut Ramp
Complex Drive Concrete Curb Cut Ramp
Veterans Drive Concrete Curb Cut Gutter
Complex Drive Concrete Curb Cut Gutter

UTILITY MARKER LEGEND

UM #	Description	Marker Elev.
1	Underground Electric – 36" Deep	999.90
2	High Pressure Steam – 3' Deep	999.21
3	24" Chilled Water – 7' Deep	1000.80
4	Communications – 36" Deep	999.52
5	Communications	998.78
6	Communications – 36" Deep	995.90
7	Steam – 43" Deep	994.51
8	Underground Telephone – 15"–6" Deep	992.87
9	Underground Telephone – 36" Deep	992.72
10	Steam – 48"	992.67
11	Chilled Water	1000.80
12	Underground Telephone – 60" Deep	992.29
13	Underground Telephone – 36" Deep	992.41
14	Water	991.96
15	High Pressure Steam – 84" Deep	997.17
16	High Pressure Steam – 84" Deep	997.15
17	High Pressure Steam – 72" Deep	997.29
18	Chilled Water – 66" Deep	997.07
19	Fire Main – 42" Deep	996.98
20	Not Legible (Paved Over)	996.98
21	12kV Electric – 42" Deep	995.89

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LEGEND

- 5/8" DIAMETER REBAR WITH SURVEYOR'S CAP (FOUND, PLS 3032)
- CONTROL POINT / BENCHMARK
- STREET LIGHT (LP)
- POWER POLE (PP) TELEPHONE POLE (TP)
- FIRE HYDRANT (FH)
- WATER VALVE (WV)
- WATER METER (WM)
- IRRIGATION CONTROL VALVE (ICV)
- GAS METER (GM)
- GAS VALVE (GV)
- ELECTRIC METER (EM)
- ELECTRIC MANHOLE
- LIGHT POLE (LP)
- POST INDICATOR VALVE (PIV)
- CLEAN OUT (c/o)
- STORM MANHOLE
- SANITARY MANHOLE
- SIGNS
- TELEPHONE MANHOLE
- MW MONITORING WELL
- UM UTILITY MARKER
- PARKING METER
- DS DOWN SPOUT
- RCP REINFORCED CONCRETE PIPE
- CMP CORRUGATED METAL PIPE
- PVC PLASTIC PIPE
- ADS PLASTIC PIPE
- VCP VITRIFIED CLAY PIPE
- CI CAST IRON PIPE
- DI DUCTILE IRON PIPE
- MH MANHOLE
- INV. INVERT ELEVATION
- F.L. FLOW LINE ELEVATION
- T.G. SURFACE ELEVATION (TOP–OF–GRATE)
- T.R. SURFACE ELEVATION (TOP–OF–RIM)
- BOT BOTTOM OF STRUCTURE
- T/W TOP OF WALL ELEVATION
- L.S.A. LANDSCAPING AREA

- CHAIN LINK FENCE
- BOARD FENCE
- WATER LINE
- WATER LINE (PER GIS MAP – LOCATION NOT CONFIRMED)
- GAS LINE
- GAS LINE (PER GIS MAP – LOCATION NOT CONFIRMED)
- WATER METER (WM)
- OVERHEAD ELECTRIC
- OVERHEAD TELEPHONE/CABLE
- UNDERGROUND ELECTRIC
- UNDERGROUND ELECTRIC (PER GIS MAP – LOCATION NOT CONFIRMED)
- UNDERGROUND TELEPHONE/CABLE
- UNDERGROUND TELEPHONE/CABLE (PER GIS MAP – LOCATION NOT CONFIRMED)
- UNDERGROUND STEAM LINE
- UNDERGROUND STEAM LINE (PER GIS MAP – LOCATION NOT CONFIRMED)
- STORM SEWER LINE (PER GIS MAP – LOCATION NOT CONFIRMED)
- SANITARY SEWER LINE (PER GIS MAP – LOCATION NOT CONFIRMED)

Per Plans PER UTILITY PLANS AND GIS MAPS FROM UK PPD – LOCATION NOT CONFIRMED

- DECIDUOUS TREE (LEAFY TREE)
- CONIFEROUS TREE (EVERGREEN)
- INDICATES ORIGIN OR OUTLET OF UTILITY OR PIPE IS UNKNOWN

KENTUCKY SPCS, GRID NORTH
NORTH ZONE, NAD 83

LAND SURVEYOR'S CERTIFICATION

I HEREBY DO CERTIFY THAT THIS SURVEY WAS PREPARED BY ME OR UNDER MY DIRECTION; AND THAT, TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE LOCATIONS AND ELEVATIONS SHOWN ARE TRUE AND ACCURATE. THE GROUND SURVEY UPON WHICH THIS MAP IS BASED WAS CONCLUDED ON MARCH 8, 2022.

STATE of KENTUCKY
KEVIN M. PHILLIPS
3350
LICENSED PROFESSIONAL LAND SURVEYOR

KEVIN M. PHILLIPS, PLS # 3350 — 10-18-2023 DATE

Match Line — Sheet 1

REVISION NUMBER	REVISION DATE	REVISION DESCRIPTION
1	10-18-23	Added Two Utility Appearers

EE ENDRIS engineering
771 ENTERPRISE DRIVE
LEXINGTON, KY 40510
PH: 859-253-1425
TOLL: 800-613-9244
Land Surveys · Construction Layout · GPS
FAX: 859-233-1436

TOPOGRAPHIC SURVEY OF

University of Kentucky Health Education Building Site
University Drive, Huguelet Drive & Veterans Drive
Lexington, Fayette County, Kentucky

Prepared For:
JRA Architects – 3225 Summit Square Place (FDX), Lexington, KY 40509 – Phone: (859) 252-6781

JOB NUMBER	4672
DRAWING DATE	March 29, 2022
DRAWING FILE	4672 UK Healthcare Topo.dwg
SCALE:	1" = 20'

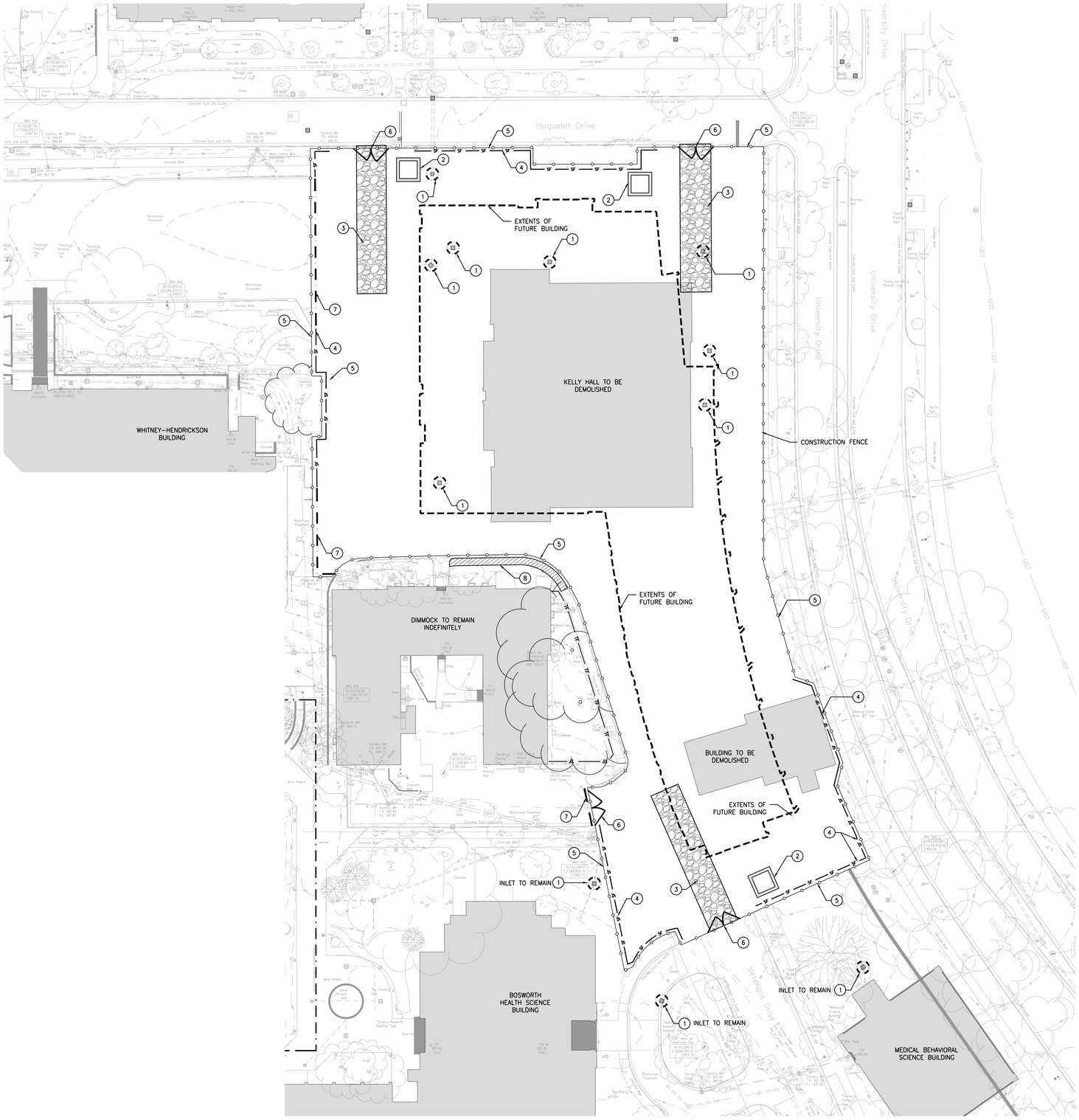
0 20'

This is NOT a boundary survey but complies with 201 KAR 18:150 otherwise

SURVEY COMPLETED March 8, 2022

SHEET 2 of 2

Z:\4672\UK Health Education Building\4672 UK Healthcare Topo.dwg, 10/18/2023 3:05:58 PM, 1:1, Endris Engineering, AMP



Erosion Control Plan

(IN FEET)
1 inch = 30 ft.

EROSION CONTROL NOTES

1. CONTRACTOR SHALL ENSURE THAT HE/SHE IS IN POSSESSION OF A SET OF APPROVED FINAL CONSTRUCTION DOCUMENTS AND STORM WATER POLLUTION PREVENTION PLANS APPROVED BY THE LOCAL AUTHORITY HAVING JURISDICTION. COPIES OF THE APPROVED PLANS AND PERMITS SHALL BE KEPT ON THE SITE AT ALL TIMES AND MADE AVAILABLE TO INSPECTORS.
2. AS PART OF THE KENTUCKY POLLUTION DISCHARGE ELIMINATION SYSTEM, THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT AN NOI-SWCA TO THE KENTUCKY DIVISION OF WATER. APPLICANTS MUST FILE USING THE ELECTRONIC WEB BASED NOI SUBMISSION SYSTEM AT THE FOLLOWING WEB ADDRESS: https://dep.gateway.ky.gov/eForms/default.aspx?FormID=7 COMPLETION OF THE NOI-SWCA SHALL BE COMPLETED A MINIMUM OF SEVEN (7) DAYS BEFORE THE PROPOSED DATE FOR COMMENCEMENT OF CONSTRUCTION ACTIVITIES. COPY OF THE APPROVED NOI-SWCA SHALL BE SUBMITTED TO CARMAN AND UK ENVIRONMENTAL DEPARTMENT. CONTRACTOR SHALL PERFORM INSPECTIONS AND KEEP ON-SITE RECORDS OF INSPECTIONS AND MAINTENANCE OF EROSION CONTROL DEVICES AS DESCRIBED IN THE SPECIFICATIONS AND KYR10.
3. CONTRACTOR SHALL INSTALL CONSTRUCTION ENTRANCE AS INDICATED ON THE PLANS. CONSTRUCTION ENTRANCE SHALL BE UNDERLAIN WITH NON-WOVEN FILTER FABRIC.
4. CONTRACTOR TO INSTALL CONCRETE WASH OUT PIT AS INDICATED ON THE PLANS, THOUGH LOCATION MAY MOVE (WITH APPROVAL OF UK ENVIRONMENTAL DEPARTMENT) AS NECESSARY TO BEST SUIT OPERATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE CONCRETE WASH, FUNCTIONING PROPERLY WITH BUILDUP OF MATERIALS DISPOSED OF OFF-SITE IN A LAWFUL MANNER.
5. SILT FENCE SHALL BE INSTALLED AS INDICATED ON THE PLAN PRIOR TO MOBILIZATION OF THE SITE. SILT FENCE IS TO BE INSTALLED FOLLOWING CONTOURS AS APPLICABLE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF SILT FENCE AND REMOVAL OF SILTATION AS NECESSARY. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND DISPOSAL OF SILT FENCE AT SUCH TIME THAT SEEDING HAS GERMINATED AND/OR SOD ESTABLISHED SO THAT NO EROSION IS OCCURRING REGARDLESS OF TIMING. SILT FENCE SHALL BE REMOVED AT NO COST TO THE OWNER.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING EXISTING ASPHALT FREE FROM MUD, DIRT, DEBRIS, ETC.
7. CONTRACTOR SHALL ESTABLISH INLET PROTECTION FOR ALL PROPOSED AND EXISTING STRUCTURES AND SHALL MAINTAIN THE FUNCTIONALITY OF THE PROTECTION THROUGHOUT THE TIME EXTENT OF THE PROJECT.
8. AFTER CONSTRUCTION ENTRANCE, SILT FENCE, CONCRETE WASHOUT PIT, AND INLET CONTROLS HAVE BEEN INSTALLED AND APPROVED BY THE UK ENVIRONMENTAL DEPARTMENT, PROCEED WITH TOPSOIL STRIPPING AND MASS EXCAVATION. TOPSOIL SHALL BE STOCKPILED OFF-SITE.
9. THE CONTRACTOR SHALL PHASE CONSTRUCTION TO MINIMIZE THE AMOUNT OF DISTURBED AREA AT ANY ONE TIME, STABILIZE AND COVER WITH GRAVEL OR SEEDING AS QUICKLY AS POSSIBLE. USE ON SITE CONTROLS SUCH AS DIVERSIONS, SUMPS, AND STRAW BALES AS NECESSARY TO PREVENT OFF SITE RUNOFF. EXTRA EFFORT SHOULD BE EXERCISED PRIOR TO WINTER OR RAINY SEASON TO HAVE ALL SITE CONTROLS IN PLACE. DISTURBED AREAS WHERE CONSTRUCTION WILL CEASE FOR MORE THAN 14 DAYS WILL BE STABILIZED WITH EROSION CONTROLS.
10. CONTRACTOR SHALL MAINTAIN SITE AFTER ANY RAINFALL EVENT BY CLEANING SILT AND DEBRIS FROM STREETS, YARDS, ETC. AND THE RE-ESTABLISHMENT OF ANY DAMAGED EROSION CONTROL DEVICE OR MEASURE INCLUDING TEMPORARY OR PERMANENT SEEDING.
11. CONTRACTOR SHALL INSPECT SITE DAILY AND IMMEDIATELY FOLLOWING A RAINFALL EVENT TO ENSURE THAT EROSION CONTROL DEVICES ARE FUNCTIONING PROPERLY AND, IF NOT, THE CONTRACTOR SHALL TAKE ACTIONS TO REMEDIATE ANY EROSION CONTROLS AT NO ADDITIONAL COST TO THE OWNER.
12. ALL WORK, CONSTRUCTION REQUIREMENTS, AND PERFORMANCE STANDARDS SHALL COMPLY WITH LOCAL AND STATE JURISDICTIONS AND/OR STANDARDS.
13. TEMPORARY STABILIZATION OF TOPSOIL STOCKPILE AND DISTURBED PORTIONS OF THE SITE SHALL BEGIN WITHIN 14 DAYS ON AREAS WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY (FOR 21 DAYS OR MORE) CEASED. TEMPORARY STABILIZATION CAN BE ACCOMPLISHED THROUGH SEEDING RYE (GRAIN) APPLIED AT A RATE OF 120 POUNDS PER ACRE AND/OR STRAW MULCHING AT A RATE OF 4,000 POUNDS OF STRAW PER ACRE.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTIVE ACTION REQUIRED BY ANY LOCAL, STATE OR FEDERAL AGENCY THAT HAS JURISDICTION FOR SITE EROSION CONTROL.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL TEMPORARY EROSION CONTROL DEVICES SUCH AS SILT FENCE, SEDIMENT BASINS, ROCK CHECKS, INLET PROTECTION, ETC AT SUCH TIME THE SITE HAS BECOME STABILIZED AND DEVICES OR CONTROLS ARE NO LONGER NECESSARY. AFFECTED ARES SHALL BE RETURNED TO THE CONTOURS PER THE GRADING PLAN.
16. THIS PLAN REFLECTS THE MINIMUM REQUIRED EROSION CONTROL MEASURES TO STABILIZE THE SITE. ADDITIONAL MEASURES MAY BE NECESSARY TO PREVENT SEDIMENT FROM LEAVING THE SITE AT NO COST TO THE OWNER.
17. ALL STORM INLETS OR OPEN PIPES SHALL BE FULLY PROTECTED TO PREVENT SEDIMENT FROM ENTERING THE SYSTEM. IF SEDIMENT ENTERS THE SYSTEM, THE CONTRACTOR SHALL FLUSH THE LINES CLEAN. VISUAL INSPECTION BY CAMERA MAY BE REQUESTED TO ENSURE THE SYSTEM IS PROPERLY MAINTAINED AT NO COST TO THE OWNER.

CODED EROSION CONTROL NOTES

KEY	SYMBOL	DESCRIPTION	DETAIL
1		INLET PROTECTION – PROTECT INLETS UNTIL THEY ARE SUBJECT TO DEMOLITION	A/C101
2		CONCRETE WASHOUT PIT. LOCATE & SIZED AS NEEDED – CONTRACTOR SHALL DISPOSE AND INSTALL NEW WASHOUT ONCE 90% CAPACITY HAS BEEN FILLED. SEE DETAIL FOR ADDITIONAL MAINTENANCE REQUIREMENTS.	B/C101
3		CONSTRUCTION ENTRANCE W/ WHEEL WASHING STATION, EXISTING PAVEMENT MAY BE USED. 20' MINIMUM WIDTH	C/C101
4	SF	SILT FENCE	D/C101
5		CONSTRUCTION FENCE PER UK STANDARDS	–
6		CONSTRUCTION GATE ENTRANCE	–
7		WATTLES	D/C101
8		TEMPORARY SIDEWALK CREATED TO PROVIDE ACCESS TO DIMMOCK ON NORTH SIDE. CONNECT TO EXISTING SIDEWALK.	–

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Kentucky 811
Call 811 Before You Dig

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Lexington, Kentucky 40509
859.252.6781

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CARMAN
LANDSCAPE ARCHITECTURE
URBAN PLANNING
CIVIL ENGINEERING

BP-01A & BP-01B

UNIVERSITY OF KENTUCKY
HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

CIVIL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

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EROSION CONTROL PLAN

C100

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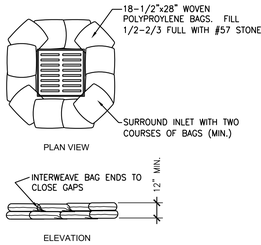
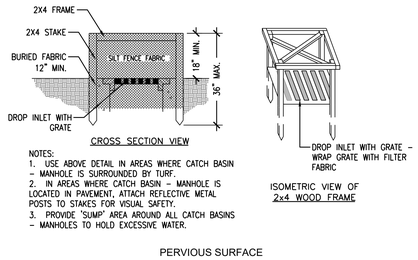
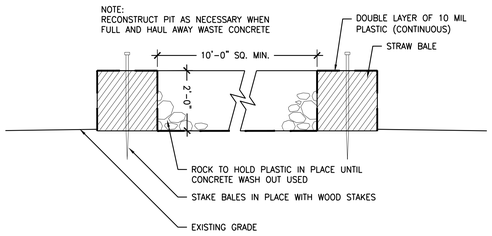




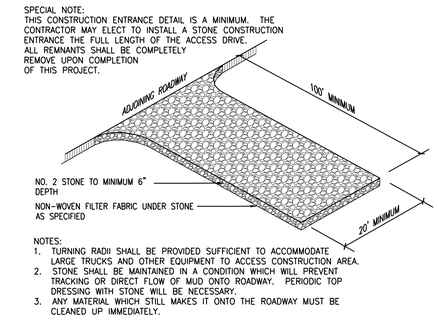
NOTES:
1. USE ABOVE DETAIL IN AREAS WHERE CATCH BASIN - MANHOLE IS SURROUNDED BY TURF.
2. IN AREAS WHERE CATCH BASIN - MANHOLE IS LOCATED IN PAVEMENT, ATTACH REFLECTIVE METAL POSTS TO STAKES FOR VISUAL SAFETY.
3. PROVIDE 'SUMP' AREA AROUND ALL CATCH BASINS - MANHOLES TO HOLD EXCESSIVE WATER.

PERVIOUS SURFACE

A INLET PROTECTION
SCALE: NTS



B CONCRETE WASHOUT PIT
SCALE: 1/2" = 1'-0"



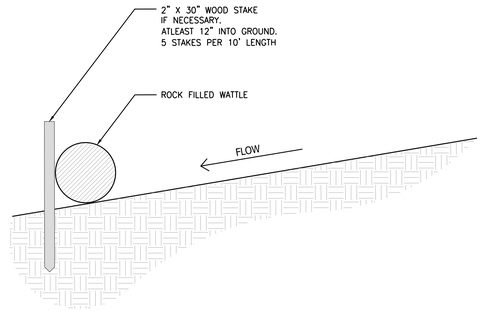
NOTES:
1. TURNING RADII SHALL BE PROVIDED SUFFICIENT TO ACCOMMODATE LARGE TRUCKS AND OTHER EQUIPMENT TO ACCESS CONSTRUCTION AREA.
2. STONE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO ROADWAY. PERIODIC TOP DRESSING WITH STONE WILL BE NECESSARY.
3. ANY MATERIAL WHICH STILL MAKES IT ONTO THE ROADWAY MUST BE CLEANED UP IMMEDIATELY.

C CONSTRUCTION ENTRANCE
SCALE: NTS

POSTS: HARDWOOD OR STEEL GREATER THAN 4' IN HEIGHT. FOR HARDWOOD, PROVIDE A MINIMUM 1-1/2" BY 1-1/2" CROSS SECTION. FOR STEEL, PROVIDE A 1-1/4" BY 1" T-SECTION WITH PROJECTIONS TO FASTEN WIRE AND FABRIC IN POSITION.
WOVEN OR WELDED WIRE FABRIC: PROVIDE FABRIC WITH A MINIMUM HEIGHT OF 2'-8". REQUIRE AT LEAST 6 HORIZONTAL WIRES SPACED 6-1/4 INCHES OR CLOSER WITH THE TOP AND BOTTOM WIRES 0.134 INCH OR LARGER AND ALL OTHER WIRES 0.1 INCH OR LARGER. REQUIRE 0.1 INCH OR LARGER VERTICAL WIRES SPACED 12" OR CLOSER.
GEOTEXTILE FABRIC: CONFORM TO AASHTO M288 FOR TEMPORARY SILT FENCE. PROVIDE FABRIC WITH A HEIGHT OF 3'. FABRIC TO BE AMOCO 2130 OR EQUAL.

NOTES:
1. THE BOTTOM 6" OF GEOTEXTILE SHALL BE BURIED IN A TRENCH CUT INTO THE GROUND ON UPSTREAM SIDE OF FENCE.
2. FENCE POST AND FABRIC WILL BE ACCEPTED BASED ON VISUAL INSPECTION BY THE LANDSCAPE ARCHITECT IN THE FIELD. GEOTEXTILE FABRIC WILL BE ACCEPTED UPON RECEIPT OF THE CERTIFICATION FROM THE MANUFACTURER THAT IT IS SUITABLE FOR USE AS SILT FENCE.
3. THE SILT FENCE SHALL BE CONSTRUCTED AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE LANDSCAPE ARCHITECT. THE SILT FENCE SHALL BE ERECTED BEFORE GRADING IS BEGUN IN THE AREA TO BE PROTECTED. POSTS SHALL BE BE INSTALLED AT 6 TO 8 FEET SPACING (CLOSER SPACING SHOULD BE USED IN AREAS WHERE RAPID RUN-OFF IS TO BE EXPECTED) AND FENCE FABRIC ATTACHED. THE WIRE FABRIC AND GEOTEXTILE FABRIC SHALL BE ATTACHED TO THE POSTS ON THE UPHILL SIDE USING STAPLES, HOG-RINGS OR OTHER APPROVED METHOD.
4. DURING THE USEFUL LIFE OF THE SILT FENCE, IT SHALL BE MAINTAINED BY THE CONTRACTOR AND SILT ACCUMULATIONS THAT THREATEN DAMAGE TO THE FENCE SHALL BE REMOVED. AFTER THE USEFULNESS OF THE FENCE HAS ENDED, IT SHALL BE REMOVED AND DISPOSED OF AND THE ACCUMULATED SILT EITHER REMOVED OR DRESSED IN PLACE AS DIRECTED, AND THE ENTIRE AREA SEEDED AND PROTECTED.

D SILT FENCE
SCALE: NTS



E WATTLES
SCALE: NTS

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CARMAN
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CIVIL ENGINEERING

BP-01A & BP-01B

UNIVERSITY OF KENTUCKY
HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

CIVIL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

JRA ARCHITECTS HAS RETAINED AN ELECTRONIC VERSION OF THESE DRAWINGS. THE CLIENT AGREES NOT TO REUSE THESE DRAWINGS - IN ELECTRONIC OR ANY OTHER FORMAT - IN WHOLE, OR IN PART, FOR ANY OTHER PROJECT OTHER THAN THE PROJECT. THE CLIENT AGREES NOT TO TRANSFER THESE ELECTRONIC FILES TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF THE ARCHITECT. THE CLIENT FURTHER AGREES TO WAIVE ALL CLAIMS AGAINST THE ARCHITECT RESULTING IN ANY WAY FROM ANY UNAUTHORIZED CHANGES TO OR REUSE OF THE ELECTRONIC FILES FOR ANY OTHER PROJECT BY ANYONE OTHER THAN THE ARCHITECT.

EROSION CONTROL DETAILS

C101

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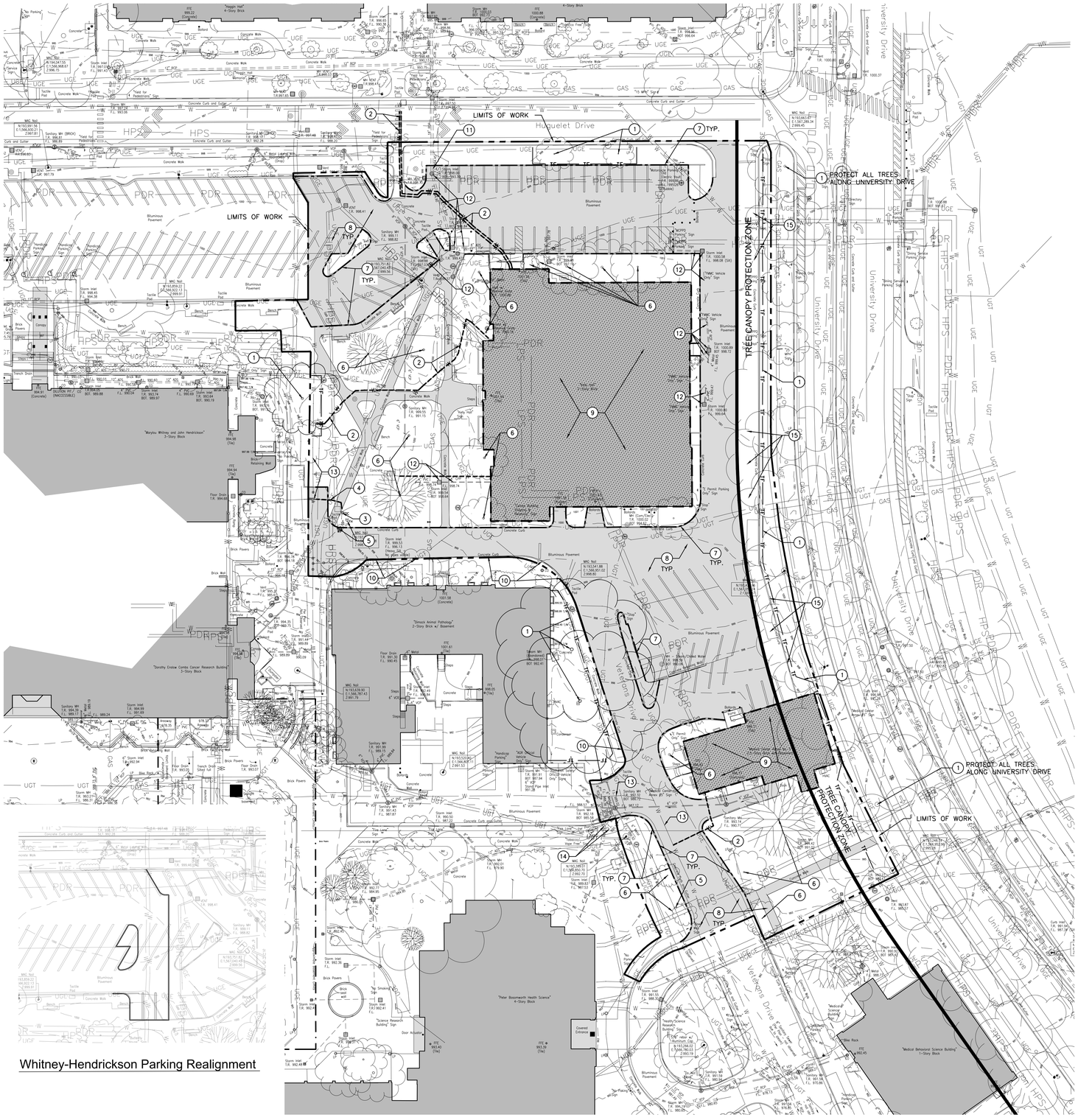
The New Look For Digging Safely in Kentucky
Kentucky 811
Call 811 Before You Dig

BEFORE YOU DIG CALL KENTUCKY UNDERGROUND (811) TWO (2) WORKING DAYS IN ADVANCE OF DIGGING


LIMITS OF WORK
Huguelet Drive
University Drive
TREE CANOPY PROTECTION ZONE
PROTECT ALL TREES ALONG UNIVERSITY DRIVE
Valentis Drive
"Whitney Hendrickson" 3-Story Block
"Dorothy Erskine Combs Cancer Research Building" 3-Story Block
"Limrick Animal Pathology" 2-Story Brick w/ Basement
"Peter Bosomworth Health Science" 4-Story Block
"Medical Behavioral Science Building" 1-Story Block
"Science Research Building" Sign
"Healthy Science Research Building" Sign
"Medical Science Building" Sign
"Box Rock"
"Tree Line" Sign
"Visitor Parking Only" Sign
"Reserved Parking Only" Sign
"No Smoking" Sign
"Fire Lane" Sign
"Close" Sign
"Do Not Enter" Sign
"Exit Only" Sign
"Entrance Only" Sign
"Visitor Parking" Sign
"Faculty Parking" Sign
"Staff Parking" Sign
"Student Parking" Sign
"Handicap Parking" Sign
"Loading Zone" Sign
"Bus Stop" Sign
"Tow Away Zone" Sign
"No Parking" Sign
"Reserved for Pedestrian" Sign
"Reserved for Ambulance" Sign
"Reserved for Police" Sign
"Reserved for Fire Department" Sign
"Reserved for Physician" Sign
"Reserved for Director" Sign
"Reserved for Chairman" Sign
"Reserved for Dean" Sign
"Reserved for President" Sign
"Reserved for Chancellor" Sign
"Reserved for Provost" Sign
"Reserved for Vice President" Sign
"Reserved for Vice Chancellor" Sign
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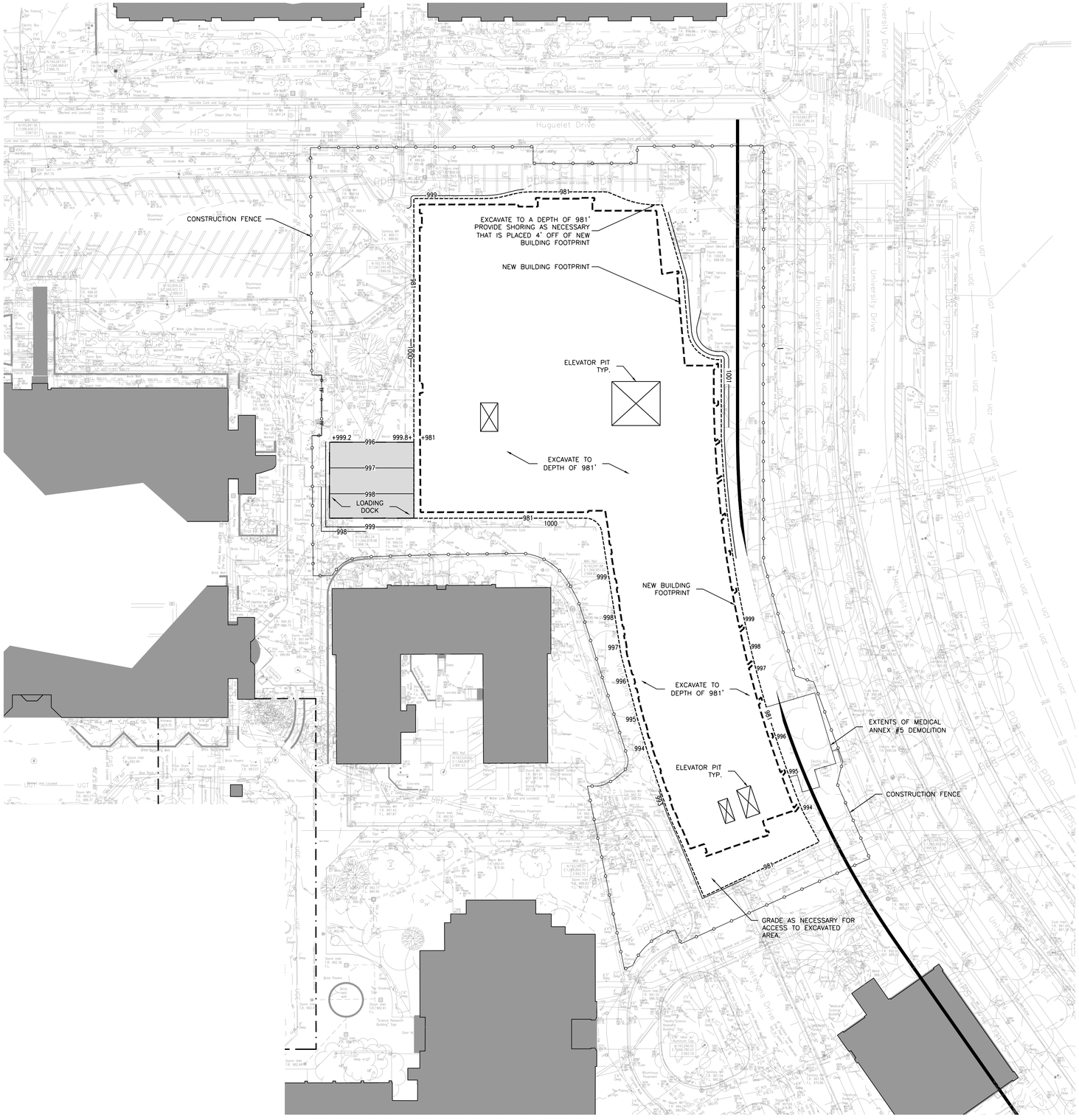

Mass Excavation Plan

30 0 15 30 60
(IN FEET)
1 inch = 30 ft.

SITE EXCAVATION NOTES

1. ALL CONTOURS INDICATE SUBGRADES WITH SLOPES LEFT AT 1/2:1 TO ACCOMMODATE CONSTRUCTION OF FIRST FLOOR BELOW GRADE (BASEMENT) WALLS FUTURE BID PACKAGE SHALL INDICATE FINISH GRADES AND INCLUDE FILL UP AGAINST BASEMENT WALLS.
2. PRIOR TO CONSTRUCTION OR DEMOLITION, CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING LOCATION OF ALL EXISTING UTILITIES SO THAT NEW CONSTRUCTION WILL NOT DAMAGE OR INTERFERE WITH EXISTING UTILITY LINES. SHOULD DAMAGE OCCUR, IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO REPAIR AND/OR REPLACE SAID DAMAGE AT THE CONTRACTOR'S EXPENSE. FINISHED REPAIRS OR REPLACEMENT SHALL MEET THE APPROVAL OF THE OWNER.
3. EXISTING FAT CLAY AND ELASTIC SILT AS IDENTIFIED IN THE GEOTECH REPORT SHALL BE COMPLETELY EXCAVATED AND HAULED AWAY WITHIN THE PROPOSED BUILDING FOOTPRINT.
4. WITHIN THE LOADING DOCK AREA, FAT CLAY AND ELASTIC SILT SHALL BE OVER EXCAVATED TO MINIMUM OF 36" DEPTH BELOW SUBGRADE AND REPLACED WITH COMPACTED LEAN CLAY.
5. AREAS WITHIN BUILDING FOOTPRINT WHERE ROCK IS LOWER THAN 981 OR DESIGNATED ELEVATION FOR ELEVATOR PITS, SHALL BE FILLED WITH 4,000 PSI CONCRETE TO SUBGRADE OF FOOTINGS OR TO 36" FROM BOTTOM OF FLOOR SLAB.
6. BEFORE STARTING SITE EXCAVATION, CONTRACTOR SHALL STRIP ALL TOPSOIL FROM DEVELOPED PORTIONS OF THE SITE AND STORE AT OFF-SITE LOCATION. CONTRACTOR SHALL BE RESPONSIBLE FOR HAULING TOPSOIL BACK TO THE SITE AND REDISTRIBUTING TOPSOIL IN ALL FINISHED GRADE AREAS, BACK FILLING CURBS, SIDEWALKS, ETC. CONTRACTOR SHALL STOCKPILE ANY/ALL EXCAVATED SOILS OFF-SITE THAT CANNOT BE PLACED IMMEDIATELY IN ENGINEERED FILLS ON SITE. THERE IS NO ROOM ON SITE FOR SOIL STOCKPILING.
7. CONTRACTOR SHALL PROVIDE ARCHITECT WITH COMPACTION TESTING FROM AN INDEPENDENT TESTING AGENCY THAT IS PRE-APPROVED BY THE CIVIL ENGINEER AND OWNER.
8. ELEVATIONS AND CONTOURS ON THIS PLAN ARE REFERENCED TO MEAN SEA LEVEL DATUM.
9. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE QUANTITY OF ROCK EXCAVATION NECESSARY FOR MASS GRADING OR TRENCHING. ALL EXCAVATION IS UNCLASSIFIED. THERE WILL BE NO EXTRA PAYMENT FOR ROCK EXCAVATION.
10. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE EXCAVATION QUANTITIES.
11. IT IS THE DESIGN INTENT FOR ALL WATER TO BE DIRECTED AWAY FROM EXISTING BUILDINGS.
12. FILL MATERIALS ARE TO BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO USE ON THIS SITE.
13. CONTRACTOR IS RESPONSIBLE FOR DESIGN OF SHORING AND UNDERPINNING STRUCTURES AT LOCATIONS INDICATED. CONTRACTOR SHALL PROVIDE SUBMITTAL DRAWINGS PREPARED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE COMMONWEALTH OF KENTUCKY.
14. CONTRACTOR SHALL DIRECT SURFACE RUNOFF AROUND AND AWAY FROM EXCAVATED AREA. DEWATERING PUMPS SHALL BE PROVIDED AT ALL TIMES AND WATER SHALL BE FILTERED PRIOR TO DISCHARGE. 80% OF SUSPENDED SOLIDS MUST BE REMOVED.
15. TREE PROTECTION ZONES SHALL BE PROTECTED DURING CONSTRUCTION. AREA WITHIN THE DRIP LINE OF TREES SHALL NOT BE DISTURBED EXCEPT FOR SIDEWALK REMOVAL. WHERE TREES/SHRUBS ARE DESIGNATED FOR REMOVAL, ALL VEGETATION , ROOTS, ETC. SHALL BE REMOVED TO A MINIMUM DEPTH OF THREE FEET BELOW FINISHED GRADE. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS NOT TO DAMAGE FOLIAGE, BRANCHES OR ROOTS OF EXISTING TREES TO BE SAVED. NO BURNING ON SITE.

SITE EXCAVATION LEGEND

- CONSTRUCTION FENCE – UK STANDARD
- NEW BUILDING FOOTPRINT
- EXCAVATION BOTTOM – 981'
- TREE PROTECTION ZONE
- ELEVATOR PIT

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JRA architects
3225 Summit Square Place, Suite 200
Lexington, Kentucky 40509
859.252.6781

NOT FOR CONSTRUCTION

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CARMAN
LANDSCAPE ARCHITECTURE
URBAN PLANNING
CIVIL ENGINEERING

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MASS EXCAVATION PLAN

C300

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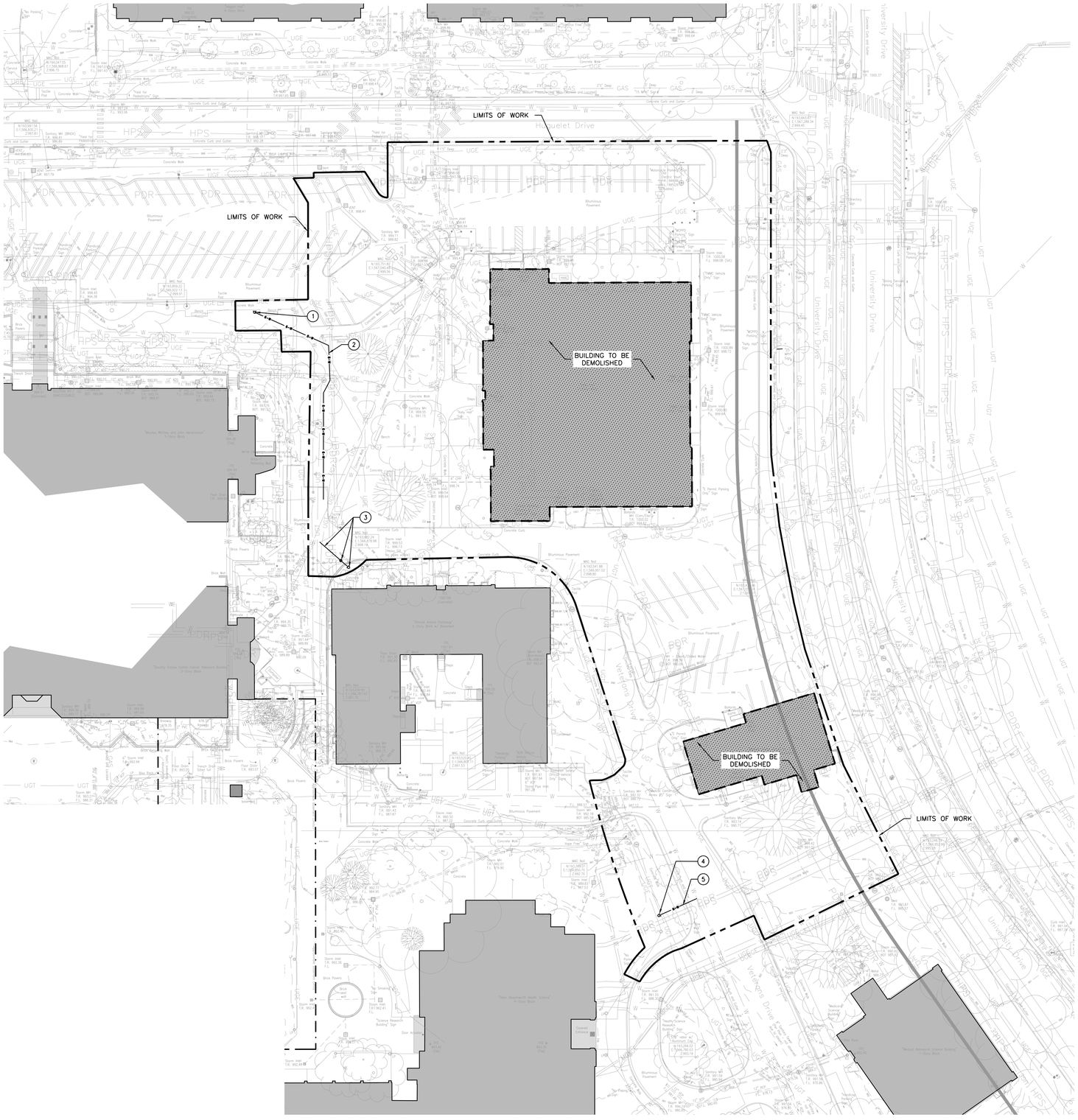


Site Utility Plan

30 0 15 30 60

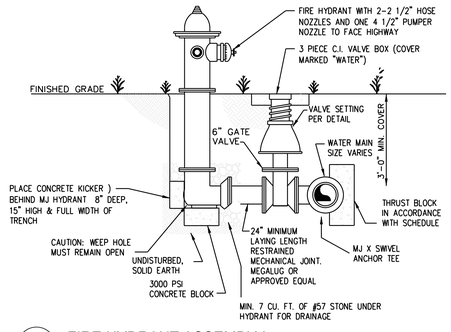
(IN FEET)
1 inch = 30 ft.

SITE UTILITY NOTES

1. THE EXISTING UTILITIES ARE SHOWN ON THE DRAWINGS AS ACCURATELY AS THEY HAVE BEEN PROVIDED TO THE LANDSCAPE ARCHITECT/ENGINEER. THEIR LOCATIONS ARE NOT GUARANTEED.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT ALL UTILITY COMPANIES AND TO HAVE ALL UTILITIES LOCATED PRIOR TO STARTING CONSTRUCTION. THE UTILITIES SHOWN REPRESENT OBSERVABLE FEATURES ALONG WITH INFORMATION PROVIDED ON THE SITE SURVEY AND IS THEREFORE NOT WARRANTED. PRIOR TO CONSTRUCTION THE CONTRACTOR IS TO FIELD VERIFY ALL UTILITY LOCATIONS, SIZES, TYPES, ETC. NEEDED TO COMPLETE THE WORK OF THE CONTRACT.
3. ALL UTILITY WORK TO MEET THE LOCAL UTILITY COMPANY AND FIRE DEPARTMENT STANDARDS.
4. CONTRACTOR TO PAY ALL ASSOCIATED FEES AS REQUIRED BY LOCAL UTILITY COMPANIES FOR ALL UTILITIES SHOWN ON THIS PLAN INCLUDING WATER, SANITARY SEWER AND/OR GAS SERVICES. THIS INCLUDES TAP/CONNECTION FEES, LICENSE FEES, PERMITTING FEES AND/OR DISCONNECT FEES FOR EXISTING CONNECTIONS, METERS, ETC.
5. ALL WATERLINE FITTINGS TO BE BLOCKED SHALL BE WRAPPED WITH HEAVY PLASTIC BEFORE PLACEMENT OF CONCRETE. (MIN. THICKNESS 4 MILS)
6. THE WATER LINE SHALL BE PRESSURE TESTED AND DISINFECTED ACCORDING TO AWWA STANDARD C651. FLUSHING VELOCITIES SHALL BE NOT LESS THAN 2.5 FT/SEC.
7. WATER LINES SHALL BE ADEQUATELY PLUGGED DURING ANY TIME WHEN THE PIPE IN THE TRENCH IS LEFT UNATTENDED IN ORDER TO PREVENT FOREIGN MATERIALS AND RODENTS FROM ENTERING THE LINE.
8. THRUST BLOCKS SHALL BE PROVIDED AT ALL CHANGES OF DIRECTION, TEES, PLUGS, AND OTHER CRITICAL LOCATIONS AS REQUIRED PER THE STANDARD DETAILS.
9. ALL PIPE AND FITTINGS SHALL BE HANDLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
10. PIPE LUBRICANTS SHALL BE IN ACCORDANCE WITH THE PIPE MANUFACTURERS RECOMMENDATIONS.
11. ALL TRENCHING AND BACKFILL SHALL BE IN STRICT ACCORDANCE OF OSHA SAFETY REGULATIONS.
12. ALL WORK TO INSTALL THE DOMESTIC WATER SERVICE TO THE EXISTING BUILDING SHALL COMPLY WITH KENTUCKY DIVISION OF PLUMBING AND THE AUTHORITY HAVING JURISDICTION SPECIFICATIONS. THE LINE SHALL BE PRESSURE TESTED, FLUSHED, AND DISINFECTED PER LOCAL REQUIREMENTS. SHOULD CONTRACTOR BE REQUIRED TO REPAIR WATER LINES AFTER THE DISINFECTION HAS OCCURRED, THE CONTRACTOR SHALL BE REQUIRED TO DISINFECT THE WATER LINES AFTER THE REPAIRS AT NO COST TO THE OWNER.
13. ALL PIPE UNDER PAVEMENT SHALL BE BACKFILLED WITH FULL DEPTH CRUSHED STONE.
14. PIPE BENDS ARE NOT ALLOWED. CHANGES IN DIRECTION ARE TO BE ACHIEVED WITH APPROPRIATE FITTINGS.
15. WATER AND SEWER MAIN SEPARATION TO BE IN ACCORDANCE WITH THE LATEST 10 STATE STANDARDS.
16. ALL PUBLIC FACILITIES TO BE DESIGNED AND CONSTRUCTED ACCORDING TO THE AUTHORITY HAVING JURISDICTION SPECIFICATIONS, CURRENT VERSION. GENERAL SPECIFICATIONS TAKE PRIMACY GIVEN ANY DISCREPANCY TO PLAN SET.
17. ALL WATER LINE TAP AND METERING FEES ARE THE RESPONSIBILITY OF THE CONTRACTOR.
18. FIRE HYDRANTS TO BE MUELLER A425 DOUBLE STEAMER WITH TWO 4-1/2 INCH OUTLETS.
19. METER – BADGER (MODEL 25) 3/4" BY-PASS METER SHALL BE INSTALLED ON "DOUBLE DETECTOR CHECK VALVE ASSEMBLY" BY FIRE PROTECTION CONTRACTOR.
20. DOUBLE DETECTOR CHECK VALVE ASSEMBLIES SHALL BE MANUFACTURED BY WATTS, AMES, FEBCO OR WILKINS.
21. 2" DOMESTIC WATER METER TO BE PROVIDED BY THE AUTHORITY HAVING JURISDICTION, CONTRACTOR TO PROVIDE NO. 32 FORD METER BOX AND COVER OR AN APPROVED EQUAL BY THE AUTHORITY HAVING JURISDICTION. CONTRACTOR SHALL PROVIDE 2.5" CONNECTION ON EACH SIDE OF THE METER.
22. ALL WATER PIPING TO BE POLYVINYL CHLORIDE PIPE (PVC) – A MINIMUM OF SDR18, PRESSURE CLASS OF 150 PSI SHALL CONFORM TO THE LATEST EDITION OF AWWA C900, MUST BE NSF APPROVED AND MANUFACTURES IN ACCORDANCE WITH LATEST ASTM STANDARDS.
23. FITTING – ALL FITTING AND ACCESSORIES SHALL BE DUCTILE IRON, RATED FOR MINIMUM OF 200 PSI WORKING PRESSURE. THE FITTINGS AND ACCESSORIES SHALL BE NEW AND UNUSED. ALL PIPE FITTING SHALL UTILIZE MECHANICAL JOINT FITTINGS. MECHANICAL JOINTS SHALL CONFORM TO AWWA C111, LATEST EDITION.
24. VALVES – ALL VALVES SHALL OPEN BY TURNING COUNTER-CLOCKWISE. VALVES 12 INCHES AND SMALLER SHALL BE RESILIENT SEATED GATE VALVES, NON-RISING STEM WITH "O" RING PACKING SEALS RATED AT 250 PSI MINIMUM WORKING PRESSURE AND CONFORM TO THE APPLICABLE PORTIONS OF AWWA STANDARD C509, LATEST EDITION. TAPPING SLEEVE AND VALVES SHALL BE DESIGNED FOR A MINIMUM WORKING PRESSURE OF 200 PSI. THE TAPPING SLEEVE TOGETHER WITH THE TAPPING VALVE SHALL BE TESTED AT 200 PSI FOR 20 MINUTES WITH NO LOSS OF PRESSURE. FULL GASKET STAINLESS STEEL TYPE TAPPING SLEEVES SHALL BE INSTALLED ON ALL SIZES OF WATER MAINS. DIRECT BURY VALVES SHALL INCLUDE VALVE BOX AND CONCRETE COLLAR TO ALLOW FOR ACCESS TO THE VALVE FOR OPERATION FROM THE SURFACE.
25. SHOULD CONFLICT OR DISCREPANCY OCCUR CONTACT CARMAN @ 859-254-9803.
26. PROVIDE TRACER TAPE 12" BELOW GRADE ON ALL UNDERGROUND UTILITIES.
27. CONTRACTOR SHALL NEATLY SAWCUT AND REMOVE EXISTING PAVEMENT AS NECESSARY. THE TRENCH AND ALL PAVEMENT SHALL BE RETURNED AS DESCRIBED IN SITE DETAILS.
28. ALL TRENCHING SHALL BE DONE AT THE REQUIRED MINIMUM DEPTHS PER REQUIREMENTS OR CODES OF UTILITY COMPANIES, LOCAL, STATE OR FEDERAL REQUIREMENTS. THE TRENCHING DEPTHS SHALL BE DETERMINED FROM THE FINISH SURFACE/GRADE ELEVATION ALONG TRENCHING ROUTE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE TRENCHING DEPTHS WITH THE APPROVED GRADING PLAN TO ENSURE THAT DEPTHS ARE REFERENCED TO PROPOSED FINISHED GRADES OF THE SITE.
29. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING REQUIRED INSPECTIONS OF CONDUIT, UTILITY PIPE INSTALLATION BY ANY APPLICABLE AGENCY OR JURISDICTION PRIOR TO ENCASEMENT OF CONDUIT/PIPES AND/OR BACKFILL OF TRENCHING.
30. THE SITE UTILITY PLAN DOES NOT SPECIFICALLY REFERENCE OR SPECIFY SHORING THAT MAY BE REQUIRED DURING SITE DEMOLITION SO THAT ADJACENT AREAS ARE PROTECTED FROM DAMAGE, COLLAPSE, ETC. SHOULD THE CONTRACTOR DETERMINE THAT SHORING IS REQUIRED FOR ADJACENT AREA PROTECTION OR TO PREVENT ENCROACHMENT OF DEMOLITION OUTSIDE OF PROJECT LIMITS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING PROPER SHORING MEANS, METHODS AND DESIGN PER LOCAL REGULATIONS OR PER REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION INCLUDING THE SHORING TYPE AND IF NECESSARY THE PREPARATION OF SHORING PLANS BY A LICENSED STRUCTURAL ENGINEER PER OSHA REQUIREMENTS.
31. SITE SPECIFIC SHOP DRAWINGS SHALL BE SUBMITTED FOR ANY AND ALL MANUFACTURED EQUIPMENT OR COMPONENTS ASSOCIATED WITH SITE UTILITIES.

CODED SITE UTILITY NOTES

KEY	DESCRIPTION	DETAIL
1	NEW FDC TO SERVICE WHITNEY-HENDRICKSON BUILDING	A/C400
2	NEW 6" WATERLINE CONNECTING NEW FDC TO WHITNEY-HENDRICKSON BUILDING CONNECTION	–
3	RELOCATED FIRE HYDRANT, FDC AND 6" WATERLINE. CONNECT TO EXISTING WATERLINE.	A/C400
4	RELOCATED FIRE HYDRANT TO PROVIDE NECESSARY SPACE FOR SITE IMPROVEMENTS	A/C400
5	NEW WATERLINE TO CONNECT RELOCATED FIRE HYDRANT	–



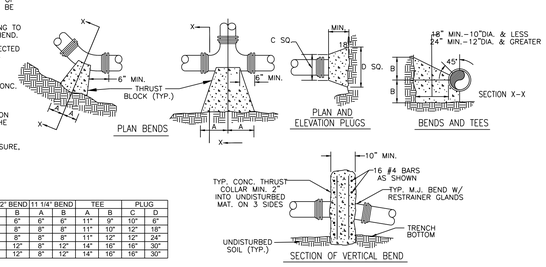
A FIRE HYDRANT ASSEMBLY
SCALE: N/A

GENERAL NOTES:

1. FOR VERT. BEND DOWN IN EXCESS OF 11 1/4° BEND, ANCHORAGE SHALL BE DESIGNED BY ENGINEER.
2. FOR VERT. BEND UPWARD, BLOCKING TO BE SIMILAR TO THAT FOR HORIZ. BEND.
3. GLANDS & BOLTS SHALL BE PROTECTED FROM CONC. BY PLASTIC SHEETING WHEN POURING THRUST BLOCKS.
4. ALL THRUST BLOCK & SUPPORT CONC. SHALL BE 3000 PSI READY MIX CONC.
5. THRUST BLOCKS WITH "B" DIMENSION GREATER THAN 30" SHALL HAVE THE RESTRAINT JOINTS ARE REQUIRED.
6. IF UNDER 100 PSI WORKING PRESSURE, RESTRAINT JOINTS MUST BE USED.

PRESSURE = 200 psi
BEARING = 2000 psf
FACTOR OF SAFETY = 1.5

PIPE SIZE	90° BEND A	90° BEND B	45° BEND A	45° BEND B	22 1/2° BEND A	22 1/2° BEND B	11 1/4° BEND A	11 1/4° BEND B	TEE A	TEE B	PLUG C	PLUG D
2"-4"	8"	12"	8"	8"	6"	6"	6"	6"	11"	9"	10"	6"
6"	18"	12"	8"	10"	8"	8"	8"	8"	11"	10"	12"	18"
8"	18"	13"	10"	10"	8"	8"	8"	8"	11"	12"	12"	24"
10"	20"	16"	12"	14"	8"	12"	8"	12"	14"	16"	16"	30"
12"	20"	16"	12"	14"	8"	12"	8"	12"	14"	16"	16"	30"



B TYPICAL THRUST BLOCK DETAILS
SCALE: N/A

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UTILITY PLAN

C400

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GENERAL NOTES

DESIGN LOADS

STRUCTURAL RISK CATEGORY ..... CATEGORY III

FLOOR LIVE LOAD
- ASSEMBLY – FIXED SEATS ..... 60 PSF
- ASSEMBLY – MOVEABLE SEATS ..... 100 PSF
- BALCONIES AND COMMONS ..... 100 PSF
- CLASSROOMS ..... **40 PSF
- CORRIDORS ABOVE FIRST FLOOR ..... 80 PSF
- ELEVATOR MACHINE ROOM ..... 300 PSF
- EXERCISE SPACES ..... 100 PSF
- LABORATORIES ..... **60 PSF
- LOBBIES AND FIRST FLOOR CORRIDORS ..... 100 PSF
- MECHANICAL PENTHOUSE ..... 150 PSF
- OFFICES ..... **50 PSF
- PATIENT ROOMS ..... **40 PSF
- STAIRS ..... 100 PSF
- STORAGE (LIGHT) ..... 125 PSF

** (PLUS NON-REDUCED 15 PSF PARTITION LOAD ALLOWANCE)
(LIVE LOADS ARE REDUCED PER KBC SECTION 1607.10)

ROOF LIVE LOAD ..... 20 PSF MIN

ROOF SNOW LOAD (PER ASCE 7-10)
- GROUND SNOW LOAD ..... P_g = 15 PSF
- IMPORTANCE FACTOR ..... Is = 1.1
- SNOW EXPOSURE FACTOR ..... Ce = 1.0
- THERMAL FACTOR
  - (BUILDING) ..... Ct = 1.0
  - (CANOPIES) ..... Ct = 1.2
- RAIN ON SNOW SURCHARGE ..... Pr = 5 PSF
- FLAT-ROOF SNOW LOAD* (Pf = 0.7CeCtIsPg)
  - (BUILDING) ..... Pf = 11.6 PSF
  - (CANOPIES) ..... Pf = 13.9 PSF
- MINIMUM-ROOF SNOW LOAD (IsPg) ..... Pm = 16.5 PSF
- SLOPED-ROOF SNOW LOAD* (P_s = Cs Pf)
  - (BUILDING) ..... Ps = 11.6 PSF
  - (CANOPIES) ..... Ps = 13.9 PSF

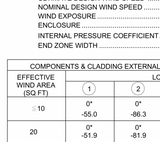
*(INCREASE FOR DRIFTING PER ASCE 7-10, SECTIONS 7.7 & 7.8)

WIND LOAD (PER ASCE 7-10)
- ULTIMATE DESIGN WIND SPEED ..... V_{ULT}= 120 MPH
- NOMINAL DESIGN WIND SPEED ..... V_{ASD}= 93 MPH
- WIND EXPOSURE ..... EXPOSURE B
- ENCLOSURE ..... FULLY ENCLOSED
- INTERNAL PRESSURE COEFFICIENT ..... GC_{pi} = ± 0.18
- END ZONE WIDTH ..... a = 16.2 FT

COMPONENTS & CLADDING EXTERNAL PRESSURE ULTIMATE (LRFD) LOADS (PSF)

EFFECTIVE WIND AREA (SQ FT)	LOCATION PER ASCE 7-10: (1)	(2)	(3)	(4)	(5)
≤10	0*	0*	0*	37.6	37.6
	-55.0	-86.3	-117.6	-37.6	-68.9
20	0*	0*	0*	37.6	37.6
	-51.9	-81.9	-112.0	-37.6	-68.9
50	0*	0*	0*	34.6	34.6
	-47.8	-76.2	-104.7	-35.6	-60.9
100	0*	0*	0*	32.3	32.3
	-44.7	-71.9	-99.1	-34.1	-55.0
500	0*	0*	0*	27.1	27.1
	-37.6	-61.9	-86.3	-30.6	-41.0

NOTES:
1. WIND LOADING PROVIDED ARE ULTIMATE (LRFD) LOADING. FOR ALLOWABLE STRESS DESIGN MULTIPLY LOADS PROVIDED BY 0.6.
2. LOADING PROVIDED IS FOR WORST CASE ROOF HEIGHT. DELEGATED DESIGNERS MAY RECALCULATE LOADS FOR SPECIFIC COMPONENT HEIGHTS USING PARAMETERS SPECIFIED.
3. PRESSURES SHOWN ARE APPLIED NORMAL TO THE SURFACE.
4. PLUS AND MINUS SIGNS SIGNIFY PRESSURES ACTING TOWARD AND AWAY FROM THE SURFACES, RESPECTIVELY.
5. EACH COMPONENT MUST BE DESIGNED FOR MAXIMUM POSITIVE AND NEGATIVE PRESSURE.
6. FOR COMPONENTS HAVING EFFECTIVE AREAS IN BETWEEN TABULATED VALUES, DESIGN LOADS MAY BE INTERPOLATED. OTHERWISE DESIGN LOAD MUST BE TAKEN FROM THE NEXT LOWEST EFFECTIVE AREA.
7. INTERNAL PRESSURE FOR ENCLOSED BUILDING IS INCLUDED IN ABOVE VALUES.
8. *THE NET GAC PRESSURE (INCLUDING INTERNAL PRESSURE) FOR ANY COMPONENT SHALL NOT BE TAKEN LESS THAN 16 PSF ACTING IN EITHER DIRECTION NORMAL TO THE SURFACE.
9. NOTATION:
   - *a:* 10 PERCENT OF LEAST HORIZONTAL DIMENSION, BUT NOT LESS THAN 3 FT.
   - *h:* MEAN ROOF HEIGHT, IN FEET, EXCEPT THAT EAVE HEIGHT SHALL BE USED FOR ROOF ANGLES $\theta \leq 10°$.
   - *θ:* ANGLE OF PLANE OF ROOF FROM HORIZONTAL, IN DEGREES.



NEAR - FLAT ROOF (θ ≤ 7°)

EARTHQUAKE DESIGN DATA
- COUNTY / STATE ..... FAYETTE / KENTUCKY
- IMPORTANCE FACTOR ..... Ie = 1.25
- MAPPED SHORT PERIOD RESPONSE ACCELERATION ..... Ss = 0.187
- MAPPED 1 SECOND PERIOD RESPONSE ACCELERATION ..... S1 = 0.091
- SITE CLASS ..... CLASS B
- DESIGN SHORT PERIOD SPECTRAL RESPONSE COEFFICIENT ..... Sds = 0.125
- DESIGN 1 SECOND PERIOD SPECTRAL RESPONSE COEFFICIENT ..... Sd1 = 0.061
- SEISMIC DESIGN CATEGORY ..... CATEGORY A
- BASIC STRUCTURAL SYSTEM ..... BUILDING FRAME SYSTEM
- SEISMIC RESISTING SYSTEM ..... STEEL SYSTEMS NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE
- RESPONSE MODIFICATION FACTOR ..... R = 3.0
- SEISMIC RESPONSE COEFFICIENT ..... NOT APPLICABLE
- METHOD OF ANALYSIS ..... STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY 'A' PER ASCE 7-10 SECTION 11.7
- SEISMIC BASE SHEAR – PLAN NORTH WING ..... = 461 KIPS
- SEISMIC BASE SHEAR – PLAN SOUTH WING ..... = 249 KIPS

DESIGN STRESSES

CONCRETE (STRENGTH DESIGN) MINIMUM COMPRESSIVE STRENGTH IN 28 DAYS:
- FOOTINGS ..... f'c = 3,000 PSI
- INTERIOR SLABS ON GRADE, DRILLED PIERS, GRADE BEAMS, WALLS, INTERIOR STRUCTURAL FRAME, AND CONCRETE ON METAL DECK ..... f'c = 4,000 PSI
- CONCRETE EXPOSED TO FREEZE/THAW ..... f'c = 5,000 PSI
- PRECAST CONCRETE ..... f'c = 5,000 PSI MIN

REINFORCING BARS (ASTM 615 GRADE 60) ..... fy = 60,000 PSI
WELDED WIRE FABRIC (ASTM A1064) ..... fy = 65,000 PSI
WIDE FLANGE AND TEE SHAPES DESIGNATED AS W AND WT (ASTM A992) ..... fy = 50,000 PSI
CHANNELS, ANGLES, PLATES AND BARS (ASTM A572) ..... fy = 50,000 PSI
HOLLOW STRUCTURAL SECTIONS - RECTANGULAR STEEL TUBES (ASTM A500 GRADE C) ..... fy = 50,000 PSI
SOIL BEARING PRESSURE FOR FOUNDATIONS (ROCK) ..... 70,000 PSF

DESIGN CRITERIA

1. STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE 2018 KENTUCKY BUILDING CODE, 3rd EDITION (2015 IBC).
2. MAXIMUM ESTIMATED DEFLECTIONS (IN INCHES) ARE AS FOLLOWS:

	LIVE LOAD	DEAD + LIVE LOAD
ROOF MEMBERS	L/360	L/240
FLOOR MEMBERS INTERIOR	L/360	L/240
FLOOR MEMBERS SPANDREL	L/480	L/360

   WHERE L = SPAN LENGTH BETWEEN CENTERLINE OF SUPPORTS (INCHES)
   FOR CANTILEVERS L = TWICE THE LENGTH OF THE CANTILEVER.
3. NO PROVISION HAS BEEN MADE FOR FUTURE HORIZONTAL OR VERTICAL EXPANSION.
4. FIRE PROTECTION: STRUCTURAL SLABS ON METAL DECK HAVE BEEN DESIGNED IN COMPLIANCE WITH UL D902 TO PROVIDE A 2 HOUR FIRE RATING WITHOUT ADDITIONAL PROTECTION. STRUCTURAL STEEL BEAMS AND FLOOR SYSTEMS WITHIN STEEL FRAMED BUILDING SYSTEMS ARE CLASSIFIED AS RESTRAINED.

GENERAL

1. THE REQUIREMENTS OF THESE GENERAL NOTES APPLY UNLESS NOTED OTHERWISE ON PLANS OR IN SPECIFICATIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL CONTRACT DOCUMENTS, ADDENDA, AND SUPPLEMENTARY INFORMATION AND DISTRIBUTING SUCH TO ALL SUBCONTRACTORS AND MATERIAL SUPPLIERS PRIOR TO THE PREPARATION AND SUBMITTAL OF SHOP DRAWINGS, FABRICATION, AND INSTALLATION OF ANY STRUCTURAL MEMBERS.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO COMMENCING WORK. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES THAT MAY EXIST.
4. ANY DISCREPANCIES BETWEEN STRUCTURAL AND ARCHITECTURAL DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND STRUCTURAL ENGINEER. DO NOT SCALE DRAWINGS.
5. THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION AND IS THEREFORE DEPENDENT UPON DIAPHRAGM ACTION OF THE ROOF DECK AND FLOOR SLAB AND ATTACHMENT TO THE SHEAR WALLS AND FRAMES FOR STABILITY AND FOR RESISTANCE TO WIND AND SEISMIC FORCES. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY BRACING REQUIRED TO PROPERLY CONSTRUCT THE BUILDING UNTIL THESE ELEMENTS ARE COMPLETE AND CAPABLE OF PROVIDING THIS SUPPORT.
6. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MEANS AND METHODS TO CONSTRUCT THE STRUCTURE, INCLUDING VERIFICATION OF LOAD CAPACITY OF THE STRUCTURE TO SUPPORT CONSTRUCTION ACTIVITIES, EQUIPMENT, ETC. AND FOR LIMITING THE AMOUNT OF CONSTRUCTION LOAD IMPOSED ON THE STRUCTURAL FRAMING. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN CAPACITY OF THE FRAMING AT THE TIME THE LOADS ARE IMPOSED. DAMAGE TO THE STRUCTURE CAUSED BY CONSTRUCTION ACTIVITIES SHALL BE CORRECTED BY THE RESPONSIBLE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
7. SHOP DRAWINGS MUST BE CHECKED AND STAMPED BY THE CONTRACTOR PRIOR TO SUBMISSION.
8. NON-STRUCTURAL ELEMENTS OF THE BUILDING (ARCHITECTURAL FINISHES, MASONRY VENEER AND ASSOCIATED TIES, INSULATION, SHEATHING, DUCTWORK, PIPING, FOUNDATION/FLOOR/ROOF DRAINS, ETC.) ARE TYPICALLY NOT SHOWN ON THE STRUCTURAL DRAWINGS. WHERE NON-STRUCTURAL ELEMENTS ARE SHOWN ON THE STRUCTURAL DRAWINGS, THEY ARE SHOWN FOR REFERENCE AND DESIGN INTENT ONLY. NON-STRUCTURAL ELEMENTS SHALL BE CONSTRUCTED AS SHOWN ON THE ARCHITECTURAL, ELECTRICAL, MECHANICAL AND PLUMBING DRAWINGS.
9. ELEVATIONS SHOWN ON STRUCTURAL DRAWINGS ARE IDEALIZED ELEVATIONS BASED ON DECK THICKNESS AND SLOPES SHOWN ON DRAWINGS AND DO NOT ACCOUNT FOR BEAM OR JOIST CAMBER. IT IS THE RESPONSIBILITY OF THE CONTRACTORS TO COORDINATE ANY CAMBER OF THEIR WORK WITH OTHER TRADES AND ADJUST ELEVATIONS AS NECESSARY TO ACCOUNT FOR DEAD LOAD DEFLECTION AND THIS CAMBER.
10. WALL OPENINGS AND TERMINATIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE DIAGRAMMATIC ONLY. WALL TERMINATIONS AND OPENING JAMBS, HEADS, AND SILLS SHALL BE CONSTRUCTED AS SHOWN ON THE ARCHITECTURAL DRAWINGS. WHERE VENEERS WRAP JAMBS, DETAIL AND FABRICATE LINTELS TO BEAR ON SOLID STRUCTURE. DO NOT BEAR LINTELS OR BEAMS ON VENEERS (BRICKS, SIDING, ETC.). IF THE ARCHITECTURAL DRAWINGS DO NOT INCLUDE DETAILS FOR ANY OF THESE CONDITIONS, CONSULT WITH ARCHITECT FOR DIRECTION.
11. DETAILS LABELED TYPICAL ON THESE DRAWINGS SHALL APPLY TO ALL SITUATIONS OCCURRING ON THE PROJECT THAT ARE THE SAME OR SIMILAR AND SHALL APPLY REGARDLESS OF WHETHER THEY ARE KEYED ON THE PLANS. CONSTRUCTION NOT SPECIFICALLY INDICATED BY DETAIL OR SECTION SHALL BE SIMILAR TO DETAILS SHOWN FOR SIMILAR CONDITIONS.

CONCRETE CONSTRUCTION

1. ALL CONCRETE CONSTRUCTION TO BE IN ACCORDANCE WITH THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE ACI 301, ACI 318 AND ACI DETAILING MANUAL, EXCEPT THAT CONSTRUCTION AND REMOVAL OF FORMS AND RESHORING SHALL BE INSPECTED BY THE CONTRACTOR'S ENGINEER.
2. FURNISH BAR SUPPORTS WHERE NECESSARY DURING CONSTRUCTION.
3. PROVIDE PLASTIC, PLASTIC-COATED (NOT PLASTIC-TIPPED) OR STAINLESS STEEL CHAIRS IN ALL CONCRETE EXPOSED TO VIEW IN COMPLETED STRUCTURE.
4. PROVIDE PIPE SLEEVES AND INSERTS AS REQUIRED FOR WORK WHERE REQUIRED. SEE ARCHITECTURAL AND MECHANICAL DRAWINGS.
5. CONSTRUCTION JOINTS SHALL BE POSITIONED SO AS NOT TO CHANGE THE STRUCTURAL DESIGN REQUIREMENTS. LOCATION OF ALL CONSTRUCTION JOINTS SHALL BE APPROVED BY THE ENGINEER.
6. WELDING OF REINFORCING BARS (INCLUDING TACK WELDING) IS NOT PERMITTED.
7. PROVIDE HORIZONTAL KEYWAYS IN CONSTRUCTION JOINTS IN WALLS, AND WALL FOOTINGS; MINIMUM 1 1/2" DEPTH WITH HEIGHT EQUAL TO ONE-THIRD OF MEMBER DEPTH, UNLESS OTHERWISE SHOWN OR NOTED.
8. ALL EXPOSED CORNERS OF CONCRETE SHALL BE CHAMFERED 45 DEGREES. MINIMUM CHAMFER TO BE 1/2".
9. WHERE POCKETS OR VOIDS ARE FORMED INTO CONCRETE WALL FOR STEEL BEAMS OR COLUMNS, FILL POCKET WITH CONCRETE AFTER THE STEEL MEMBER HAS BEEN INSTALLED
10. SPLICES: ALL REINFORCING SPLICES SHALL BE AS TENSION LAP, U.N.O.
    A. LAP ALL COMPRESSION SPLICES 30 BAR DIAMETERS OF THE LARGER BAR.
    B. LAP ALL TENSION SPLICES (ALL SPLICES EXCEPT COLUMN SPLICES, U.N.O.) IN ACCORDANCE WITH THE FOLLOWING TABLE. MODIFY LENGTHS AS NOTED:

BAR SIZE	CONCRETE COMPRESSIVE STRENGTH 3,000 PSI	4,000 PSI	5,000 PSI
#3	21"	19"	17"
#4	29"	25"	22"
#5	36"	31"	28"
#6	43"	37"	33"
#7	62"	54"	48"
#8	71"	62"	55"
#9	80"	70"	62"
#10	90"	78"	70"
#11	100"	87"	78"

1. INCREASE SPLICE LENGTH BY THE FOLLOWING:
2. NOTE: INCREASED LENGTHS ARE ACCUMULATIVE

1. HORIZONTAL TOP BARS WITH GREATER THAN 12" OF CONCRETE BELOW +30 %
2. BAR SPACING LESS THAN 2 BAR DIAMETERS +50 %

11. CONCRETE PROTECTION FOR REINFORCEMENT: COVER
    A. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH ..... 3"
    B. CONCRETE EXPOSED TO EARTH OR WEATHER
       NO. 6 THROUGH NO. 18 BARS ..... 2"
       NO. 5 BAR, W31 OR D31 WIRE AND SMALLER ..... 1 ½"
    C. CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND
       NO. 14 AND NO. 18 BARS ..... 1 ½"
       NO. 11 BAR AND SMALLER ..... ¾"

STEEL CONSTRUCTION

1. STEEL DETAILING, FABRICATION, AND ERECTION SHALL CONFORM TO THE AISC SPECIFICATIONS AND CODE OF STANDARD PRACTICE, AND THE AWS STRUCTURAL WELDING CODE.
2. CONNECTIONS - WELDED OR HIGH-STRENGTH BOLTED:
   A. A325-SC, CLASS A, WITH HARDENED WASHERS - USE FOR ALL MOMENT CONNECTIONS, HANGERS, AND OTHER CONNECTIONS AS NOTED ON DRAWINGS.
   B. A325-N WITH HARDENED WASHERS - USE FOR ALL CONNECTIONS OTHER THAN SLIP CRITICAL CONNECTIONS.
   C. UNLESS SNUG-TIGHT CONNECTIONS ARE NOTED ON THE DRAWINGS AS BEING PERMITTED, ALL BOLTS SHALL BE TIGHTENED TO FULL PRETENSIONING LOAD.
   D. UNLESS SPECIFICALLY NOTED ON THE DRAWINGS OR WITHOUT WRITTEN PERMISSION FROM THE ENGINEER, ALL BOLTS FOR THE PROJECT SHALL BE OF ONE ASTM TYPE AND ONE DIAMETER.
   E. USE STANDARD HOLES WITH THE FOLLOWING EXCEPTIONS: OVERSIZE HOLES ARE PERMITTED WHEN BOLTS ARE LOADED IN TENSION; SHORT-SLOTTED HOLES ARE PERMITTED FOR SHEAR LOADING PERPENDICULAR TO THE SLOT IN ANY ONE PLY AT EACH FAYING SURFACE.
   F. HARDENED WASHERS SHALL BE USED OVER ALL OVERSIZED OR SHORT-SLOTTED HOLES IN AN OUTER PLY. WHERE LONG-SLOTTED HOLES ARE USED IN AN OUTER PLY, 5/16" THICK A36 PLATE WASHERS OR CONTINUOUS BAR WITH STANDARD HOLES SHALL BE PROVIDED.
   G. WHERE REACTION IS NOTED, DEVELOP SAME. WHERE NOT NOTED, FOR NON-COMPOSITE BEAMS, CONNECTIONS SHALL DEVELOP ONE-HALF OF THE TOTAL UNIFORM LOAD CAPACITY OF THE BEAM. FOR COMPOSITE BEAMS, SEE TABLE.
   H. WHEREVER POSSIBLE, USE FRAMED BEAM CONNECTIONS AS LISTED IN TABLES 10-1, 10-2, 10-3,10-4, 10-10, 10-11 AND 10-12 OF THE AISC STEEL CONSTRUCTION MANUAL, 14TH EDITION. THE LENGTH OF CONNECTION ANGLES AND PLATES SHALL BE NOT LESS THAN ONE-HALF OF THE T DISTANCE OF THE BEAM WEB.
   J. SINGLE PLATE SHEAR CONNECTIONS ARE NOT PERMITTED WHERE THE REACTION EXCEEDS 50 KIPS, AT FIELD-APPLIED CONNECTIONS, OR CONNECTIONS TO COLUMNS (OTHER THAN AT SKEWED CONNECTIONS, MOMENT CONNECTIONS, PIPE COLUMNS, TUBE COLUMNS WITH FACE DIMENSION 4" OR LESS, OR CONNECTIONS WITH REACTIONS LESS THAN 15 KIPS).
   K. THROUGH PLATE CONNECTIONS AT TUBE COLUMNS ARE NOT PERMITTED, UNLESS NOTED OTHERWISE. SHEAR CONNECTIONS TO TUBE COLUMNS SHALL BE WT OR DOUBLE ANGLE KNIFE CONNECTIONS, EXCEPT AS NOTED ABOVE.
   L. WT SHEAR CONNECTIONS FROM GIRDERS (SUPPORTING JOISTS, PURLINS, PIPING, ETC.) TO TUBE COLUMNS SHALL BE 3 BOLTS MINIMUM DEPTH. WHERE GIRDER DEPTH ALLOWS ONLY 2 BOLT DEPTH, CONNECTION SHALL BE KNIFED DOUBLE ANGLE.
   M. SHEAR CONNECTIONS TO VERTICAL EMBED PLATES IN CONCRETE WALLS SHALL BE DOUBLE ANGLE TYPE.
3. WELDING ELECTRODES SHALL BE E70XX EXCEPT WHERE OTHER ELECTRODES ARE REQUIRED FOR COMPATIBILITY WITH MATERIALS BEING WELDED.
   A. USE E80XX ELECTRODES FOR WELDING ASTM A706 (WELDABLE) REBAR.
4. ALL SLIP CONNECTIONS SHALL BE PROVIDED WITH A MEANS OF PREVENTING THE NUTS FROM UNTHREADING.
5. SHOP DRAWINGS ARE REQUIRED AND SHALL NOTE TYPE OF ELECTRODES, SIZE OF ALL WELDS, AND TYPE AND SIZE OF ALL BOLTS.
6. SEE SPECIFICATIONS FOR ALL PAINTING REQUIREMENTS.
7. ALL SHOP AND FIELD WELDING SHALL BE DONE BY A CERTIFIED WELDER.
8. MISCELLANEOUS HANGING LOADS SUCH AS STAIR STRINGERS, PIPING, MECHANICAL UNITS, ETC., SUPPORTED BY STEEL MEMBERS SHALL HAVE THESE LOADS APPLIED IN SUCH A MANNER THAT NO TORSIONAL FORCES ARE INDUCED IN THESE MEMBERS, I.E., LOADS SHALL PASS THROUGH CENTERLINE OF WIDE FLANGE SECTIONS AND THROUGH THE SHEAR CENTER OF CHANNELS.
9. STEEL RELIEF ANGLES THAT SUPPORT MASONRY VENEER SHALL BE INSTALLED AS FOLLOWS:
   A. ANGLES SHALL BE DISCONTINUOUS AT ALL MASONRY VENEER EXPANSION JOINTS. WIDTH OF GAP BETWEEN ANGLES SHALL MATCH WIDTH OF MASONRY EXPANSION JOINT, NOT LESS THAN ½" OR MORE THAN 1".
   B. AT BUILDING CORNER, THE ANGLES SHALL BE MITER CUT. THE VERTICAL LEGS OF THE ANGLES SHALL NOT EXTEND PAST THE CORNER CAUSING INTERFERENCE WITH THE MASONRY VENEER.
   C. CLEAN ALL FIELD WELDS, CUTS AND ABRADED AREAS AND APPLY GALVANIZING REPAIR PAINT.

SITE OBSERVATION BY THE STRUCTURAL ENGINEER

1. THE ENGINEER HAS NO CONTROL OR CHARGE OF, AND SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES; FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK; FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTOR, OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK; OR FOR THE FAILURE OF ANY THEM TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
2. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY ACTS OR OMISSIONS OF THE CONTRACTOR, ANY SUBCONTRACTOR, MATERIAL SUPPLIER, OR AGENTS THEREOF. THE ENGINEER DOES NOT GUARANTEE THE PERFORMANCE OF THE CONTRACTOR AND SHALL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S FAILURE TO PERFORM ITS WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS OR APPLICABLE LAWS, CODES, RULES, OR REGULATIONS. THE CONTRACTOR SHALL MAINTAIN SOLE RESPONSIBILITY FOR DEFECTS AND DEFICIENCIES, INCLUDING PROVIDING TESTING AND INSPECTION ONCE SUCH ARE DISCOVERED, AND FOR PROVIDING ENGINEERED CORRECTIVE ACTION FOR DESIGN TEAM REVIEW.
3. PERIODIC SITE OBSERVATION BY FIELD REPRESENTATIVES OF BROWN+KUBICAN, PSC IS SOLELY FOR THE PURPOSE OF DETERMINING IF THE WORK OF THE CONTRACTOR IS PROCEEDING IN GENERAL ACCORDANCE WITH THE STRUCTURAL CONTRACT DOCUMENTS. THIS LIMITED SITE OBSERVATION SHALL NOT BE CONSTRUED AS EXHAUSTIVE OR CONTINUOUS TO CHECK THE QUALITY, QUANTITY, OR ACCURACY OF THE CONSTRUCTOR'S WORK, BUT RATHER PERIODIC OBSERVATION TO INFORM THE CLIENT ABOUT GENERAL PROGRESS AND TO ADVISE THE CLIENT ABOUT OBSERVED DEFECTS AND DEFICIENCIES IN THE WORK OF THE CONTRACTOR.

ROOF, FLOOR, OR WALL OPENINGS

1. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE NUMBER, SIZE, AND LOCATION OF ALL SLEEVES AND OPENINGS REQUIRED FOR MECHANICAL OR ELECTRICAL ITEMS.
2. SLEEVES AND OPENINGS SHALL BE LOCATED IN A MANNER THAT WILL MAINTAIN THE STRUCTURAL INTEGRITY OF THE ROOF, FLOOR, OR WALL SYSTEM.
3. NO STRUCTURAL ELEMENTS ARE TO BE CUT UNLESS SPECIFICALLY APPROVED BY THE ENGINEER.

OPENINGS / PENETRATIONS / ATTACHMENTS TO STRUCTURE BY OTHER TRADES
1. THE CONTRACTOR SHALL COORDINATE AND VERIFY THE NUMBER, SIZE, AND LOCATION OF ALL SLEEVES AND OPENINGS REQUIRED FOR OTHER TRADES IN STRUCTURAL ELEMENTS.

TO STRUCTURAL STEEL:
1. FIELD CUTTING/DRILLING OF HOLES LARGER THAN 3/8" INTO BEAM FLANGES OR COLUMNS IS PROHIBITED EXCEPT WHERE REQUIRED FOR STRUCTURAL STEEL CONNECTIONS.
2. PENETRATIONS / HOLES THROUGH BEAM WEBS MAY BE POSSIBLE. TRADE CONTRACTOR SHALL BE RESPONSIBLE FOR ENGINEERING COST TO VERIFY ADEQUACY AND DESIGN AND FOR INSTALLATION COST OF OPENING AND ANY REINFORCEMENT.

TO STRUCTURAL PRECAST CONCRETE:
1. DO NOT USE DRILLED OR POWDER-ACTUATED FASTENERS FOR ATTACHING ACCESSORY ITEMS TO PRECAST, PRESTRESSED UNITS. ATTACHMENT TO THE PRECAST PLANK SHALL BE LOCATED AROUND TENDON LAYOUT AND SHALL INCORPORATE FASTENERS DESIGNED FOR USE IN HOLLOW CONCRETE AND THAT DO NOT PENETRATE THE CONCRETE MORE THAN ¼" (SUCH AS DROP-IN ANCHORS).
2. CONTRACTORS SHALL COORDINATE PENETRATION REQUIREMENTS WITH STRUCTURAL ENGINEER AND STRUCTURAL MANUFACTURERS. TRADE CONTRACTORS SHALL COORDINATE AND MARK ALL PENETRATIONS LARGER THAN 12 INCHES IN DIAMETER/SQUARE THROUGH PRECAST CONCRETE PLANK DURING THE STRUCTURAL SUBMITTAL PROCESS. REINFORCEMENT OF SUBSEQUENT FIELD CUT OPENING OF 12" OR LARGER SHALL BE THE RESPONSIBILITY OF THE TRADE CONTRACTOR REQUIRING SUCH OPENING.

MAINTENANCE STATEMENT AND STRUCTURE LIFESPAN

1. THE ENGINEER MAKES NO CLAIM OR AGREEMENT AS TO THE LIFESPAN OF THE BUILDING STRUCTURE. THE CLIENT AND OWNER SHALL UNDERSTAND THAT STRUCTURAL TYPES DO HAVE LIFESPAN RELATIVE TO INITIAL COST AND MAINTENANCE AND THAT BY REQUESTING OR ACCEPTING A STRUCTURAL SYSTEM OF LOWER INITIAL COST THAT THE USEABLE LIFESPAN WILL DECREASE AND MAINTENANCE INCREASE.
2. ALL STRUCTURES REQUIRE PERIODIC MAINTENANCE TO EXTEND LIFESPAN AND TO ENSURE STRUCTURAL INTEGRITY FROM EXPOSURE TO THE ENVIRONMENT. THE ENGINEER SHALL NOT BE HELD LIABLE FOR MAINTENANCE REQUIREMENTS OR DETERIORATION RESULTING FROM LACK OF BUILDING MAINTENANCE.
3. A PLANNED PROGRAM OF MAINTENANCE SHALL INCLUDE ITEMS SUCH AS, BUT NOT LIMITED TO: PAINTING OF STRUCTURAL STEEL AND LINTELS, PROTECTIVE COATING FOR CONCRETE, SEALANTS, CAULKED JOINTS, EXPANSION JOINTS, CONTROL JOINTS, TIMELY REPAIR OF SPALLS AND CRACKS IN CONCRETE, AND PRESSURE WASHING OF STRUCTURAL ELEMENTS EXPOSED TO A SALT ENVIRONMENT OR OTHER HARSH CHEMICALS.

STRUCTURAL ABBREVIATIONS

APA	AMERICAN PLYWOOD ASSOCIATION	HORIZ	HORIZONTAL
ARCH	ARCHITECTURAL	HSS	HOLLOW STRUCTURAL SECTION
B.L.E.	BRICK LEDGE ELEVATION	I.C.F.	INSULATED CONCRETE FORM
BOT	BOTTOM	LBS	POUNDS
BTWN	BETWEEN	L.D.H.	LONG DIMENSION HORIZONTAL
CANT	CANTILEVER BEAM	L.D.V.	LONG DIMENSION VERTICAL
C.F.S.	COLD-FORMED STEEL	LVL	LAMINATED VENEER LUMBER
C.I.P.	CAST-IN-PLACE	MANUF	MANUFACTURER
CJP	COMPLETE JOINT PENETRATION	MAX	MAXIMUM
CLR	CLEAR	MECH	MECHANICAL
C.M.U.	CONCRETE MASONRY UNIT	M.E.P.	MECHANICAL/ELECTRICAL/PLUMBING
COL	COLUMN	MIN	MINIMUM
CONC	CONCRETE	N.I.C.	NOT IN CONTRACT
CONT	CONTINUOUS	N.S.	NEAR SIDE
D	DEEP	N.T.S.	NOT TO SCALE
DET	DETAIL	O.C.	ON CENTER
D.G.A.	DENSE GRADED AGGREGATE	O.P.H.	OPPOSITE HAND
DWGS	DRAWINGS	P.A.F.	POWDER ACTUATED FASTENER
EA	EACH	P.E.M.B.	PRE-ENGINEERED METAL BUILDING
E.F.	EACH FACE	P.J.P.	PARTIAL JOINT PENETRATION
ELEV	ELEVATION	PL	PLATE
EMBED	MINIMUM EMBEDMENT DEPTH INTO SUBSTRATE	R	RADIUS
E.O.S.	EDGE OF SLAB	REINF	REINFORCEMENT
E.W.	EACH WAY	R.T.U.	ROOF TOP UNIT (MECHANICAL)
EX	EXISTING	S.C.	SLIP CRITICAL
EXP	EXPANSION	SIM.	SIMILAR
F.F.E.	FINISHED FLOOR ELEVATION	S.O.G.	SLAB ON GRADE
F.R.C.	FIBER REINFORCED CONCRETE	SP	COLUMN SPLICE
F.R.P.	FIBER REINFORCED POLYMER	S.S.	STAINLESS STEEL
F.R.T.	FIRE RESISTANCE TREATED	STD	STANDARD
F.S.	FAR SIDE	TYP	TYPICAL
FTG	FOOTING	U.N.O.	UNLESS NOTED OTHERWISE
F.V.	FIELD VERIFY	VERT	VERTICAL
GA	GAUGE	W	WIDE
GALV	GALVANIZED	W.W.F.	WELDED WIRE FABRIC

MATERIAL LEGEND

- BEDROCK
- CRUSHED STONE
- NATIVE EARTH / ENGINEERED FILL
- CONCRETE
- PRECAST CONCRETE
- FLOWABLE FILL
- DENSE GRADED AGGREGATE (DGA)
- PRECAST CONCRETE GROUT "IN SECTION"
- MASONRY GROUT "IN SECTION"
- RAISED FLOOR
- RECESSED FLOOR
- C.M.U. "IN SECTION"
- BRICK "IN SECTION"
- GRATING 1/8" SCALE

STRUCTURAL SPECIAL INSPECTIONS CHART

COMPONENT	TEST OR SPECIAL INSPECTION	PERIODIC OR CONTINUOUS	ACCEPTABLE QUALIFICATIONS
FABRICATORS (IBC 1704.2.5)	INSPECT THE FABRICATION OF STRUCTURAL LOAD-BEARING MEMBERS WHERE SUCH WORK IS BEING PERFORMED ON THE PREMISES OF THE FABRICATOR'S SHOP. 1. FABRICATORS SHALL BE EXEMPT FROM SPECIAL INSPECTION WHEN A QUALIFIED CERTIFICATION AUTHORITY HAS PERIODICALLY REVIEWED AND APPROVED FABRICATOR'S WRITTEN PROCEDURAL AND QUALITY CONTROL MANUALS AND FABRICATION PRACTICES. SUBJECT TO COMPLIANCE WITH KENTUCKY BUILDING CODE REQUIREMENTS, QUALIFIED CERTIFICATION AUTHORITIES PROVIDING CERTIFICATION WHICH MAY BE APPLICABLE TO PROJECT INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING: a. PRECAST CONCRETE FABRICATORS – PCI CERTIFIED.	PERIODIC	COMPLY WITH SECTIONS BELOW WHEN REQUIRED
	VERIFY THAT THE FABRICATOR MAINTAINS AND REVIEW FO

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A S-003-PC ISOMETRIC VIEW 1

B S-003-PC ISOMETRIC VIEW 2

NOTE:
3D VIEWS SHOWN ON THIS SHEET ARE FOR REFERENCE ONLY.
3D STRUCTURAL MODEL IS NOT GUARANTEED TO BE COMPLETE OR EXACT.
SEE ALL OTHER SHEETS FOR ACCURATE STRUCTURAL PLANS AND DETAILS.

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BP-01A & BP-01B

UNIVERSITY OF KENTUCKY
HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

STATE OF KENTUCKY
ALISON B JOHNSON
37327
LICENSED PROFESSIONAL ENGINEER
BROWN + KUBICAN, PSC

ISOMETRIC VIEWS

S-003-PC

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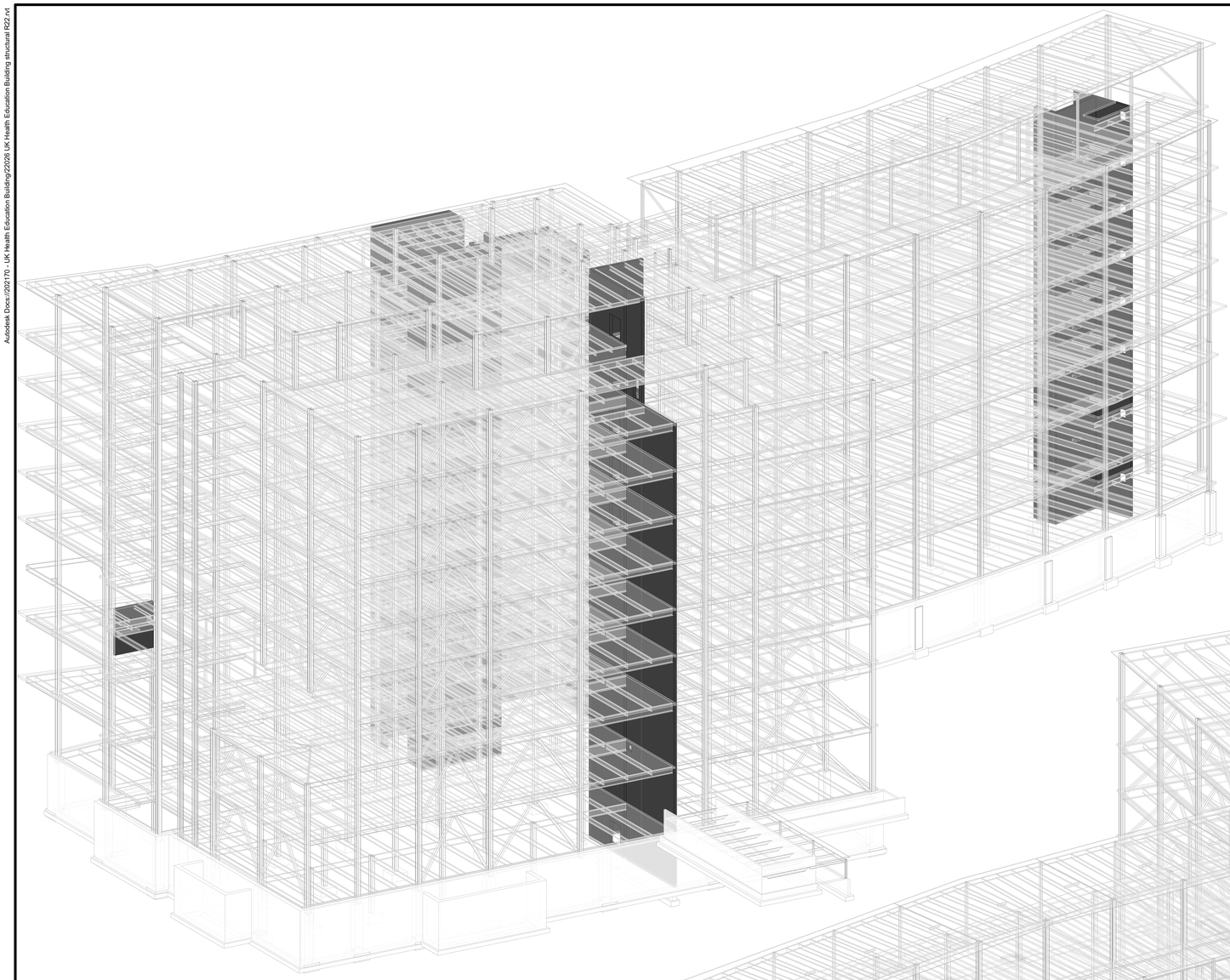
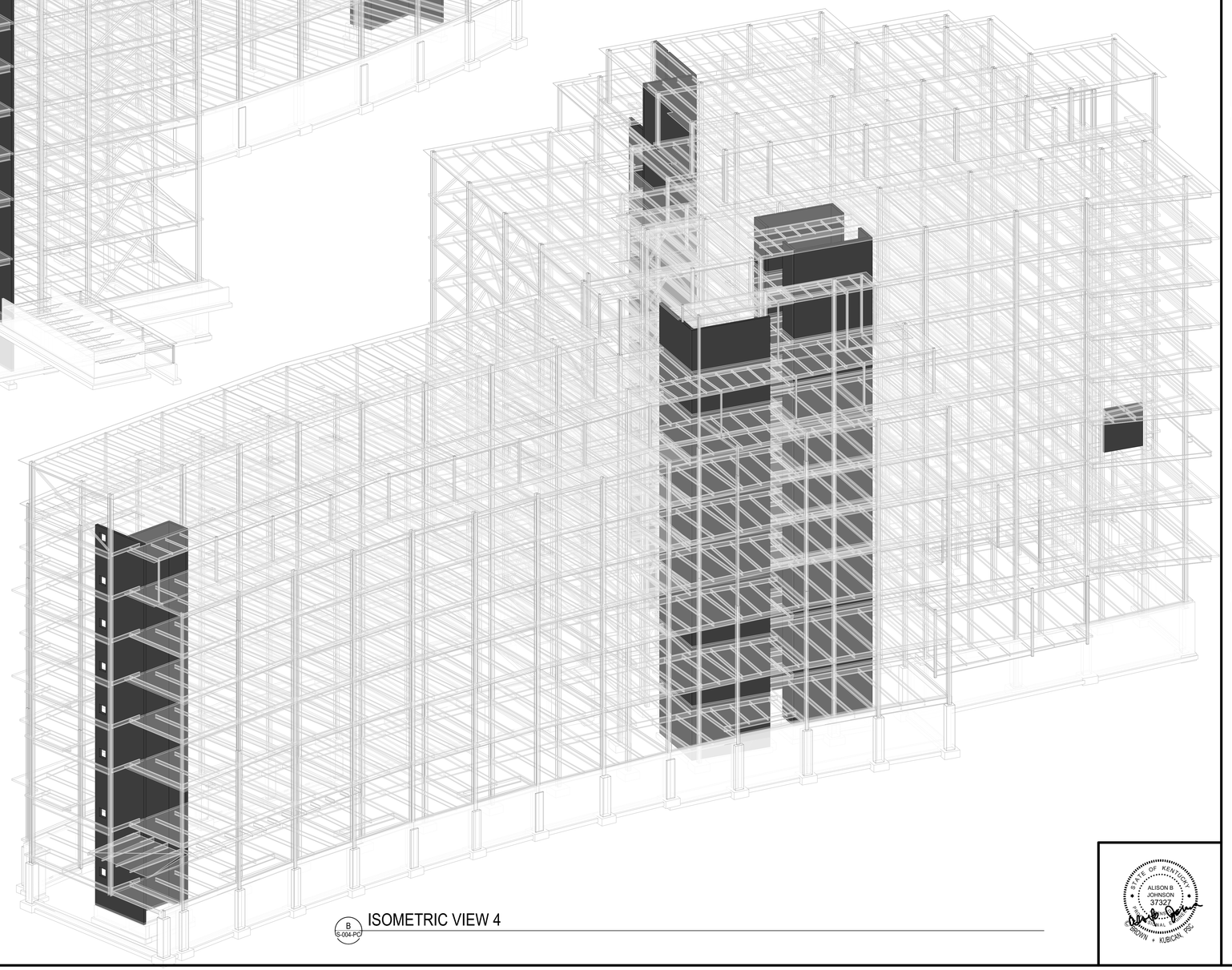


A S-004-PC ISOMETRIC VIEW 3



B S-004-PC ISOMETRIC VIEW 4

NOTE:
3D VIEWS SHOWN ON THIS SHEET ARE FOR REFERENCE ONLY.
3D STRUCTURAL MODEL IS NOT GUARANTEED TO BE COMPLETE OR EXACT.
SEE ALL OTHER SHEETS FOR ACCURATE STRUCTURAL PLANS AND DETAILS.

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RESERVED FOR AHJ STAMP

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BP-01A & BP-01B

UNIVERSITY OF KENTUCKY
HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

STATE OF KENTUCKY
ALISON B JOHNSON
37327
LICENSED PROFESSIONAL ENGINEER
BROWN + KUBICAN, PSC

ISOMETRIC VIEWS

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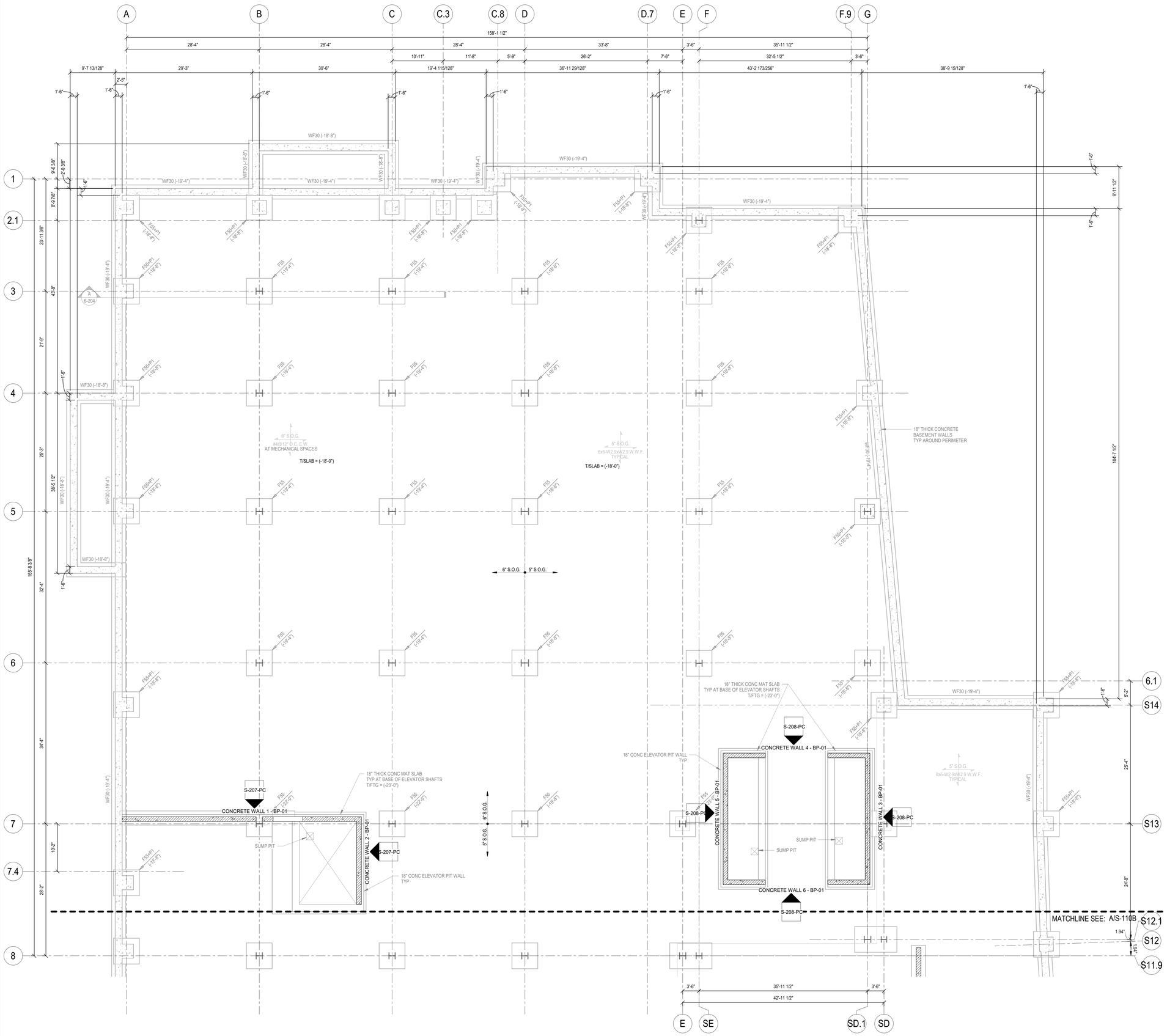


A S-110A-PC
FOUNDATION PLAN - GARDEN LEVEL - AREA A
1/8" = 1'-0"

BP-01 (PRECAST) PLAN NOTES

1. THIS IS AN EARLY RELEASE PACKAGE TO OBTAIN DESIGN ASSIST SERVICES AS IT RELATES TO THE PRECAST CONCRETE WALLS. THE INFORMATION SHOWN ON THESE DRAWINGS IS NOT COMPLETE AND SHALL BE USED FOR BID PURPOSES ONLY. **NO ACTUAL CONSTRUCTION NOR FABRICATION SHALL PROCEED BASED ON THIS DRAWING SET.**
2. FINISHED FIRST FLOOR ELEVATION (+0'-0").
   FINISHED SECOND FLOOR ELEVATION (+24'-0").
   FINISHED THIRD FLOOR ELEVATION (+46'-0").
   FINISHED FOURTH FLOOR ELEVATION (+62'-0").
   FINISHED FIFTH FLOOR ELEVATION (+77'-6").
   FINISHED SIXTH FLOOR ELEVATION (+93'-0").
   FINISHED SEVENTH FLOOR ELEVATION (+108'-6").
   FINISHED EIGHTH FLOOR ELEVATION (+124'-0").
   FINISHED ROOF ELEVATION (+142'-1 1/2").
   FINISHED PENTHOUSE ROOF ELEVATION (+153'-1 1/2").
3. TOP OF FIRST FLOOR STEEL BEAMS = (-0'-6") U.N.O.
   TOP OF SECOND FLOOR STEEL BEAMS = (+23'-6") U.N.O.
   TOP OF THIRD FLOOR STEEL BEAMS = (+45'-3") U.N.O.
   TOP OF FOURTH FLOOR STEEL BEAMS = (+61'-3") U.N.O.
   TOP OF FIFTH FLOOR STEEL BEAMS = (+76'-9") U.N.O.
   TOP OF SIXTH FLOOR STEEL BEAMS = (+92'-3") U.N.O.
   TOP OF SEVENTH FLOOR STEEL BEAMS = (+107'-9") U.N.O.
   TOP OF EIGHTH FLOOR STEEL BEAMS = (+123'-3") U.N.O.
   TOP OF ROOF STEEL BEAMS = (+142'-0") U.N.O.
   TOP OF PENTHOUSE ROOF STEEL BEAMS = (+153'-0") U.N.O.
4. SEE DWG S-001-PC FOR GENERAL NOTES AND SPECIAL INSPECTIONS.
5. SEE ARCHITECTURAL DRAWINGS FOR PRECAST CLADDING PANELS. LAYOUT AND QUANTITY SHOWN ON STRUCTURE SHEETS IS NOT GUARANTEED TO BE EXACT.
6. INTENT OF THIS STRUCTURAL PLAN SET IS TO CONVEY THE SCOPE AND REQUIREMENTS FOR THE INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ONLY. SEE S-200-PC SERIES SHEETS FOR STRUCTURAL WALL ELEVATION VIEWS AND ADDITIONAL INFORMATION.
   A. SEE SHEET S-113A-PC FOR ONE-STORY PRECAST CONCRETE WALL IN PT/AT CLINICAL SPACE THAT IS NOT CONVEYED ELSEWHERE IN THE DRAWING SET. (ENSURE THIS WALL IS INCLUDED IN THE STRUCTURAL PRECAST BID PACKAGE.)
7. UNLESS NOTED OTHERWISE, INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ARE 12" THICK, SOLID CONCRETE, WITH A MINIMUM OF TWO REINFORCING MATS.
8. PRECAST SUPPLIER SHALL LAYOUT STRUCTURAL PANEL JOINTS. JOINT POSITIONS ARE SHALL BE APPROVED BY THE E.O.R. PRIOR TO FABRICATION. HORIZONTAL JOINTS SHALL ONLY OCCUR AT A FLOOR LINE US APPROVED BY THE E.O.R.
9. PRECAST SUPPLIER CAN ELECT TO PRESTRESS AND/OR POST-TENSION THE STRUCTURAL PRECAST WALL PANELS AT THEIR DISCRETION (AS NEEDED TO OPTIMIZE THE DESIGN.)
10. PRECAST SUPPLIER SHALL BE RESPONSIBLE FOR ALL PANEL-TO-PANEL CONNECTIONS.
11. PRECAST SUPPLIER SHALL BE REPSONSIBLE FOR ALL EMBEDS, AND REINFORCEMENT INTERNAL TO THE WALL, NECESSARY FOR STRUCTURAL STEEL TO WALL PANEL CONNECTIONS.
12. PRECAST PANEL DESIGN SHALL INCLUDE DIAGONAL CORNER BARS AT EACH OPENING CORNER.
13. PRECAST SUPPLIER SHALL COORDINATE WITH M.E.P. DRAWINGS AND SHOP FABRICATE ALL OPENINGS WITH A DIMENSION GREATER THAN 10".
14. THIS IS AN EARLY BID PACKAGE, THE FOLLOWING ADJUSTMENTS MUST BE ALLOWED FOR IN THE BID PRICE:
   A. MISCELLANEOUS M.E.P. PENETRATIONS THROUGH THE WALLS (BEYOND THE NUMBER OF OPENINGS CURRENTLY SHOWN).
   B. LENGTHENING OR SHORTENING EACH WALL PANEL BY UP TO 1'-0".
   C. ADJUSTMENTS TO WALL BASE FORCES BY UP TO 25%.
   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
   E. SPECIALTY EMBEDS TO RECEIVE LATERAL FORCE COLLECTOR BEAMS (WELABLE REBAR ON REAR ON EMBED PLATE TO DRAG LOAD INTO THE CONCRETE PANEL.)

BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

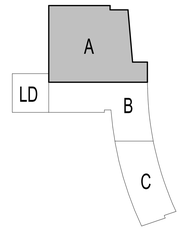
- 1.5WR20 = 1 1/2" 20 GA GALVANIZED WIDE RIB STEEL ROOF DECK.
- S6.0 = 4 1/2" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 W.W.F. ON 1 1/2" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (6" TOTAL THICKNESS).
- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [10] (15k) — STEEL BEAM SIZE. NUMBER OF SHEAR STUDS, ZERO IF BLANK. SERVICE LOAD REACTION (KIPS) EACH END.
- C=3/4" — CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6") = TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
- = MOMENT CONNECTION.
- = HSS DIAGONAL BRACING.
- F55 = SPREAD FOOTING. SEE SCHEDULE.
- WF40 = WALL FOOTING. SEE SCHEDULE.
- = STRUCTURAL PRECAST CONCRETE WALL.
- = ARCHITECTURAL PRECAST CONCRETE CLADDING PANEL.

SPREAD FOOTING SCHEDULE

MARK	LENGTH	WIDTH	THICKNESS	REINFORCING E.W. BOTTOM U.N.O.
F55	5'-6"	5'-6"	2'-6"	(9) #4
F9055	5'-6"	9'-0"	2'-6"	(9) #4

WALL FOOTING SCHEDULE

MARK	WIDTH	THICKNESS	REINFORCING CONT BOTTOM	TRANSVERSE REINFORCING BOTTOM
WF30	3'-0"	1'-4"	(4) #5	#4@12" O.C.
WF40	3'-0"	1'-8"	(5) #5	#4@9" O.C.



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FOUNDATION PLAN - GARDEN LEVEL - AREA A

S-110A-PC

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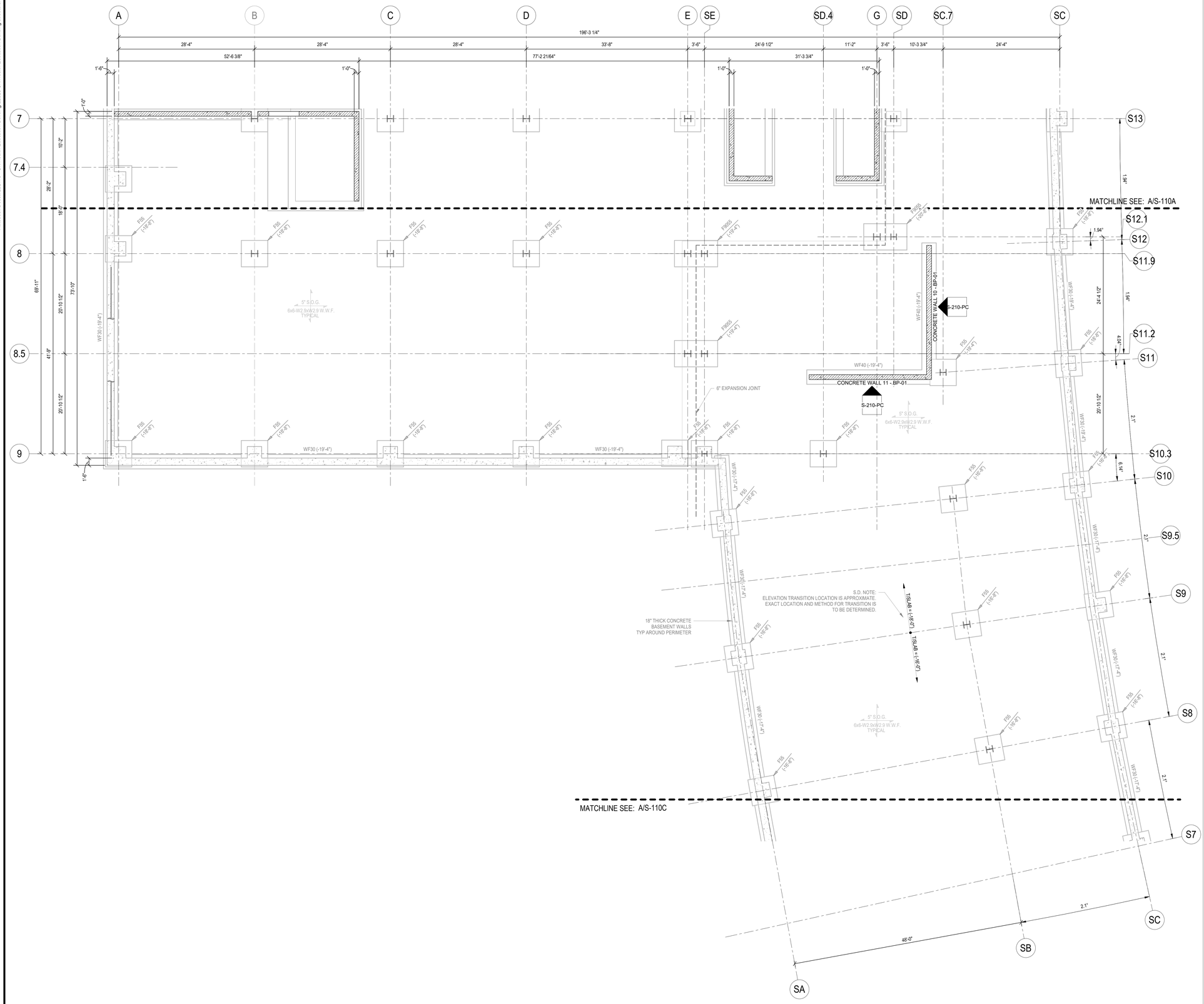

A S-110B-PC FOUNDATION PLAN - GARDEN LEVEL - AREA B
1/8" = 1'-0"

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- F55 = SPREAD FOOTING. SEE SCHEDULE.
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SPREAD FOOTING SCHEDULE

MARK	LENGTH	WIDTH	THICKNESS	REINFORCING E.W. BOTTOM U.N.O.
F55	5'-6"	5'-6"	2'-6"	(9) #4
F9055	5'-6"	9'-0"	2'-6"	(9) #4

WALL FOOTING SCHEDULE

MARK	WIDTH	THICKNESS	REINFORCING CONT BOTTOM	TRANSVERSE REINFORCING BOTTOM
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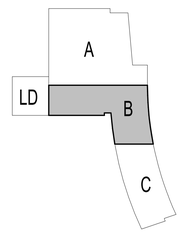
WF40	3'-0"	1'-8"	(5) #5	#4@9" O.C.



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FOUNDATION PLAN - GARDEN LEVEL - AREA B

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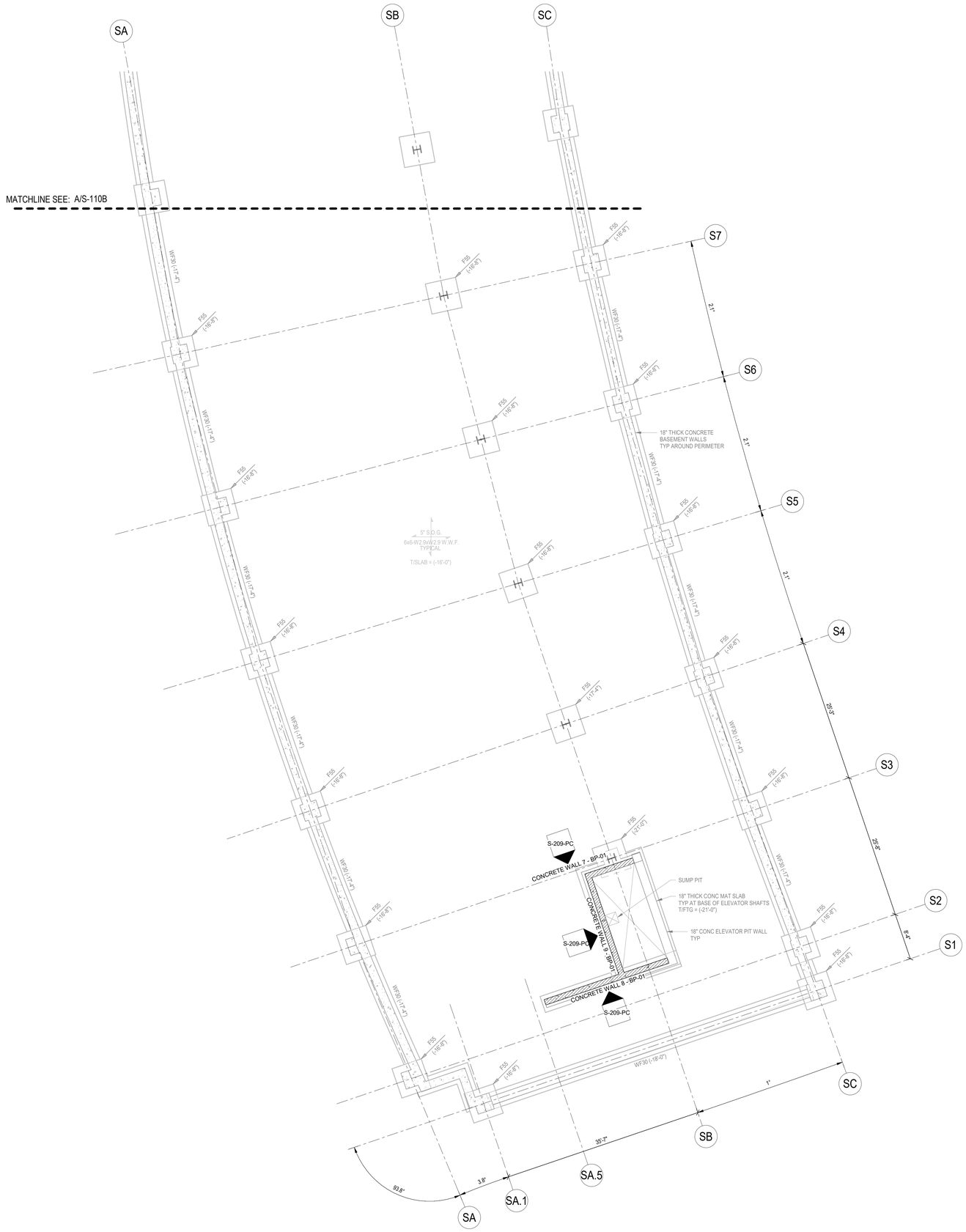

A S-110C-PC FOUNDATION PLAN - GARDEN LEVEL - AREA C
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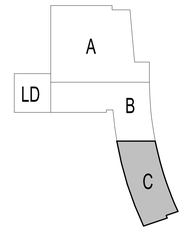
SPREAD FOOTING SCHEDULE

MARK	LENGTH	WIDTH	THICKNESS	REINFORCING E.W. BOTTOM U.N.O.
F55	5'-6"	5'-6"	2'-6"	(9) #4
F9055	5'-6"	9'-0"	2'-6"	(9) #4

WALL FOOTING SCHEDULE

MARK	WIDTH	THICKNESS	REINFORCING CONT BOTTOM	TRANSVERSE REINFORCING BOTTOM
WF30	3'-0"	1'-4"	(4) #5	#4@12" O.C.
WF40	3'-0"	1'-8"	(5) #5	#4@9" O.C.



KEYPLAN

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Lexington, Kentucky 40509
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STATE OF KENTUCKY BRIAN McMILLAN 29837 LICENSED PROFESSIONAL ENGINEER BROWN + KUBICAN, PSC

RESERVED FOR AHJ STAMP

BROWN+KUBICAN STRUCTURAL ENGINEERS
546 East Main Street, Suite 300
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859-543-0933
www.brownkubican.com

BP-01A & BP-01B

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

FOUNDATION PLAN - GARDEN LEVEL - AREA C

S-110C-PC

STATE OF KENTUCKY ALISON B JOHNSON 37327 LICENSED PROFESSIONAL ENGINEER BROWN + KUBICAN PSC

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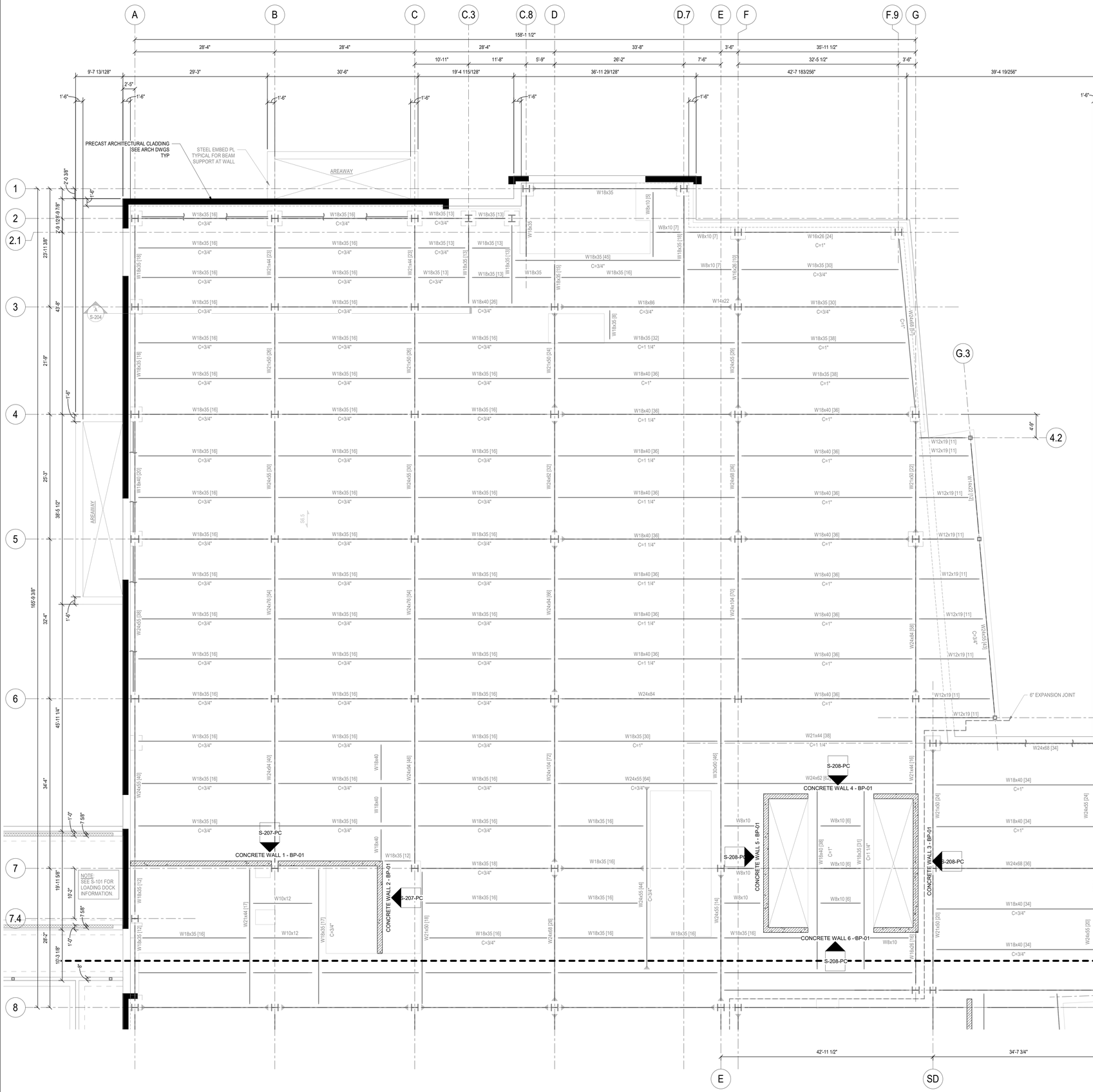

A S-111A-PC FRAMING PLAN - FIRST FLOOR - AREA A

1/8" = 1'-0"

BP-01 (PRECAST) PLAN NOTES

1. THIS IS AN EARLY RELEASE PACKAGE TO OBTAIN DESIGN ASSIST SERVICES AS IT RELATES TO THE PRECAST CONCRETE WALLS. THE INFORMATION SHOWN ON THESE DRAWINGS IS NOT COMPLETE AND SHALL BE USED FOR BID PURPOSES ONLY. **NO ACTUAL CONSTRUCTION NOR FABRICATION SHALL PROCEED BASED ON THIS DRAWING SET.**
2. FINISHED FIRST FLOOR ELEVATION (+0'-0").
   FINISHED SECOND FLOOR ELEVATION (+24'-0").
   FINISHED THIRD FLOOR ELEVATION (+46'-0").
   FINISHED FOURTH FLOOR ELEVATION (+62'-0").
   FINISHED FIFTH FLOOR ELEVATION (+77'-6").
   FINISHED SIXTH FLOOR ELEVATION (+93'-0").
   FINISHED SEVENTH FLOOR ELEVATION (+108'-6").
   FINISHED EIGHTH FLOOR ELEVATION (+124'-0").
   FINISHED ROOF ELEVATION (+142'-1 1/2").
   FINISHED PENTHOUSE ROOF ELEVATION (+153'-1 1/2").
3. TOP OF FIRST FLOOR STEEL BEAMS = (-0'-6") U.N.O.
   TOP OF SECOND FLOOR STEEL BEAMS = (+23'-6") U.N.O.
   TOP OF THIRD FLOOR STEEL BEAMS = (+45'-3") U.N.O.
   TOP OF FOURTH FLOOR STEEL BEAMS = (+61'-3") U.N.O.
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   TOP OF PENTHOUSE ROOF STEEL BEAMS = (+153'-0") U.N.O.
4. SEE DWG S-001-PC FOR GENERAL NOTES AND SPECIAL INSPECTIONS.
5. SEE ARCHITECTURAL DRAWINGS FOR PRECAST CLADDING PANELS. LAYOUT AND QUANTITY SHOWN ON STRUCTURE SHEETS IS NOT GUARANTEED TO BE EXACT.
6. INTENT OF THIS STRUCTURAL PLAN SET IS TO CONVEY THE SCOPE AND REQUIREMENTS FOR THE INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ONLY. SEE S-200-PC SERIES SHEETS FOR STRUCTURAL WALL ELEVATION VIEWS AND ADDITIONAL INFORMATION.
   A. SEE SHEET S-113A-PC FOR ONE-STORY PRECAST CONCRETE WALL IN PTAT CLINICAL SPACE THAT IS NOT CONVEYED ELSEWHERE IN THE DRAWING SET. (ENSURE THIS WALL IS INCLUDED IN THE STRUCTURAL PRECAST BID PACKAGE.)
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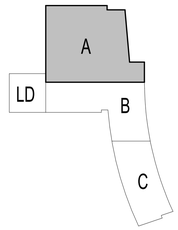
   B. LENGTHENING OR SHORTENING EACH WALL PANEL BY UP TO 1'-0".
   C. ADJUSTMENTS TO WALL BASE FORCES BY UP TO 25%.
   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
   E. SPECIALTY EMBEDS TO RECEIVE LATERAL FORCE COLLECTOR BEAMS (WELABLE REBAR ON REAR ON EMBED PLATE TO DRAG LOAD INTO THE CONCRETE PANEL.)

BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

- 1.5WR20 = 1 1/2" 20 GA GALVANIZED WIDE RIB STEEL ROOF DECK.
- S6.0 = 4 1/2" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 W.W.F. ON 1 1/2" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (6" TOTAL THICKNESS).
- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [10] (15k) — STEEL BEAM SIZE, NUMBER OF SHEAR STUDS, ZERO IF BLANK, SERVICE LOAD REACTION (KIPS) EACH END.
- C=3/4" — CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6") = TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
- = MOMENT CONNECTION.
- = HSS DIAGONAL BRACING.
- F55 = SPREAD FOOTING. SEE SCHEDULE.
- WF40 = WALL FOOTING. SEE SCHEDULE.
- = STRUCTURAL PRECAST CONCRETE WALL.
- = ARCHITECTURAL PRECAST CONCRETE CLADDING PANEL.



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REVISIONS

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FRAMING PLAN - FIRST FLOOR - AREA A

S-111A-PC

STATE OF KENTUCKY ALISON B JOHNSON 37327 LICENSED PROFESSIONAL ENGINEER BROWN + KUBICAN, PSC

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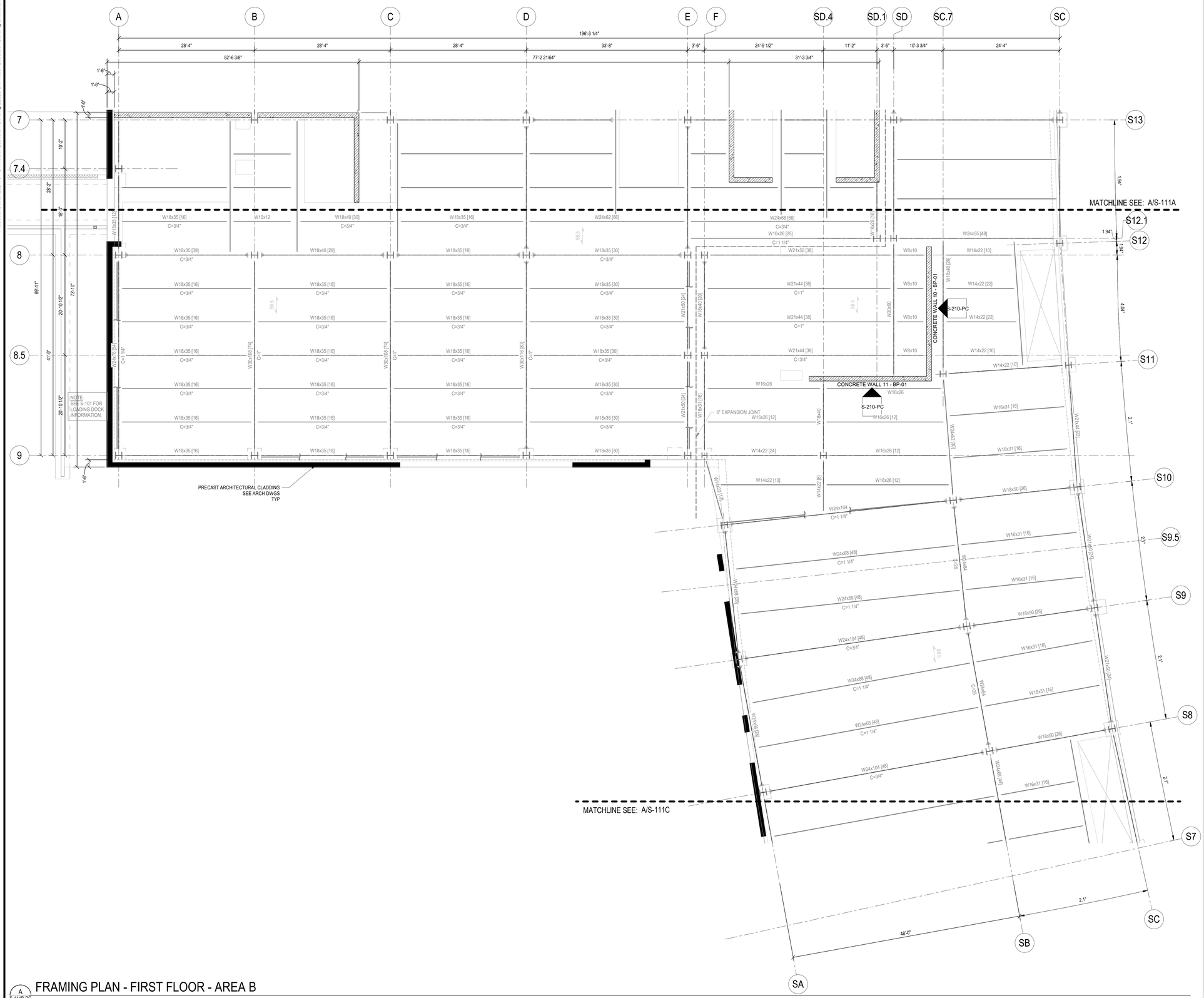

A S-111B-PC FRAMING PLAN - FIRST FLOOR - AREA B

1/8" = 1'-0"

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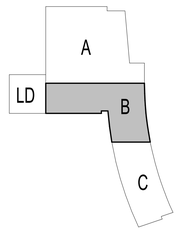

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STRUCTURAL	
PROJECT	202170
DATE	10.20.23

REVISIONS

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FRAMING PLAN - FIRST FLOOR - AREA B

S-111B-PC

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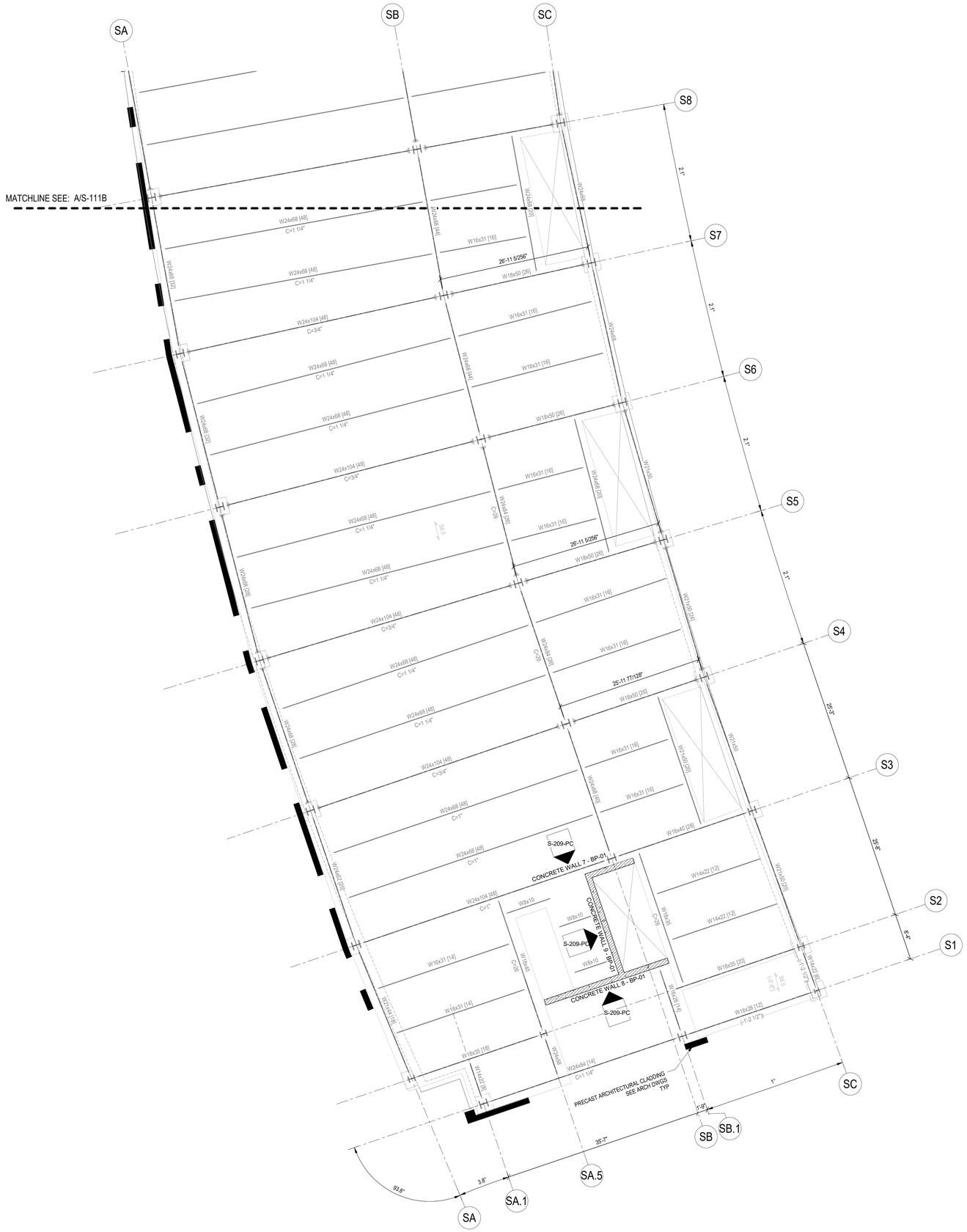

A S-111C-PC FRAMING PLAN - FIRST FLOOR - AREA C

1/8" = 1'-0"

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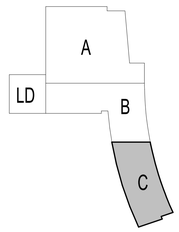

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FRAMING PLAN - FIRST FLOOR - AREA C

S-111C-PC

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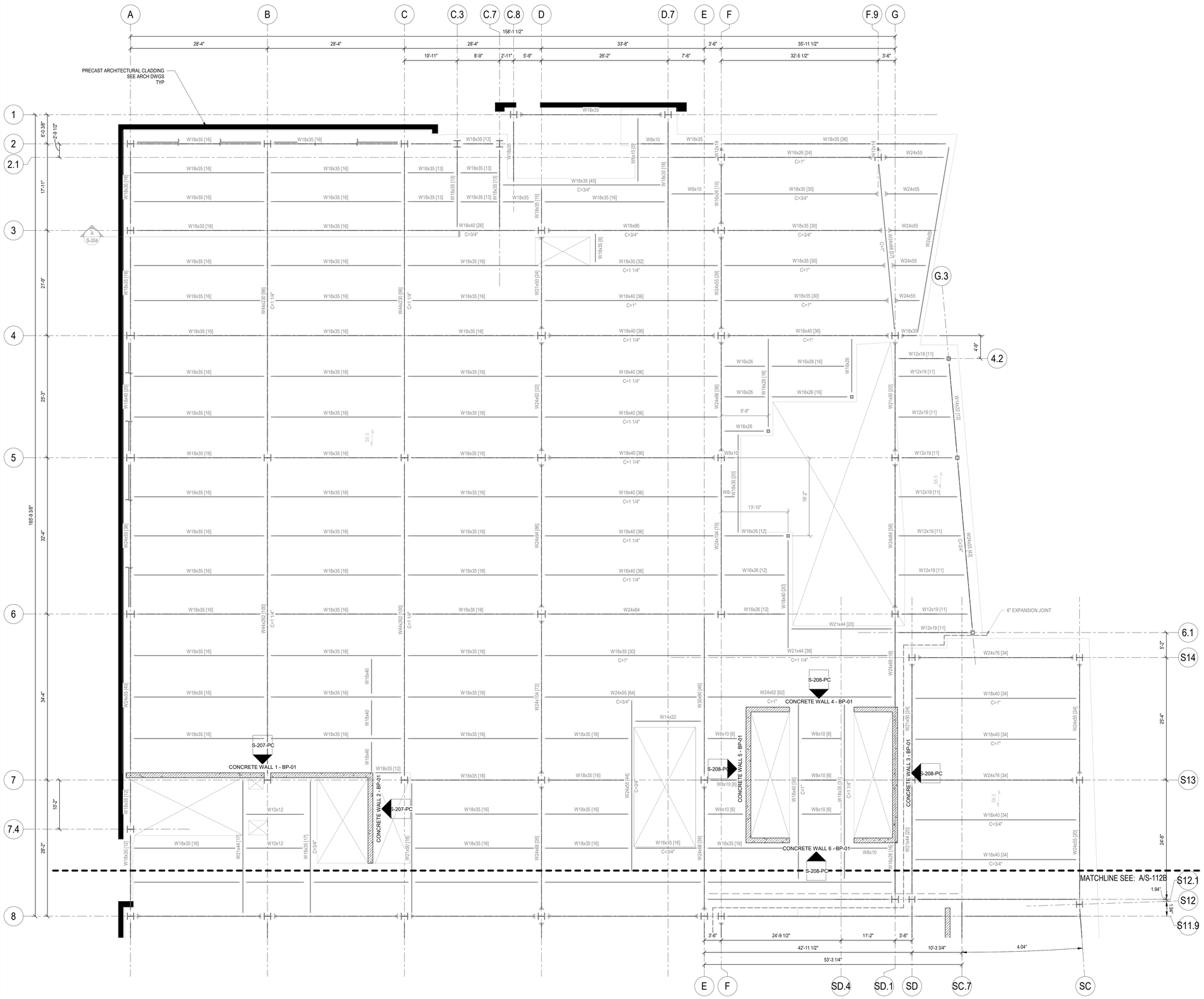
A
B
C
C.3
C.7
C.8
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F
F.9
G
158'-1 1/2"
28'-4"
28'-4"
28'-4"
33'-8"
3'-6"
35'-1 1/2"
10'-11"
8'-9"
2'-11"
5'-9"
26'-2"
7'-6"
32'-5 1/2"
3'-6"
PRECAST ARCHITECTURAL CLADDING
SEE ARCH DWGS
TYP
1
2
2.1
3
4
5
6
7
7.4
8
6'-0.38"
2'-9 1/2"
17'-11"
21'-9"
25'-3"
16'-5.38"
32'-4"
34'-4"
15'-2"
28'-2"
A
S-204
G.3
4.2
6.1
S14
S13
S12.1
S12
S11.9
4'-9"
5'-2"
25'-4"
24'-8"
1.94"
4'-5"
6" EXPANSION JOINT
MATCHLINE SEE: A/S-112B
S-207-PC
CONCRETE WALL 1 - BP-01
CONCRETE WALL 2 - BP-01
S-208-PC
CONCRETE WALL 4 - BP-01
CONCRETE WALL 5 - BP-01
CONCRETE WALL 3 - BP-01
CONCRETE WALL 6 - BP-01
W18x35 [16]
W18x35 [13]
W18x35 [12]
W18x35 [18]
W18x35 [17]
W18x35 [30]
W18x35 [32]
W18x35 [36]
W18x35 [45]
W18x40 [26]
W18x40 [36]
W18x86
W8x10
W8x10 [6]
W8x10 [10]
W16x26
W16x26 [12]
W16x26 [16]
W16x26 [18]
W24x55
W24x55 [64]
W24x62 [62]
W24x76 [34]
W24x84
W24x104 [72]
W24x104 [70]
W24x162 [32]
W24x192 [28]
W24x207 [40]
W24x207 [36]
W24x229 [88]
W24x229 [100]
W24x250 [26]
W24x250 [28]
W24x250 [30]
W24x250 [32]
W24x250 [34]
W24x250 [36]
W24x250 [38]
W24x250 [40]
W24x250 [42]
W24x250 [44]
W24x250 [46]
W24x250 [48]
W24x250 [50]
W24x250 [52]
W24x250 [54]
W24x250 [56]
W24x250 [58]
W24x250 [60]
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W24x250 [64]
W24x250

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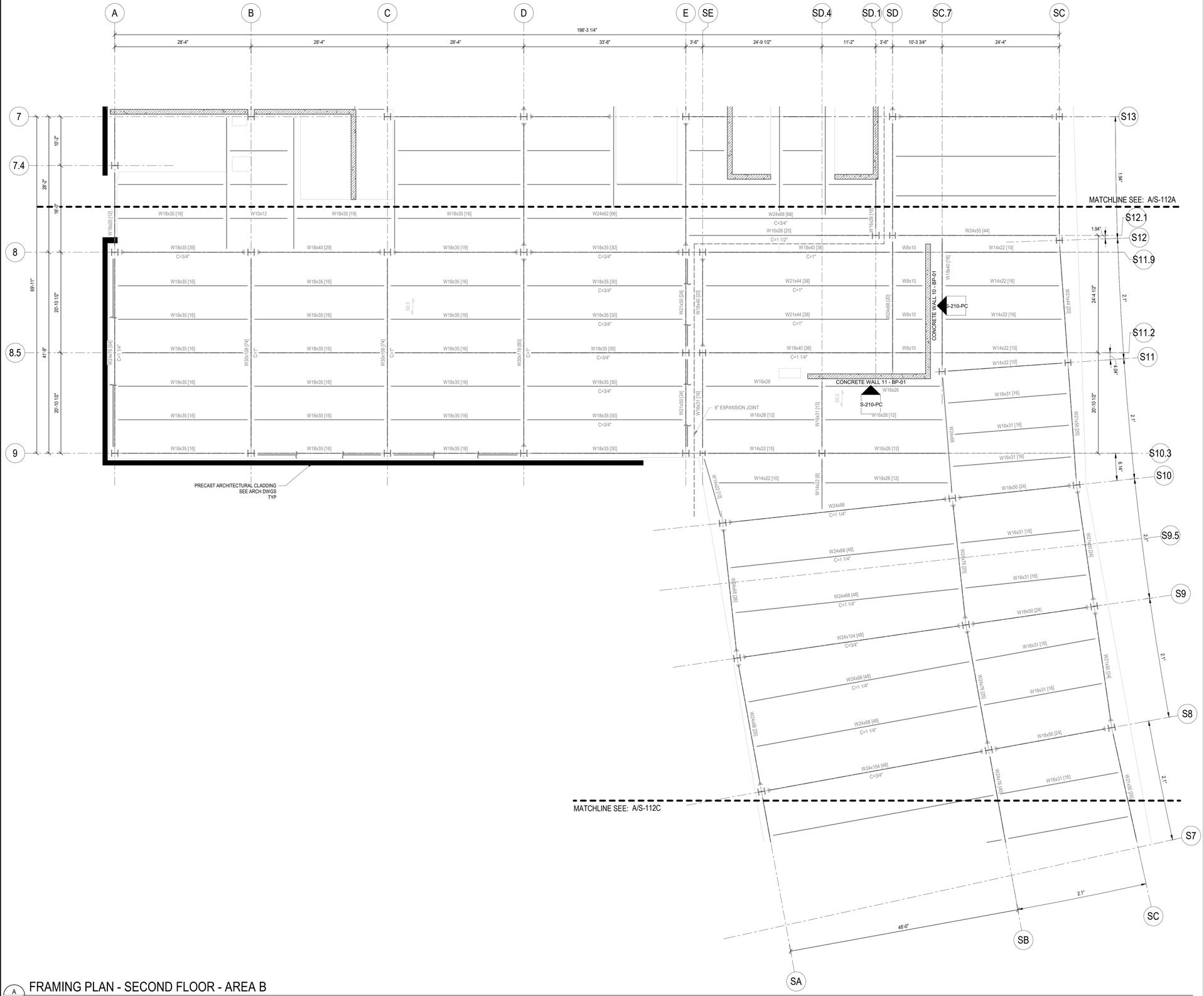

A
S-112B-PC

FRAMING PLAN - SECOND FLOOR - AREA B

1/8" = 1'-0"

BP-01 (PRECAST) PLAN NOTES

1. THIS IS AN EARLY RELEASE PACKAGE TO OBTAIN DESIGN ASSIST SERVICES AS IT RELATES TO THE PRECAST CONCRETE WALLS. THE INFORMATION SHOWN ON THESE DRAWINGS IS NOT COMPLETE AND SHALL BE USED FOR BID PURPOSES ONLY. **NO ACTUAL CONSTRUCTION NOR FABRICATION SHALL PROCEED BASED ON THIS DRAWING SET.**
2. FINISHED FIRST FLOOR ELEVATION (+0'-0").
   FINISHED SECOND FLOOR ELEVATION (+24'-0").
   FINISHED THIRD FLOOR ELEVATION (+46'-0").
   FINISHED FOURTH FLOOR ELEVATION (+62'-0").
   FINISHED FIFTH FLOOR ELEVATION (+77'-6").
   FINISHED SIXTH FLOOR ELEVATION (+93'-0").
   FINISHED SEVENTH FLOOR ELEVATION (+108'-6").
   FINISHED EIGHTH FLOOR ELEVATION (+124'-0").
   FINISHED ROOF ELEVATION (+142'-1 1/2").
   FINISHED PENTHOUSE ROOF ELEVATION (+153'-1 1/2").
3. TOP OF FIRST FLOOR STEEL BEAMS = (-0'-6") U.N.O.
   TOP OF SECOND FLOOR STEEL BEAMS = (+23'-6") U.N.O.
   TOP OF THIRD FLOOR STEEL BEAMS = (+45'-3") U.N.O.
   TOP OF FOURTH FLOOR STEEL BEAMS = (+61'-3") U.N.O.
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4. SEE DWG S-001-PC FOR GENERAL NOTES AND SPECIAL INSPECTIONS.
5. SEE ARCHITECTURAL DRAWINGS FOR PRECAST CLADDING PANELS. LAYOUT AND QUANTITY SHOWN ON STRUCTURE SHEETS IS NOT GUARANTEED TO BE EXACT.
6. INTENT OF THIS STRUCTURAL PLAN SET IS TO CONVEY THE SCOPE AND REQUIREMENTS FOR THE INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ONLY. SEE S-200-PC SERIES SHEETS FOR STRUCTURAL WALL ELEVATION VIEWS AND ADDITIONAL INFORMATION.
   A. SEE SHEET S-113A-PC FOR ONE-STORY PRECAST CONCRETE WALL IN PTAT CLINICAL SPACE THAT IS NOT CONVEYED ELSEWHERE IN THE DRAWING SET. (ENSURE THIS WALL IS INCLUDED IN THE STRUCTURAL PRECAST BID PACKAGE.)
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   B. LENGTHENING OR SHORTENING EACH WALL PANEL BY UP TO 1'-0".
   C. ADJUSTMENTS TO WALL BASE FORCES BY UP TO 25%.
   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
   E. SPECIALTY EMBEDS TO RECEIVE LATERAL FORCE COLLECTOR BEAMS (WELABLE REBAR ON REAR ON EMBED PLATE TO DRAG LOAD INTO THE CONCRETE PANEL.)

BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

- 1.5WR20 = 1 1/2" 20 GA GALVANIZED WIDE RIB STEEL ROOF DECK.
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- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [10] (15k) — STEEL BEAM SIZE. NUMBER OF SHEAR STUDS, ZERO IF BLANK. SERVICE LOAD REACTION (KIPS) EACH END.
- C=3/4" — CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6") = TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
- = MOMENT CONNECTION.
- = HSS DIAGONAL BRACING.
- F55 = SPREAD FOOTING. SEE SCHEDULE.
- WF40 = WALL FOOTING. SEE SCHEDULE.
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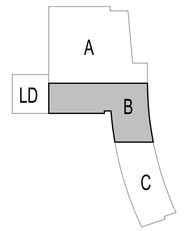

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BP-01A & BP-01B

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

FRAMING PLAN - SECOND FLOOR - AREA B

S-112B-PC

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STATE OF KENTUCKY
ALISON B JOHNSON
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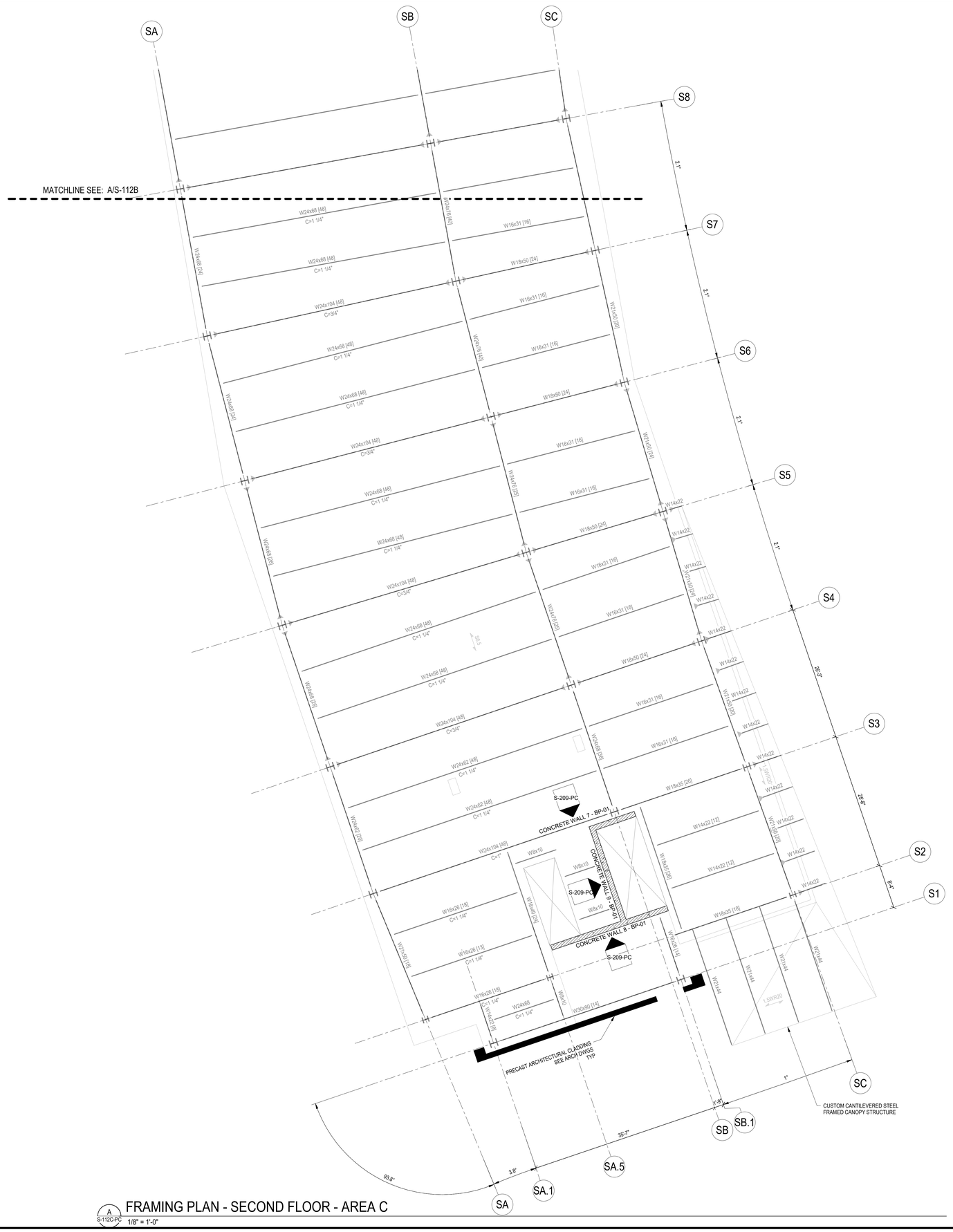

A S-112C-PC FRAMING PLAN - SECOND FLOOR - AREA C

1/8" = 1'-0"

BP-01 (PRECAST) PLAN NOTES

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   TOP OF PENTHOUSE ROOF STEEL BEAMS = (+153'-0") U.N.O.

4. SEE DWG S-001-PC FOR GENERAL NOTES AND SPECIAL INSPECTIONS.

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   C. ADJUSTMENTS TO WALL BASE FORCES BY UP TO 25%.
   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
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BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

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- W16x26 [10] (15k)
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- WF40 = WALL FOOTING. SEE SCHEDULE.
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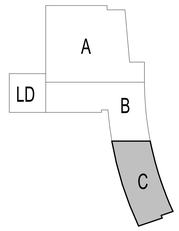

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BP-01A & BP-01B

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UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL	
PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

STATE OF KENTUCKY
ALISON B JOHNSON
37327
LICENSED PROFESSIONAL ENGINEER
BROWN + KUBICAN, PSC

FRAMING PLAN - SECOND FLOOR - AREA C

S-112C-PC

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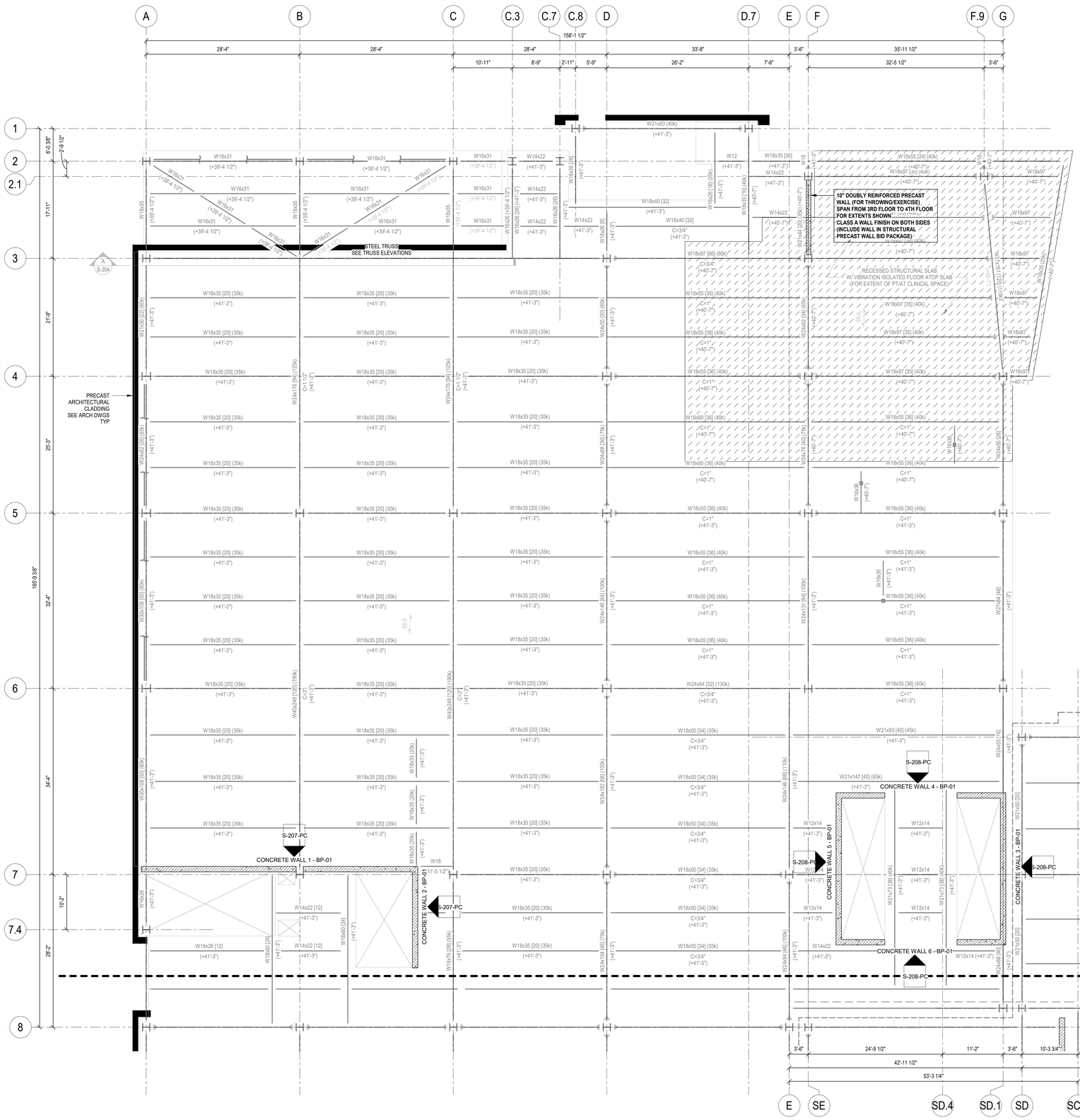

A S-113A-PC FRAMING PLAN - THIRD FLOOR - AREA A

1/8" = 1'-0"

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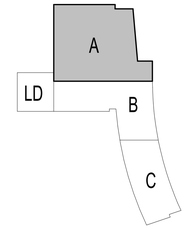

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1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL	
PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

FRAMING PLAN - THIRD FLOOR - AREA A

S-113A-PC

STATE OF KENTUCKY
ALISON B JOHNSON
37327
LICENSED PROFESSIONAL ENGINEER
BROWN + KUBICAN, PSC

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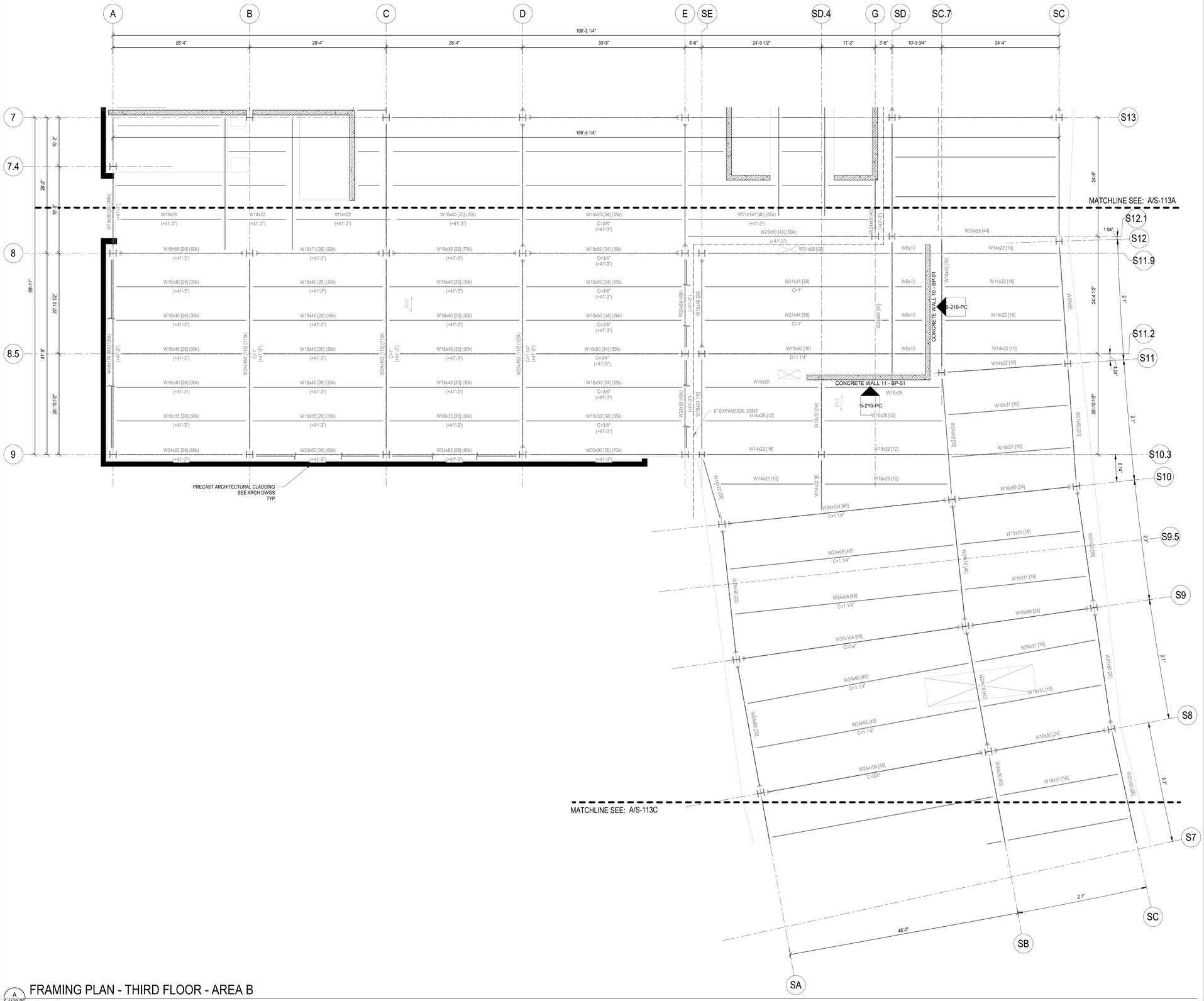
Autodesk Docs://202170 - UK Health Education Building/22026 UK Health Education Building structural R22.rvt


A
B
C
D
E
SE
SD.4
G
SD
SC.7
SC
196'-3 1/4"
28'-4"
28'-4"
28'-4"
33'-8"
3'-6"
24'-9 1/2"
11'-2"
3'-6"
10'-3 3/4"
24'-4"
7
7.4
8
8.5
9
10'-2"
28'-2"
18'-4"
69'-4"
22'-10 1/2"
41'-9"
20'-10 1/2"
S13
S12.1
S12
S11.9
S11.2
S11
S10.3
S10
S9.5
S9
S8
S7
SA
SB
MATCHLINE SEE: A/S-113A
MATCHLINE SEE: A/S-113C
CONCRETE WALL 10 - BP-01
CONCRETE WALL 11 - BP-01
S-210-PC
6" EXPANSION JOINT
PRECAST ARCHITECTURAL CLADDING SEE ARCH DWGS TYP
W16x26 (+41'-3")
W14x22 (+41'-3")
W14x22 (+41'-3")
W18x40 [20] (30k) (+41'-3")
W18x50 [34] (35k) (+41'-3")
W21x147 [40] (65k) (+41'-3")
W24x68 [20] (+41'-3")
W21x50 [40] (50k) (+41'-3")
W21x50 [38]
W24x55 [44]
W14x22 [10]
W14x22 [16]
W8x10
W18x40 [18]
W18x71 [36] (50k) (+41'-3")
W18x60 [20] (60k) (+41'-3")
W18x40 [22] (75k) (+41'-3")
W30x170 [50] (125k) (+41'-3")
W24x162 [12] (115k) C=1" (+41'-3")
W24x162 [12] (115k) C=1" (+41'-3")
W24x162 [12] (125k) C=1 1/4" (+41'-3")
W24x55 (45k) (+41'-3")
W18x40 [20] (+41'-3")
W21x44 [38] C=1"
W24x68 [20]
W18x40 [38] C=1 1/4"
W16x26
W16x31 [16]
W16x26 [12]
W16x31 [14]
W24x55 (45k) (+41'-3")
W16x31 [16]
W18x35 [20] (30k) (+41'-3")
W24x62 [26] (60k) (+41'-3")
W30x90 [50] (70k) (+41'-3")
W14x22 [10]
W14x22 [8]
W16x26 [12]
W24x104 [48] C=1 1/4"
W18x50 [24]
W24x68 [48] C=1 1/4"
W24x104 [48] C=3/4"
W21x50 [20]
W24x68 [26]
W24x104 [48]
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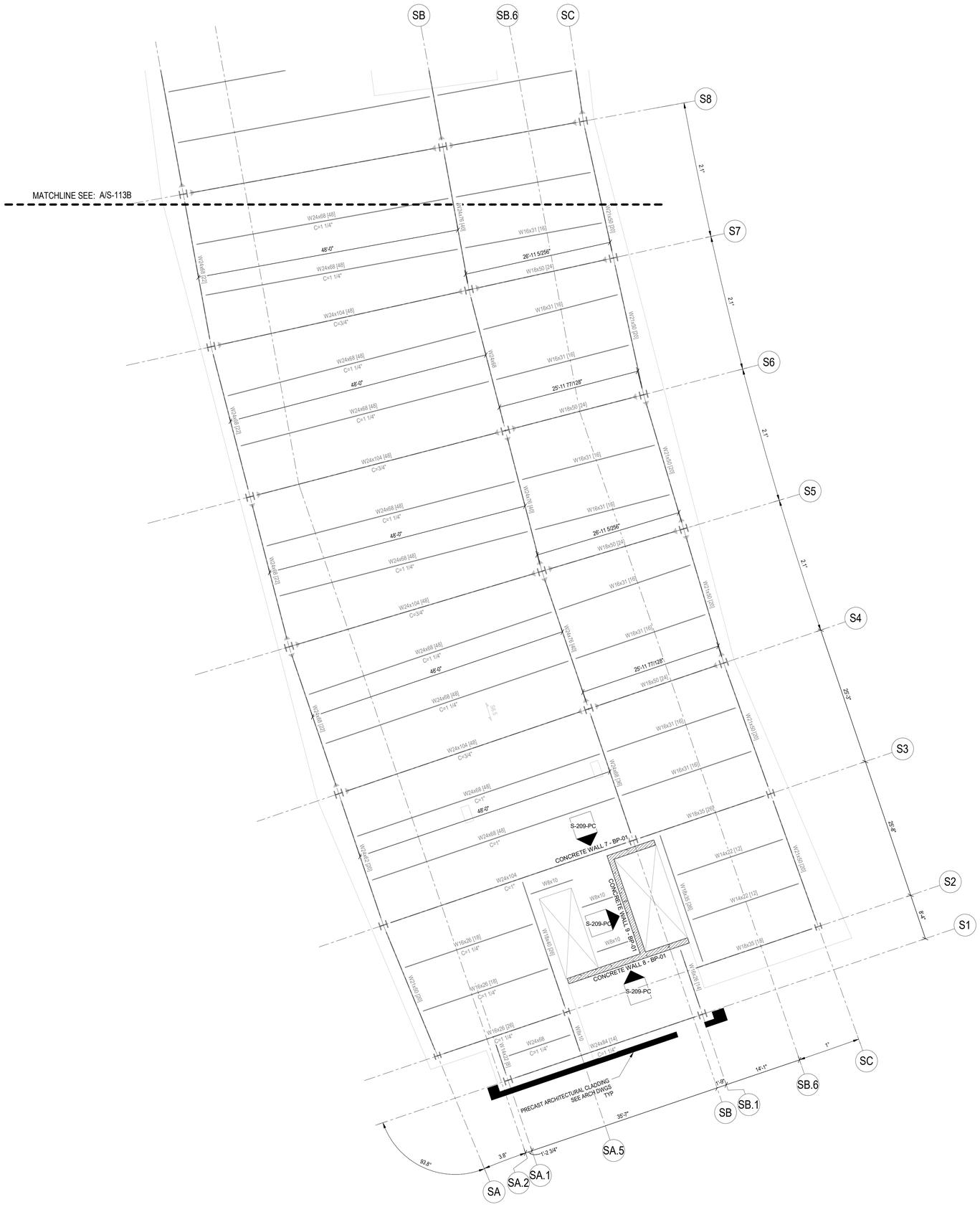

A S-113C-PC
FRAMING PLAN - THIRD FLOOR - AREA C
1/8" = 1'-0"

BP-01 (PRECAST) PLAN NOTES

1. THIS IS AN EARLY RELEASE PACKAGE TO OBTAIN DESIGN ASSIST SERVICES AS IT RELATES TO THE PRECAST CONCRETE WALLS. THE INFORMATION SHOWN ON THESE DRAWINGS IS NOT COMPLETE AND SHALL BE USED FOR BID PURPOSES ONLY. **NO ACTUAL CONSTRUCTION NOR FABRICATION SHALL PROCEED BASED ON THIS DRAWING SET.**
2. FINISHED FIRST FLOOR ELEVATION (+0'-0").
   FINISHED SECOND FLOOR ELEVATION (+24'-0").
   FINISHED THIRD FLOOR ELEVATION (+46'-0").
   FINISHED FOURTH FLOOR ELEVATION (+62'-0").
   FINISHED FIFTH FLOOR ELEVATION (+77'-6").
   FINISHED SIXTH FLOOR ELEVATION (+93'-0").
   FINISHED SEVENTH FLOOR ELEVATION (+108'-6").
   FINISHED EIGHTH FLOOR ELEVATION (+124'-0").
   FINISHED ROOF ELEVATION (+142'-1 1/2").
   FINISHED PENTHOUSE ROOF ELEVATION (+153'-1 1/2").
3. TOP OF FIRST FLOOR STEEL BEAMS = (-0'-6") U.N.O.
   TOP OF SECOND FLOOR STEEL BEAMS = (+23'-6") U.N.O.
   TOP OF THIRD FLOOR STEEL BEAMS = (+45'-3") U.N.O.
   TOP OF FOURTH FLOOR STEEL BEAMS = (+61'-3") U.N.O.
   TOP OF FIFTH FLOOR STEEL BEAMS = (+76'-9") U.N.O.
   TOP OF SIXTH FLOOR STEEL BEAMS = (+92'-3") U.N.O.
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   TOP OF ROOF STEEL BEAMS = (+142'-0") U.N.O.
   TOP OF PENTHOUSE ROOF STEEL BEAMS = (+153'-0") U.N.O.
4. SEE DWG S-001-PC FOR GENERAL NOTES AND SPECIAL INSPECTIONS.
5. SEE ARCHITECTURAL DRAWINGS FOR PRECAST CLADDING PANELS. LAYOUT AND QUANTITY SHOWN ON STRUCTURE SHEETS IS NOT GUARANTEED TO BE EXACT.
6. INTENT OF THIS STRUCTURAL PLAN SET IS TO CONVEY THE SCOPE AND REQUIREMENTS FOR THE INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ONLY. SEE S-200-PC SERIES SHEETS FOR STRUCTURAL WALL ELEVATION VIEWS AND ADDITIONAL INFORMATION.
   A. SEE SHEET S-113A-PC FOR ONE-STORY PRECAST CONCRETE WALL IN PT/AT CLINICAL SPACE THAT IS NOT CONVEYED ELSEWHERE IN THE DRAWING SET. (ENSURE THIS WALL IS INCLUDED IN THE STRUCTURAL PRECAST BID PACKAGE.)
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   B. LENGTHENING OR SHORTENING EACH WALL PANEL BY UP TO 1'-0".
   C. ADJUSTMENTS TO WALL BASE FORCES BY UP TO 25%.
   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
   E. SPECIALTY EMBEDS TO RECEIVE LATERAL FORCE COLLECTOR BEAMS (WELABLE REBAR ON REAR ON EMBED PLATE TO DRAG LOAD INTO THE CONCRETE PANEL.)

BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

- 1.5WR20 = 1 1/2" 20 GA GALVANIZED WIDE RIB STEEL ROOF DECK.
- S6.0 = 4 1/2" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 W.W.F. ON 1 1/2" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (6" TOTAL THICKNESS).
- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [10] (15k) = STEEL BEAM SIZE. NUMBER OF SHEAR STUDS, ZERO IF BLANK. SERVICE LOAD REACTION (KIPS) EACH END.
- C=3/4" = CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6") = TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
- = MOMENT CONNECTION.
- = HSS DIAGONAL BRACING.
- F55 = SPREAD FOOTING. SEE SCHEDULE.
- WF40 = WALL FOOTING. SEE SCHEDULE.
- = STRUCTURAL PRECAST CONCRETE WALL.
- = ARCHITECTURAL PRECAST CONCRETE CLADDING PANEL.

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BP-01A & BP-01B

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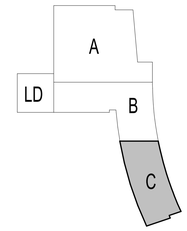
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date



KEYPLAN

FRAMING PLAN - THIRD FLOOR - AREA C

S-113C-PC

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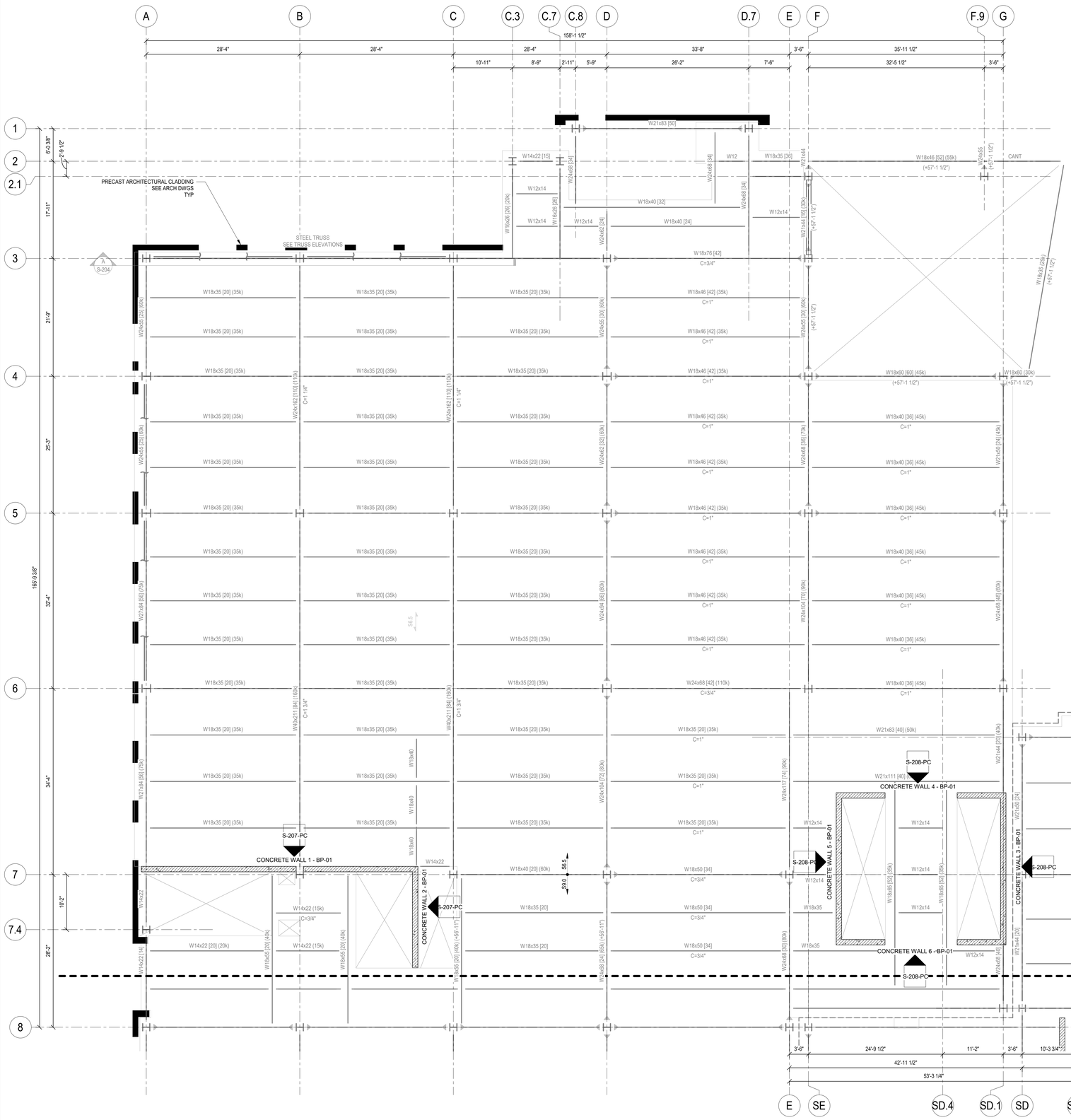

A
S-114A-PC
FRAMING PLAN - FOURTH FLOOR - AREA A
1/8" = 1'-0"

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BP-01 (PRECAST) FRAMING LEGEND

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- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [10] (15k) = STEEL BEAM SIZE. NUMBER OF SHEAR STUDS, ZERO IF BLANK. SERVICE LOAD REACTION (KIPS) EACH END.
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- F55 = SPREAD FOOTING. SEE SCHEDULE.
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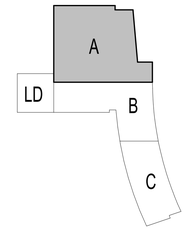
KEYPLAN



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STATE OF KENTUCKY
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HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

STATE OF KENTUCKY
ALISON B JOHNSON
37327
LICENSED PROFESSIONAL ENGINEER
BROWN + KUBICAN, PSC

FRAMING PLAN - FOURTH FLOOR - AREA A

S-114A-PC

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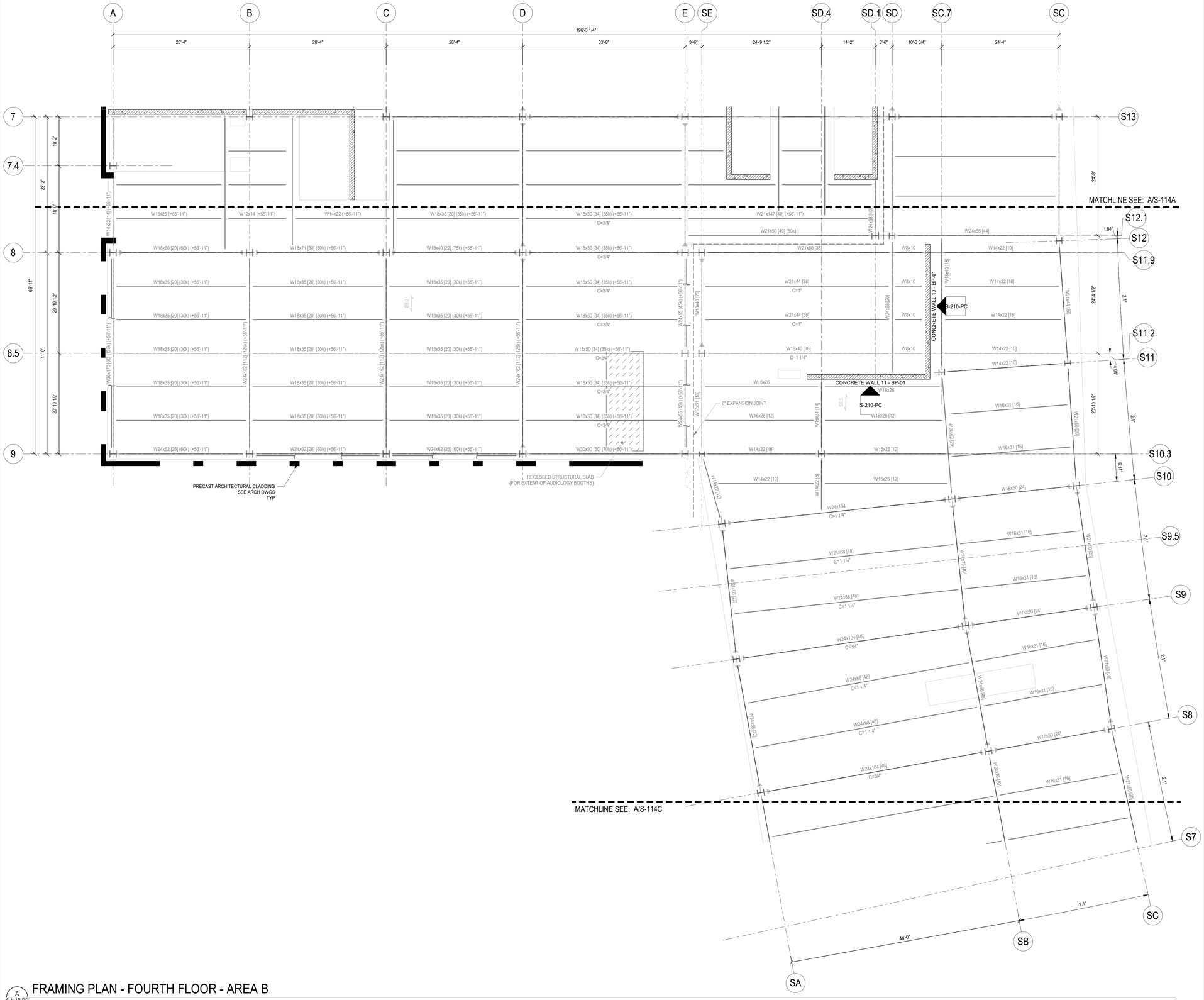

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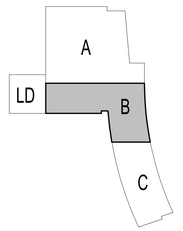

KEYPLAN

A S-114B-PC FRAMING PLAN - FOURTH FLOOR - AREA B
1/8" = 1'-0"

JRA architects
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FRAMING PLAN - FOURTH FLOOR - AREA B

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STATE OF KENTUCKY ALISON B JOHNSON 37327 LICENSED PROFESSIONAL ENGINEER BROWN + KUBICAN, PSC

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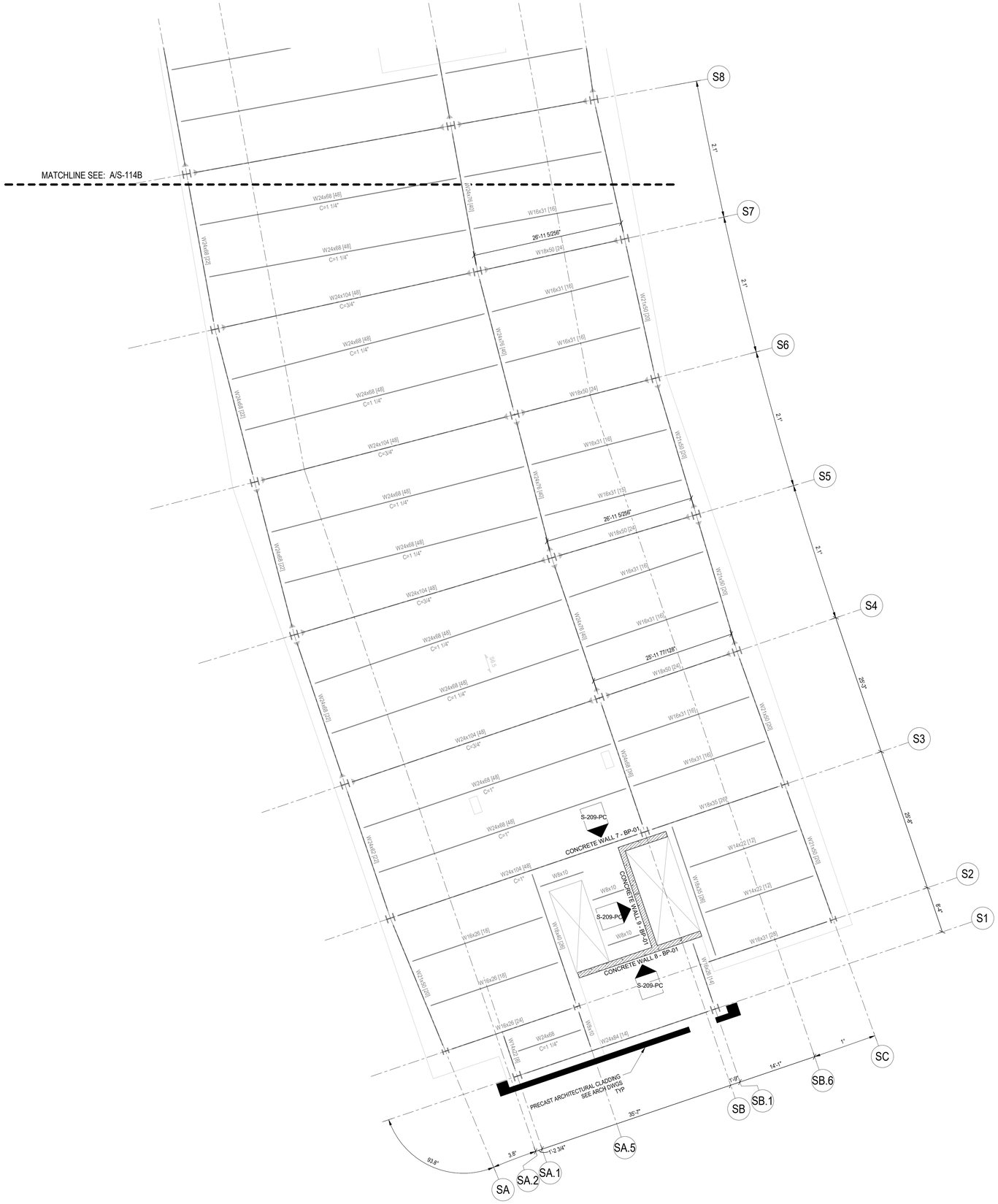
Autodesk Docs://202170 - UK Health Education Building/202035 UK Health Education Building structural R22.rvt



A S-114C-PC FRAMING PLAN - FOURTH FLOOR - AREA C

1/8" = 1'-0"

BP-01 (PRECAST) PLAN NOTES

1. THIS IS AN EARLY RELEASE PACKAGE TO OBTAIN DESIGN ASSIST SERVICES AS IT RELATES TO THE PRECAST CONCRETE WALLS. THE INFORMATION SHOWN ON THESE DRAWINGS IS NOT COMPLETE AND SHALL BE USED FOR BID PURPOSES ONLY. **NO ACTUAL CONSTRUCTION NOR FABRICATION SHALL PROCEED BASED ON THIS DRAWING SET.**
2. FINISHED FIRST FLOOR ELEVATION (+0'-0").
   FINISHED SECOND FLOOR ELEVATION (+24'-0").
   FINISHED THIRD FLOOR ELEVATION (+46'-0").
   FINISHED FOURTH FLOOR ELEVATION (+62'-0").
   FINISHED FIFTH FLOOR ELEVATION (+77'-6").
   FINISHED SIXTH FLOOR ELEVATION (+93'-0").
   FINISHED SEVENTH FLOOR ELEVATION (+108'-6").
   FINISHED EIGHTH FLOOR ELEVATION (+124'-0").
   FINISHED ROOF ELEVATION (+142'-1 1/2").
   FINISHED PENTHOUSE ROOF ELEVATION (+153'-1 1/2").
3. TOP OF FIRST FLOOR STEEL BEAMS = (-0'-6") U.N.O.
   TOP OF SECOND FLOOR STEEL BEAMS = (+23'-6") U.N.O.
   TOP OF THIRD FLOOR STEEL BEAMS = (+45'-3") U.N.O.
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   TOP OF ROOF STEEL BEAMS = (+142'-0") U.N.O.
   TOP OF PENTHOUSE ROOF STEEL BEAMS = (+153'-0") U.N.O.
4. SEE DWG S-001-PC FOR GENERAL NOTES AND SPECIAL INSPECTIONS.
5. SEE ARCHITECTURAL DRAWINGS FOR PRECAST CLADDING PANELS. LAYOUT AND QUANTITY SHOWN ON STRUCTURE SHEETS IS NOT GUARANTEED TO BE EXACT.
6. INTENT OF THIS STRUCTURAL PLAN SET IS TO CONVEY THE SCOPE AND REQUIREMENTS FOR THE INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ONLY. SEE S-200-PC SERIES SHEETS FOR STRUCTURAL WALL ELEVATION VIEWS AND ADDITIONAL INFORMATION.
   A. SEE SHEET S-113A-PC FOR ONE-STORY PRECAST CONCRETE WALL IN PT/AT CLINICAL SPACE THAT IS NOT CONVEYED ELSEWHERE IN THE DRAWING SET. (ENSURE THIS WALL IS INCLUDED IN THE STRUCTURAL PRECAST BID PACKAGE.)
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8. PRECAST SUPPLIER SHALL LAYOUT STRUCTURAL PANEL JOINTS. JOINT POSITIONS ARE SHALL BE APPROVED BY THE E.O.R. PRIOR TO FABRICATION. HORIZONTAL JOINTS SHALL ONLY OCCUR AT A FLOOR LINE US APPROVED BY THE E.O.R.
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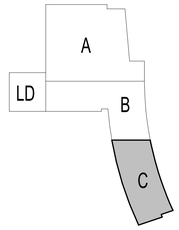
   C. ADJUSTMENTS TO WALL BASE FORCES BY UP TO 25%.
   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
   E. SPECIALTY EMBEDS TO RECEIVE LATERAL FORCE COLLECTOR BEAMS (WELABLE REBAR ON REAR ON EMBED PLATE TO DRAG LOAD INTO THE CONCRETE PANEL.)

BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

- 1.5WR20 = 1 1/2" 20 GA GALVANIZED WIDE RIB STEEL ROOF DECK.
- S6.0 = 4 1/2" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 W.W.F. ON 1 1/2" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (6" TOTAL THICKNESS).
- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [10] (15k) = STEEL BEAM SIZE. NUMBER OF SHEAR STUDS, ZERO IF BLANK. SERVICE LOAD REACTION (KIPS) EACH END.
- C=3/4" = CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6") = TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
- = MOMENT CONNECTION.
- = HSS DIAGONAL BRACING.
- F55 = SPREAD FOOTING. SEE SCHEDULE.
- WF40 = WALL FOOTING. SEE SCHEDULE.
- = STRUCTURAL PRECAST CONCRETE WALL.
- = ARCHITECTURAL PRECAST CONCRETE CLADDING PANEL.



KEYPLAN

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Lexington, Kentucky 40509
859.252.6781

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BRIAN McMILLAN
29837
LICENSED PROFESSIONAL ENGINEER
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RESERVED FOR AHJ STAMP

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BP-01A & BP-01B

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

FRAMING PLAN - FOURTH FLOOR - AREA C

S-114C-PC

STATE OF KENTUCKY
ALISON B JOHNSON
37327
LICENSED PROFESSIONAL ENGINEER
BROWN + KUBICAN, PSC

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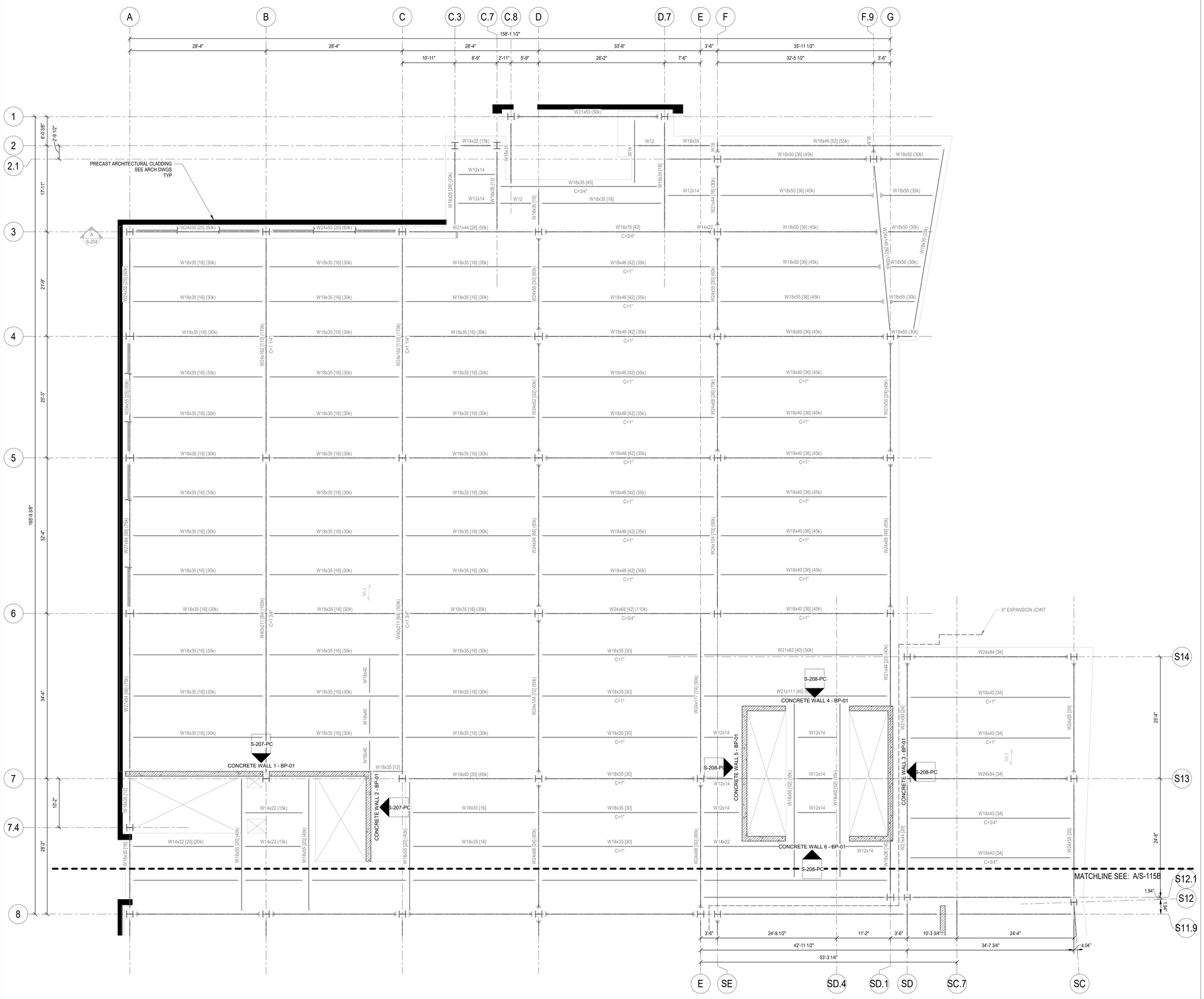

A S-115A-PC
FRAMING PLAN - FIFTH FLOOR - AREA A
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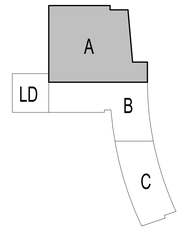

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STATE OF KENTUCKY
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FRAMING PLAN - FIFTH FLOOR - AREA A

S-115A-PC

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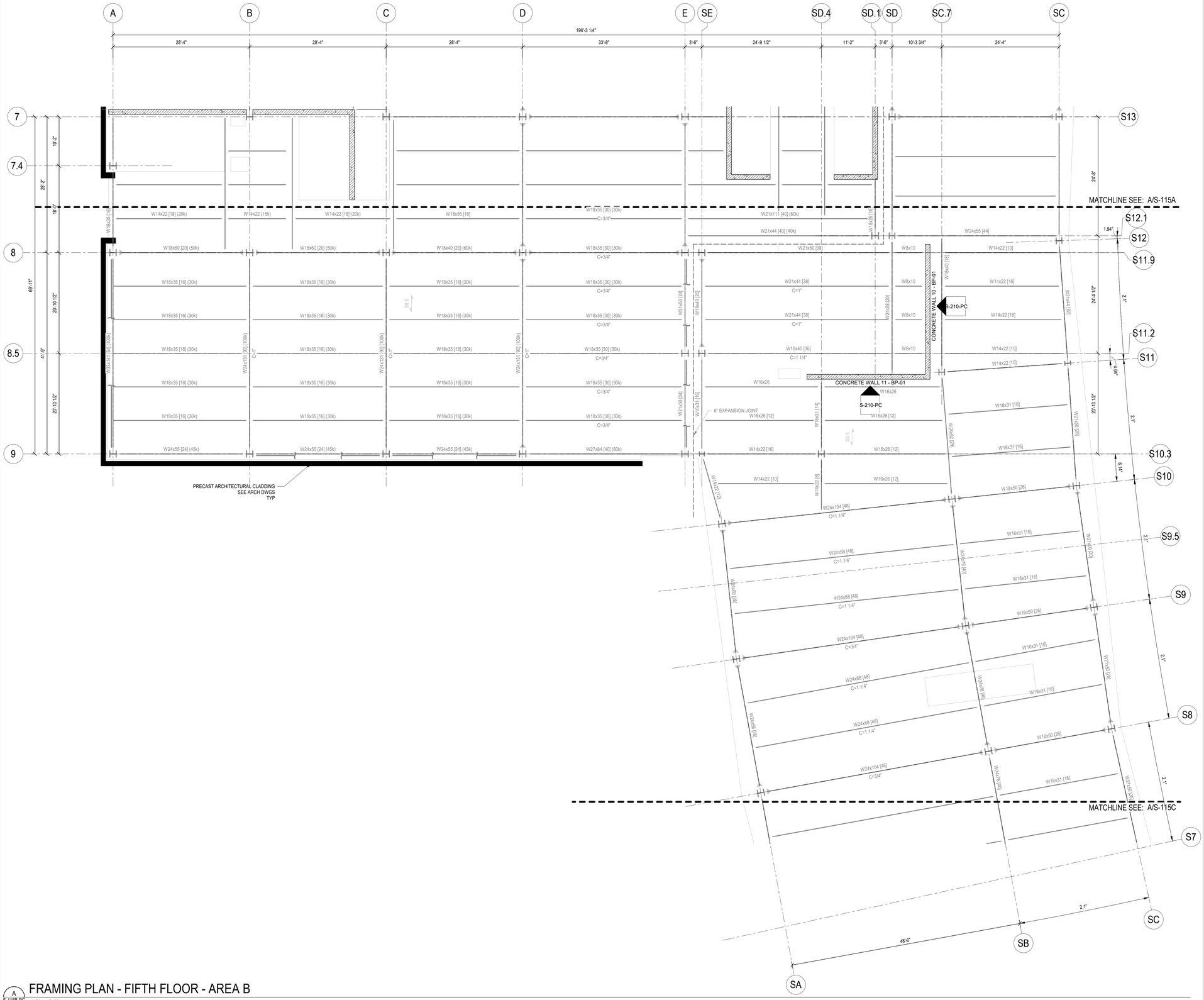

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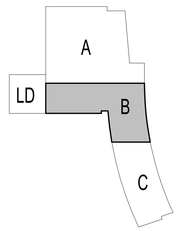

KEYPLAN

A S-115B-PC
FRAMING PLAN - FIFTH FLOOR - AREA B
1/8" = 1'-0"

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FRAMING PLAN - FIFTH FLOOR - AREA B

S-115B-PC

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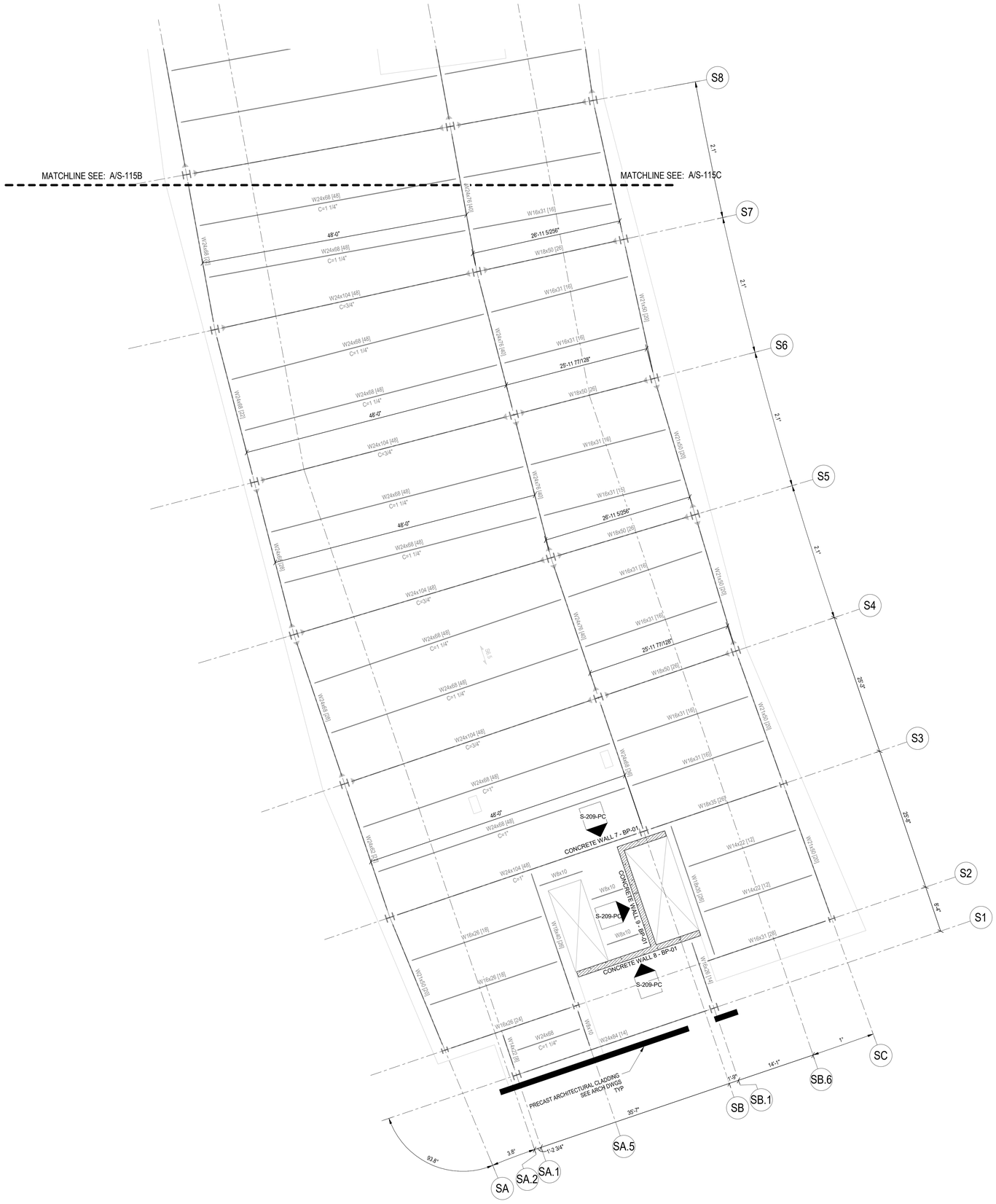

A S-115C-PC FRAMING PLAN - FIFTH FLOOR - AREA C
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   TOP OF ROOF STEEL BEAMS = (+142'-0") U.N.O.
   TOP OF PENTHOUSE ROOF STEEL BEAMS = (+153'-0") U.N.O.
4. SEE DWG S-001-PC FOR GENERAL NOTES AND SPECIAL INSPECTIONS.
5. SEE ARCHITECTURAL DRAWINGS FOR PRECAST CLADDING PANELS. LAYOUT AND QUANTITY SHOWN ON STRUCTURE SHEETS IS NOT GUARANTEED TO BE EXACT.
6. INTENT OF THIS STRUCTURAL PLAN SET IS TO CONVEY THE SCOPE AND REQUIREMENTS FOR THE INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ONLY. SEE S-200-PC SERIES SHEETS FOR STRUCTURAL WALL ELEVATION VIEWS AND ADDITIONAL INFORMATION.
   A. SEE SHEET S-113A-PC FOR ONE-STORY PRECAST CONCRETE WALL IN PT/AT CLINICAL SPACE THAT IS NOT CONVEYED ELSEWHERE IN THE DRAWING SET. (ENSURE THIS WALL IS INCLUDED IN THE STRUCTURAL PRECAST BID PACKAGE.)
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   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
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BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

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- C=3/4": CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6"): TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
- = MOMENT CONNECTION.
- = HSS DIAGONAL BRACING.
- F55 = SPREAD FOOTING. SEE SCHEDULE.
- WF40 = WALL FOOTING. SEE SCHEDULE.
- = STRUCTURAL PRECAST CONCRETE WALL.
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1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL	
PROJECT	202170
DATE	10.20.23

REVISIONS

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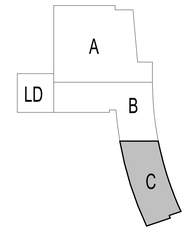
KEYPLAN



STATE OF KENTUCKY
ALISON B JOHNSON
37327
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BROWN + KUBICAN, PSC

FRAMING PLAN - FIFTH FLOOR - AREA C

S-115C-PC

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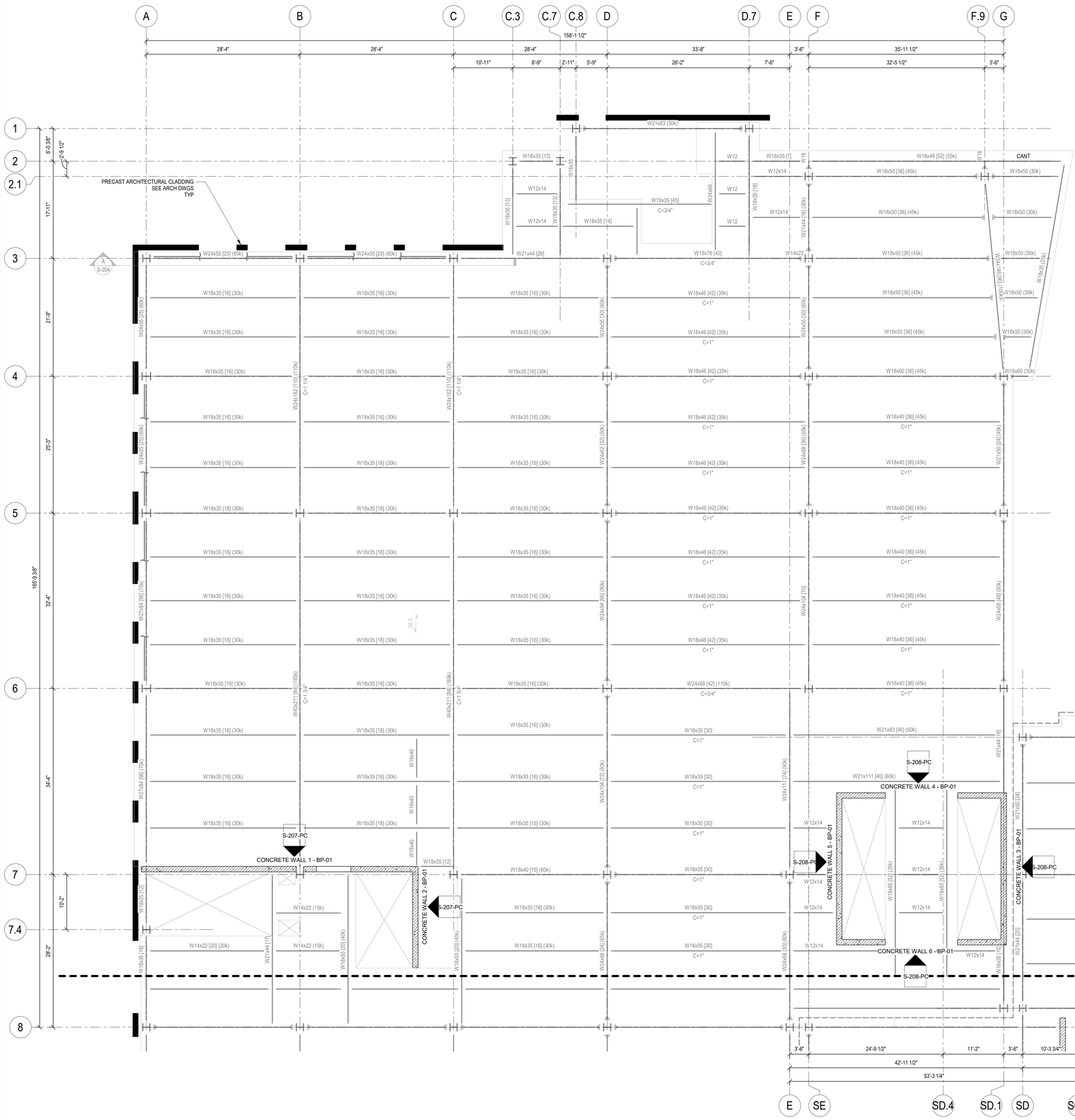

A
S-116A-PC
FRAMING PLAN - SIXTH FLOOR - AREA A
1/8" = 1'-0"

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2. FINISHED FIRST FLOOR ELEVATION (+0'-0").
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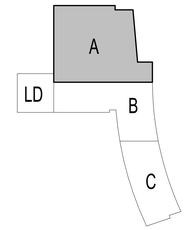

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STATE OF KENTUCKY
ALISON B JOHNSON
37327
LICENSED PROFESSIONAL ENGINEER
BROWN + KUBICAN, PSC

FRAMING PLAN - SIXTH FLOOR - AREA A

S-116A-PC

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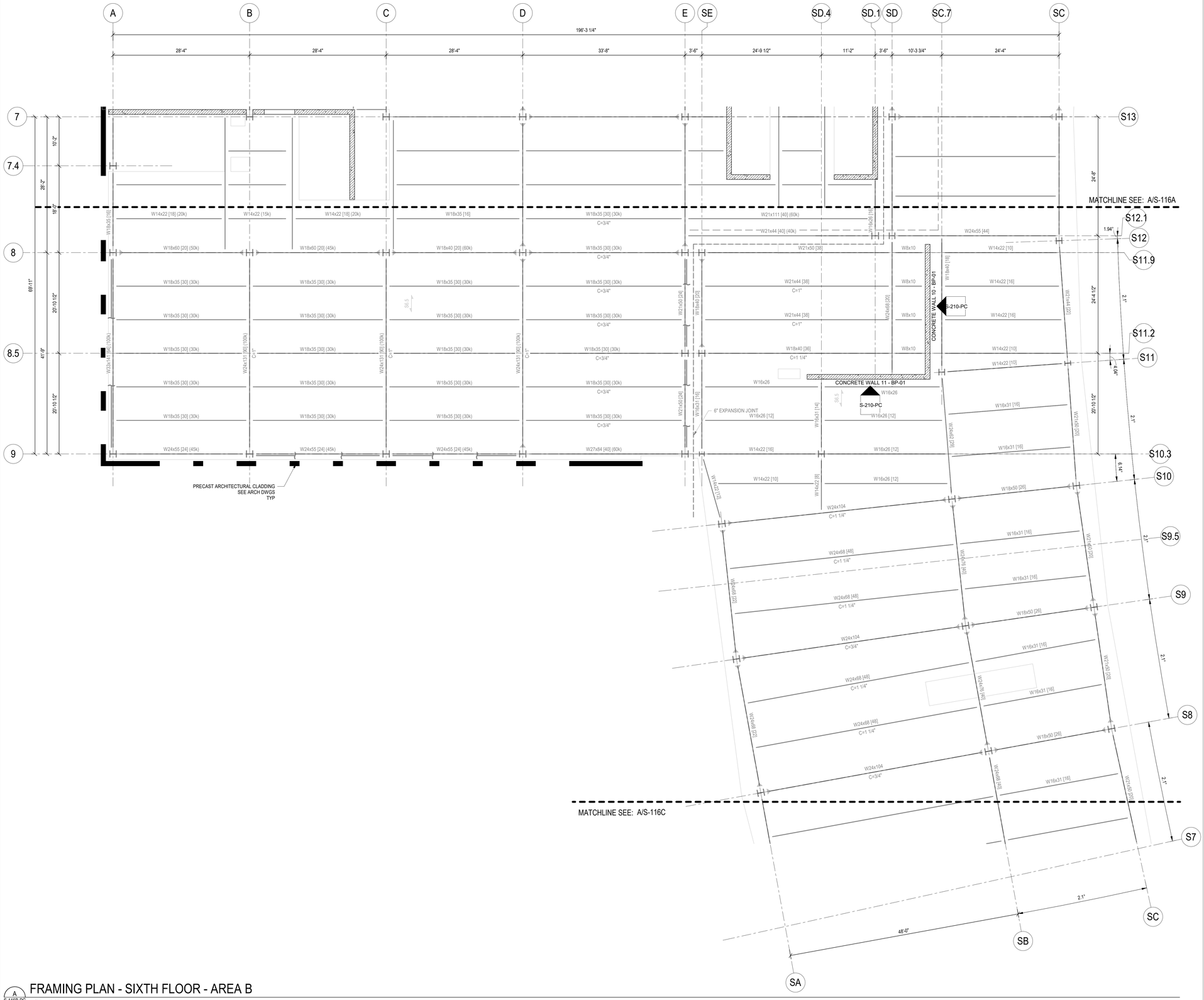

A
S-116B-PC
FRAMING PLAN - SIXTH FLOOR - AREA B
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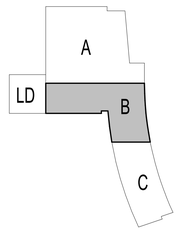

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FRAMING PLAN - SIXTH FLOOR - AREA B

S-116B-PC

STATE OF KENTUCKY
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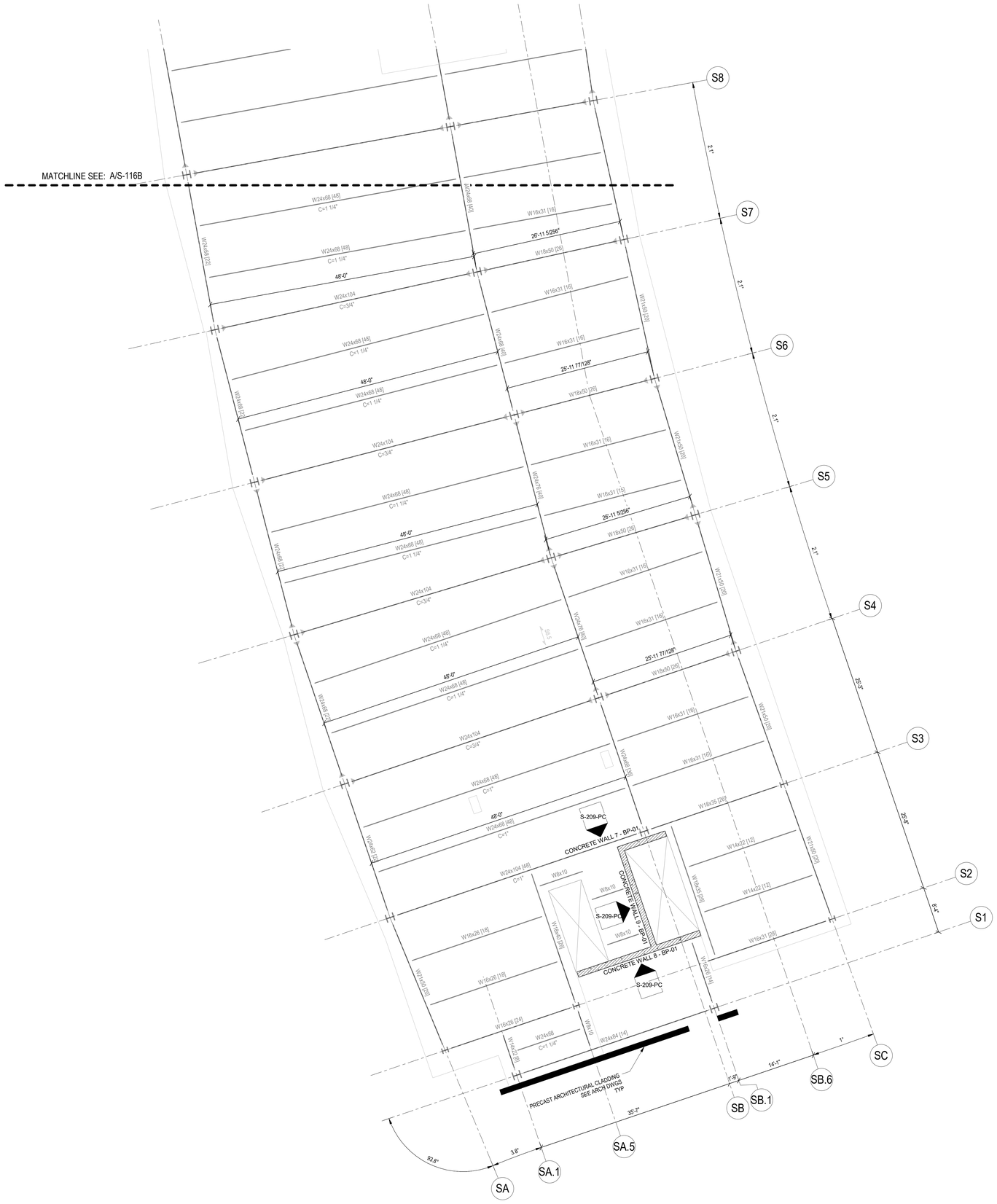

A S-116C-PC FRAMING PLAN - SIXTH FLOOR - AREA C

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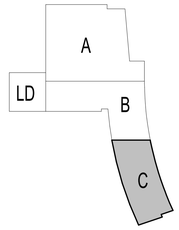
14. THIS IS AN EARLY BID PACKAGE, THE FOLLOWING ADJUSTMENTS MUST BE ALLOWED FOR IN THE BID PRICE:
   A. MISCELLANEOUS M.E.P. PENETRATIONS THROUGH THE WALLS (BEYOND THE NUMBER OF OPENINGS CURRENTLY SHOWN).
   B. LENGTHENING OR SHORTENING EACH WALL PANEL BY UP TO 1'-0".
   C. ADJUSTMENTS TO WALL BASE FORCES BY UP TO 25%.
   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
   E. SPECIALTY EMBEDS TO RECEIVE LATERAL FORCE COLLECTOR BEAMS (WELABLE REBAR ON REAR ON EMBED PLATE TO DRAG LOAD INTO THE CONCRETE PANEL.)

BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

- 1.5WR20 = 1 1/2" 20 GA GALVANIZED WIDE RIB STEEL ROOF DECK.
- S6.0 = 4 1/2" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 W.W.F. ON 1 1/2" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (6" TOTAL THICKNESS).
- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [10] (15k) — STEEL BEAM SIZE. NUMBER OF SHEAR STUDS, ZERO IF BLANK. SERVICE LOAD REACTION (KIPS) EACH END.
- C=3/4" — CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6") = TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
- = MOMENT CONNECTION.
- = HSS DIAGONAL BRACING.
- F55 = SPREAD FOOTING. SEE SCHEDULE.
- WF40 = WALL FOOTING. SEE SCHEDULE.
- = STRUCTURAL PRECAST CONCRETE WALL.
- = ARCHITECTURAL PRECAST CONCRETE CLADDING PANEL.



KEYPLAN

JRA architects
3225 Summit Square Place, Suite 200
Lexington, Kentucky 40509
859.252.6781

STATE OF KENTUCKY BRIAN McMILLAN 29837 LICENSED PROFESSIONAL ENGINEER BROWN + KUBICAN, PSC

RESERVED FOR AHJ STAMP

BROWN+KUBICAN STRUCTURAL ENGINEERS
546 East Main Street, Suite 300
Lexington, KY 40508
859-543-0933
www.brownkubican.com

BP-01A & BP-01B

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING

UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL	
PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

STATE OF KENTUCKY ALISON B JOHNSON 37327 LICENSED PROFESSIONAL ENGINEER BROWN + KUBICAN PSC

FRAMING PLAN - SIXTH FLOOR - AREA C

S-116C-PC

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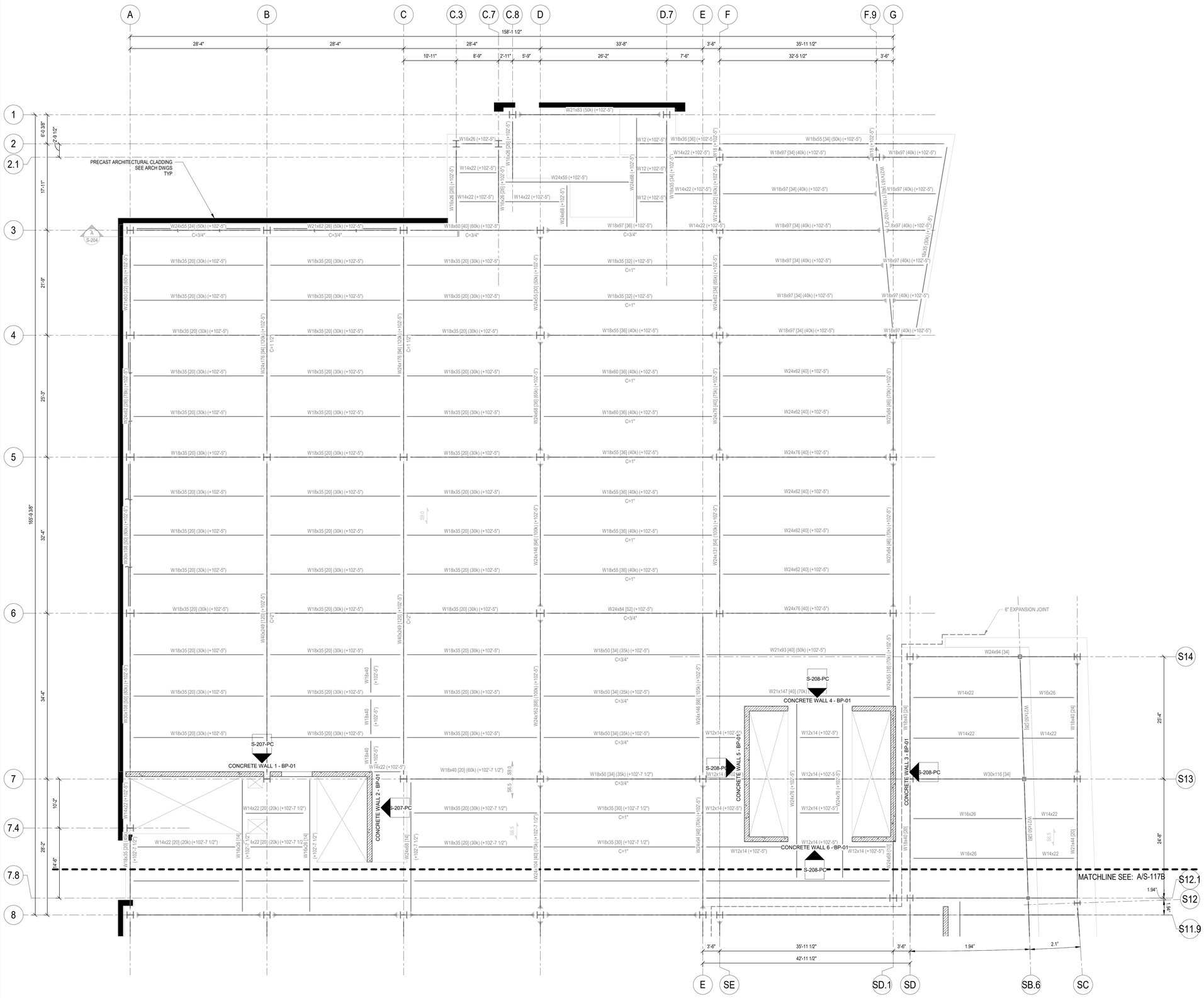
Autodesk Docs://202170 - UK Health Education Building/22026 UK Health Education Building structural R22.rvt


A
B
C
C.3
C.7
C.8
D
D.7
E
F
F.9
G
158'-1 1/2"
28'-4"
28'-4"
28'-4"
33'-8"
3'-6"
35'-11 1/2"
10'-11"
8'-9"
2'-11"
5'-9"
26'-2"
7'-6"
32'-5 1/2"
3'-6"
1
2
2.1
3
4
5
6
7
7.4
7.8
8
6'-0 3/8"
2'-9 1/2"
17'-11"
21'-9"
25'-3"
169'-9 3/8"
32'-4"
34'-4"
10'-2"
28'-2"
4'-6"
PRECAST ARCHITECTURAL CLADDING
SEE ARCH DWGS
TYP
A
S-204
W21x83 (50k) (+102'-5")
W24x55 [24] (50k) (+102'-5")
W21x62 [26] (50k) (+102'-5")
W18x60 [40] (60k) (+102'-5")
W18x97 [36] (+102'-5")
W21x44 [20] (+102'-5")
W18x97 [34] (40k) (+102'-5")
W18x97 (40k) (+102'-5")
W18x35 [20] (30k) (+102'-5")
W18x35 [32] (+102'-5")
W18x55 [36] (+102'-5")
W18x55 [34] (50k) (+102'-5")
W18x26 (+102'-5")
W16x26 [26] (+102'-5")
W14x22 (+102'-5")
W24x55 (+102'-5")
W24x68 (+102'-5")
W12 (+102'-5")
W18x35 [34] (+102'-5")
W21x44 [20] (+102'-5")
W16x40 [24]
W16x26 [24]
W24x55 [24]
W24x76 [40] (+102'-5")
W24x62 [40] (+102'-5")
W24x62 [34] (65k) (+102'-5")
W24x76 [48] (70k) (+102'-5")
W24x68 [36] (65k) (+102'-5")
W24x146 [94] (100k) (+102'-5")
W24x131 [96] (100k) (+102'-5")
W24x146 [98] (100k) (+102'-5")
W24x152 [88] (100k) (+102'-5")
W24x84 [52] (+102'-5")
W21x93 [40] (50k) (+102'-5")
W18x50 [34] (35k) (+102'-5")
W18x40 [20] (60k) (+102'-7 1/2")
W18x50 [34] (35k) (+102'-7 1/2")
W18x35 [30] (+102'-7 1/2")
W14x22 [20] (20k) (+102'-7 1/2")
W16x26 [14] (+102'-7 1/2")
W24x76 [14] (+102'-7 1/2")
W40x249 [120] (+102'-5")
W30x108 [54] (60k) (+102'-5")
W24x176 [94] (120k) (+102'-5")
W24x131 [84] (120k) (+102'-5")
W24x146 [94] (120k) (+102'-5")
W24x146 [98] (120k) (+102'-5")
W24x76 [48] (75k) (+102'-5")
W24x104 [62] (75k) (+102'-5")
W24x146 [98] (70k) (+102'-5")
W24x94 [34]
W30x116 [34]
W16x26 [10]
W14x22 [24]
W18x40 [24]
W21x44 [20]
W24x68 [18]
W24x76 [24]
W24x76 [40]
W24x55 [18] (70k) (+102'-5")
W21x147 [40] (70k)
W12x14 (+102'-5")
W12x14 [20] (+102'-5")
W12x14 [22] (+102'-5")
W12x14 [24] (+102'-5")
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W18x35 [32] (+102'-5")
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W18x55 [34] (50k) (+102'-5")
W18x97 [34] (40k) (+102'-5")
W18x97 (40k) (+102'-5")
W18x97 [36] (+102'-5")
W21x44 [20] (+102'-5")
W16x26 [10]
W14x22 [24]
W18x40 [24]
W24x55 [24]
W24x76 [40]
W24x62 [40] (+102'-5")
W24x62 [34] (65k) (+102'-5")
W24x76 [48] (70k) (+102'-5")
W24x68 [36] (65k) (+102'-5")
W24x146 [94] (100k) (+102'-5")
W24x131 [96] (100k) (+102'-5")
W24x146 [98] (100k) (+102'-5")
W24x152 [88] (100k) (+102'-5")
W24x84 [52] (+102'-5")
W21x93 [40] (50k) (+102'-5")
W18x50 [34] (35k) (+102'-5")
W18x40 [20] (60k) (+102'-7 1/2")
W18x50 [34] (35k) (+102'-7 1/2")
W18x35 [30] (+102'-7 1/2")
W14x22 [20] (20k) (+102'-7 1/2")
W16x26 [14] (+102'-7 1/2")
W24x76 [14] (+102'-7 1/2")
W40x249 [120] (+102'-5")
W30x108 [54] (60k) (+102'-5")
W24x176 [94] (120k) (+102'-5")
W24x131 [84] (120k) (+102'-5")
W24x146 [94] (120k) (+102'-5")
W24x146 [98] (120k) (+102'-5")
W24x76 [48] (75k) (+102'-5")
W24x104 [62] (75k) (+102'-5")
W24x146 [98] (70k) (+102'-5")
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W30x116 [34]
W16x26 [10]
W14x22 [24]
W18x40 [24]
W21x44 [20]
W24x68 [18]
W24x76 [24]
W24x76 [40]
W24x55 [18] (70k) (+102'-5")
W21x147 [40] (70k)
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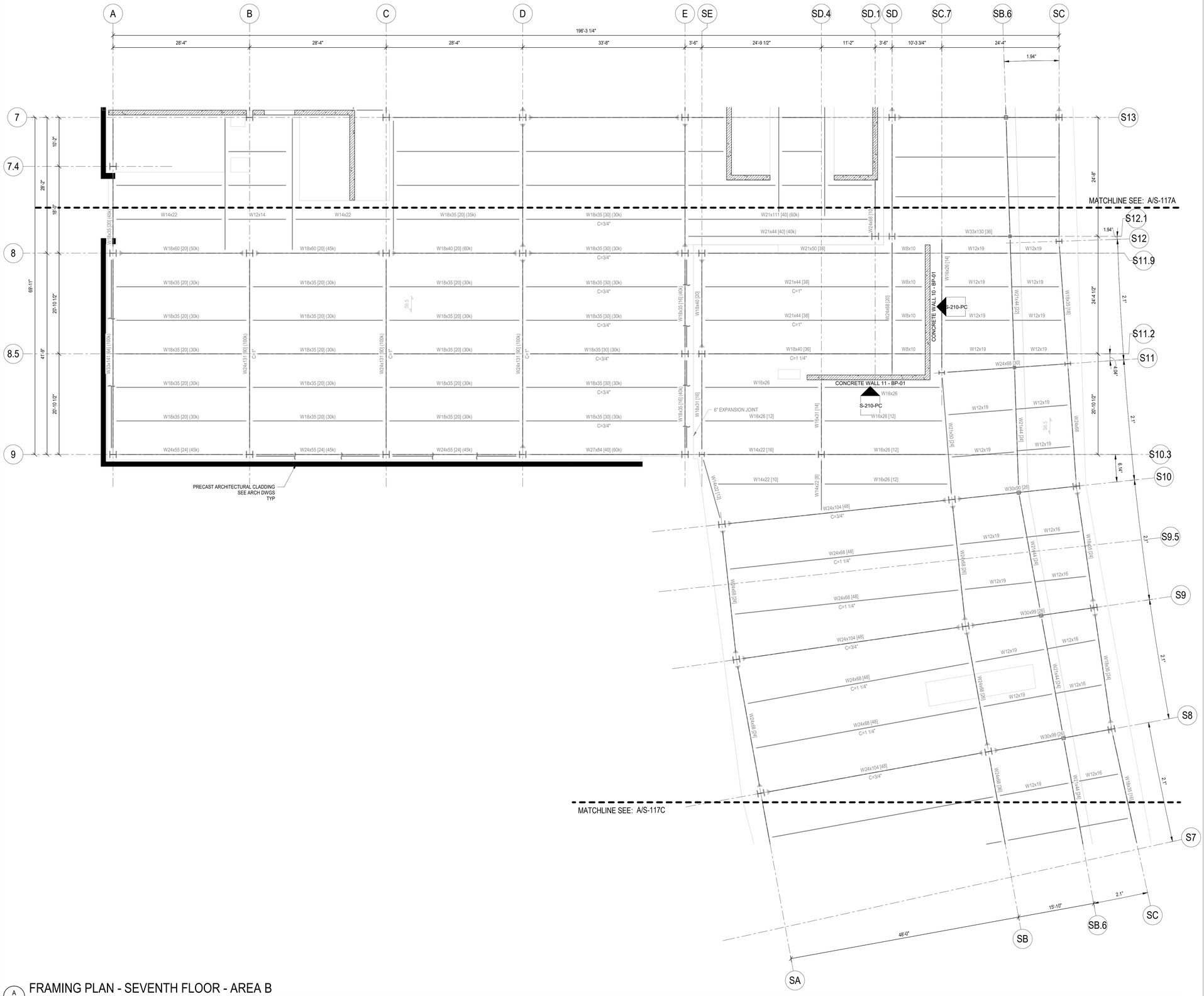

FRAMING PLAN - SEVENTH FLOOR - AREA B

A / S-117B-PC — 1/8" = 1'-0"

BP-01 (PRECAST) PLAN NOTES

1. THIS IS AN EARLY RELEASE PACKAGE TO OBTAIN DESIGN ASSIST SERVICES AS IT RELATES TO THE PRECAST CONCRETE WALLS. THE INFORMATION SHOWN ON THESE DRAWINGS IS NOT COMPLETE AND SHALL BE USED FOR BID PURPOSES ONLY. **NO ACTUAL CONSTRUCTION NOR FABRICATION SHALL PROCEED BASED ON THIS DRAWING SET.**
2. FINISHED FIRST FLOOR ELEVATION (+0'-0").
   FINISHED SECOND FLOOR ELEVATION (+24'-0").
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   FINISHED FOURTH FLOOR ELEVATION (+62'-0").
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   FINISHED ROOF ELEVATION (+142'-1 1/2").
   FINISHED PENTHOUSE ROOF ELEVATION (+153'-1 1/2").
3. TOP OF FIRST FLOOR STEEL BEAMS = (-0'-6") U.N.O.
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4. SEE DWG S-001-PC FOR GENERAL NOTES AND SPECIAL INSPECTIONS.
5. SEE ARCHITECTURAL DRAWINGS FOR PRECAST CLADDING PANELS. LAYOUT AND QUANTITY SHOWN ON STRUCTURE SHEETS IS NOT GUARANTEED TO BE EXACT.
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   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
   E. SPECIALTY EMBEDS TO RECEIVE LATERAL FORCE COLLECTOR BEAMS (WELABLE REBAR ON REAR ON EMBED PLATE TO DRAG LOAD INTO THE CONCRETE PANEL.)

BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

- 1.5WR20 — = 1 1/2" 20 GA GALVANIZED WIDE RIB STEEL ROOF DECK.
- S6.0 — = 4 1/2" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 W.W.F. ON 1 1/2" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (6" TOTAL THICKNESS).
- S9.0 — = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [10] (15k) — STEEL BEAM SIZE. NUMBER OF SHEAR STUDS, ZERO IF BLANK. SERVICE LOAD REACTION (KIPS) EACH END.
- C=3/4" — CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6") — = TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
- = MOMENT CONNECTION.
- = HSS DIAGONAL BRACING.
- F55 — = SPREAD FOOTING. SEE SCHEDULE.
- WF40 — = WALL FOOTING. SEE SCHEDULE.
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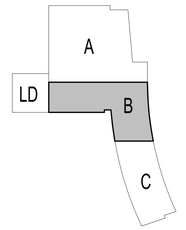

KEYPLAN

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859.252.6781

STATE OF KENTUCKY — BRIAN McMILLAN — 29837 — LICENSED PROFESSIONAL ENGINEER — BROWN + KUBICAN, PSC

RESERVED FOR AHJ STAMP

BROWN+KUBICAN STRUCTURAL ENGINEERS
546 East Main Street, Suite 300
Lexington, KY 40508
859-543-0933
www.brownkubican.com

BP-01A & BP-01B

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING

UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL	
PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

FRAMING PLAN - SEVENTH FLOOR - AREA B

S-117B-PC

STATE OF KENTUCKY — ALISON B JOHNSON — 37327 — LICENSED PROFESSIONAL ENGINEER — BROWN + KUBICAN, PSC

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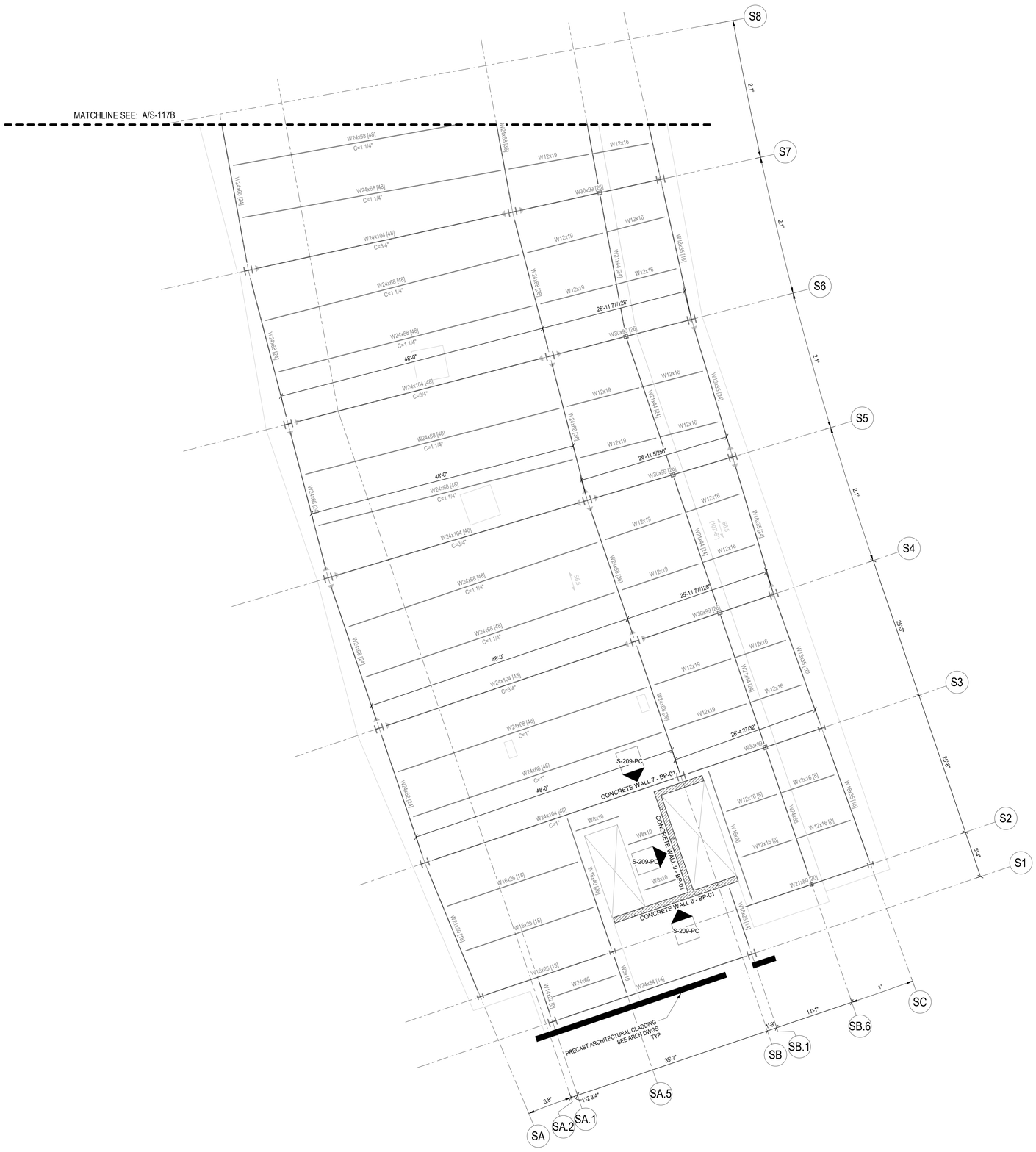

A S-117C-PC FRAMING PLAN - SEVENTH FLOOR - AREA C

1/8" = 1'-0"

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BP-01 (PRECAST) FRAMING LEGEND

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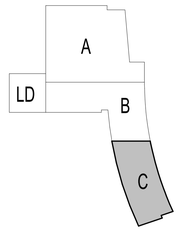

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BP-01A & BP-01B

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING

UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL	
PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

FRAMING PLAN - SEVENTH FLOOR - AREA C

S-117C-PC

STATE OF KENTUCKY ALISON B JOHNSON 37327 LICENSED STRUCTURAL ENGINEER BROWN + KUBICAN, PSC

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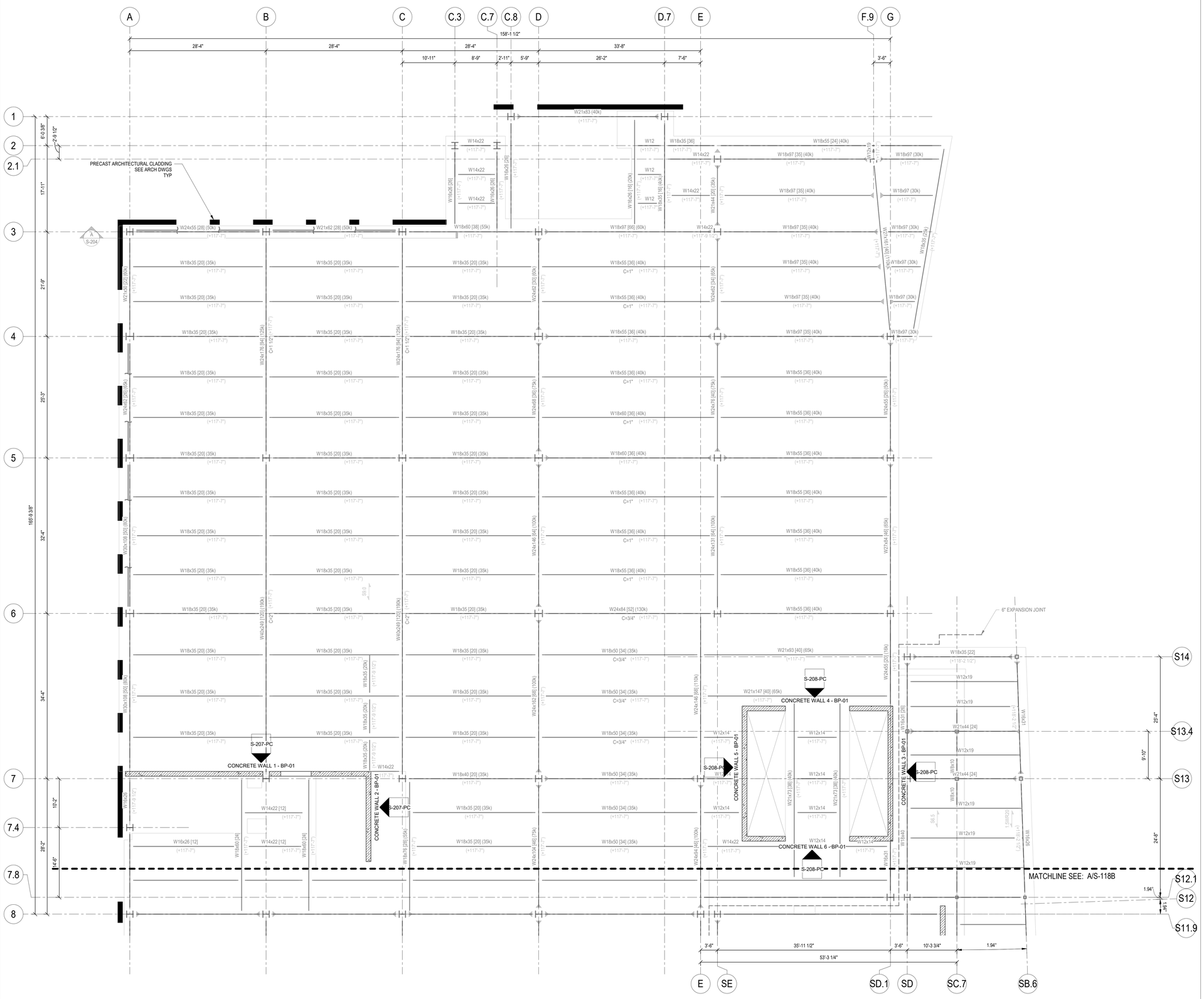
A
B
C
C.3
C.7
C.8
D
D.7
E
F.9
G
158'-1 1/2"
28'-4"
28'-4"
28'-4"
33'-8"
10'-11"
8'-9"
2'-11"
5'-9"
26'-2"
7'-6"
3'-6"
1
2
2.1
3
4
5
6
7
7.4
7.8
8
6'-0 3/8"
2'-4 1/2"
17'-11"
21'-9"
25'-3"
32'-4"
34'-4"
28'-2"
10'-2"
14'-6"
165'-9 3/8"
PRECAST ARCHITECTURAL CLADDING
SEE ARCH DWGS
TYP
A
S-204
W21x83 (40k)
(+117-7")
W24x55 [28] (50k)
W21x62 [28] (50k)
W18x60 [38] (55k)
W18x97 [66] (60k)
W14x22
W18x35 [20] (35k)
W18x55 [36] (40k)
W18x97 [35] (40k)
W18x97 (30k)
W24x62 [30] (65k)
W24x62 [34] (65k)
W24x76 [94] (125k)
C=1 1/2"
W24x76 [94] (125k)
C=1 1/2"
W24x68 [36] (75k)
W24x76 [40] (75k)
W24x55 [26] (50k)
W40x249 [120] (190k)
C=2"
W40x249 [120] (190k)
C=2"
W30x108 [65] (60k)
W18x35 [20]
W18x35 [20]
W24x146 [64] (100k)
W24x131 [64] (100k)
W27x94 [46] (65k)
W24x162 [68] (100k)
W24x146 [68] (110k)
W24x104 [48] (75k)
W24x94 [48] (100k)
W18x35 [20]
W18x31 [26]
W18x40
W16x26 [28]
W16x26 [26]
W16x26 [26]
W16x26 [16] (20k)
W16x26 [15] (40k)
W16x26 [26]
W16x26 [29k]
W16x26
W16x26 [12]
W14x22 [12]
W18x60 [24]
W18x60 [24]
W16x78 [28] (55k)
W12
W14x22
W14x44 [28] (35k)
W18x35 [20k]
W18x35 [20k]
W18x35 [20k]
W18x35 [20k]
W18x40 [20] (35k)
W21x147 [40] (65k)
W21x73 [38] (40k)
W21x73 [38] (40k)
W12x14
W12x22
W18x50 [34] (35k)
W18x55 [36] (40k)
W18x97 [35] (40k)
W18x97 (30k)
W12x19
W21x44 [24]
W18x19
W18x40
W18x35 [22]
W12x19
W21x93 [40] (65k)
W18x55 [20] (15k)
W18x97 [29k]
W18x35 [29k]
W18x35 [29k]
W18x35

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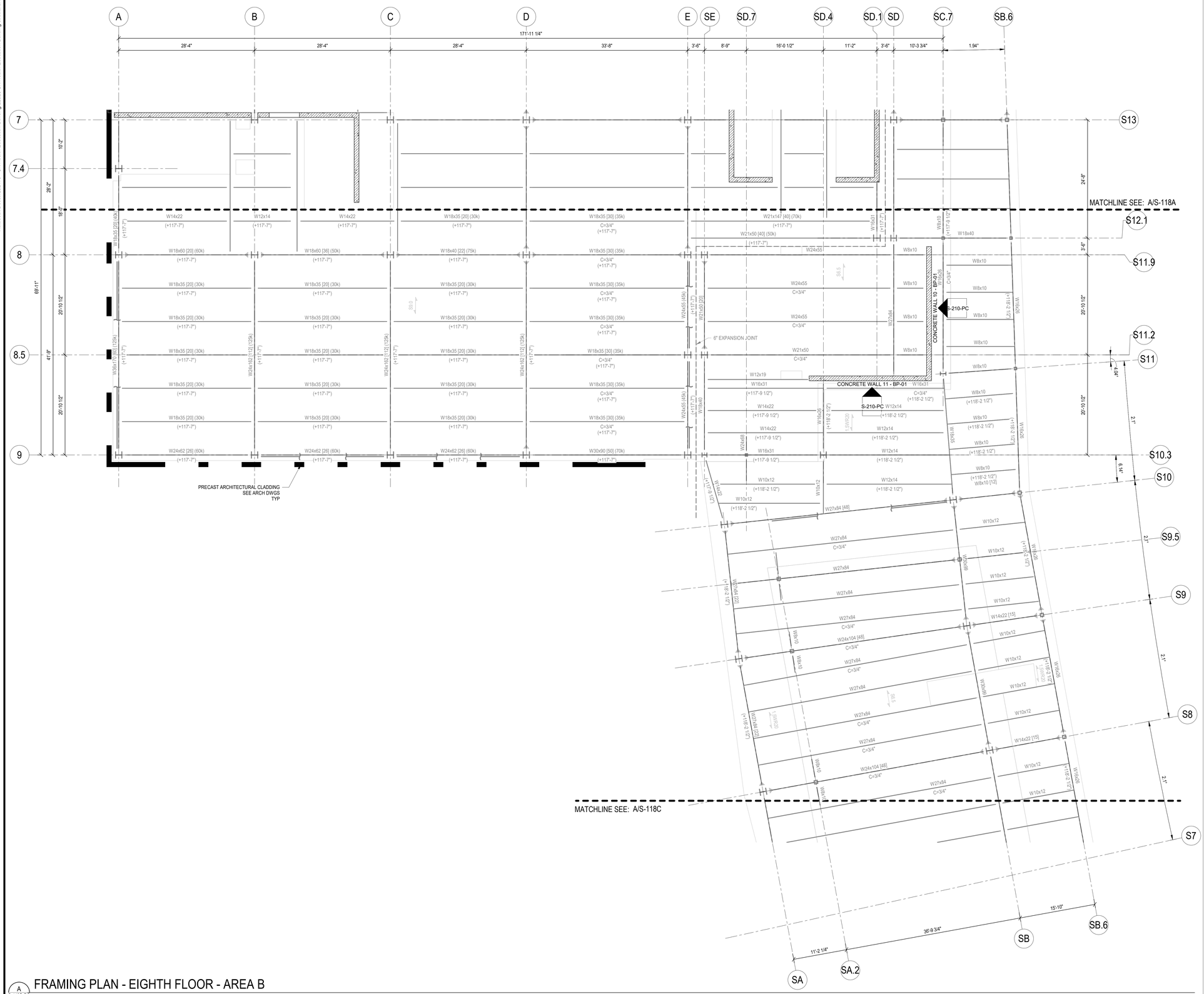

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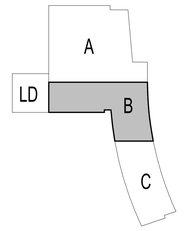

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STRUCTURAL ENGINEERS
546 East Main Street, Suite 300
Lexington, KY 40508
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BP-01A & BP-01B

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING

UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

FRAMING PLAN - EIGHTH FLOOR - AREA B

S-118B-PC

STATE OF KENTUCKY
ALISON B JOHNSON
37327
LICENSED PROFESSIONAL ENGINEER
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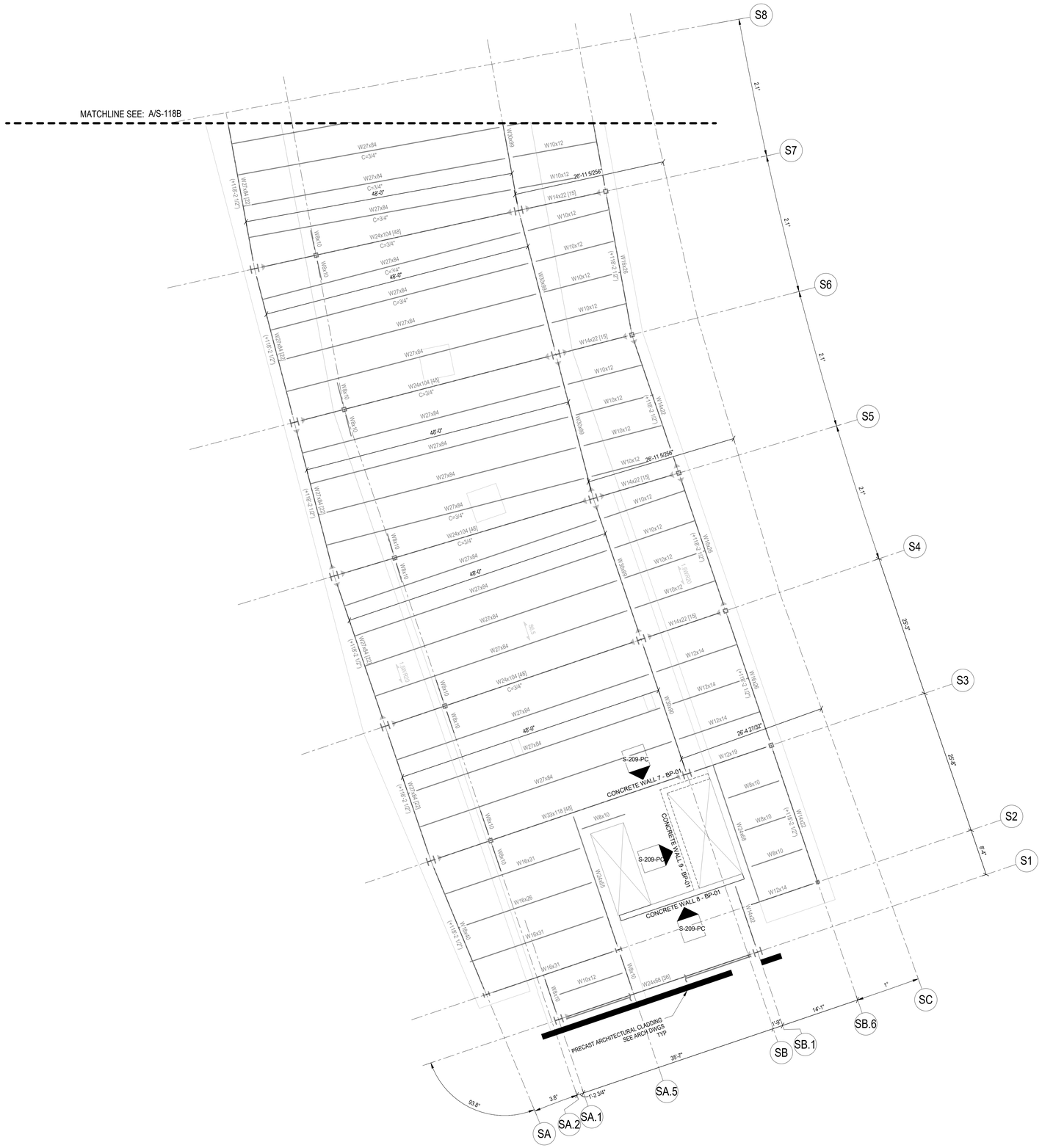

A S-118C-PC FRAMING PLAN - EIGHTH FLOOR - AREA C

1/8" = 1'-0"

BP-01 (PRECAST) PLAN NOTES

1. THIS IS AN EARLY RELEASE PACKAGE TO OBTAIN DESIGN ASSIST SERVICES AS IT RELATES TO THE PRECAST CONCRETE WALLS. THE INFORMATION SHOWN ON THESE DRAWINGS IS NOT COMPLETE AND SHALL BE USED FOR BID PURPOSES ONLY. **NO ACTUAL CONSTRUCTION NOR FABRICATION SHALL PROCEED BASED ON THIS DRAWING SET.**

2. FINISHED FIRST FLOOR ELEVATION (+0'-0").
   FINISHED SECOND FLOOR ELEVATION (+24'-0").
   FINISHED THIRD FLOOR ELEVATION (+46'-0").
   FINISHED FOURTH FLOOR ELEVATION (+62'-0").
   FINISHED FIFTH FLOOR ELEVATION (+77'-6").
   FINISHED SIXTH FLOOR ELEVATION (+93'-0").
   FINISHED SEVENTH FLOOR ELEVATION (+108'-6").
   FINISHED EIGHTH FLOOR ELEVATION (+124'-0").
   FINISHED ROOF ELEVATION (+142'-1 1/2").
   FINISHED PENTHOUSE ROOF ELEVATION (+153'-1 1/2").

3. TOP OF FIRST FLOOR STEEL BEAMS = (-0'-6") U.N.O.
   TOP OF SECOND FLOOR STEEL BEAMS = (+23'-6") U.N.O.
   TOP OF THIRD FLOOR STEEL BEAMS = (+45'-3") U.N.O.
   TOP OF FOURTH FLOOR STEEL BEAMS = (+61'-3") U.N.O.
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   TOP OF ROOF STEEL BEAMS = (+142'-0") U.N.O.
   TOP OF PENTHOUSE ROOF STEEL BEAMS = (+153'-0") U.N.O.

4. SEE DWG S-001-PC FOR GENERAL NOTES AND SPECIAL INSPECTIONS.

5. SEE ARCHITECTURAL DRAWINGS FOR PRECAST CLADDING PANELS. LAYOUT AND QUANTITY SHOWN ON STRUCTURE SHEETS IS NOT GUARANTEED TO BE EXACT.

6. INTENT OF THIS STRUCTURAL PLAN SET IS TO CONVEY THE SCOPE AND REQUIREMENTS FOR THE INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ONLY. SEE S-200-PC SERIES SHEETS FOR STRUCTURAL WALL ELEVATION VIEWS AND ADDITIONAL INFORMATION.
   A. SEE SHEET S-113A-PC FOR ONE-STORY PRECAST CONCRETE WALL IN PT/AT CLINICAL SPACE THAT IS NOT CONVEYED ELSEWHERE IN THE DRAWING SET. (ENSURE THIS WALL IS INCLUDED IN THE STRUCTURAL PRECAST BID PACKAGE.)

7. UNLESS NOTED OTHERWISE, INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ARE 12" THICK, SOLID CONCRETE, WITH A MINIMUM OF TWO REINFORCING MATS.

8. PRECAST SUPPLIER SHALL LAYOUT STRUCTURAL PANEL JOINTS. JOINT POSITIONS ARE SHALL BE APPROVED BY THE E.O.R. PRIOR TO FABRICATION. HORIZONTAL JOINTS SHALL ONLY OCCUR AT A FLOOR LINE US APPROVED BY THE E.O.R.

9. PRECAST SUPPLIER CAN ELECT TO PRESTRESS AND/OR POST-TENSION THE STRUCTURAL PRECAST WALL PANELS AT THEIR DISCRETION (AS NEEDED TO OPTIMIZE THE DESIGN.)

10. PRECAST SUPPLIER SHALL BE RESPONSIBLE FOR ALL PANEL-TO-PANEL CONNECTIONS.

11. PRECAST SUPPLIER SHALL BE REPSONSIBLE FOR ALL EMBEDS, AND REINFORCEMENT INTERNAL TO THE WALL, NECESSARY FOR STRUCTURAL STEEL TO WALL PANEL CONNECTIONS.

12. PRECAST PANEL DESIGN SHALL INCLUDE DIAGONAL CORNER BARS AT EACH OPENING CORNER.

13. PRECAST SUPPLIER SHALL COORDINATE WITH M.E.P. DRAWINGS AND SHOP FABRICATE ALL OPENINGS WITH A DIMENSION GREATER THAN 10".

14. THIS IS AN EARLY BID PACKAGE, THE FOLLOWING ADJUSTMENTS MUST BE ALLOWED FOR IN THE BID PRICE:
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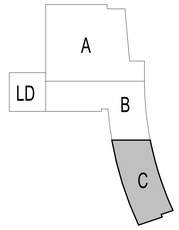
   B. LENGTHENING OR SHORTENING EACH WALL PANEL BY UP TO 1'-0".
   C. ADJUSTMENTS TO WALL BASE FORCES BY UP TO 25%.
   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
   E. SPECIALTY EMBEDS TO RECEIVE LATERAL FORCE COLLECTOR BEAMS (WELABLE REBAR ON REAR ON EMBED PLATE TO DRAG LOAD INTO THE CONCRETE PANEL.)

BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

- 1.5WR20 = 1 1/2" 20 GA GALVANIZED WIDE RIB STEEL ROOF DECK.
- S6.0 = 4 1/2" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 W.W.F. ON 1 1/2" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (6" TOTAL THICKNESS).
- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [10] (15k) = STEEL BEAM SIZE, NUMBER OF SHEAR STUDS, ZERO IF BLANK, SERVICE LOAD REACTION (KIPS) EACH END.
- C=3/4" = CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6") = TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
- = MOMENT CONNECTION.
- = HSS DIAGONAL BRACING.
- F55 = SPREAD FOOTING. SEE SCHEDULE.
- WF40 = WALL FOOTING. SEE SCHEDULE.
- = STRUCTURAL PRECAST CONCRETE WALL.
- = ARCHITECTURAL PRECAST CONCRETE CLADDING PANEL.



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FRAMING PLAN - EIGHTH FLOOR - AREA C

S-118C-PC

COMMONWEALTH OF KENTUCKY
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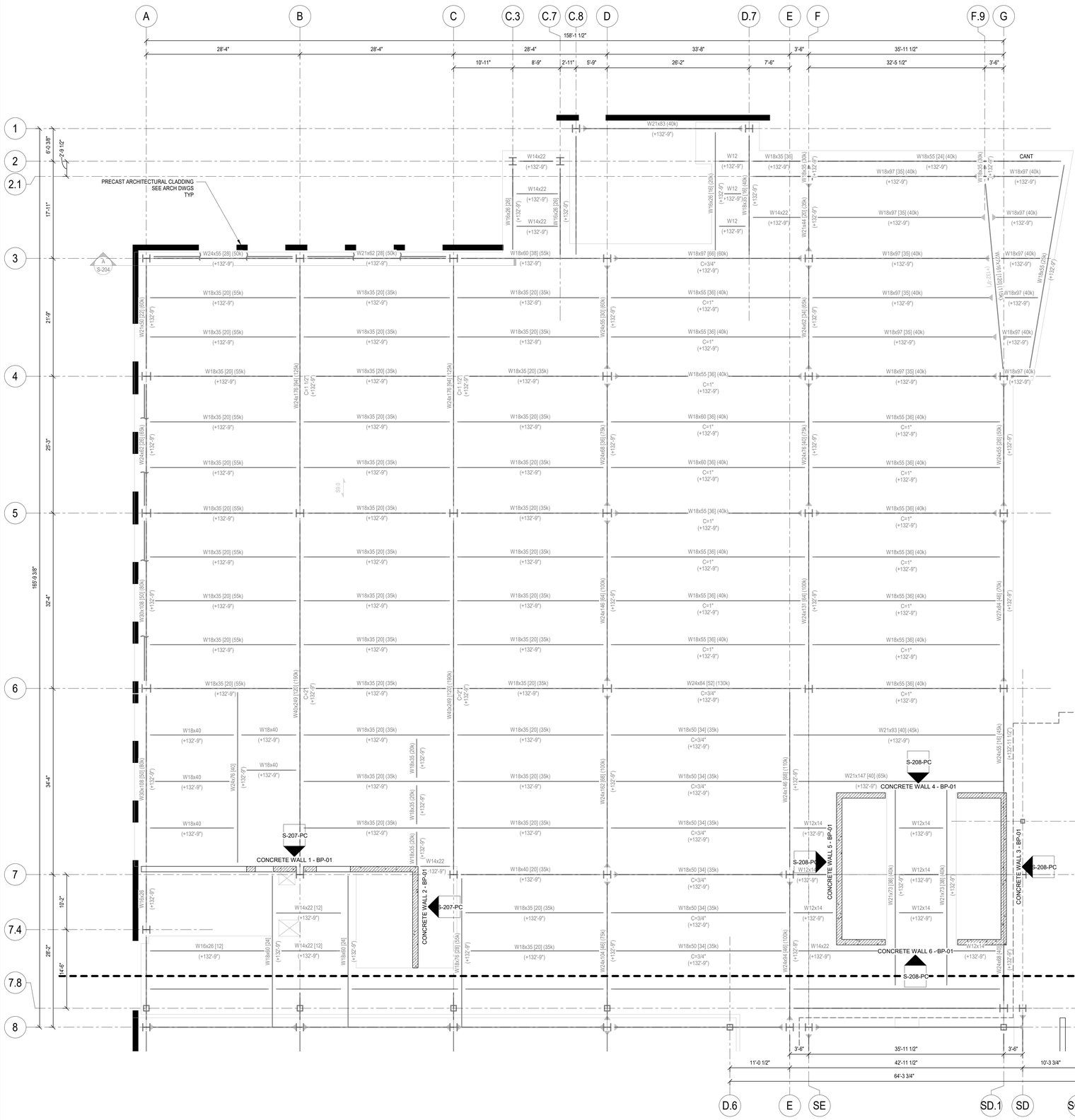

A
S-119A-PC
FRAMING PLAN - NINTH FLOOR - AREA A
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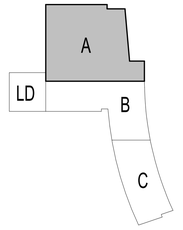

KEYPLAN

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FRAMING PLAN - NINTH FLOOR - AREA A

S-119A-PC

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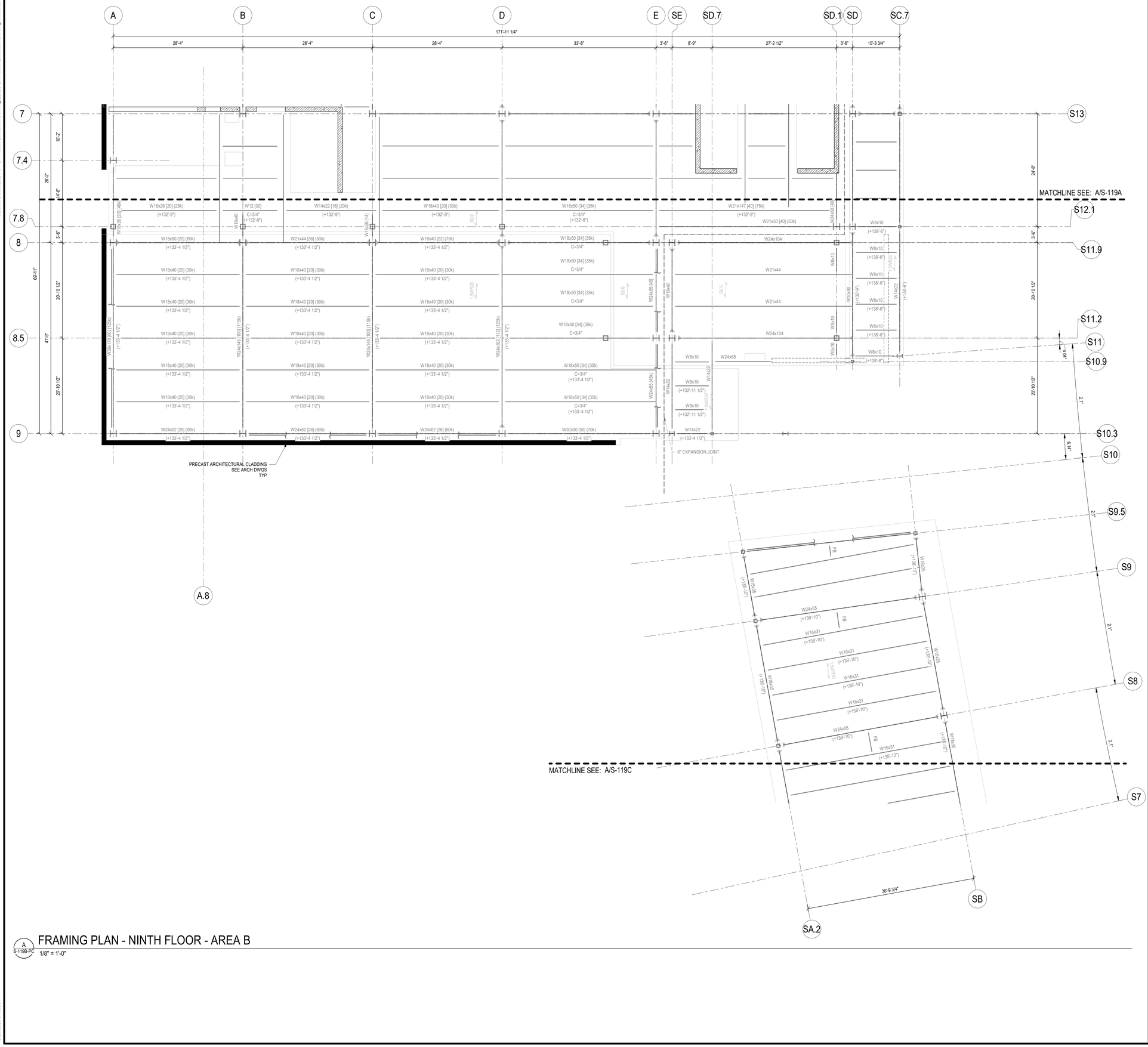

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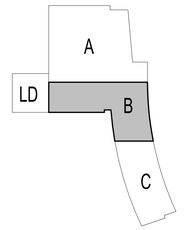

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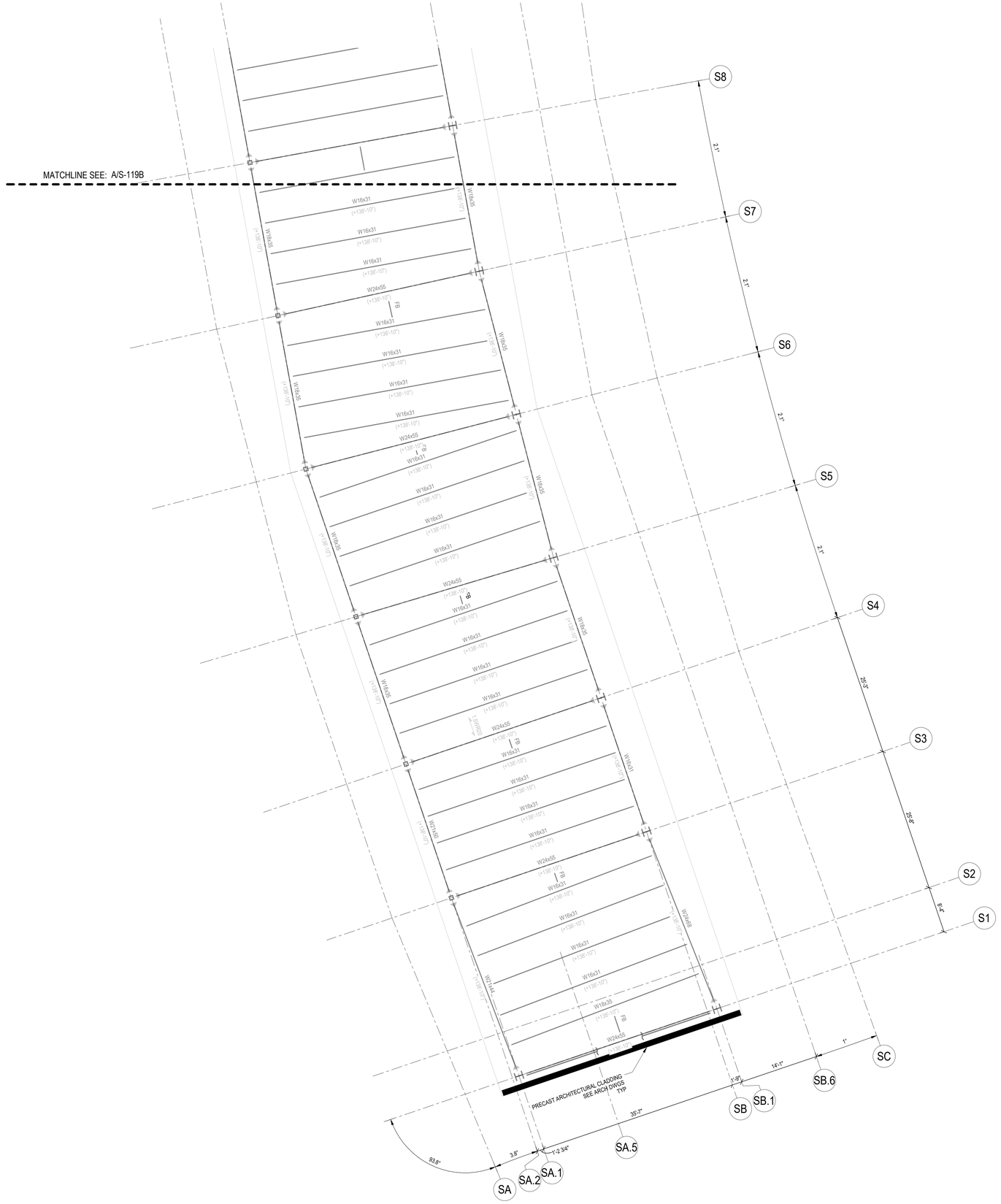

A S-119C-PC FRAMING PLAN - NINTH FLOOR - AREA C

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   FINISHED ROOF ELEVATION (+142'-1 1/2").
   FINISHED PENTHOUSE ROOF ELEVATION (+153'-1 1/2").
3. TOP OF FIRST FLOOR STEEL BEAMS = (-0'-6") U.N.O.
   TOP OF SECOND FLOOR STEEL BEAMS = (+23'-6") U.N.O.
   TOP OF THIRD FLOOR STEEL BEAMS = (+45'-3") U.N.O.
   TOP OF FOURTH FLOOR STEEL BEAMS = (+61'-3") U.N.O.
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   TOP OF ROOF STEEL BEAMS = (+142'-0") U.N.O.
   TOP OF PENTHOUSE ROOF STEEL BEAMS = (+153'-0") U.N.O.
4. SEE DWG S-001-PC FOR GENERAL NOTES AND SPECIAL INSPECTIONS.
5. SEE ARCHITECTURAL DRAWINGS FOR PRECAST CLADDING PANELS. LAYOUT AND QUANTITY SHOWN ON STRUCTURE SHEETS IS NOT GUARANTEED TO BE EXACT.
6. INTENT OF THIS STRUCTURAL PLAN SET IS TO CONVEY THE SCOPE AND REQUIREMENTS FOR THE INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ONLY. SEE S-200-PC SERIES SHEETS FOR STRUCTURAL WALL ELEVATION VIEWS AND ADDITIONAL INFORMATION.
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   B. LENGTHENING OR SHORTENING EACH WALL PANEL BY UP TO 1'-0".
   C. ADJUSTMENTS TO WALL BASE FORCES BY UP TO 25%.
   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
   E. SPECIALTY EMBEDS TO RECEIVE LATERAL FORCE COLLECTOR BEAMS (WELABLE REBAR ON REAR ON EMBED PLATE TO DRAG LOAD INTO THE CONCRETE PANEL.)

BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

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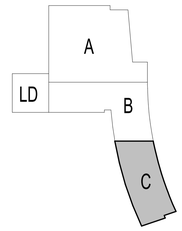
- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [10] (15k): STEEL BEAM SIZE, NUMBER OF SHEAR STUDS, ZERO IF BLANK, SERVICE LOAD REACTION (KIPS) EACH END.
- C=3/4": CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6"): TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
- = MOMENT CONNECTION.
- = HSS DIAGONAL BRACING.
- F55 = SPREAD FOOTING. SEE SCHEDULE.
- WF40 = WALL FOOTING. SEE SCHEDULE.
- = STRUCTURAL PRECAST CONCRETE WALL.
- = ARCHITECTURAL PRECAST CONCRETE CLADDING PANEL.



KEYPLAN

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BP-01A & BP-01B

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1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STATE OF KENTUCKY
ALISON B JOHNSON
37327
LICENSED PROFESSIONAL ENGINEER
BROWN + KUBICAN, PSC

STRUCTURAL	
PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

FRAMING PLAN - NINTH FLOOR - AREA C

S-119C-PC

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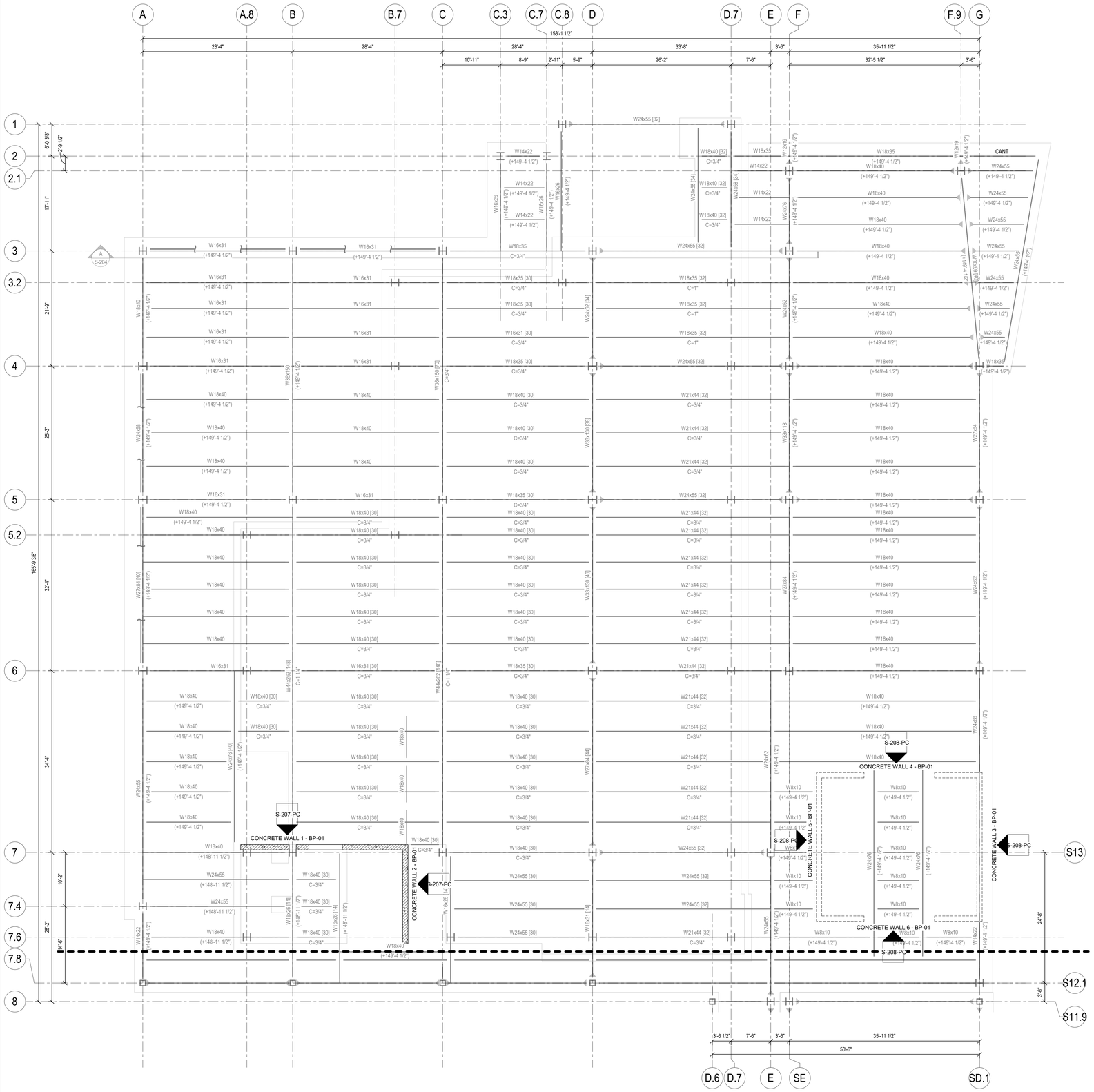

A S-120A-PC
FRAMING PLAN - ROOF/PENTHOUSE FLOOR - AREA A
1/8" = 1'-0"

BP-01 (PRECAST) PLAN NOTES

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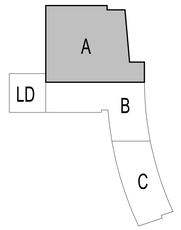
KEYPLAN



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1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL	
PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

STATE OF KENTUCKY
ALISON B JOHNSON
37327
LICENSED PROFESSIONAL ENGINEER
BROWN + KUBICAN, PSC

FRAMING PLAN - ROOF/PENTHOUSE FLOOR - AREA A

S-120A-PC

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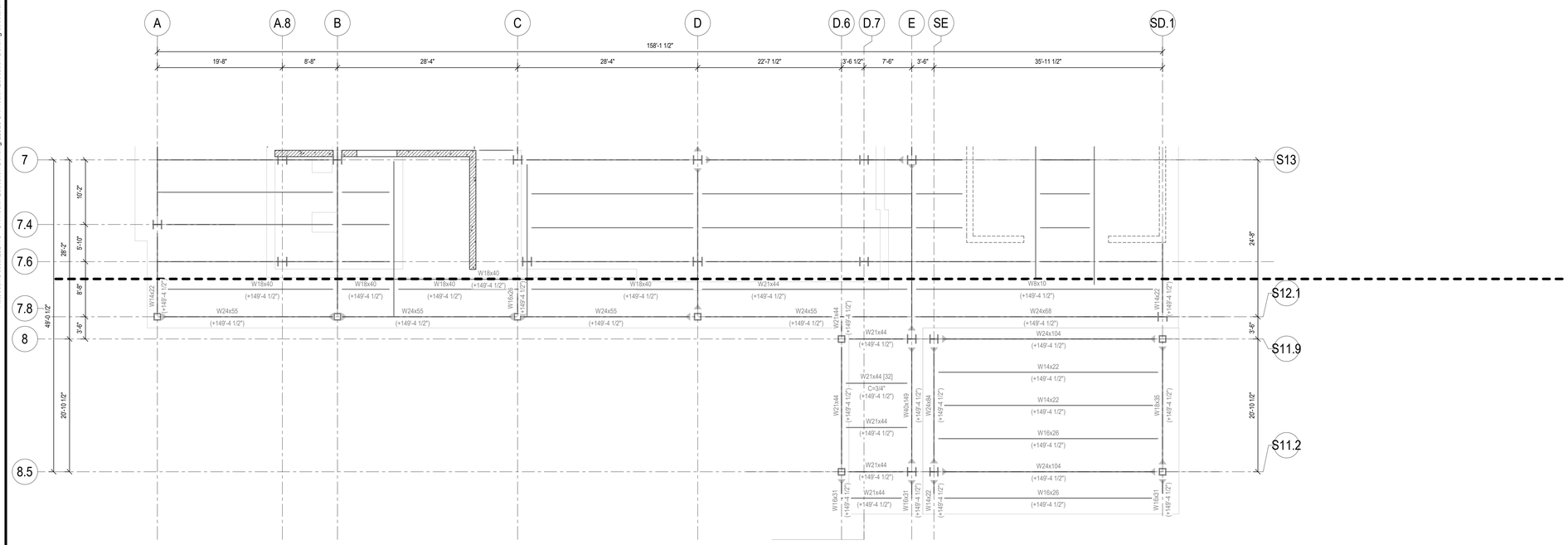

FRAMING PLAN - ROOF/PENTHOUSE FLOOR - AREA B

A
S-120B-PC
1/8" = 1'-0"

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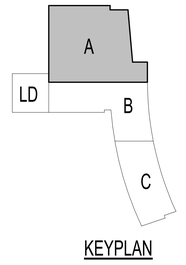

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PROJECT	202170
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FRAMING PLAN - ROOF/PENTHOUSE FLOOR - AREA B

S-120B-PC

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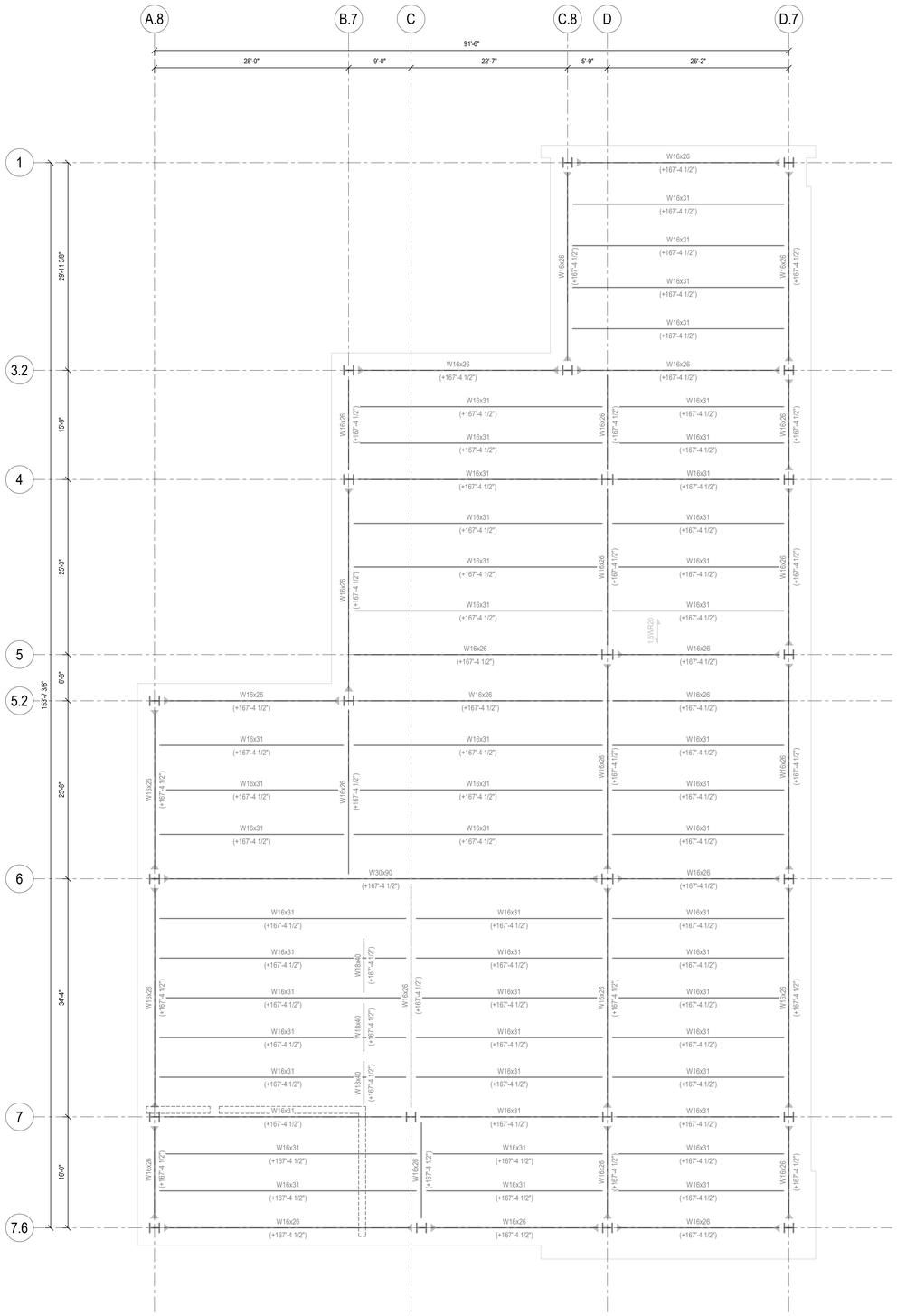

A S-121A-PC
FRAMING PLAN - PENTHOUSE ROOF - AREA A
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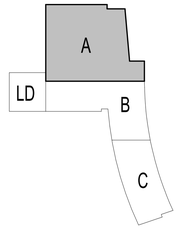
9. PRECAST SUPPLIER CAN ELECT TO PRESTRESS AND/OR POST-TENSION THE STRUCTURAL PRECAST WALL PANELS AT THEIR DISCRETION (AS NEEDED TO OPTIMIZE THE DESIGN.)
10. PRECAST SUPPLIER SHALL BE RESPONSIBLE FOR ALL PANEL-TO-PANEL CONNECTIONS.
11. PRECAST SUPPLIER SHALL BE REPSONSIBLE FOR ALL EMBEDS, AND REINFORCEMENT INTERNAL TO THE WALL, NECESSARY FOR STRUCTURAL STEEL TO WALL PANEL CONNECTIONS.
12. PRECAST PANEL DESIGN SHALL INCLUDE DIAGONAL CORNER BARS AT EACH OPENING CORNER.
13. PRECAST SUPPLIER SHALL COORDINATE WITH M.E.P. DRAWINGS AND SHOP FABRICATE ALL OPENINGS WITH A DIMENSION GREATER THAN 10".
14. THIS IS AN EARLY BID PACKAGE, THE FOLLOWING ADJUSTMENTS MUST BE ALLOWED FOR IN THE BID PRICE:
   A. MISCELLANEOUS M.E.P. PENETRATIONS THROUGH THE WALLS (BEYOND THE NUMBER OF OPENINGS CURRENTLY SHOWN).
   B. LENGTHENING OR SHORTENING EACH WALL PANEL BY UP TO 1'-0".
   C. ADJUSTMENTS TO WALL BASE FORCES BY UP TO 25%.
   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
   E. SPECIALTY EMBEDS TO RECEIVE LATERAL FORCE COLLECTOR BEAMS (WELABLE REBAR ON REAR ON EMBED PLATE TO DRAG LOAD INTO THE CONCRETE PANEL.)

BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

- 1.5WR20 = 1 1/2" 20 GA GALVANIZED WIDE RIB STEEL ROOF DECK.
- S6.0 = 4 1/2" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 W.W.F. ON 1 1/2" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (6" TOTAL THICKNESS).
- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [10] (15k) = STEEL BEAM SIZE, NUMBER OF SHEAR STUDS, ZERO IF BLANK, SERVICE LOAD REACTION (KIPS) EACH END.
- C=3/4" = CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6") = TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
- = MOMENT CONNECTION.
- = HSS DIAGONAL BRACING.
- F55 = SPREAD FOOTING. SEE SCHEDULE.
- WF40 = WALL FOOTING. SEE SCHEDULE.
- = STRUCTURAL PRECAST CONCRETE WALL.
- = ARCHITECTURAL PRECAST CONCRETE CLADDING PANEL.



KEYPLAN

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BP-01A & BP-01B

UNIVERSITY OF KENTUCKY
HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

FRAMING PLAN - PENTHOUSE ROOF - AREA A

S-121A-PC

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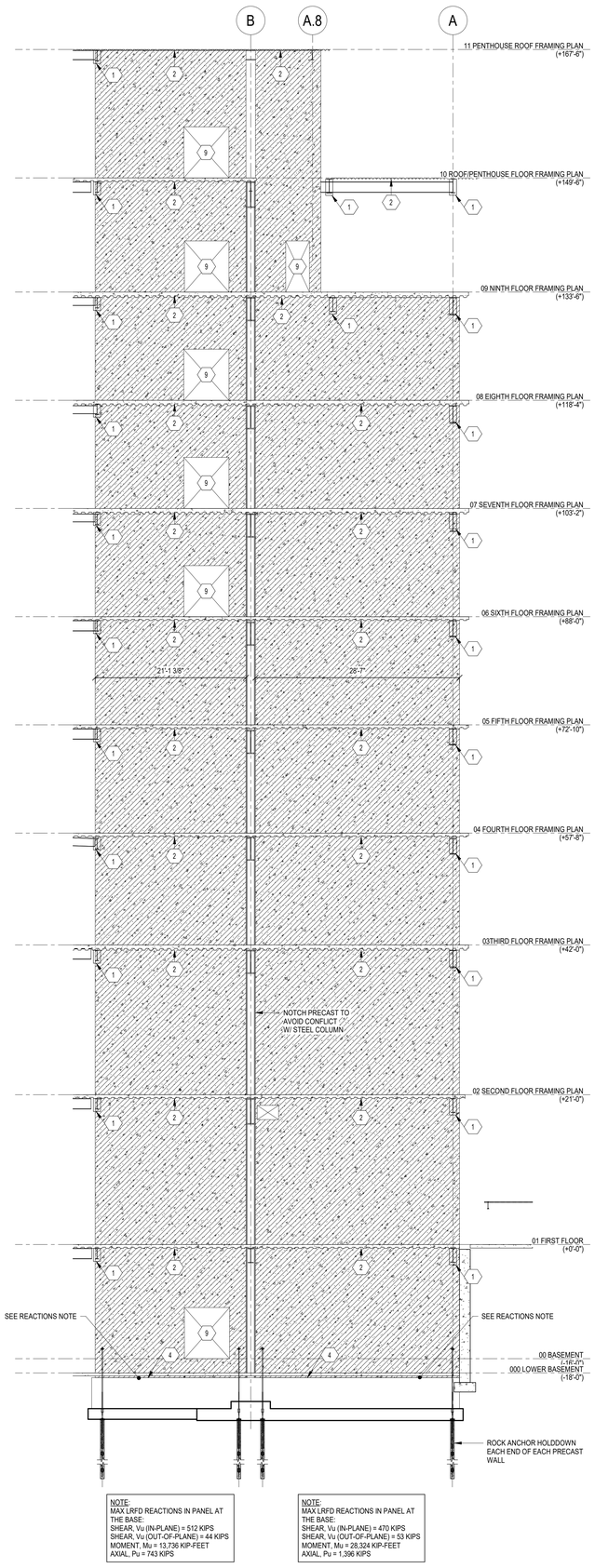
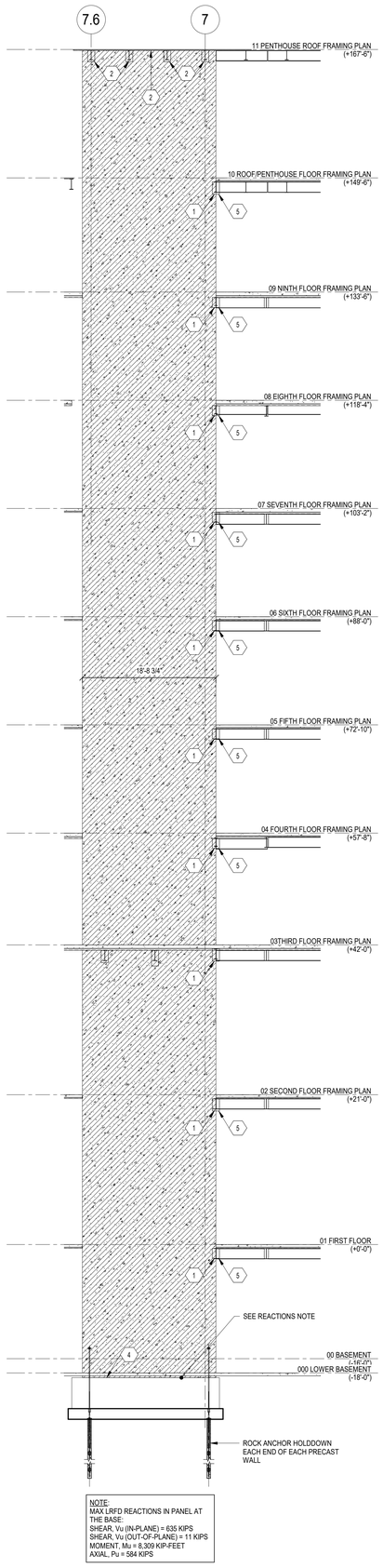


NOTE:
MAX LRFD REACTIONS IN PANEL AT THE BASE:
SHEAR, V_U (IN-PLANE) = 512 KIPS
SHEAR, V_U (OUT-OF-PLANE) = 44 KIPS
MOMENT, M_U = 13,736 KIP-FEET
AXIAL, P_U = 743 KIPS

NOTE:
MAX LRFD REACTIONS IN PANEL AT THE BASE:
SHEAR, V_U (IN-PLANE) = 470 KIPS
SHEAR, V_U (OUT-OF-PLANE) = 53 KIPS
MOMENT, M_U = 28,324 KIP-FEET
AXIAL, P_U = 1,396 KIPS

A S-207-PC
CONCRETE WALL 1 - BP-01
1/8" = 1'-0"



NOTE:
MAX LRFD REACTIONS IN PANEL AT THE BASE:
SHEAR, V_U (IN-PLANE) = 635 KIPS
SHEAR, V_U (OUT-OF-PLANE) = 11 KIPS
MOMENT, M_U = 8,309 KIP-FEET
AXIAL, P_U = 584 KIPS

B S-207-PC
CONCRETE WALL 2 - BP-01
1/8" = 1'-0"

BP-01 (PRECAST) PLAN NOTES

1. THIS IS AN EARLY RELEASE PACKAGE TO OBTAIN DESIGN ASSIST SERVICES AS IT RELATES TO THE PRECAST CONCRETE WALLS. THE INFORMATION SHOWN ON THESE DRAWINGS IS NOT COMPLETE AND SHALL BE USED FOR BID PURPOSES ONLY. **NO ACTUAL CONSTRUCTION NOR FABRICATION SHALL PROCEED BASED ON THIS DRAWING SET.**
2. FINISHED FIRST FLOOR ELEVATION (+0'-0").
   FINISHED SECOND FLOOR ELEVATION (+24'-0").
   FINISHED THIRD FLOOR ELEVATION (+46'-0").
   FINISHED FOURTH FLOOR ELEVATION (+62'-0").
   FINISHED FIFTH FLOOR ELEVATION (+77'-6").
   FINISHED SIXTH FLOOR ELEVATION (+93'-0").
   FINISHED SEVENTH FLOOR ELEVATION (+108'-6").
   FINISHED EIGHTH FLOOR ELEVATION (+124'-0").
   FINISHED ROOF ELEVATION (+142'-1 1/2").
   FINISHED PENTHOUSE ROOF ELEVATION (+153'-1 1/2").
3. TOP OF FIRST FLOOR STEEL BEAMS = (-0'-6") U.N.O.
   TOP OF SECOND FLOOR STEEL BEAMS = (+23'-6") U.N.O.
   TOP OF THIRD FLOOR STEEL BEAMS = (+45'-3") U.N.O.
   TOP OF FOURTH FLOOR STEEL BEAMS = (+61'-3") U.N.O.
   TOP OF FIFTH FLOOR STEEL BEAMS = (+76'-9") U.N.O.
   TOP OF SIXTH FLOOR STEEL BEAMS = (+92'-3") U.N.O.
   TOP OF SEVENTH FLOOR STEEL BEAMS = (+107'-9") U.N.O.
   TOP OF EIGHTH FLOOR STEEL BEAMS = (+123'-3") U.N.O.
   TOP OF ROOF STEEL BEAMS = (+142'-0") U.N.O.
   TOP OF PENTHOUSE ROOF STEEL BEAMS = (+153'-0") U.N.O.
4. SEE DWG S-001-PC FOR GENERAL NOTES AND SPECIAL INSPECTIONS.
5. SEE ARCHITECTURAL DRAWINGS FOR PRECAST CLADDING PANELS. LAYOUT AND QUANTITY SHOWN ON STRUCTURE SHEETS IS NOT GUARANTEED TO BE EXACT.
6. INTENT OF THIS STRUCTURAL PLAN SET IS TO CONVEY THE SCOPE AND REQUIREMENTS FOR THE INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ONLY. SEE S-200-PC SERIES SHEETS FOR STRUCTURAL WALL ELEVATION VIEWS AND ADDITIONAL INFORMATION.
   A. SEE SHEET S-113A-PC FOR ONE-STORY PRECAST CONCRETE WALL IN PT/AT CLINICAL SPACE THAT IS NOT CONVEYED ELSEWHERE IN THE DRAWING SET. (ENSURE THIS WALL IS INCLUDED IN THE STRUCTURAL PRECAST BID PACKAGE.)
7. UNLESS NOTED OTHERWISE, INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ARE 12" THICK, SOLID CONCRETE, WITH A MINIMUM OF TWO REINFORCING MATS.
8. PRECAST SUPPLIER SHALL LAYOUT STRUCTURAL PANEL JOINTS. JOINT POSITIONS ARE SHALL BE APPROVED BY THE E.O.R. PRIOR TO FABRICATION. HORIZONTAL JOINTS SHALL ONLY OCCUR AT A FLOOR LINE US APPROVED BY THE E.O.R.
9. PRECAST SUPPLIER CAN ELECT TO PRESTRESS AND/OR POST-TENSION THE STRUCTURAL PRECAST WALL PANELS AT THEIR DISCRETION (AS NEEDED TO OPTIMIZE THE DESIGN.)
10. PRECAST SUPPLIER SHALL BE RESPONSIBLE FOR ALL PANEL-TO-PANEL CONNECTIONS.
11. PRECAST SUPPLIER SHALL BE REPSONSIBLE FOR ALL EMBEDS, AND REINFORCEMENT INTERNAL TO THE WALL, NECESSARY FOR STRUCTURAL STEEL TO WALL PANEL CONNECTIONS.
12. PRECAST PANEL DESIGN SHALL INCLUDE DIAGONAL CORNER BARS AT EACH OPENING CORNER.
13. PRECAST SUPPLIER SHALL COORDINATE WITH M.E.P. DRAWINGS AND SHOP FABRICATE ALL OPENINGS WITH A DIMENSION GREATER THAN 10".
14. THIS IS AN EARLY BID PACKAGE, THE FOLLOWING ADJUSTMENTS MUST BE ALLOWED FOR IN THE BID PRICE:
   A. MISCELLANEOUS M.E.P. PENETRATIONS THROUGH THE WALLS (BEYOND THE NUMBER OF OPENINGS CURRENTLY SHOWN).
   B. LENGTHENING OR SHORTENING EACH WALL PANEL BY UP TO 1'-0".
   C. ADJUSTMENTS TO WALL BASE FORCES BY UP TO 25%.
   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
   E. SPECIALTY EMBEDS TO RECEIVE LATERAL FORCE COLLECTOR BEAMS (WELABLE REBAR ON REAR ON EMBED PLATE TO DRAG LOAD INTO THE CONCRETE PANEL.)

BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

- 1.5WR20 = 1 1/2" 20 GA GALVANIZED WIDE RIB STEEL ROOF DECK.
- S6.0 = 4 1/2" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 W.W.F. ON 1 1/2" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (6" TOTAL THICKNESS).
- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [f0] (15k) — STEEL BEAM SIZE. NUMBER OF SHEAR STUDS, ZERO IF BLANK. SERVICE LOAD REACTION (KIPS) EACH END.
- C=3/4" — CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6") = TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
- = MOMENT CONNECTION.
- = HSS DIAGONAL BRACING.
- F55 = SPREAD FOOTING. SEE SCHEDULE.
- WF40 = WALL FOOTING. SEE SCHEDULE.
- = STRUCTURAL PRECAST CONCRETE WALL.
- = ARCHITECTURAL PRECAST CONCRETE CLADDING PANEL.

STRUCTURAL PRECAST CONCRETE WALL TAG NOTES

1. EMBED PLATE FOR BEAM SUPPORT.
2. ANCHORAGE (EMBED PALTE AND/OR DOWEL RECIEVER INSERTS) FOR CONTINUOUS CONNECTION TO FLOOR/ROOF DIAPHRAGM.
3. PRECAST WALL SHALL BEAR ON, AND ANCHOR TO, CONTINUOUS C.I.P. CONCRETE FOOTING.
4. PRECAST WALL SHALL BEAR ON, AND ANCHOR TO, CONTINUOUS C.I.P. STEM WALL.
5. STEEL EMBED AT END WALL FOR STEEL BEAM DRAG STRUT (AXIAL BEAM LOAD) CONNECTION.
6. PRECAST WALL BID SHALL ACCOUNT FOR POTENTIAL THAT STEEL COLUMN IS DELETED AND INDICATED BEAM ATTACHES TO WALL FOR SUPPORT.
7. OPENING FOR MECHANICAL DUCT.
8. STEEL LATERAL FORCE COLLECTOR TO RUN ALONG FACE & CONTINUOUSLY ATTACH TO THE WALL. (CONT EMBED PL REQUIRED).
9. ROUGH DOOR OPENING SHALL BE 1" LARGER THAN DOOR FRAME ON ALL SIDES, U.N.O.

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STRUCTURAL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

CONCRETE WALL ELEVATIONS

S-207-PC

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STATE OF KENTUCKY
ALISON B JOHNSON
37327
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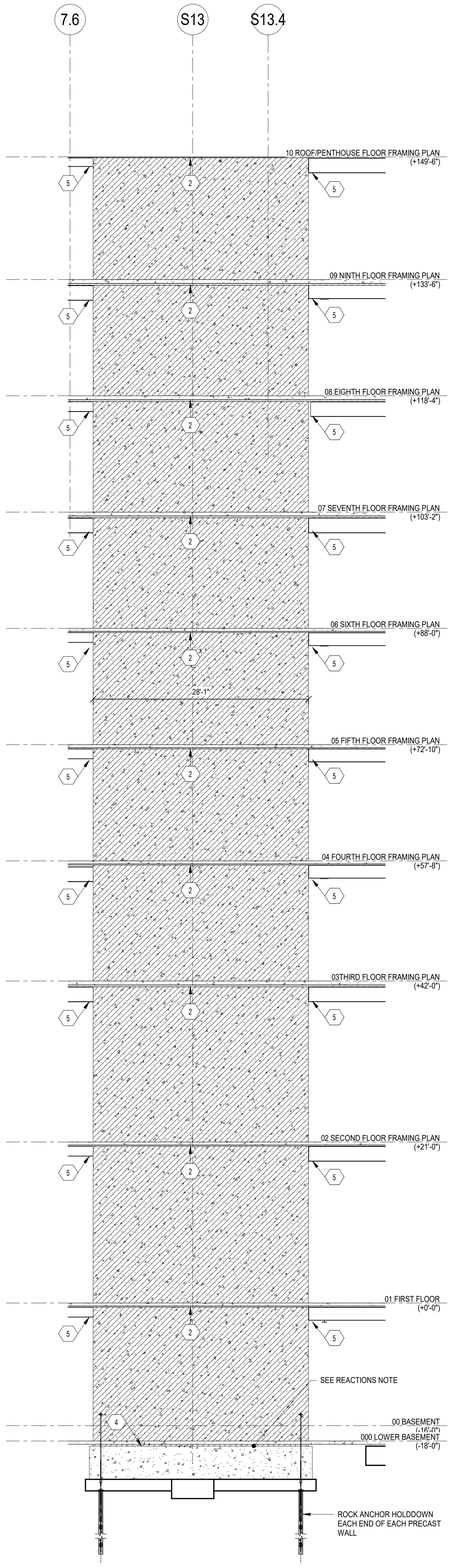
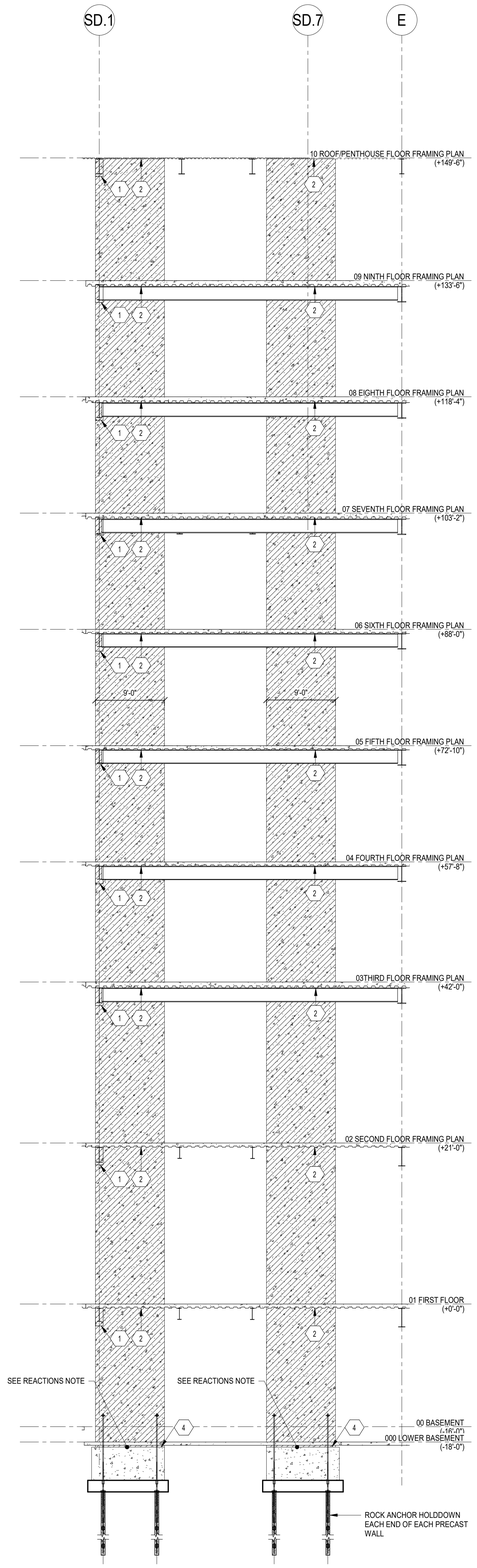


NOTE:
MAX LRFD REACTIONS IN PANEL AT THE BASE:
SHEAR, Vu (IN-PLANE) = 705 KIPS
SHEAR, Vu (OUT-OF-PLANE) = 33 KIPS
MOMENT, Mu = 19,520 KIP-FEET
AXIAL, Pu = 1,143 KIPS

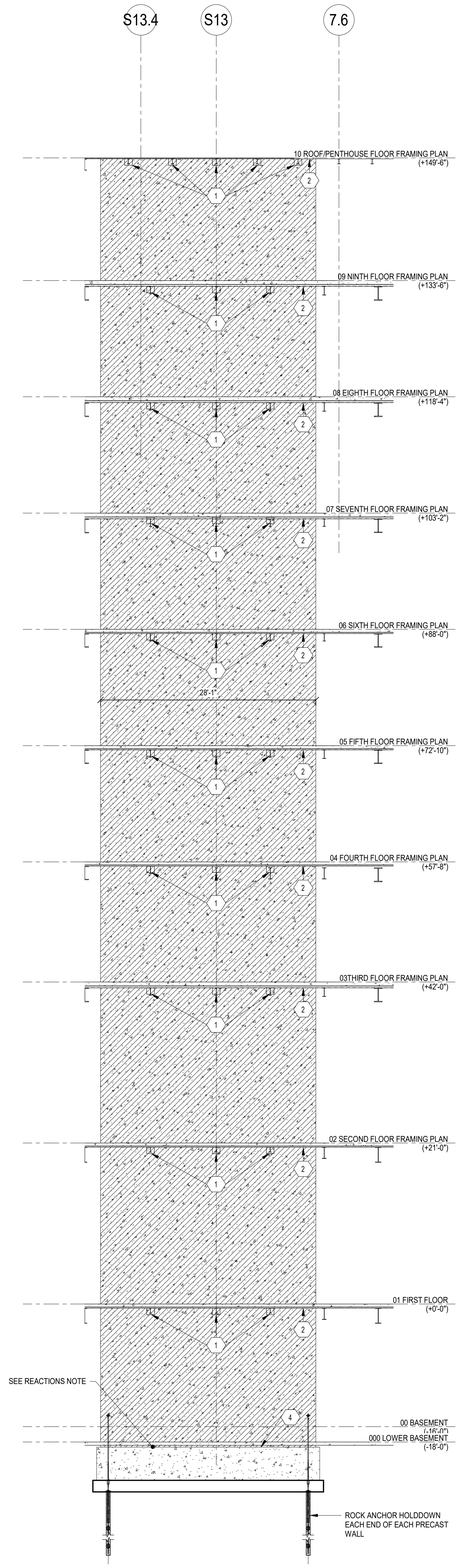
A S-208-PC CONCRETE WALL 3 - BP-01
1/8" = 1'-0"



NOTE:
MAX LRFD REACTIONS IN PANEL AT THE BASE:
SHEAR, Vu (IN-PLANE) = 238 KIPS
SHEAR, Vu (OUT-OF-PLANE) = 9 KIPS
MOMENT, Mu = 1,568 KIP-FEET
AXIAL, Pu = 218 KIPS

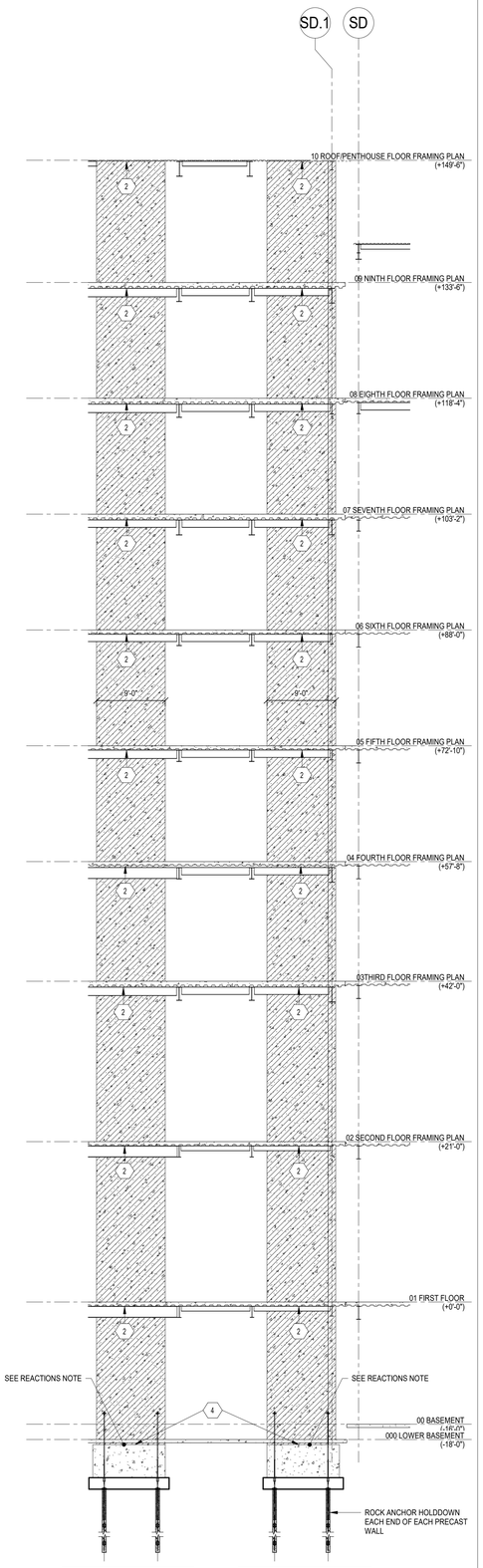
NOTE:
MAX LRFD REACTIONS IN PANEL AT THE BASE:
SHEAR, Vu (IN-PLANE) = 220 KIPS
SHEAR, Vu (OUT-OF-PLANE) = 6 KIPS
MOMENT, Mu = 1,282 KIP-FEET
AXIAL, Pu = 200 KIPS

B S-208-PC CONCRETE WALL 4 - BP-01
1/8" = 1'-0"



NOTE:
MAX LRFD REACTIONS IN PANEL AT THE BASE:
SHEAR, Vu (IN-PLANE) = 676 KIPS
SHEAR, Vu (OUT-OF-PLANE) = 33 KIPS
MOMENT, Mu = 19,121 KIP-FEET
AXIAL, Pu = 730 KIPS

C S-208-PC CONCRETE WALL 5 - BP-01
1/8" = 1'-0"



NOTE:
MAX LRFD REACTIONS IN PANEL AT THE BASE:
SHEAR, Vu (IN-PLANE) = 139 KIPS
SHEAR, Vu (OUT-OF-PLANE) = 6 KIPS
MOMENT, Mu = 940 KIP-FEET
AXIAL, Pu = 193 KIPS

NOTE:
MAX LRFD REACTIONS IN PANEL AT THE BASE:
SHEAR, Vu (IN-PLANE) = 150 KIPS
SHEAR, Vu (OUT-OF-PLANE) = 9 KIPS
MOMENT, Mu = 1,182 KIP-FEET
AXIAL, Pu = 211 KIPS

D S-208-PC CONCRETE WALL 6 - BP-01
1/8" = 1'-0"

BP-01 (PRECAST) PLAN NOTES

1. THIS IS AN EARLY RELEASE PACKAGE TO OBTAIN DESIGN ASSIST SERVICES AS IT RELATES TO THE PRECAST CONCRETE WALLS. THE INFORMATION SHOWN ON THESE DRAWINGS IS NOT COMPLETE AND SHALL BE USED FOR BID PURPOSES ONLY. **NO ACTUAL CONSTRUCTION NOR FABRICATION SHALL PROCEED BASED ON THIS DRAWING SET.**
2. FINISHED FIRST FLOOR ELEVATION (+0'-0").
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   FINISHED THIRD FLOOR ELEVATION (+46'-0").
   FINISHED FOURTH FLOOR ELEVATION (+62'-0").
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   FINISHED SIXTH FLOOR ELEVATION (+93'-0").
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   FINISHED EIGHTH FLOOR ELEVATION (+124'-0").
   FINISHED ROOF ELEVATION (+142'-1 1/2").
   FINISHED PENTHOUSE ROOF ELEVATION (+153'-1 1/2").
3. TOP OF FIRST FLOOR STEEL BEAMS = (-0'-6") U.N.O.
   TOP OF SECOND FLOOR STEEL BEAMS = (+23'-6") U.N.O.
   TOP OF THIRD FLOOR STEEL BEAMS = (+45'-3") U.N.O.
   TOP OF FOURTH FLOOR STEEL BEAMS = (+61'-3") U.N.O.
   TOP OF FIFTH FLOOR STEEL BEAMS = (+76'-9") U.N.O.
   TOP OF SIXTH FLOOR STEEL BEAMS = (+92'-3") U.N.O.
   TOP OF SEVENTH FLOOR STEEL BEAMS = (+107'-9") U.N.O.
   TOP OF EIGHTH FLOOR STEEL BEAMS = (+123'-3") U.N.O.
   TOP OF ROOF STEEL BEAMS = (+142'-0") U.N.O.
   TOP OF PENTHOUSE ROOF STEEL BEAMS = (+153'-0") U.N.O.
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5. SEE ARCHITECTURAL DRAWINGS FOR PRECAST CLADDING PANELS. LAYOUT AND QUANTITY SHOWN ON STRUCTURE SHEETS IS NOT GUARANTEED TO BE EXACT.
6. INTENT OF THIS STRUCTURAL PLAN SET IS TO CONVEY THE SCOPE AND REQUIREMENTS FOR THE INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ONLY. SEE S-200-PC SERIES SHEETS FOR STRUCTURAL WALL ELEVATION VIEWS AND ADDITIONAL INFORMATION.
   A. SEE SHEET S-113A-PC FOR ONE-STORY PRECAST CONCRETE WALL IN PT/AT CLINICAL SPACE THAT IS NOT CONVEYED ELSEWHERE IN THE DRAWING SET. (ENSURE THIS WALL IS INCLUDED IN THE STRUCTURAL PRECAST BID PACKAGE.)
7. UNLESS NOTED OTHERWISE, INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ARE 12" THICK, SOLID CONCRETE, WITH A MINIMUM OF TWO REINFORCING MATS.
8. PRECAST SUPPLIER SHALL LAYOUT STRUCTURAL PANEL JOINTS. JOINT POSITIONS ARE SHALL BE APPROVED BY THE E.O.R. PRIOR TO FABRICATION. HORIZONTAL JOINTS SHALL ONLY OCCUR AT A FLOOR LINE US APPROVED BY THE E.O.R.
9. PRECAST SUPPLIER CAN ELECT TO PRESTRESS AND/OR POST-TENSION THE STRUCTURAL PRECAST WALL PANELS AT THEIR DISCRETION (AS NEEDED TO OPTIMIZE THE DESIGN.)
10. PRECAST SUPPLIER SHALL BE RESPONSIBLE FOR ALL PANEL-TO-PANEL CONNECTIONS.
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12. PRECAST PANEL DESIGN SHALL INCLUDE DIAGONAL CORNER BARS AT EACH OPENING CORNER.
13. PRECAST SUPPLIER SHALL COORDINATE WITH M.E.P. DRAWINGS AND SHOP FABRICATE ALL OPENINGS WITH A DIMENSION GREATER THAN 10".
14. THIS IS AN EARLY BID PACKAGE, THE FOLLOWING ADJUSTMENTS MUST BE ALLOWED FOR IN THE BID PRICE:
   A. MISCELLANEOUS M.E.P. PENETRATIONS THROUGH THE WALLS (BEYOND THE NUMBER OF OPENINGS CURRENTLY SHOWN).
   B. LENGTHENING OR SHORTENING EACH WALL PANEL BY UP TO 1'-0".
   C. ADJUSTMENTS TO WALL BASE FORCES BY UP TO 25%.
   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
   E. SPECIALTY EMBEDS TO RECEIVE LATERAL FORCE COLLECTOR BEAMS (WELABLE REBAR ON REAR ON EMBED PLATE TO DRAG LOAD INTO THE CONCRETE PANEL.)

BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

- 1.5WR20 = 1 1/2" 20 GA GALVANIZED WIDE RIB STEEL ROOF DECK.
- S6.0 = 4 1/2" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 W.W.F. ON 1 1/2" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (6" TOTAL THICKNESS).
- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [10] (15k) = STEEL BEAM SIZE. NUMBER OF SHEAR STUDS, ZERO IF BLANK. SERVICE LOAD REACTION (KIPS) EACH END.
- C=3/4" = CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6") = TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
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- = HSS DIAGONAL BRACING.
- F55 = SPREAD FOOTING. SEE SCHEDULE.
- WF40 = WALL FOOTING. SEE SCHEDULE.
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- = ARCHITECTURAL PRECAST CONCRETE CLADDING PANEL.

STRUCTURAL PRECAST CONCRETE WALL TAG NOTES

1. EMBED PLATE FOR BEAM SUPPORT.
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3. PRECAST WALL SHALL BEAR ON, AND ANCHOR TO, CONTINUOUS C.I.P. CONCRETE FOOTING.
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9. ROUGH DOOR OPENING SHALL BE 1" LARGER THAN DOOR FRAME ON ALL SIDES, U.N.O.

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BP-01A & BP-01B

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING

UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

CONCRETE WALL ELEVATIONS

S-208-PC

STATE OF KENTUCKY ALISON B JOHNSON 37327 LICENSED PROFESSIONAL ENGINEER BROWN + KUBICAN, PSC

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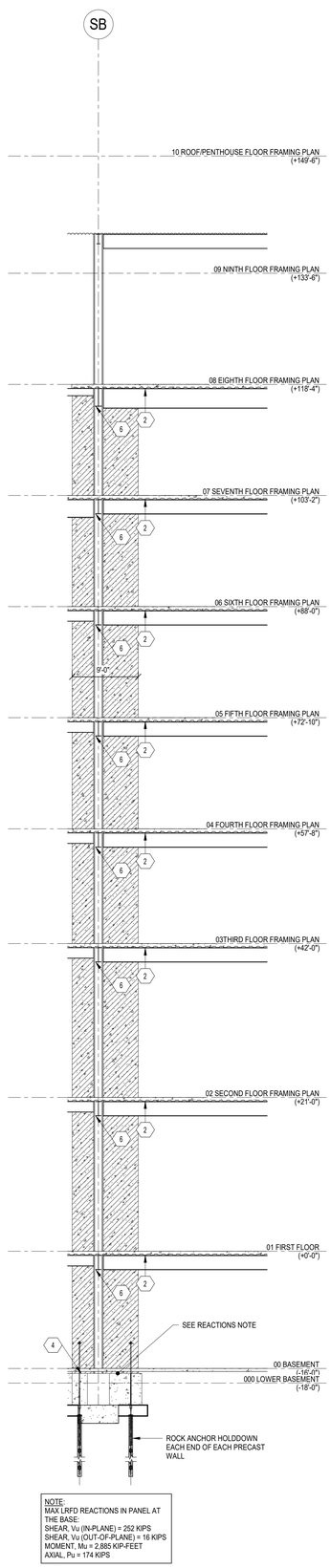
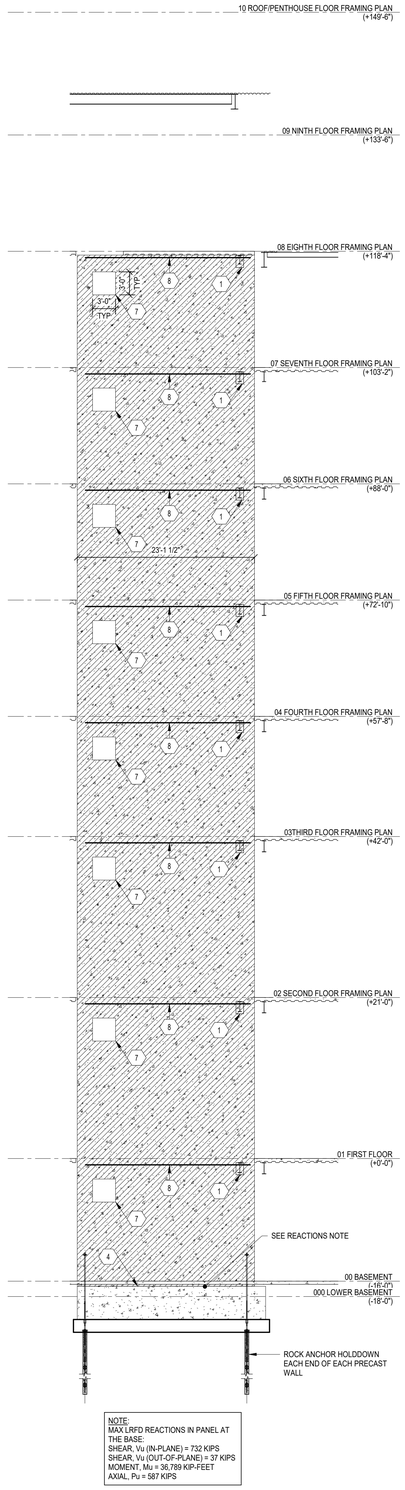
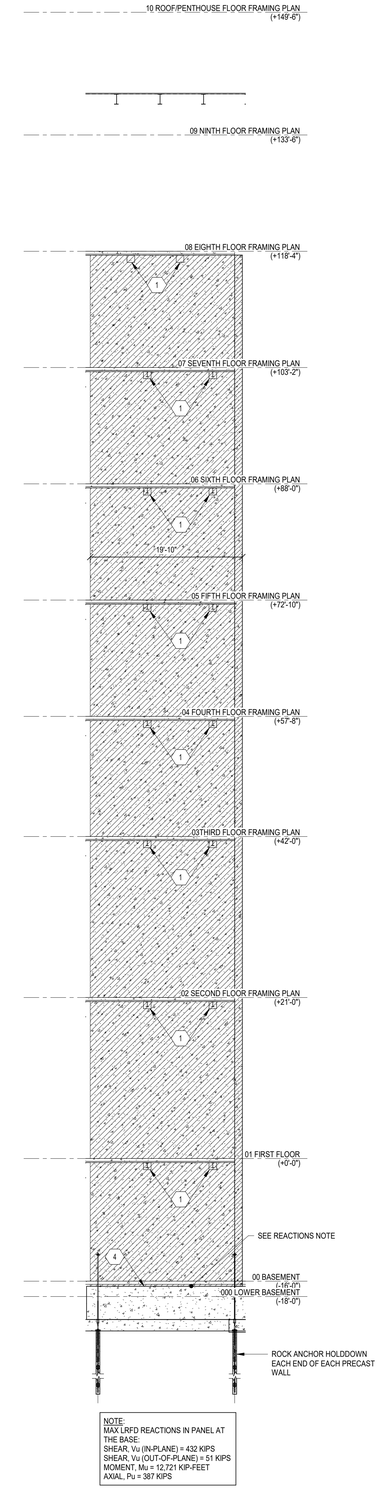


A S-209-PC CONCRETE WALL 7 - BP-01
1/8" = 1'-0"



B S-209-PC CONCRETE WALL 8 - BP-01
1/8" = 1'-0"



C S-209-PC CONCRETE WALL 9 - BP-01
1/8" = 1'-0"

BP-01 (PRECAST) PLAN NOTES

1. THIS IS AN EARLY RELEASE PACKAGE TO OBTAIN DESIGN ASSIST SERVICES AS IT RELATES TO THE PRECAST CONCRETE WALLS. THE INFORMATION SHOWN ON THESE DRAWINGS IS NOT COMPLETE AND SHALL BE USED FOR BID PURPOSES ONLY. **NO ACTUAL CONSTRUCTION NOR FABRICATION SHALL PROCEED BASED ON THIS DRAWING SET.**
2. FINISHED FIRST FLOOR ELEVATION (+0'-0").
   FINISHED SECOND FLOOR ELEVATION (+24'-0").
   FINISHED THIRD FLOOR ELEVATION (+46'-0").
   FINISHED FOURTH FLOOR ELEVATION (+62'-0").
   FINISHED FIFTH FLOOR ELEVATION (+77'-6").
   FINISHED SIXTH FLOOR ELEVATION (+93'-0").
   FINISHED SEVENTH FLOOR ELEVATION (+108'-6").
   FINISHED EIGHTH FLOOR ELEVATION (+124'-0").
   FINISHED ROOF ELEVATION (+142'-1 1/2").
   FINISHED PENTHOUSE ROOF ELEVATION (+153'-1 1/2").
3. TOP OF FIRST FLOOR STEEL BEAMS = (-0'-6") U.N.O.
   TOP OF SECOND FLOOR STEEL BEAMS = (+23'-6") U.N.O.
   TOP OF THIRD FLOOR STEEL BEAMS = (+45'-3") U.N.O.
   TOP OF FOURTH FLOOR STEEL BEAMS = (+61'-3") U.N.O.
   TOP OF FIFTH FLOOR STEEL BEAMS = (+76'-9") U.N.O.
   TOP OF SIXTH FLOOR STEEL BEAMS = (+92'-3") U.N.O.
   TOP OF SEVENTH FLOOR STEEL BEAMS = (+107'-9") U.N.O.
   TOP OF EIGHTH FLOOR STEEL BEAMS = (+123'-3") U.N.O.
   TOP OF ROOF STEEL BEAMS = (+142'-0") U.N.O.
   TOP OF PENTHOUSE ROOF STEEL BEAMS = (+153'-0") U.N.O.
4. SEE DWG S-001-PC FOR GENERAL NOTES AND SPECIAL INSPECTIONS.
5. SEE ARCHITECTURAL DRAWINGS FOR PRECAST CLADDING PANELS. LAYOUT AND QUANTITY SHOWN ON STRUCTURE SHEETS IS NOT GUARANTEED TO BE EXACT.
6. INTENT OF THIS STRUCTURAL PLAN SET IS TO CONVEY THE SCOPE AND REQUIREMENTS FOR THE INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ONLY. SEE S-200-PC SERIES SHEETS FOR STRUCTURAL WALL ELEVATION VIEWS AND ADDITIONAL INFORMATION.
   A. SEE SHEET S-113A-PC FOR ONE-STORY PRECAST CONCRETE WALL IN PT/AT CLINICAL SPACE THAT IS NOT CONVEYED ELSEWHERE IN THE DRAWING SET. (ENSURE THIS WALL IS INCLUDED IN THE STRUCTURAL PRECAST BID PACKAGE.)
7. UNLESS NOTED OTHERWISE, INTERIOR STRUCTURAL PRECAST CONCRETE WALL PANELS ARE 12" THICK, SOLID CONCRETE, WITH A MINIMUM OF TWO REINFORCING MATS.
8. PRECAST SUPPLIER SHALL LAYOUT STRUCTURAL PANEL JOINTS. JOINT POSITIONS ARE SHALL BE APPROVED BY THE E.O.R. PRIOR TO FABRICATION. HORIZONTAL JOINTS SHALL ONLY OCCUR AT A FLOOR LINE US APPROVED BY THE E.O.R.
9. PRECAST SUPPLIER CAN ELECT TO PRESTRESS AND/OR POST-TENSION THE STRUCTURAL PRECAST WALL PANELS AT THEIR DISCRETION (AS NEEDED TO OPTIMIZE THE DESIGN.)
10. PRECAST SUPPLIER SHALL BE RESPONSIBLE FOR ALL PANEL-TO-PANEL CONNECTIONS.
11. PRECAST SUPPLIER SHALL BE REPSONSIBLE FOR ALL EMBEDS, AND REINFORCEMENT INTERNAL TO THE WALL, NECESSARY FOR STRUCTURAL STEEL TO WALL PANEL CONNECTIONS.
12. PRECAST PANEL DESIGN SHALL INCLUDE DIAGONAL CORNER BARS AT EACH OPENING CORNER.
13. PRECAST SUPPLIER SHALL COORDINATE WITH M.E.P. DRAWINGS AND SHOP FABRICATE ALL OPENINGS WITH A DIMENSION GREATER THAN 10".
14. THIS IS AN EARLY BID PACKAGE, THE FOLLOWING ADJUSTMENTS MUST BE ALLOWED FOR IN THE BID PRICE:
   A. MISCELLANEOUS M.E.P. PENETRATIONS THROUGH THE WALLS (BEYOND THE NUMBER OF OPENINGS CURRENTLY SHOWN).
   B. LENGTHENING OR SHORTENING EACH WALL PANEL BY UP TO 1'-0".
   C. ADJUSTMENTS TO WALL BASE FORCES BY UP TO 25%.
   D. ADDITIONAL EMBEDS FOR BEAM ATTACHMENT POINTS.
   E. SPECIALTY EMBEDS TO RECEIVE LATERAL FORCE COLLECTOR BEAMS (WELABLE REBAR ON REAR ON EMBED PLATE TO DRAG LOAD INTO THE CONCRETE PANEL.)

BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

- 1.5WR20 = 1 1/2" 20 GA GALVANIZED WIDE RIB STEEL ROOF DECK.
- S6.0 = 6 1/2" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 W.W.F. ON 1 1/2" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (6" TOTAL THICKNESS).
- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
- W16x26 [10] (15k) = STEEL BEAM SIZE. NUMBER OF SHEAR STUDS, ZERO IF BLANK. SERVICE LOAD REACTION (KIPS) EACH END.
- C=3/4" = CAMBER UPWARD AT MIDSPAN (INCHES).
- (+45'-6") = TOP OF STEEL BEAM ELEVATION REFERENCED FROM FINISHED FIRST FLOOR REFERENCE ELEVATION (0'-0").
- = MOMENT CONNECTION.
- = HSS DIAGONAL BRACING.
- F55 = SPREAD FOOTING. SEE SCHEDULE.
- WF40 = WALL FOOTING. SEE SCHEDULE.
- = STRUCTURAL PRECAST CONCRETE WALL.
- = ARCHITECTURAL PRECAST CONCRETE CLADDING PANEL.

STRUCTURAL PRECAST CONCRETE WALL TAG NOTES

1. EMBED PLATE FOR BEAM SUPPORT.
2. ANCHORAGE (EMBED PALTE AND/OR DOWEL RECIEVER INSERTS) FOR CONTINUOUS CONNECTION TO FLOOR/ROOF DIAPHRAGM.
3. PRECAST WALL SHALL BEAR ON, AND ANCHOR TO, CONTINUOUS C.I.P. CONCRETE FOOTING.
4. PRECAST WALL SHALL BEAR ON, AND ANCHOR TO, CONTINUOUS C.I.P. STEM WALL.
5. STEEL EMBED AT END WALL FOR STEEL BEAM DRAG STRUT (AXIAL BEAM LOAD) CONNECTION.
6. PRECAST WALL BID SHALL ACCOUNT FOR POTENTIAL THAT STEEL COLUMN IS DELETED AND INDICATED BEAM ATTACHES TO WALL FOR SUPPORT.
7. OPENING FOR MECHANICAL DUCT.
8. STEEL LATERAL FORCE COLLECTOR TO RUN ALONG FACE & CONTINUOUSLY ATTACH TO THE WALL. (CONT EMBED PL REQUIRED).
9. ROUGH DOOR OPENING SHALL BE 1" LARGER THAN DOOR FRAME ON ALL SIDES, U.N.O.

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BP-01A & BP-01B

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HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL

PROJECT	202170
DATE	10.20.23

REVISIONS

No.	Description	Date

CONCRETE WALL ELEVATIONS

S-209-PC

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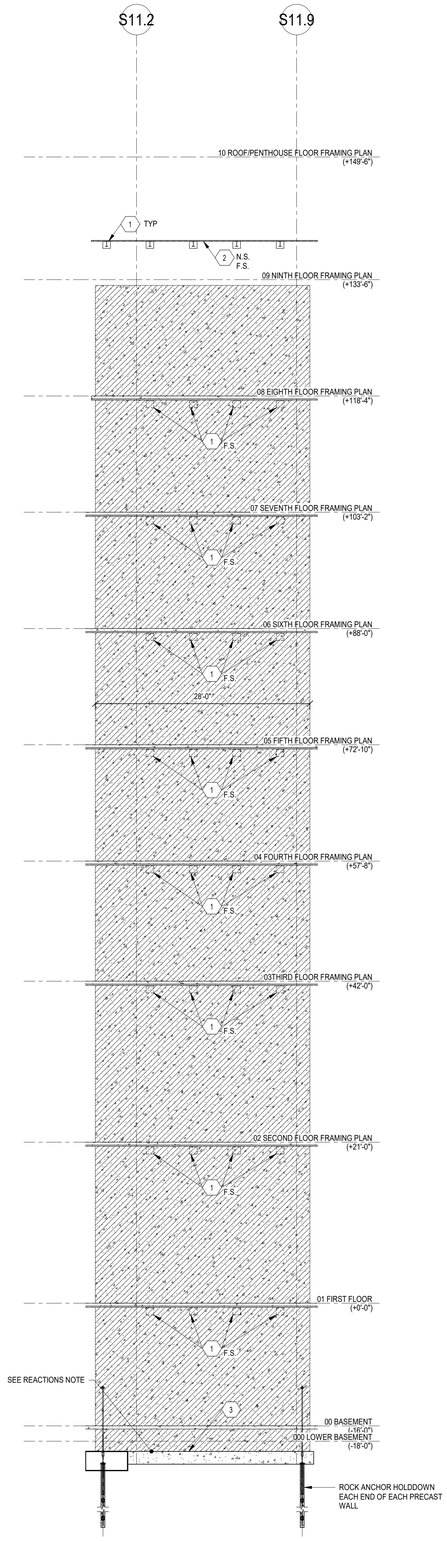
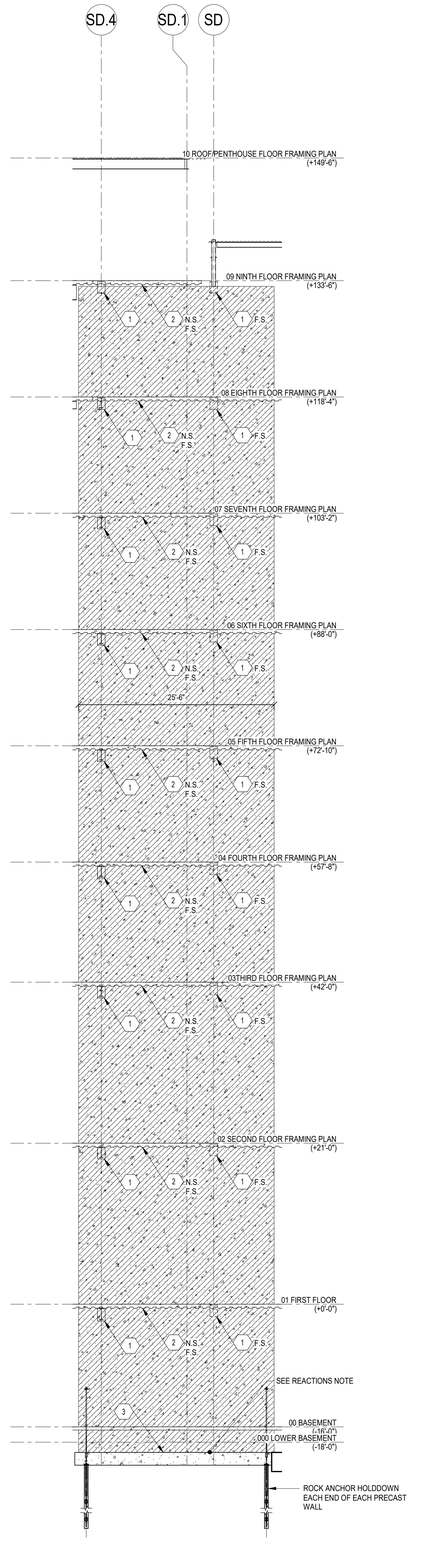


NOTE:
MAX LRFD REACTIONS IN PANEL AT THE BASE:
SHEAR, Vu (IN-PLANE) = 622 KIPS
SHEAR, Vu (OUT-OF-PLANE) = 77 KIPS
MOMENT, Mu = 27,502 KIP-FEET
AXIAL, Pu = 630 KIPS

A S-210-PC CONCRETE WALL 10 - BP-01
1/8" = 1'-0"



NOTE:
MAX LRFD REACTIONS IN PANEL AT THE BASE:
SHEAR, Vu (IN-PLANE) = 1,494 KIPS
SHEAR, Vu (OUT-OF-PLANE) = 33 KIPS
MOMENT, Mu = 52,372 KIP-FEET
AXIAL, Pu = 1,087 KIPS

B S-210-PC CONCRETE WALL 11 - BP-01
1/8" = 1'-0"

BP-01 (PRECAST) PLAN NOTES

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2. FINISHED FIRST FLOOR ELEVATION (+0'-0").
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   FINISHED EIGHTH FLOOR ELEVATION (+124'-0").
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   FINISHED PENTHOUSE ROOF ELEVATION (+153'-1 1/2").
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   TOP OF FOURTH FLOOR STEEL BEAMS = (+61'-3") U.N.O.
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BP-01 (PRECAST) FRAMING LEGEND

INFORMATIONAL ONLY (N.I.C.)

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- S6.0 = 4 1/2" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W2.1xW2.1 W.W.F. ON 1 1/2" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (6" TOTAL THICKNESS).
- S9.0 = 6" NORMAL WEIGHT CONCRETE REINFORCED W/ 6x6-W4.0xW4.0 W.W.F. ON 3" 18 GA GALVANIZED COMPOSITE STEEL FLOOR DECK (9" TOTAL THICKNESS).
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BP-01A & BP-01B

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1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

STRUCTURAL

PROJECT	202170
DATE	10.20.23

REVISIONS

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CONCRETE WALL ELEVATIONS

S-210-PC

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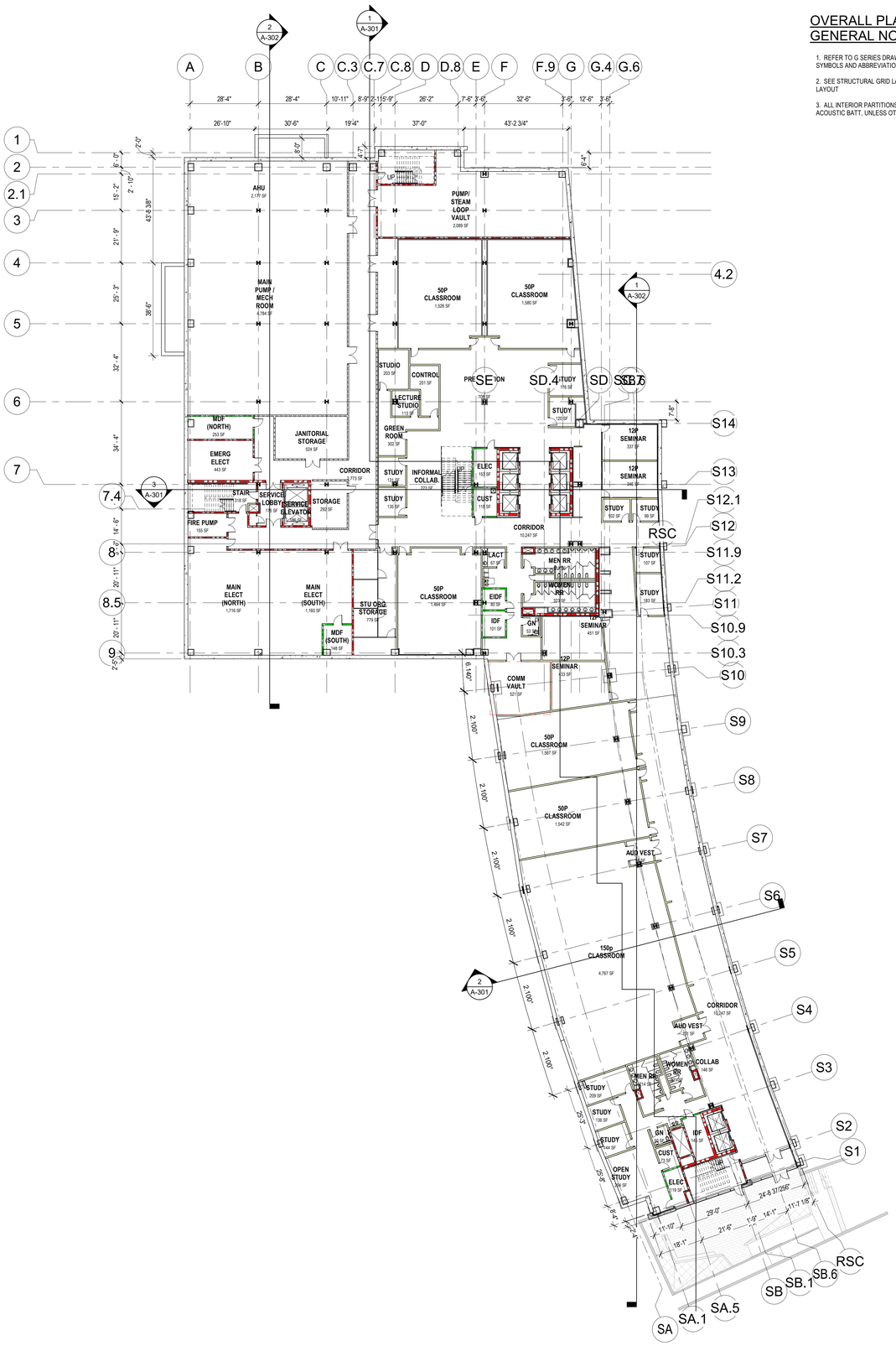

1 **OVERALL BASEMENT FLOOR PLAN**
3/64" = 1'-0"

OVERALL PLANS GENERAL NOTES

1. REFER TO G SERIES DRAWINGS FOR ADDITIONAL NOTES, SYMBOLS AND ABBREVIATIONS
2. SEE STRUCTURAL GRID LAYOUT PLAN FOR DETAILED GRID LAYOUT
3. ALL INTERIOR PARTITIONS TO BE FULL HEIGHT AND WITH ACOUSTIC BATT, UNLESS OTHERWISE NOTED.

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OVERALL BASEMENT FLOOR PLAN

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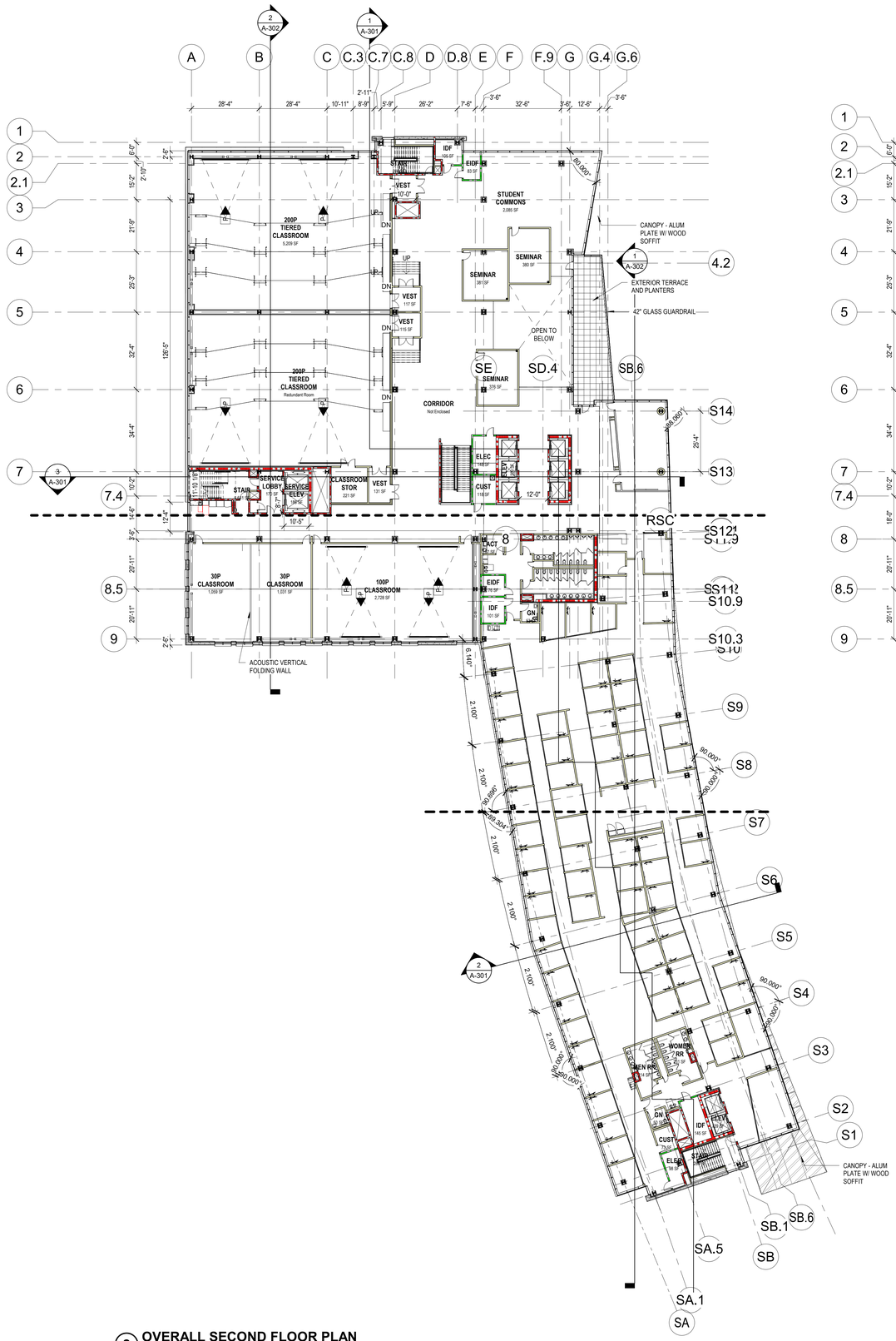
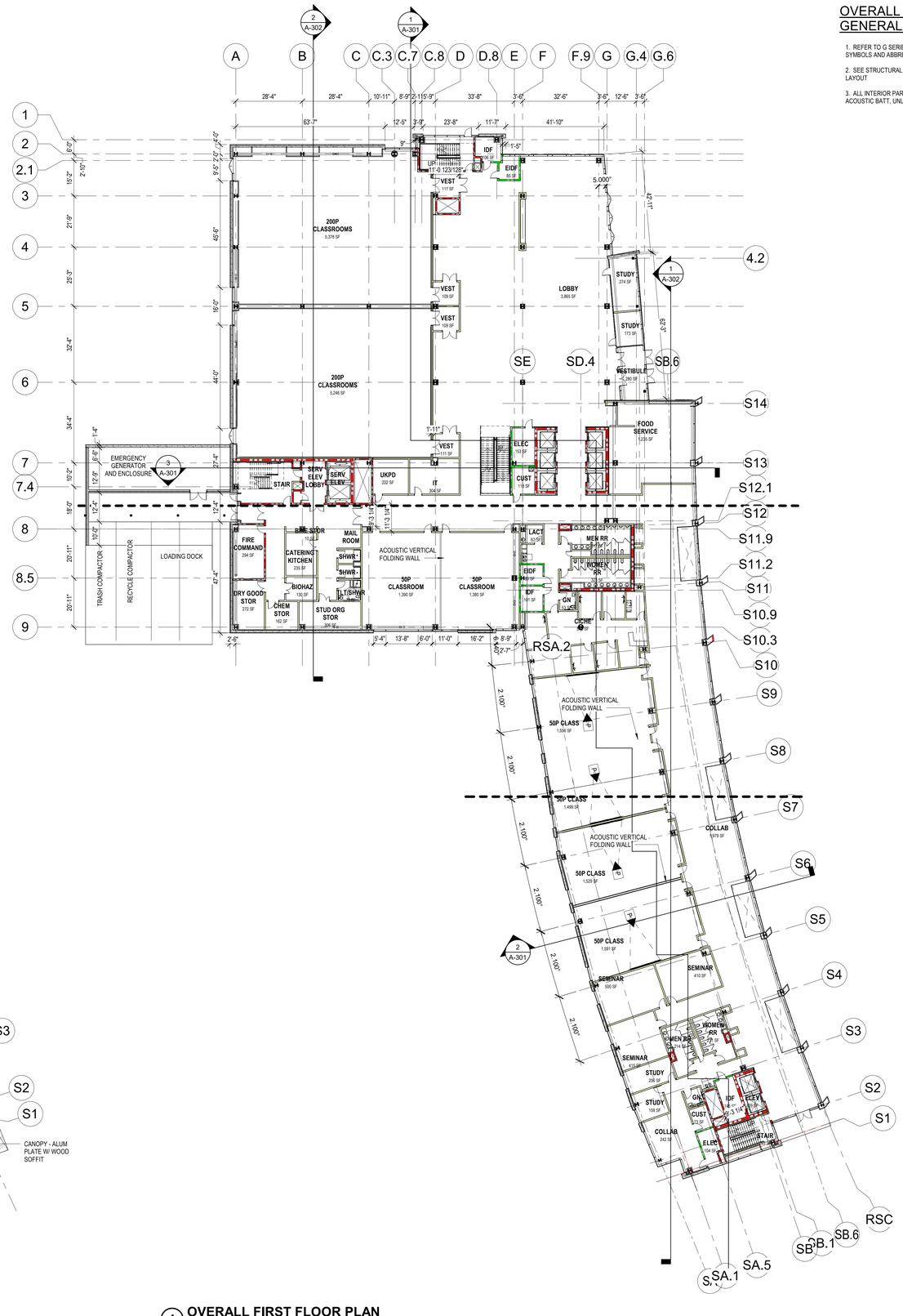


2 OVERALL SECOND FLOOR PLAN
3/64" = 1'-0"



1 OVERALL FIRST FLOOR PLAN
3/64" = 1'-0"

OVERALL PLANS GENERAL NOTES

1. REFER TO G SERIES DRAWINGS FOR ADDITIONAL NOTES, SYMBOLS AND ABBREVIATIONS
2. SEE STRUCTURAL GRID LAYOUT PLAN FOR DETAILED GRID LAYOUT
3. ALL INTERIOR PARTITIONS TO BE FULL HEIGHT AND WITH ACOUSTIC BATT, UNLESS OTHERWISE NOTED.

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BP-01A & BP-01B

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OVERALL FIRST & SECOND FLOOR PLAN

A-101

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OVERALL PLANS GENERAL NOTES

1. REFER TO G SERIES DRAWINGS FOR ADDITIONAL NOTES, SYMBOLS AND ABBREVIATIONS
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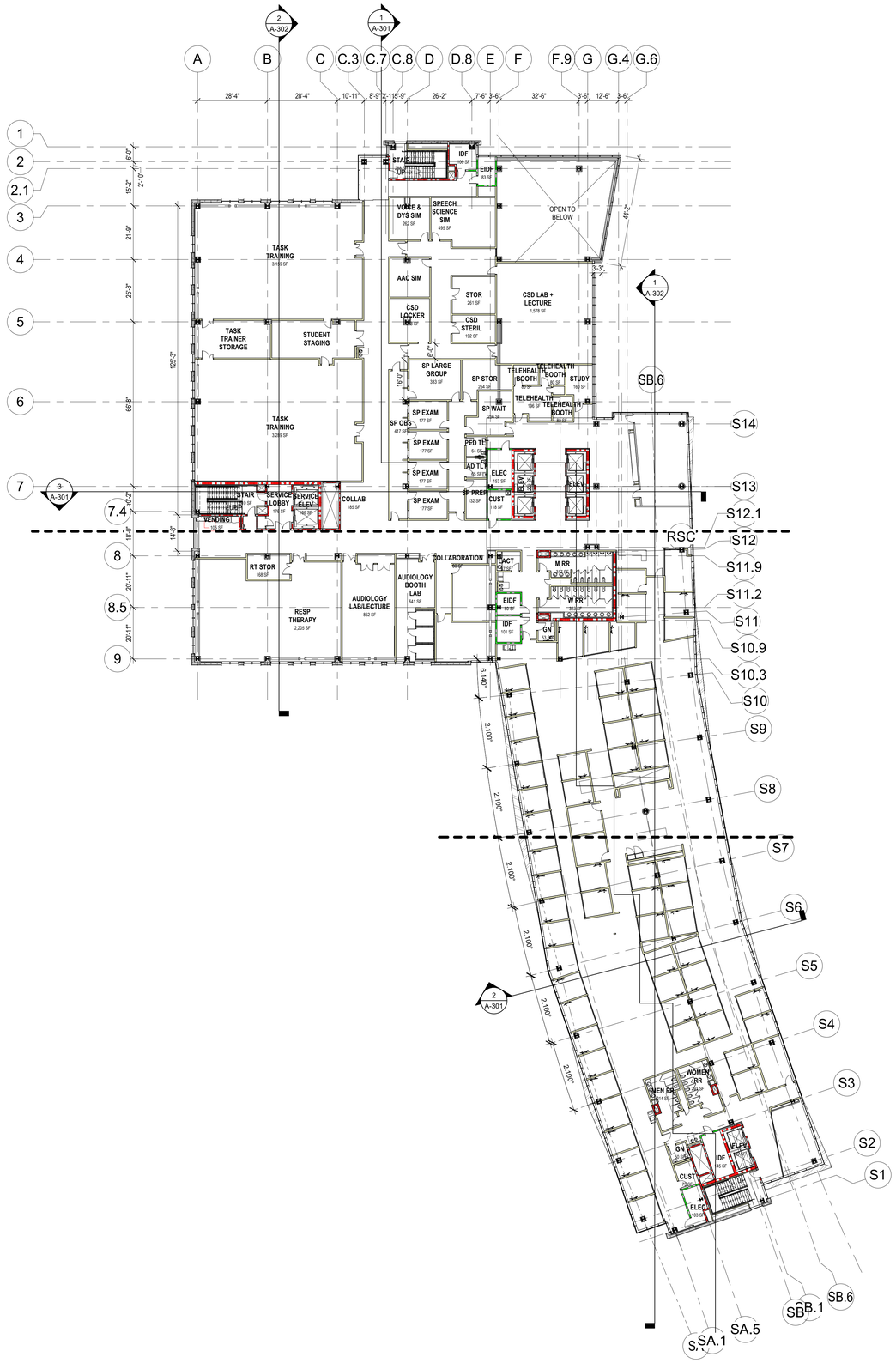
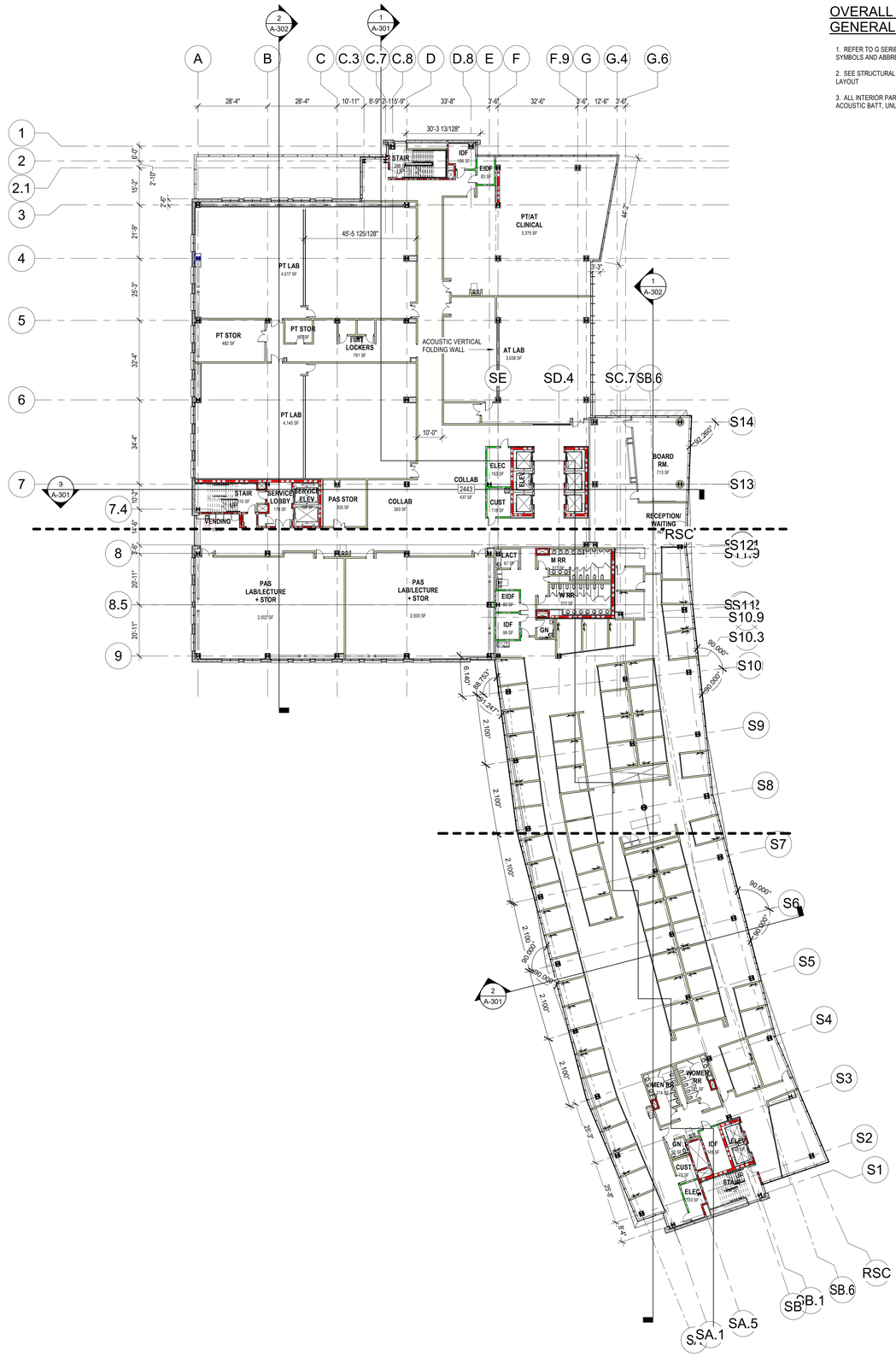


2 OVERALL FOURTH FLOOR PLAN
3/64" = 1'-0"



1 OVERALL THIRD FLOOR PLAN
3/64" = 1'-0"

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OVERALL THIRD & FOURTH FLOOR PLAN

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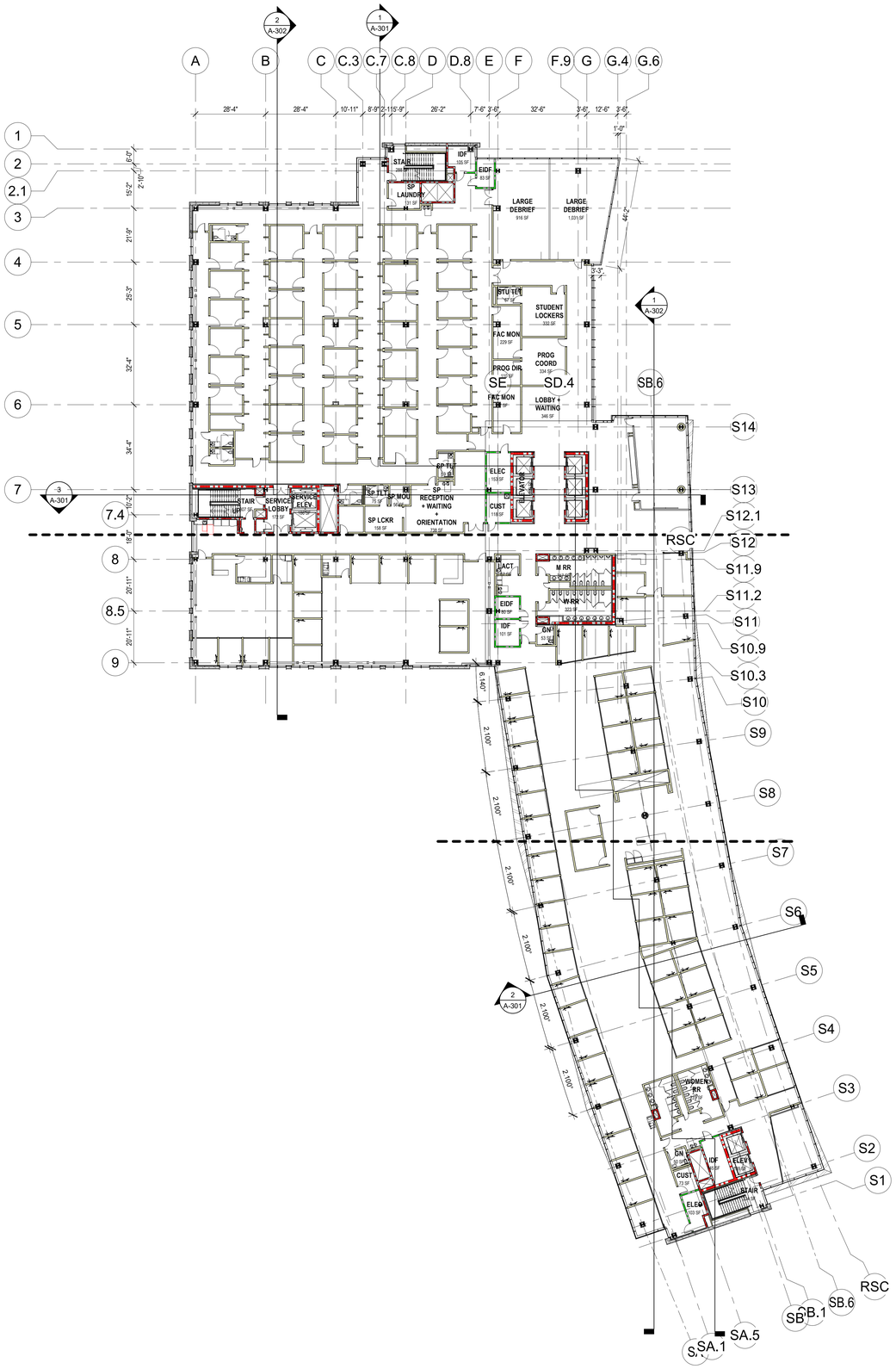
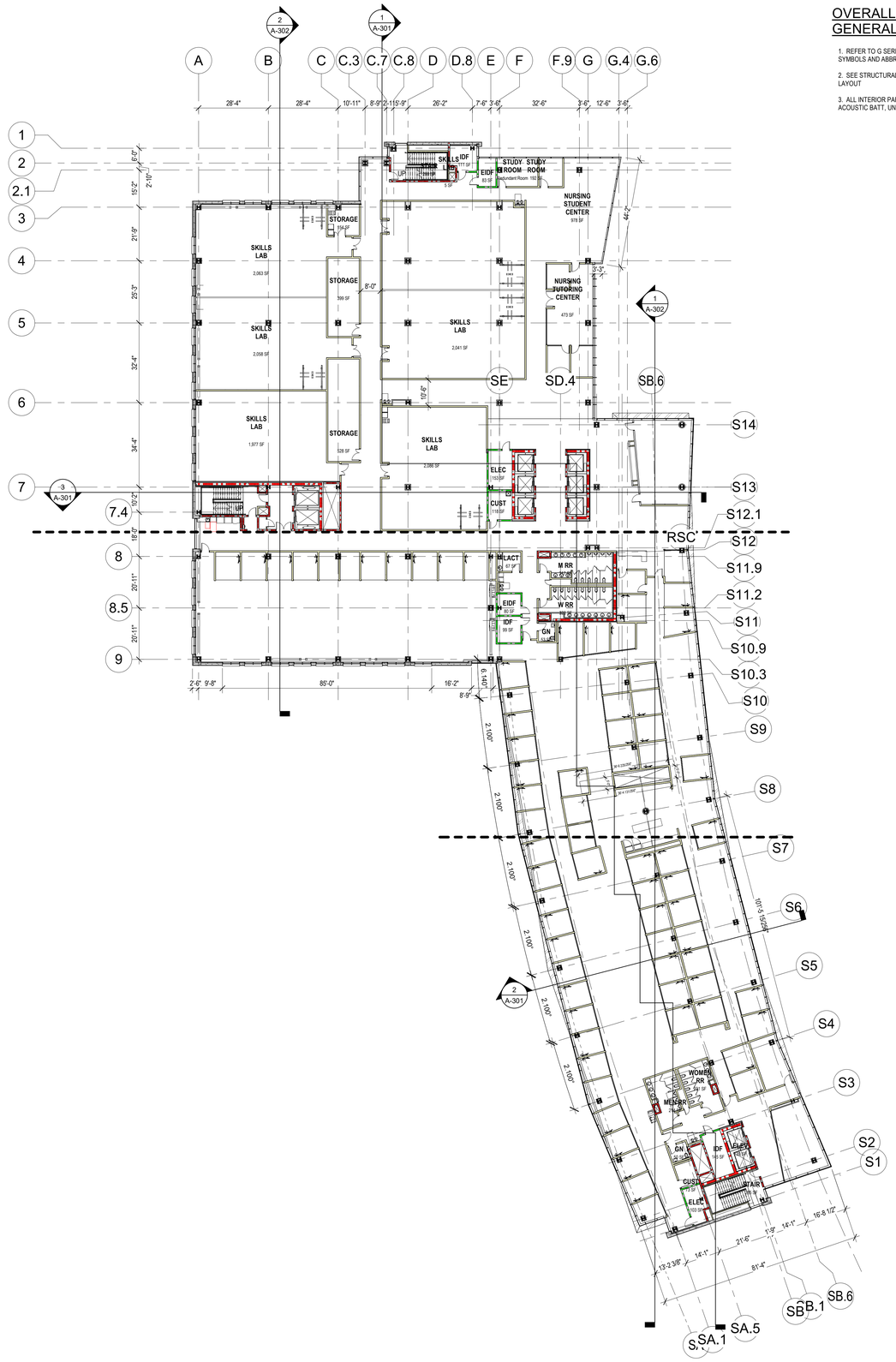
2. SEE STRUCTURAL GRID LAYOUT PLAN FOR DETAILED GRID LAYOUT
3. ALL INTERIOR PARTITIONS TO BE FULL HEIGHT AND WITH ACOUSTIC BATT, UNLESS OTHERWISE NOTED.



2 **OVERALL SIXTH FLOOR PLAN**
3/64" = 1'-0"



1 **OVERALL FIFTH FLOOR PLAN**
3/64" = 1'-0"

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OVERALL FIFTH & SIXTH FLOOR PLAN

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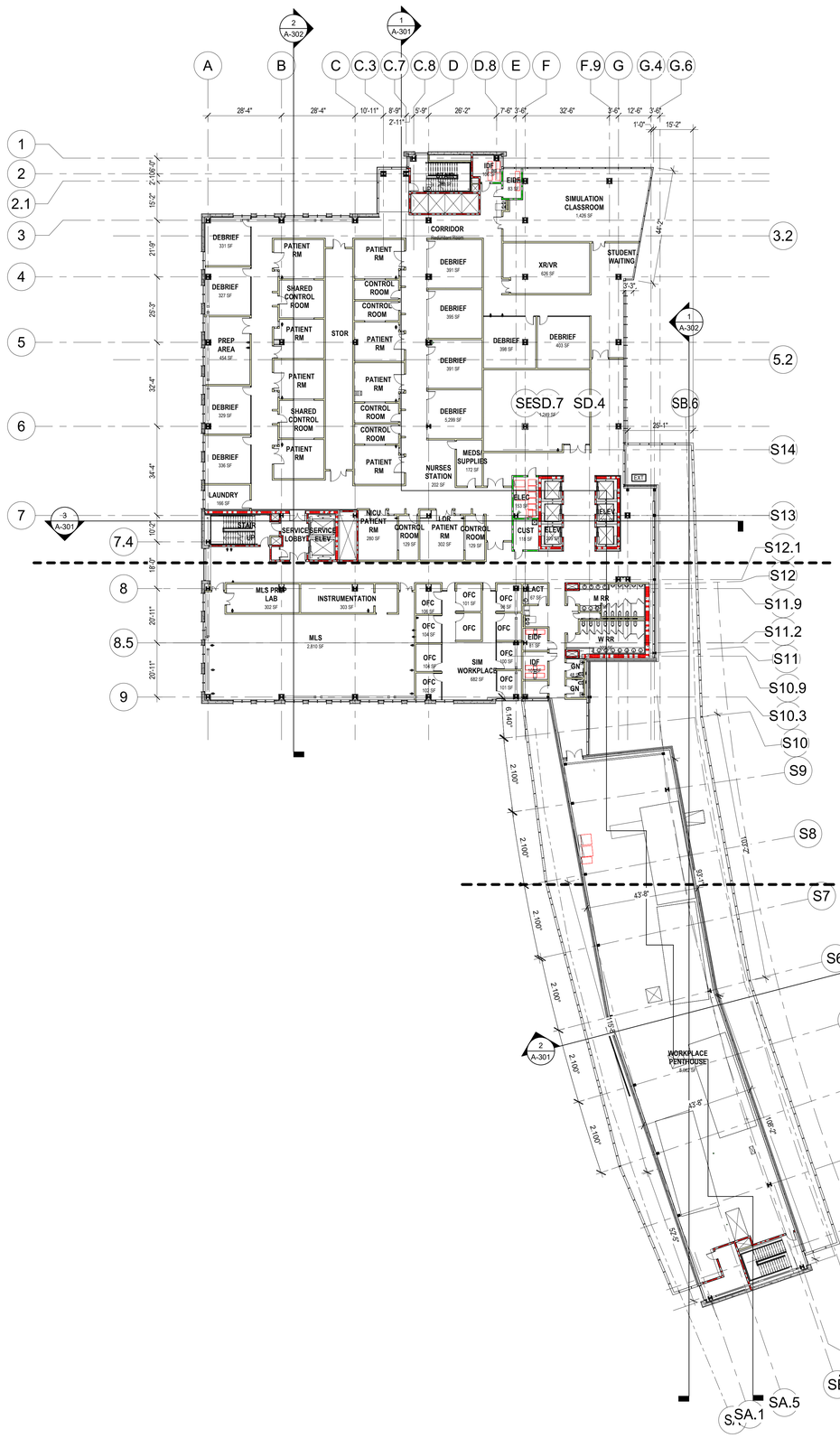
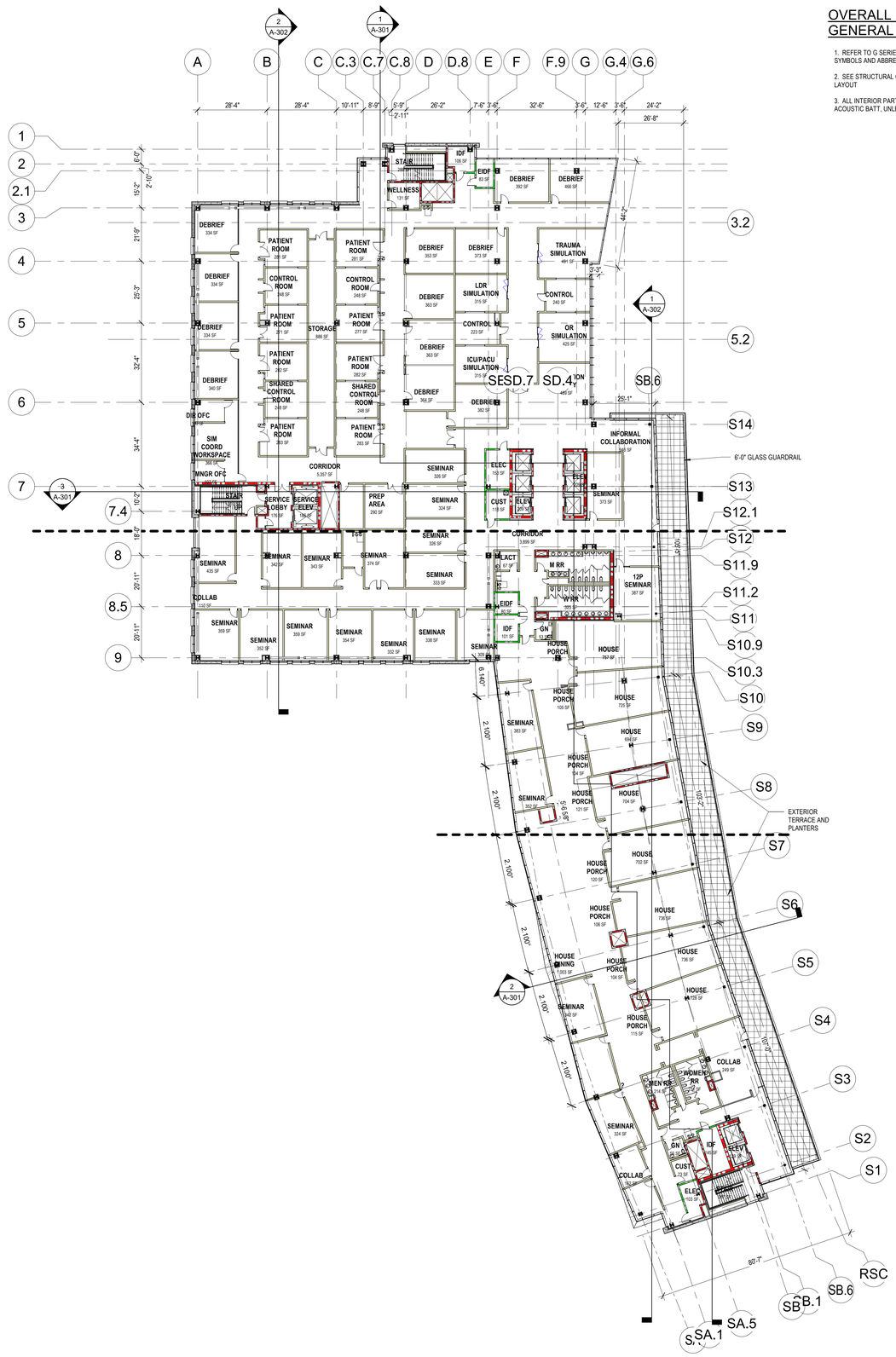


2 OVERALL EIGHTH FLOOR PLAN

3/64" = 1'-0"



1 OVERALL SEVENTH FLOOR PLAN

3/64" = 1'-0"

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OVERALL SEVENTH & EIGHTH FLOOR PLAN

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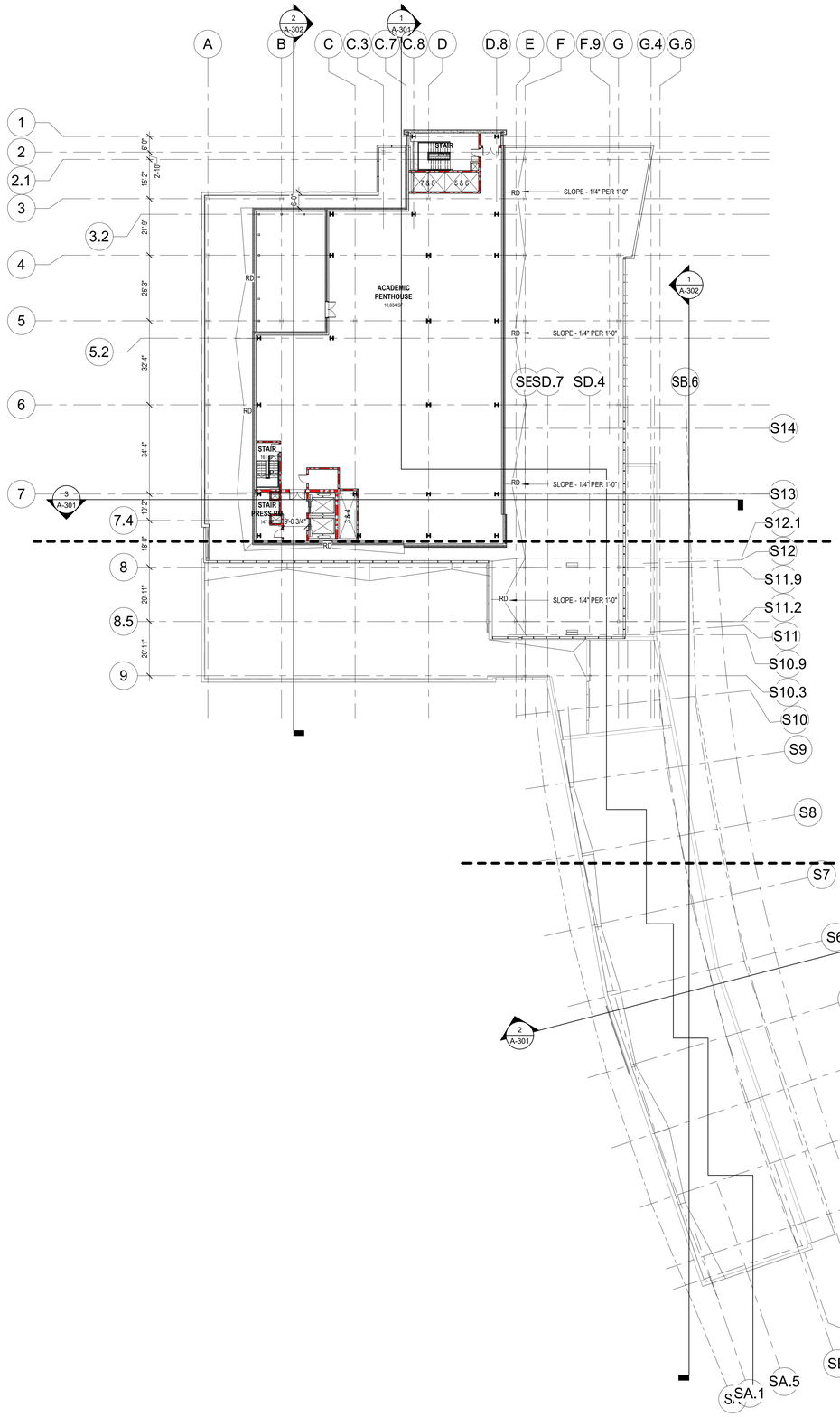
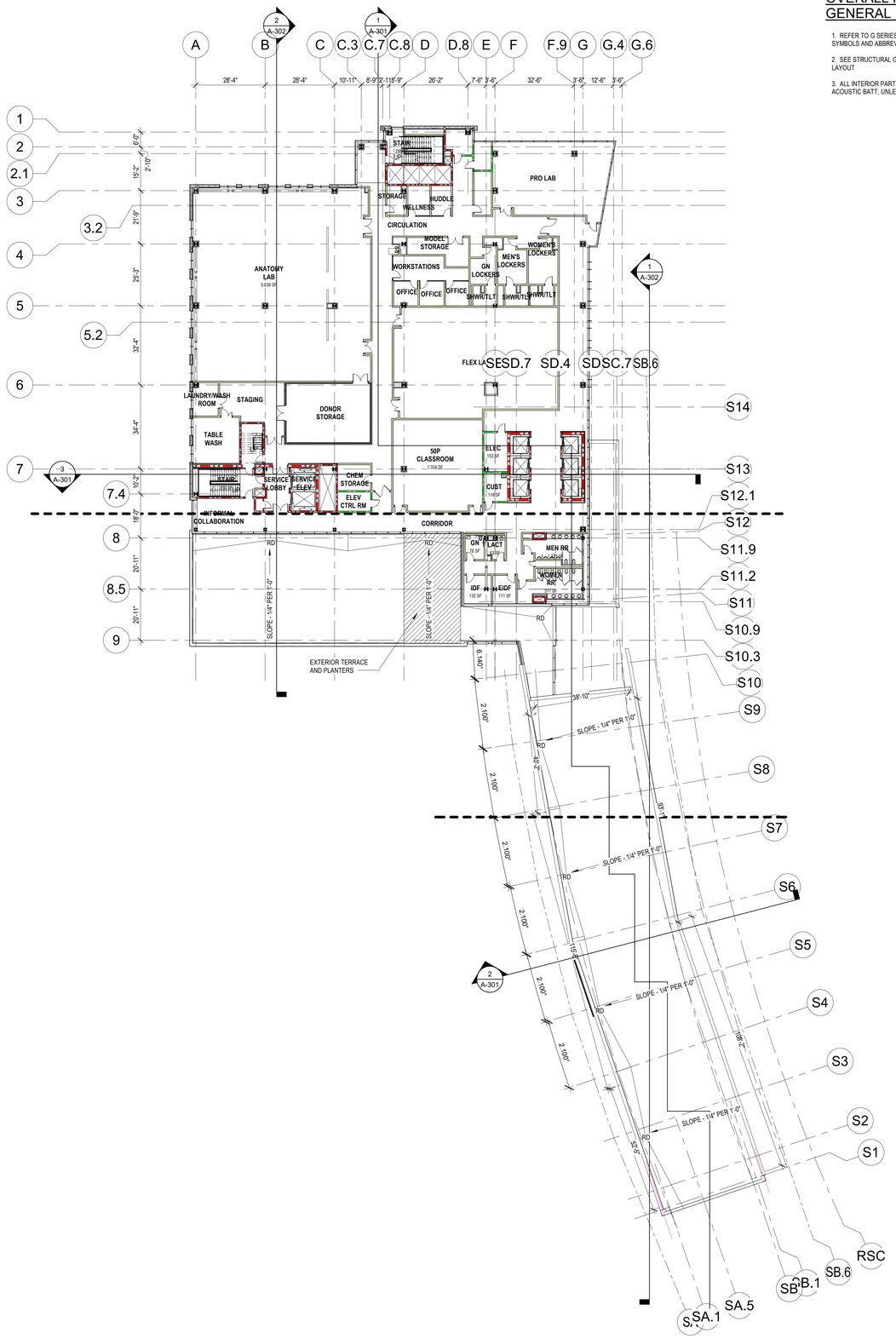


2 OVERALL PENTHOUSE
3/64" = 1'-0"



1 OVERALL NINTH FLOOR PLAN
3/64" = 1'-0"

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OVERALL NINTH & TENTH FLOOR PLANS

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1 **DIMENSION PLAN - FIRST FLOOR - AREA A**
1/8" = 1'-0"

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DIMENSION PLAN - FIRST FLOOR - AREA A

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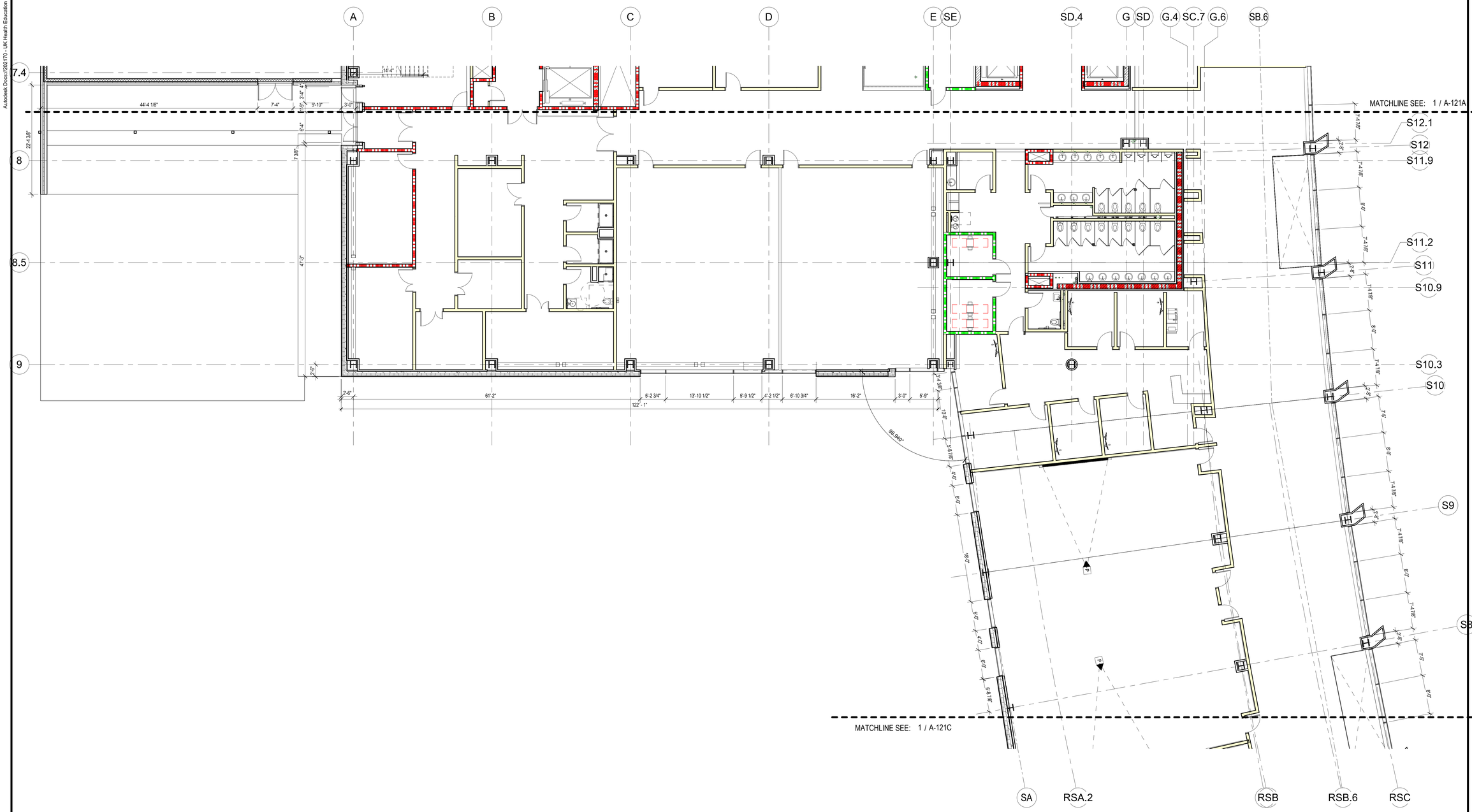

1 DIMENSION PLAN - FIRST FLOOR - AREA B

1/8" = 1'-0"

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DIMENSION PLAN - FIRST FLOOR - AREA B

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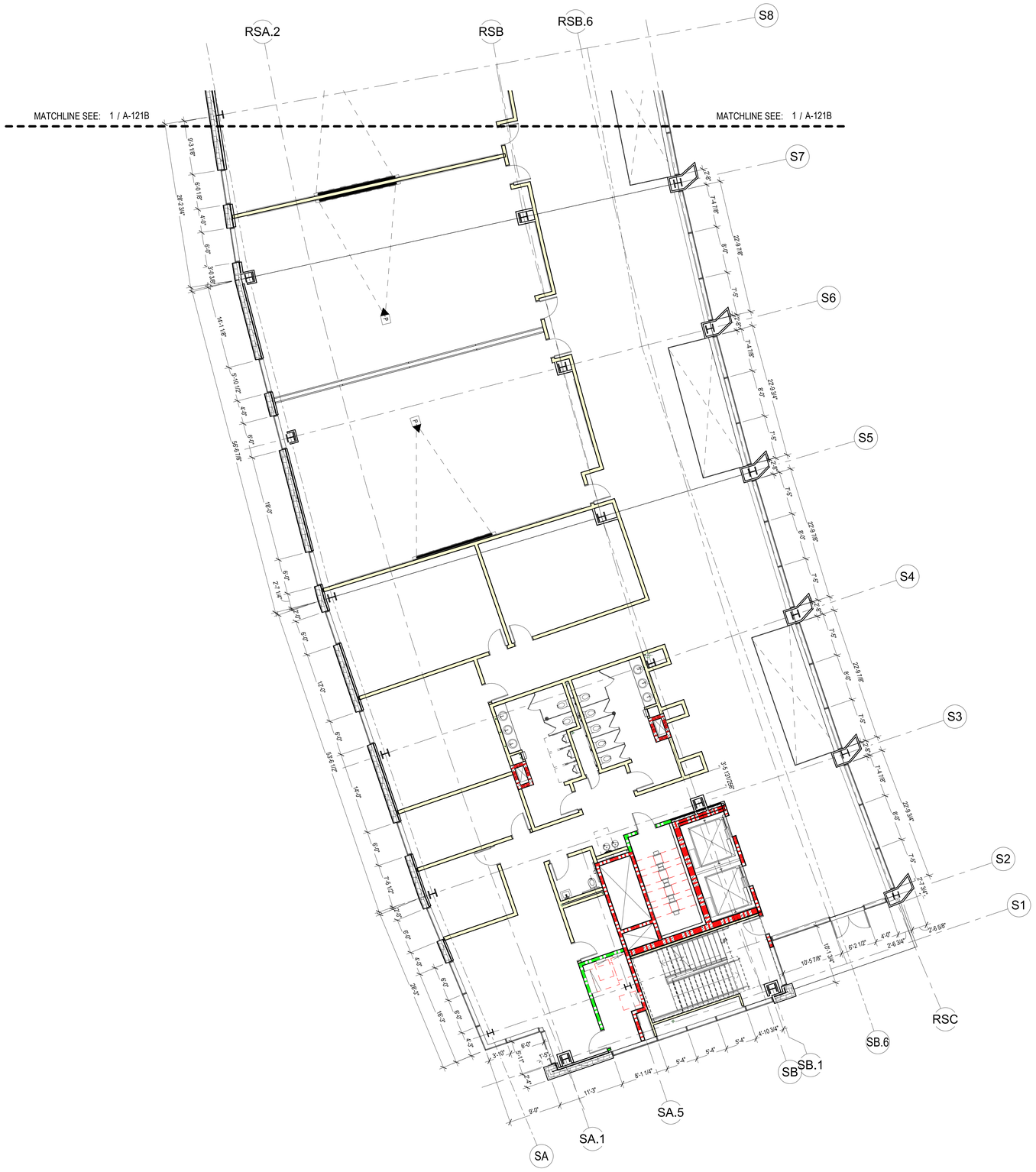

1 DIMENSION PLAN - FIRST FLOOR - AREA C

1/8" = 1'-0"

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DIMENSION PLAN - FIRST FLOOR - AREA C

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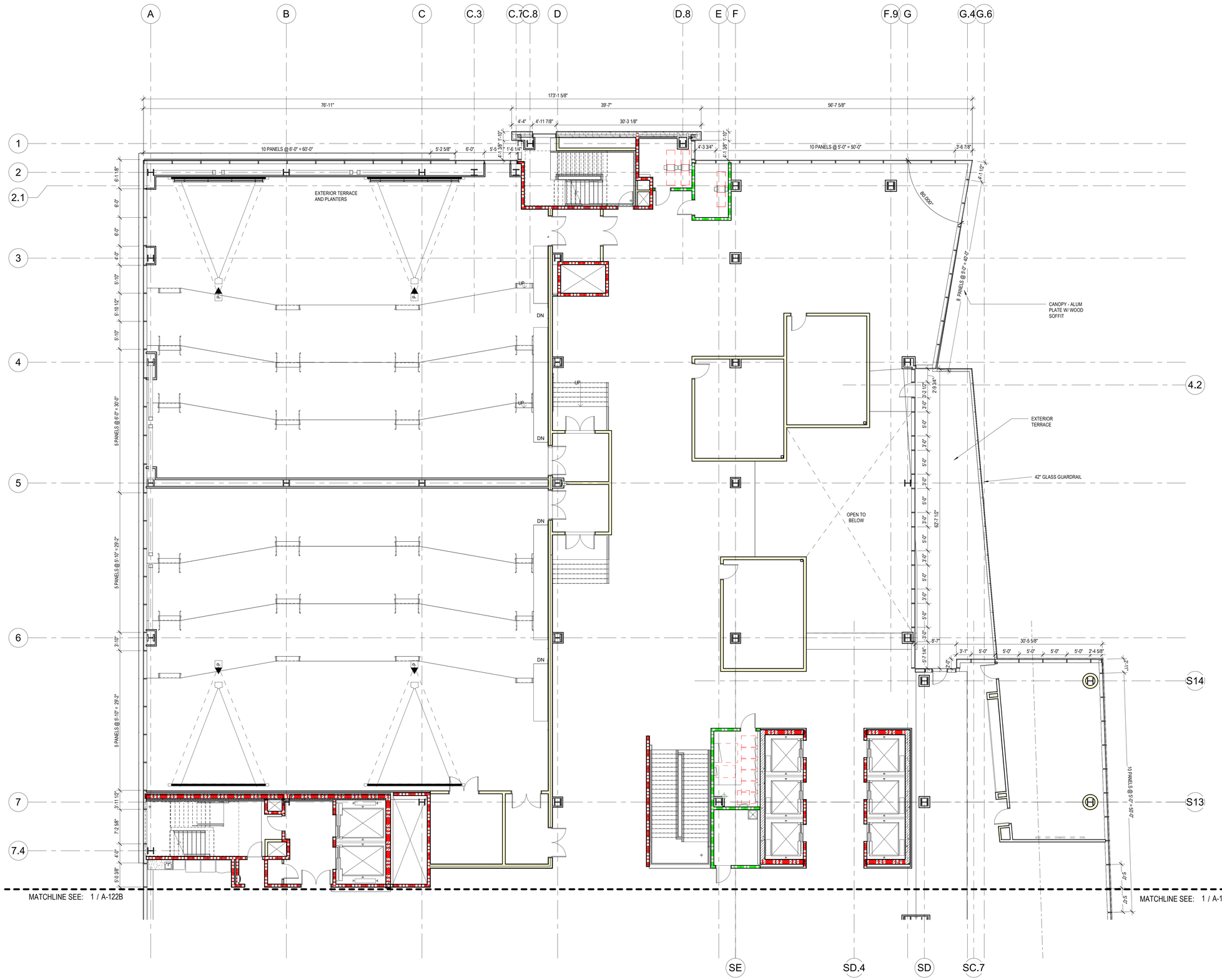

1 **DIMENSION PLAN - SECOND FLOOR - AREA A**
1/8" = 1'-0"

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DIMENSION PLAN - SECOND FLOOR - AREA A

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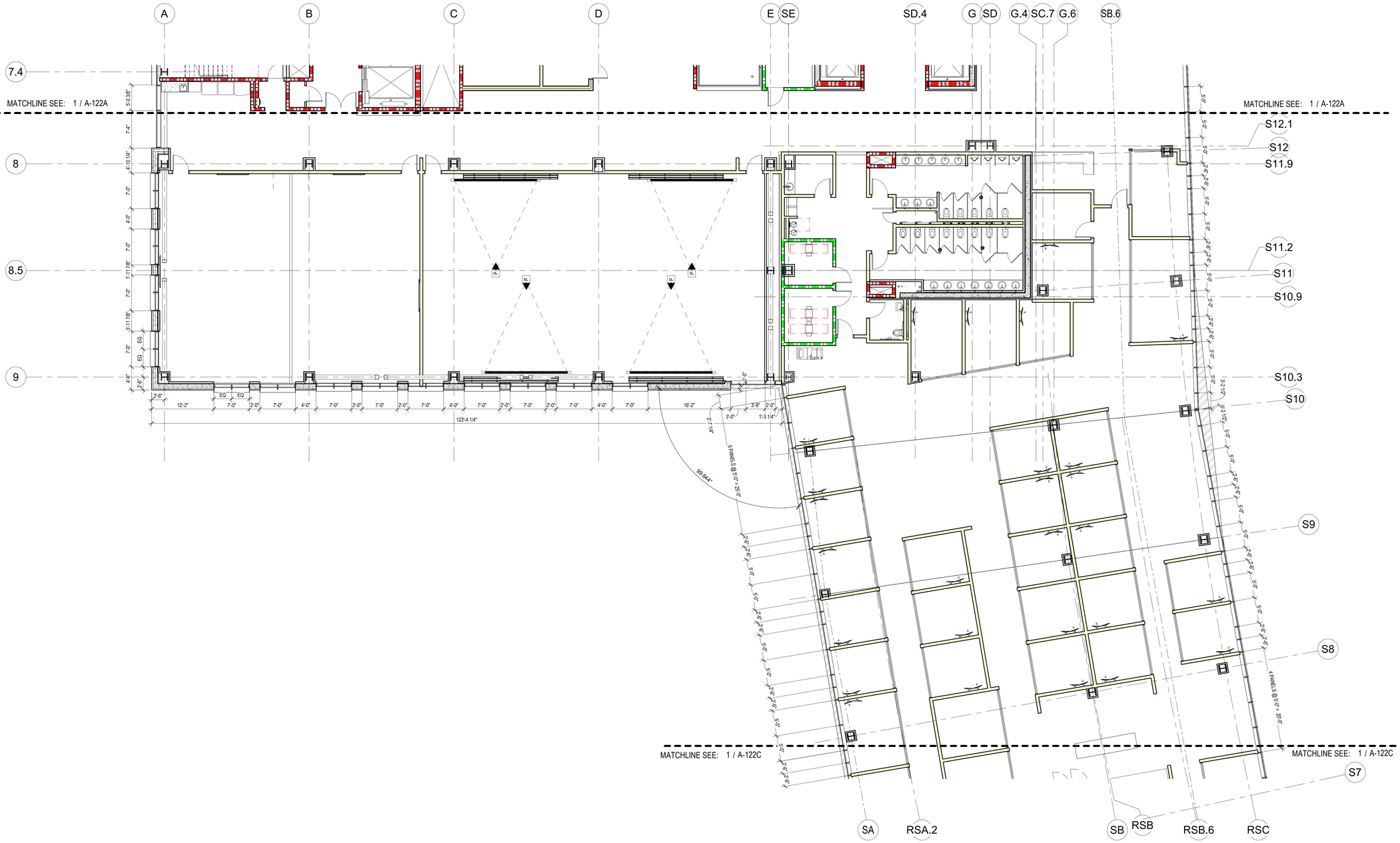

1 DIMENSION PLAN - SECOND FLOOR - AREA B

1/8" = 1'-0"

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DIMENSION PLAN - SECOND FLOOR - AREA B

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1 DIMENSION PLAN - SECOND FLOOR - AREA C
1/8" = 1'-0"

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DIMENSION PLAN - SECOND FLOOR - AREA C

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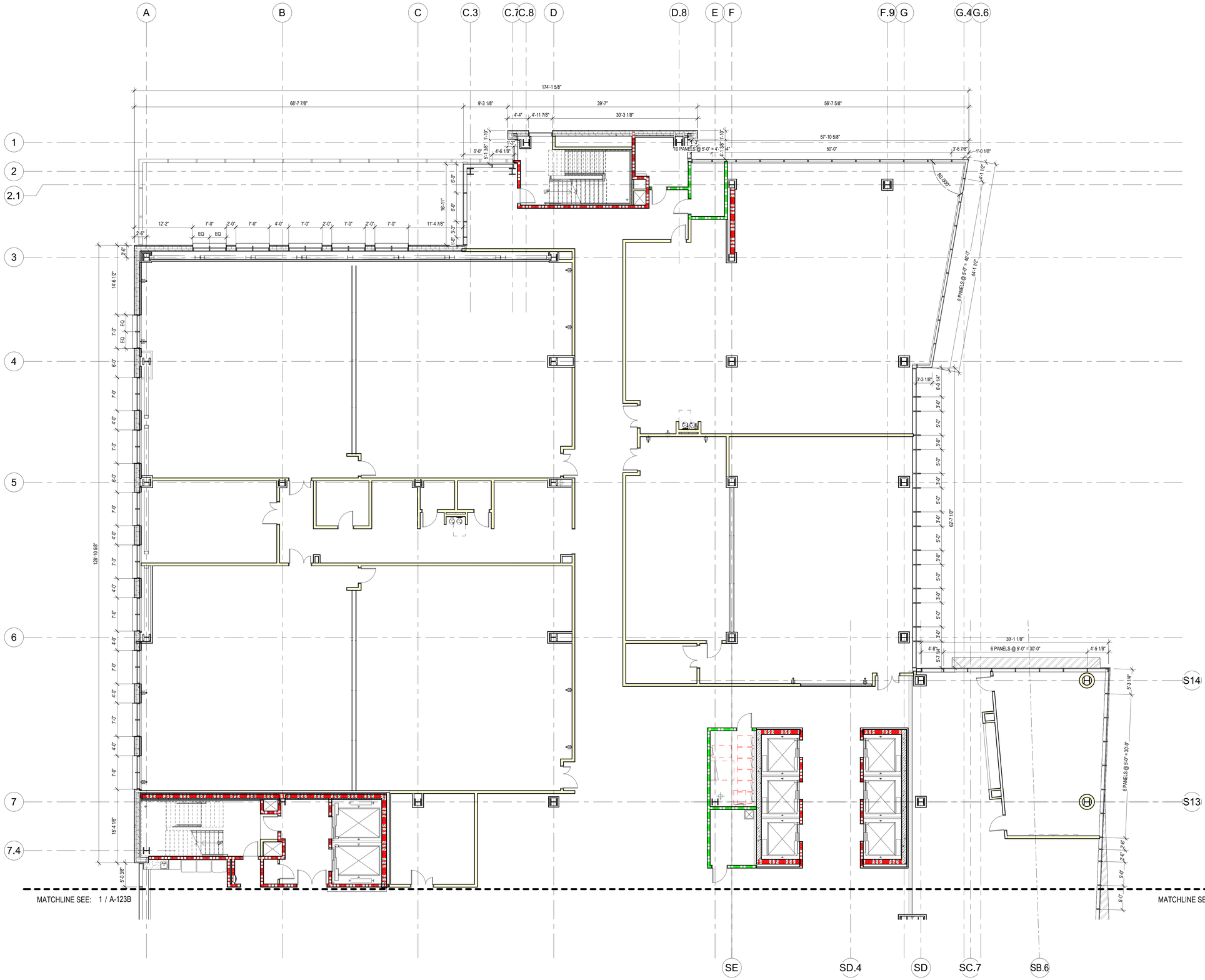

1 **DIMENSION PLAN - THIRD FLOOR - AREA A**
1/8" = 1'-0"

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DIMENSION PLAN - THIRD FLOOR - AREA A

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1 **DIMENSION PLAN - THIRD FLOOR - AREA B**
1/8" = 1'-0"

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DIMENSION PLAN - THIRD FLOOR - AREA B

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1 **DIMENSION PLAN - THIRD FLOOR - AREA C**
1/8" = 1'-0"

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DIMENSION PLAN - THIRD FLOOR - AREA C

A-123C

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1 DIMENSION PLAN - FOURTH FLOOR - AREA A

1/8" = 1'-0"

JRA architects
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Lexington, Kentucky 40509
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DIMENSION PLAN - FOURTH FLOOR - AREA A

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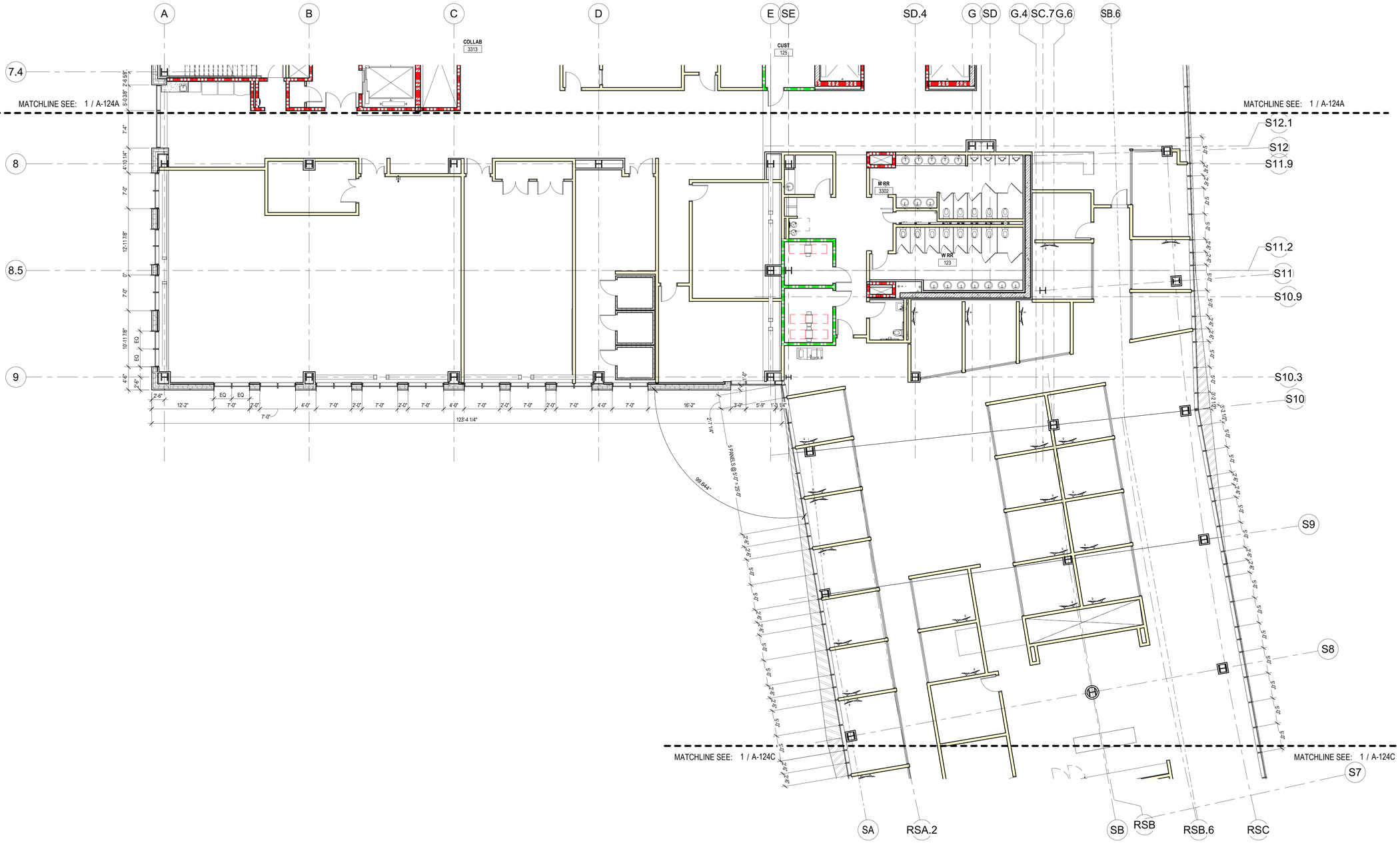

1 **DIMENSION PLAN - FOURTH FLOOR - AREA B**
1/8" = 1'-0"

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DIMENSION PLAN - FOURTH FLOOR - AREA B

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1 **DIMENSION PLAN - FOURTH FLOOR - AREA C**
1/8" = 1'-0"

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DIMENSION PLAN - FOURTH FLOOR - AREA C

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1 **DIMENSION PLAN - FIFTH FLOOR - AREA A**
1/8" = 1'-0"

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DIMENSION PLAN - FIFTH FLOOR - AREA A

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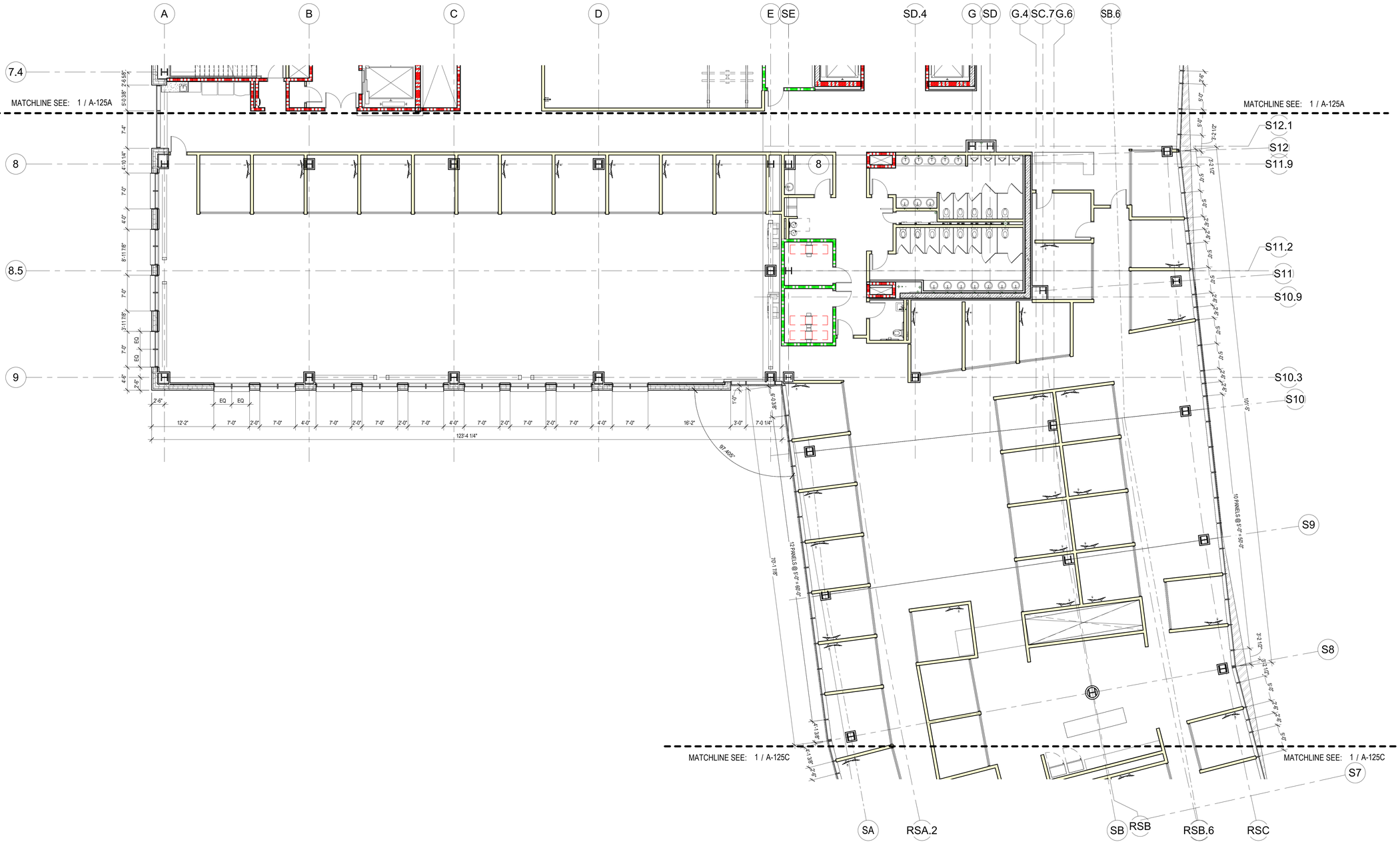

1 **DIMENSION PLAN - FIFTH FLOOR - AREA B**
1/8" = 1'-0"

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DIMENSION PLAN - FIFTH FLOOR - AREA B

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1 **DIMENSION PLAN - FIFTH FLOOR - AREA C**
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1 **DIMENSION PLAN - SIXTH FLOOR - AREA A**
1/8" = 1'-0"

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DIMENSION PLAN - SIXTH FLOOR - AREA A

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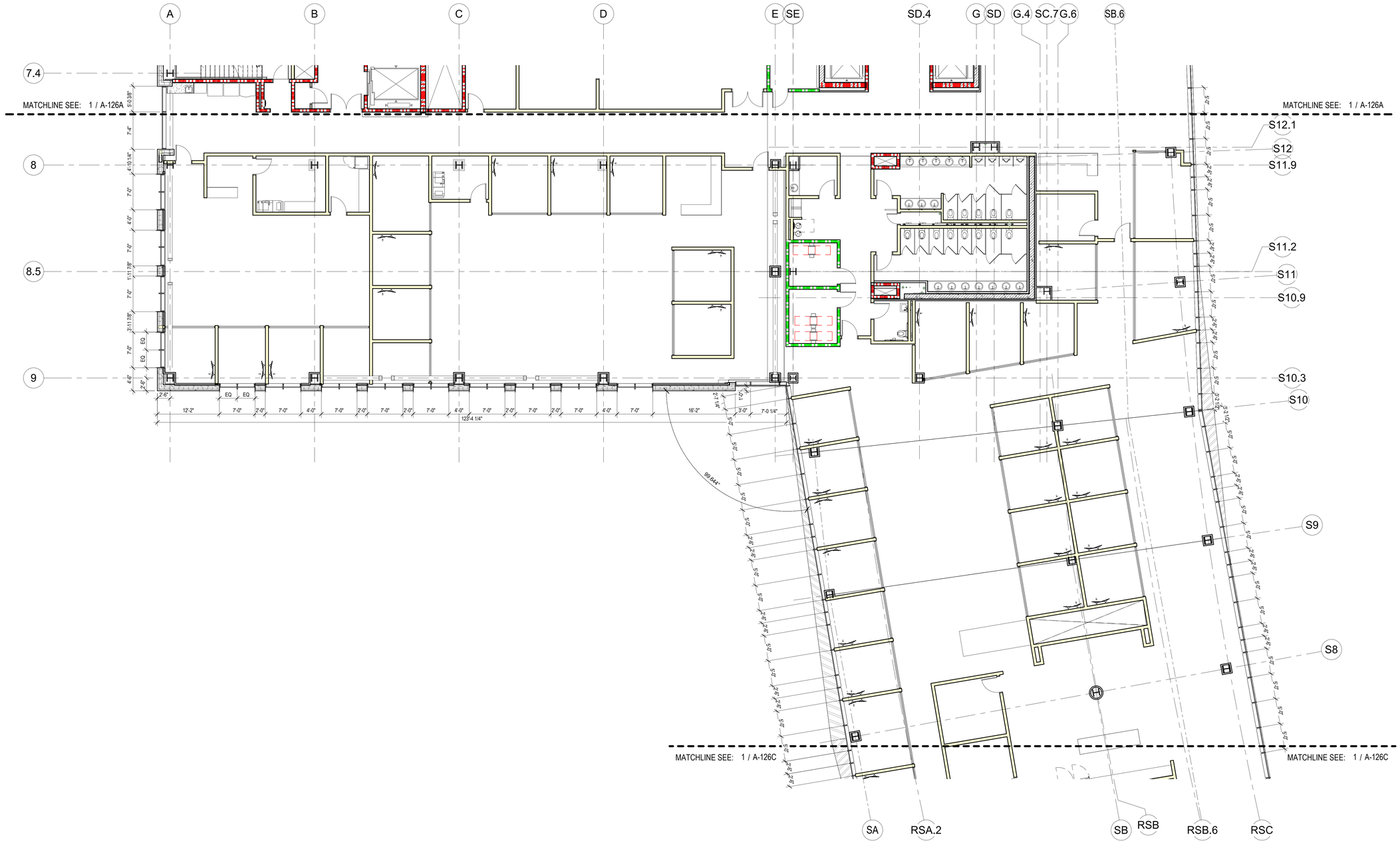

1 **DIMENSION PLAN - SIXTH FLOOR - AREA B**
1/8" = 1'-0"

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DIMENSION PLAN - SIXTH FLOOR - AREA B

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1 **DIMENSION PLAN - SIXTH FLOOR - AREA C**
1/8" = 1'-0"

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1 **DIMENSION PLAN - SEVENTH FLOOR - AREA A**
1/8" = 1'-0"

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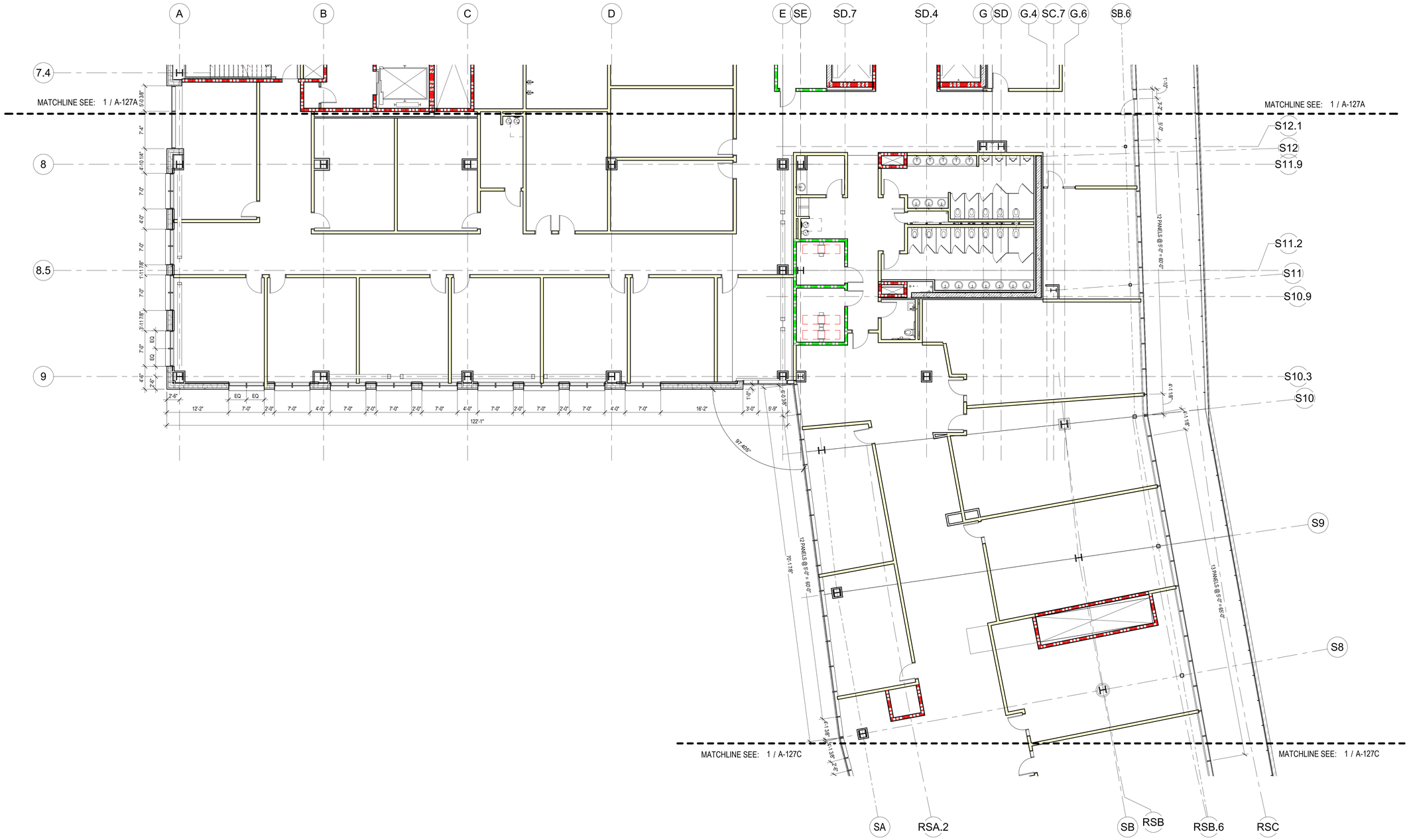

1 **DIMENSION PLAN - SEVENTH FLOOR - AREA B**
1/8" = 1'-0"

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DIMENSION PLAN - SEVENTH FLOOR - AREA B

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1 DIMENSION PLAN - SEVENTH FLOOR - AREA C
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DIMENSION PLAN - SEVENTH FLOOR - AREA C

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1 DIMENSION PLAN - EIGHTH FLOOR - AREA A
1/8" = 1'-0"

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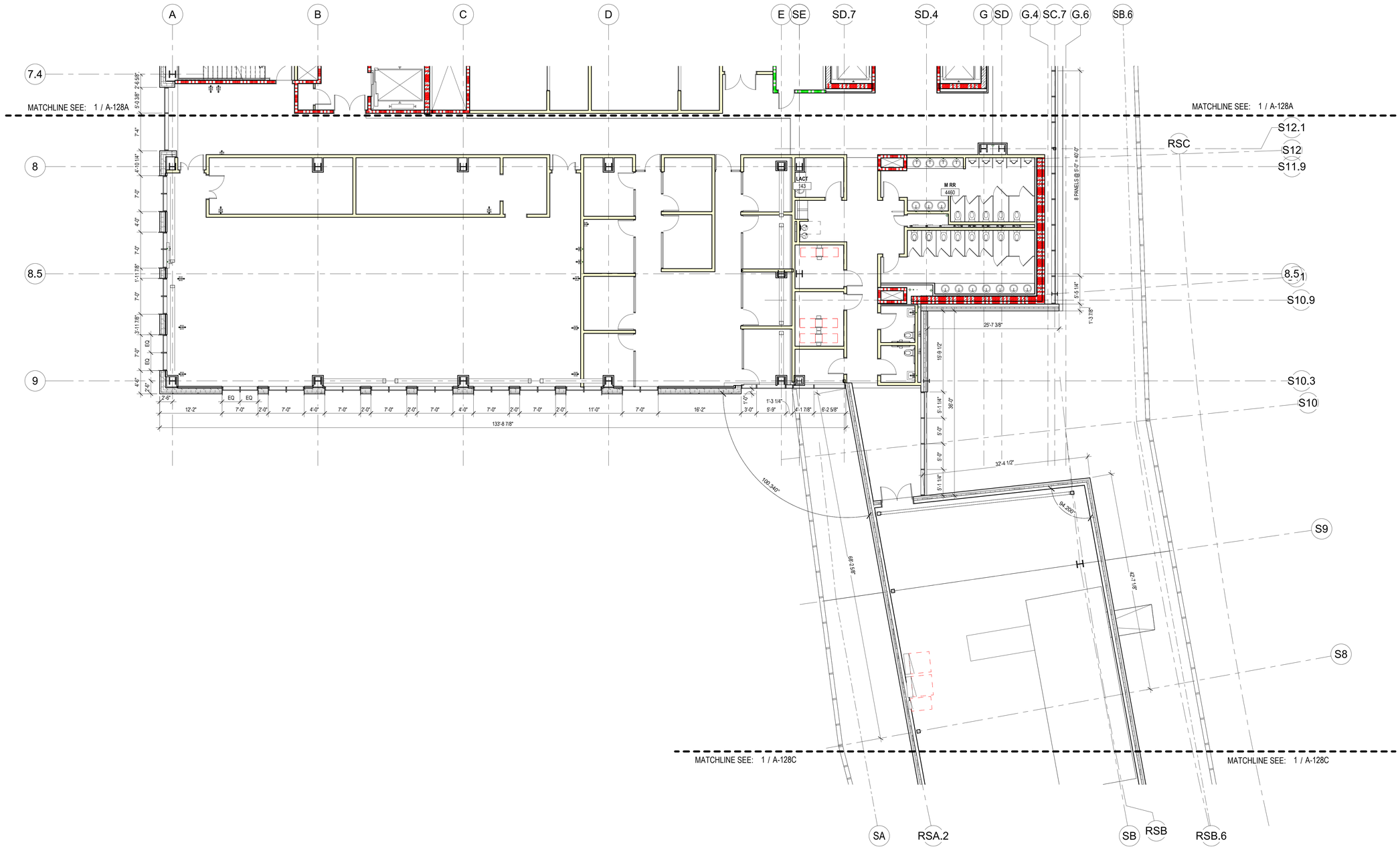

1 DIMENSION PLAN - EIGHTH FLOOR - AREA B

1/8" = 1'-0"

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DIMENSION PLAN - EIGHTH FLOOR - AREA B

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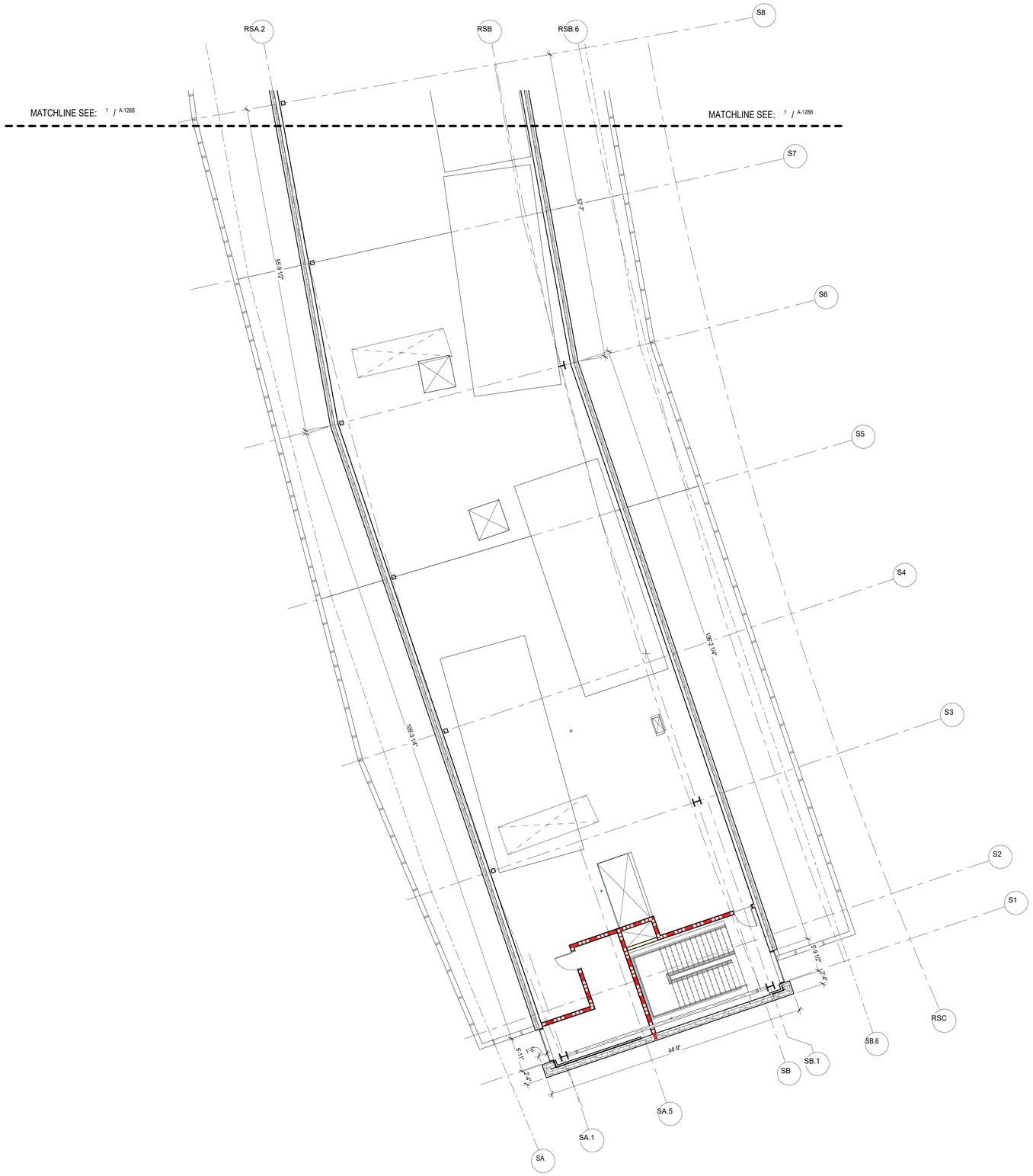

1 **DIMENSION PLAN - EIGHTH FLOOR - AREA C**
1/8" = 1'-0"

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UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

ARCHITECTURAL

PROJECT	202170
DATE	10.20.2023

REVISIONS

No.	Description	Date

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DIMENSION PLAN - EIGHTH FLOOR - AREA C

A-128C

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1 DIMENSION PLAN - NINTH FLOOR - AREA A
1/8" = 1'-0"

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DIMENSION PLAN - NINTH FLOOR - AREA A

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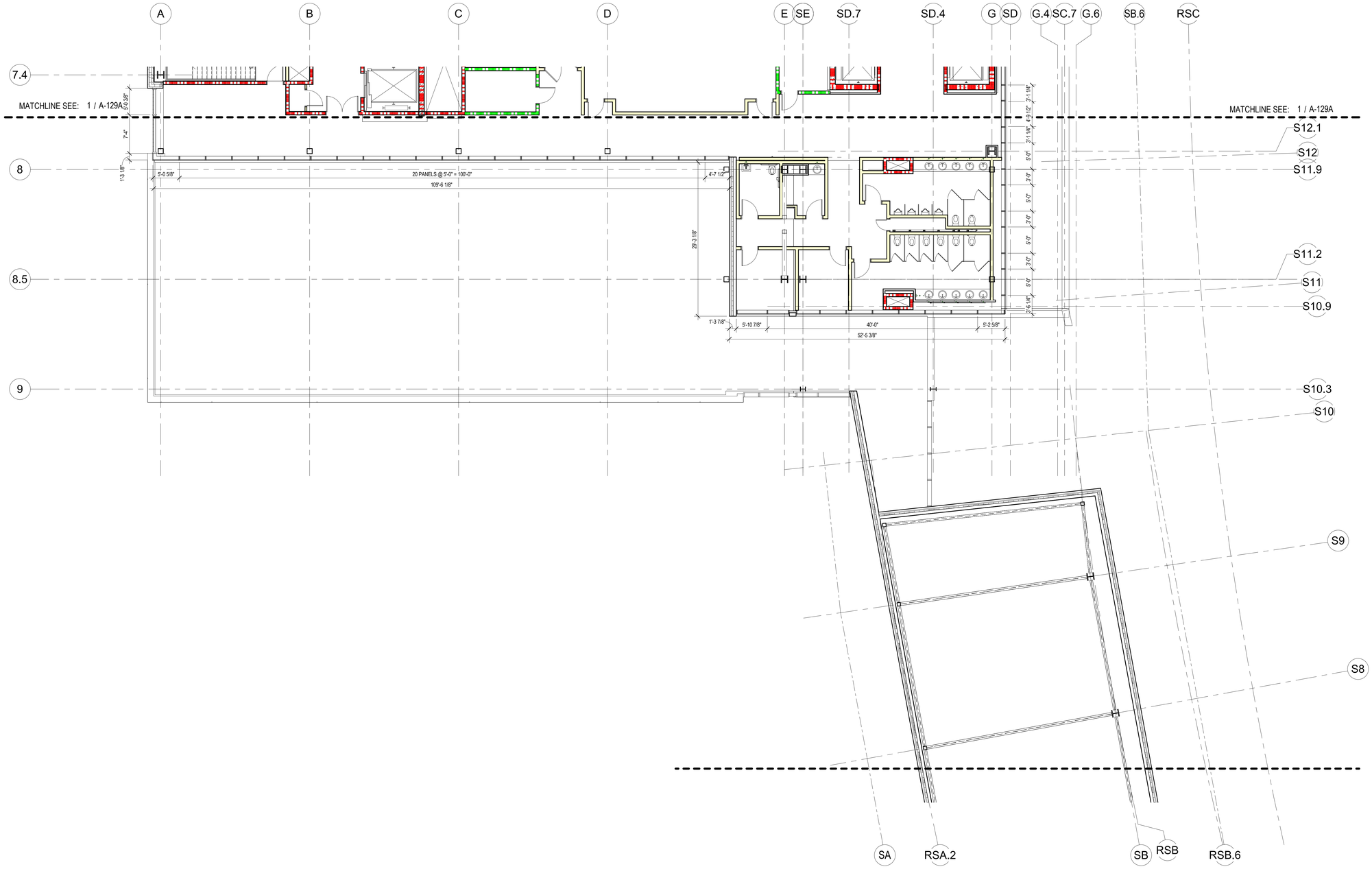

1 DIMENSION PLAN - NINTH FLOOR - AREA B
1/8" = 1'-0"

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DIMENSION PLAN - NINTH FLOOR - AREA B

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1 **DIMENSION PLAN - PENTHOUSE - AREA A**
1/8" = 1'-0"

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DIMENSION PLAN - PENTHOUSE - AREA A

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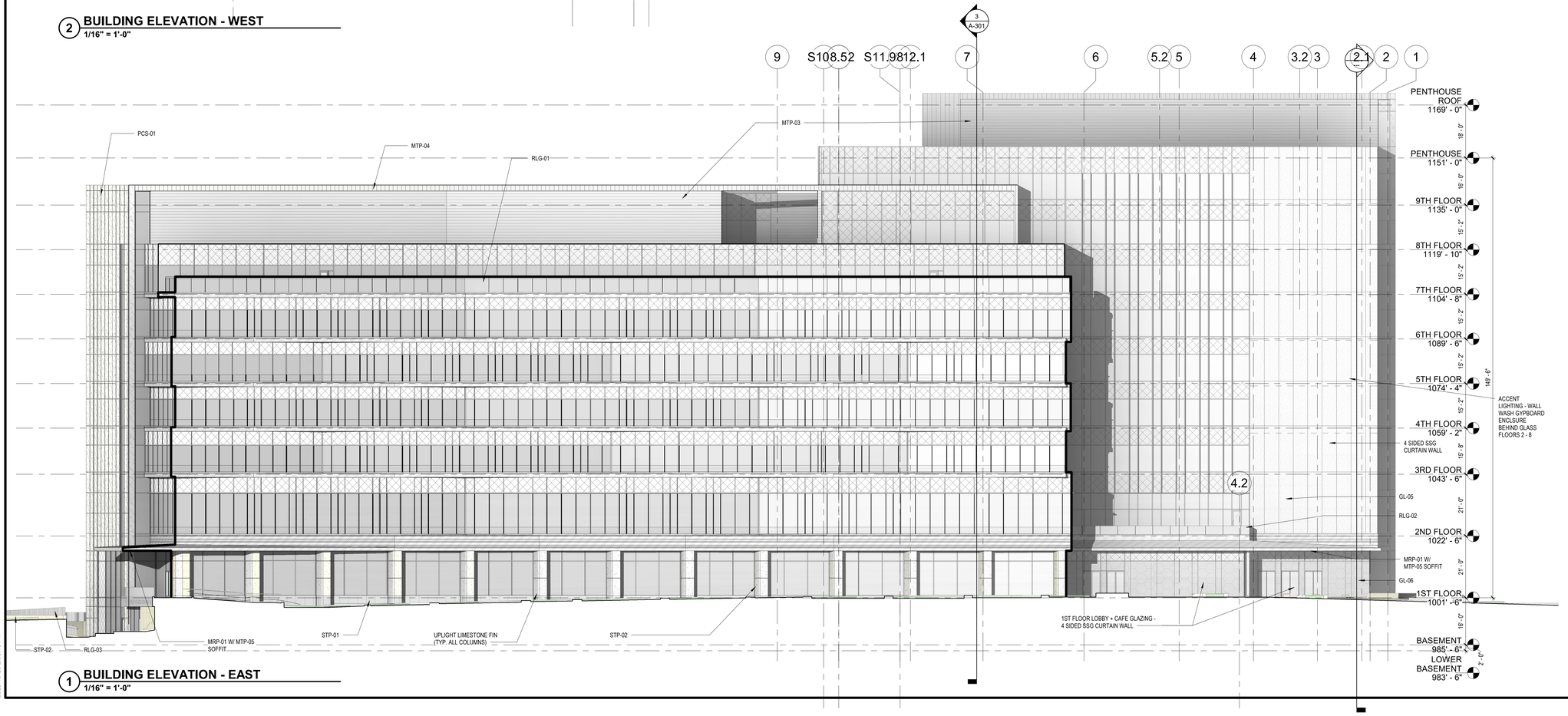
2 BUILDING ELEVATION - WEST
1/16" = 1'-0"



1 BUILDING ELEVATION - EAST
1/16" = 1'-0"

EXTERIOR ELEVATION GENERAL NOTES

1. SEE CIVIL DRAWINGS FOR FINAL GRADING PLANS
2. SEE SHEET A501 FOR EXTERIOR WALL TYPES DESIGNATIONS
3. SEE SHEET A502 FOR EXTERIOR CURTAIN WALL GLAZING AND FRAME TYPES
4. SEE MECHANICAL, PLUMBING AND ELECTRICAL SHEETS FOR ADDITIONAL INFORMATION RELATED TO FACADE EQUIPMENT AND/OR DEVICES

MATERIAL LEGEND

- MTP-01, METAL TRIM PANELS @ FLOOR LEVELS, MISC TRANSITIONS
  MTP-02, METAL PANEL RAINSCREEN W/ INTEGRATED REVEALS
  MTP-06: METAL PANEL @ PUNCHED OPENING
- MTP-03: PROFILE METAL PANEL @ PENTHOUSE & SCREENWALL
- MTP-04: METAL PANEL RAINSCREEN COPING @ PENTHOUSE
- GL-01: IGU VISION
  GL-02: IGU VISION BIRD SAFE GLASS
- GL-03: SPANDREL GLASS / SHADOWBOX
- GL-04: INSULATING GLASS W/ CUSTOM FRIT @ BASKET WEAVE
- GL-05: 1" INSULATING GLASS W/ CUSTOM FRIT @ LANTERN
- GL-06: 1" INSULATING CLEAR GLASS @ ENTRY VESTIBULE
- PCS-01: ARCHITECTURAL PRECAST CONCRETE - LIMESTONE LOOK
- PCS-02: ARCH. PRECAST W/ THIN BRICK VENEER
- STP-01: LIMESTONE BASE - MEDIUM GRAY
- STP-02: LIMESTONE
- RLG - 01: 6' GLASS GUARDRAIL
- RLG - 02: 42" GLASS GUARDRAIL
- RLG - 03: 42" METAL RAILING SYSTEM W/ VERTICAL PICKETS
- LVR-01: MECHANICAL LOUVER
- MRP-01 INVERTED FLAT SEAM METAL ROOF
- MTP-05 METAL PLANK SOFFIT W/ WOOD LOOK FINISH

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BUILDING ELEVATIONS - EAST AND WEST

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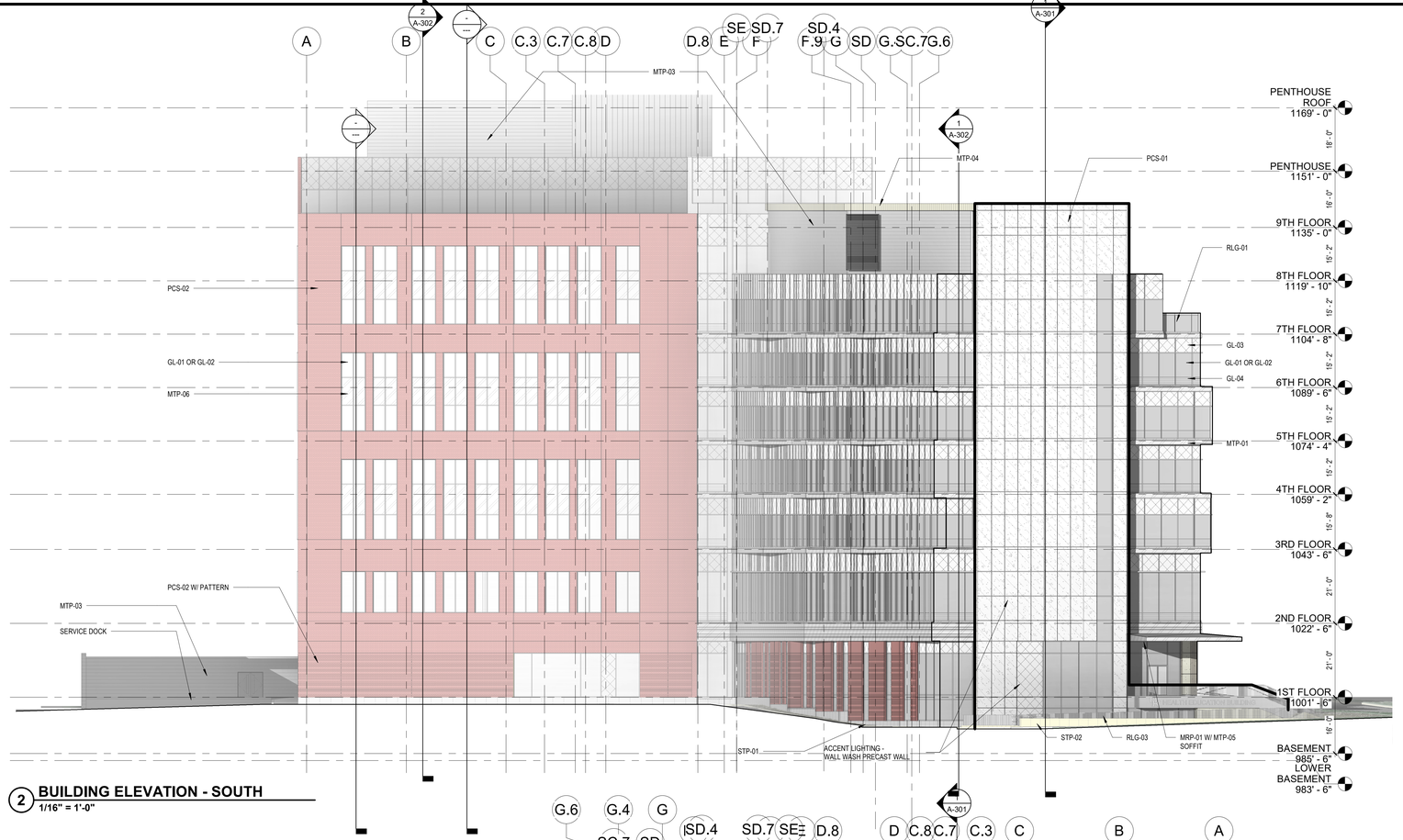

2 BUILDING ELEVATION - SOUTH
1/16" = 1'-0"

1 BUILDING ELEVATION - NORTH
1/16" = 1'-0"

EXTERIOR ELEVATION GENERAL NOTES

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- MRP-01 INVERTED FLAT SEAM METAL ROOF
- MTP-05 METAL PLANK SOFFIT W/ WOOD LOOK FINISH

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BUILDING ELEVATIONS - NORTH AND SOUTH

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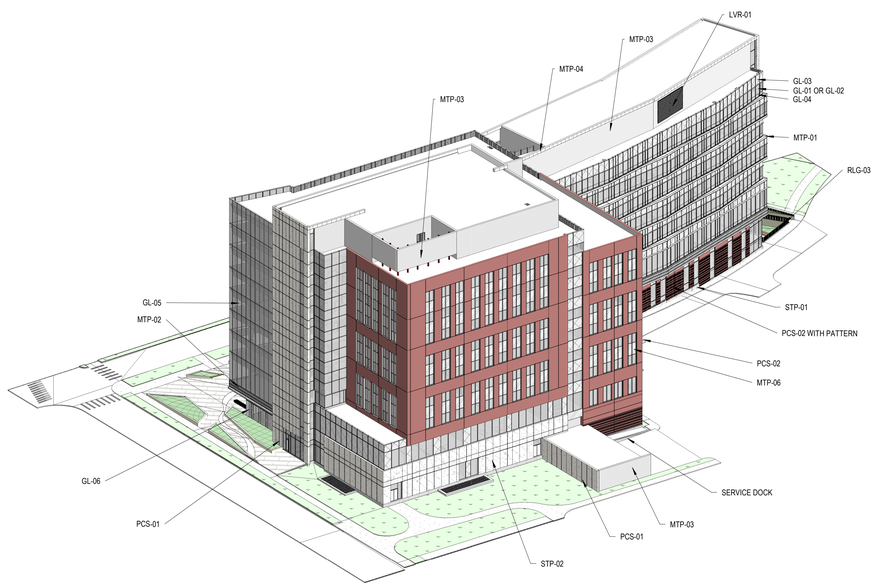
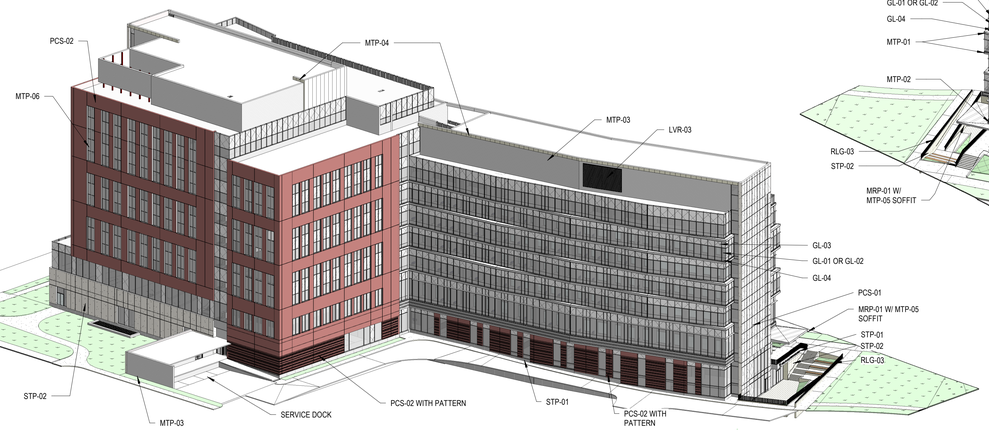
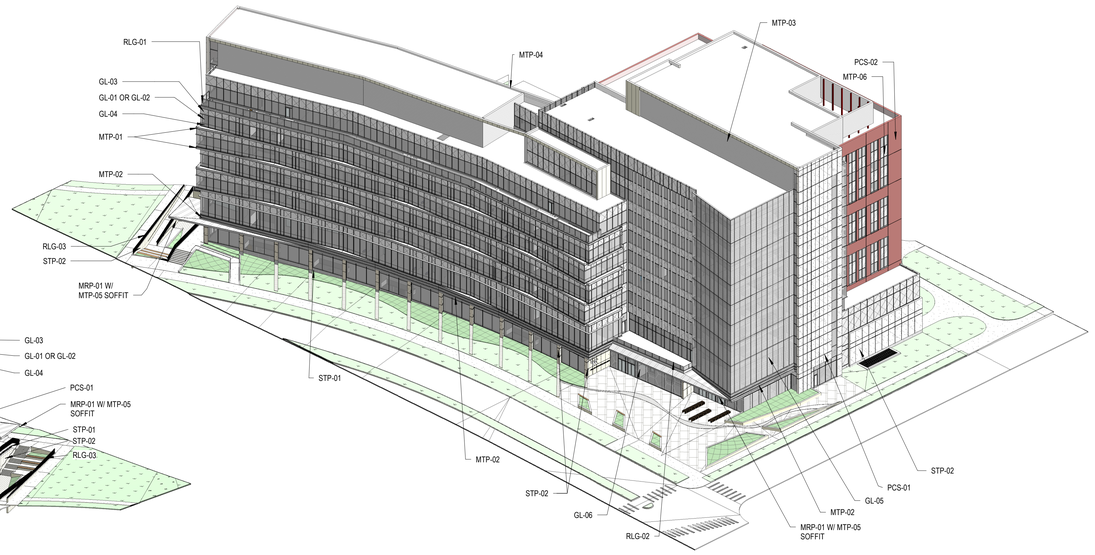
4 AXON FROM SW



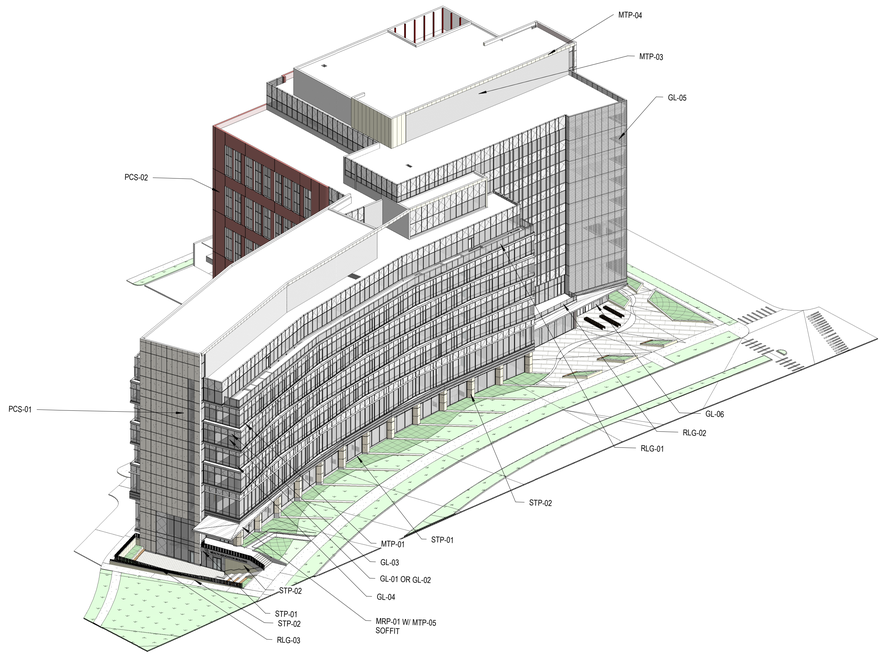
3 AXON FROM NW



2 AXON FROM NE



1 AXON FROM SE



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MTP-04: METAL PANEL RAINSCREEN COPING @ PENTHOUSE

GL-01: IGU VISION
GL-02: IGU VISION BIRD SAFE GLASS

GL-03: SPANDREL GLASS / SHADOWBOX

GL-04: INSULATING GLASS W/ CUSTOM FRIT @ BASKET WEAVE

GL-05: 1" INSULATING GLASS W/ CUSTOM FRIT @ LANTERN

GL-06: 1" INSULATING CLEAR GLASS @ ENTRY VESTIBULE

PCS-01: ARCHITECTURAL PRECAST CONCRETE - LIMESTONE LOOK

PCS-02: ARCH. PRECAST W/ THIN BRICK VENEER

STP-01: LIMESTONE BASE - MEDIUM GRAY

STP-02: LIMESTONE

RLG - 01: 6' GLASS GUARDRAIL

RLG - 02: 42" GLASS GUARDRAIL

RLG - 03: 42" METAL RAILING SYSTEM W/ VERTICAL PICKETS

LVR-01: MECHANICAL LOUVER

MRP-01 INVERTED FLAT SEAM METAL ROOF

MTP-05 METAL PLANK SOFFIT W/ WOOD LOOK FINISH

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UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

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BUILDING AXONS

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1 VIEW FROM NORTHEAST
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1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

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BUILDING RENDERINGS

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1 VIEW FROM SOUTHEAST
12" = 1'-0"

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BUILDING RENDERINGS

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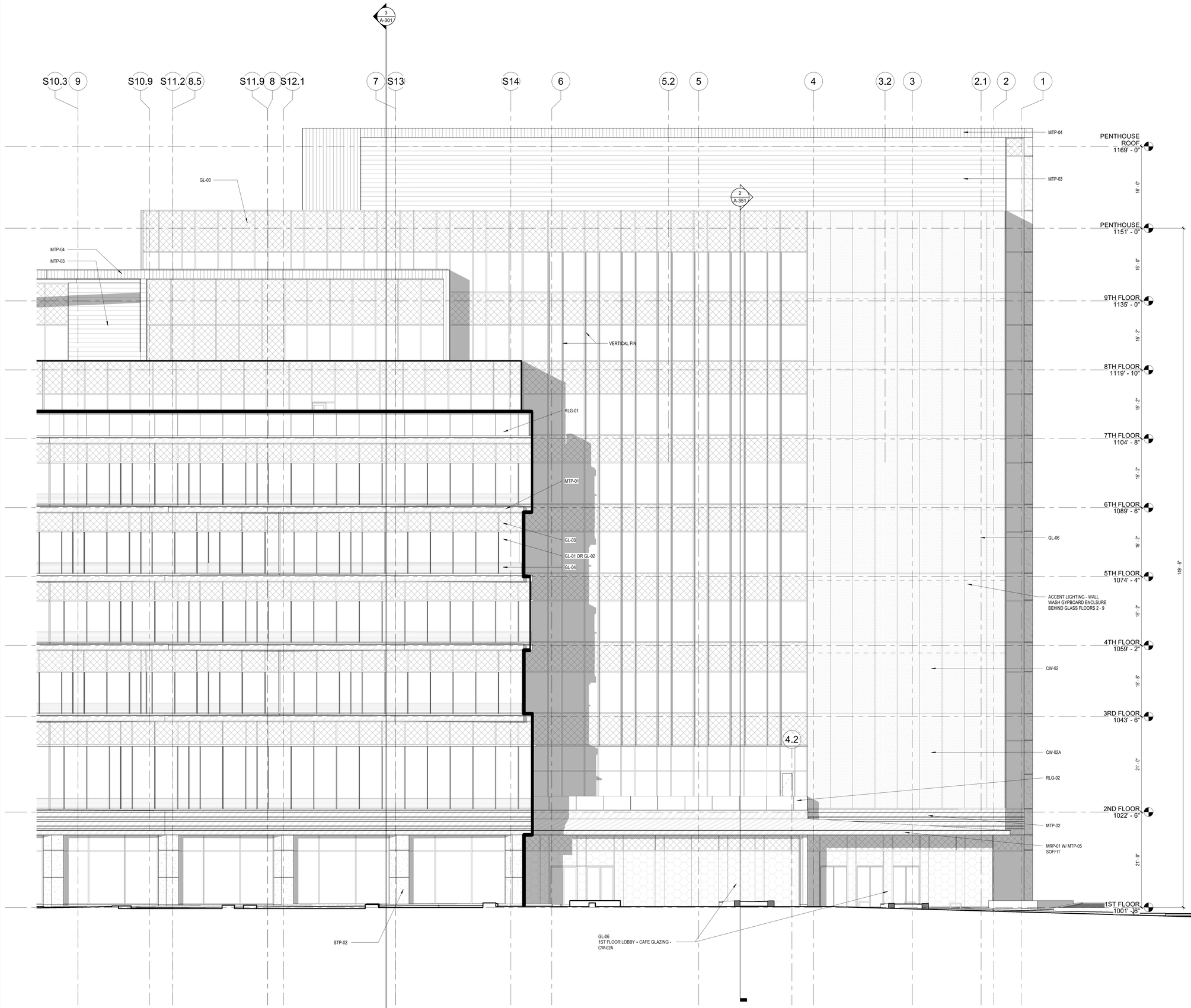

EXTERIOR ELEVATION GENERAL NOTES

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- GL-05: 1" INSULATING GLASS W/ CUSTOM FRIT @ LANTERN
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- PCS-02: ARCH. PRECAST W/ THIN BRICK VENEER
- STP-01: LIMESTONE BASE - MEDIUM GRAY
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- RLG - 02: 42" GLASS GUARDRAIL
- RLG - 03: 42" METAL RAILING SYSTEM W/ VERTICAL PICKETS
- LVR-01: MECHANICAL LOUVER
- MRP-01 INVERTED FLAT SEAM METAL ROOF
- MTP-05 METAL PLANK SOFFIT W/ WOOD LOOK FINISH

1 **BUILDING ELEVATION - EAST 1_8 A**
1/8" = 1'-0"

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BUILDING ENLARGED ELEVATIONS - EAST

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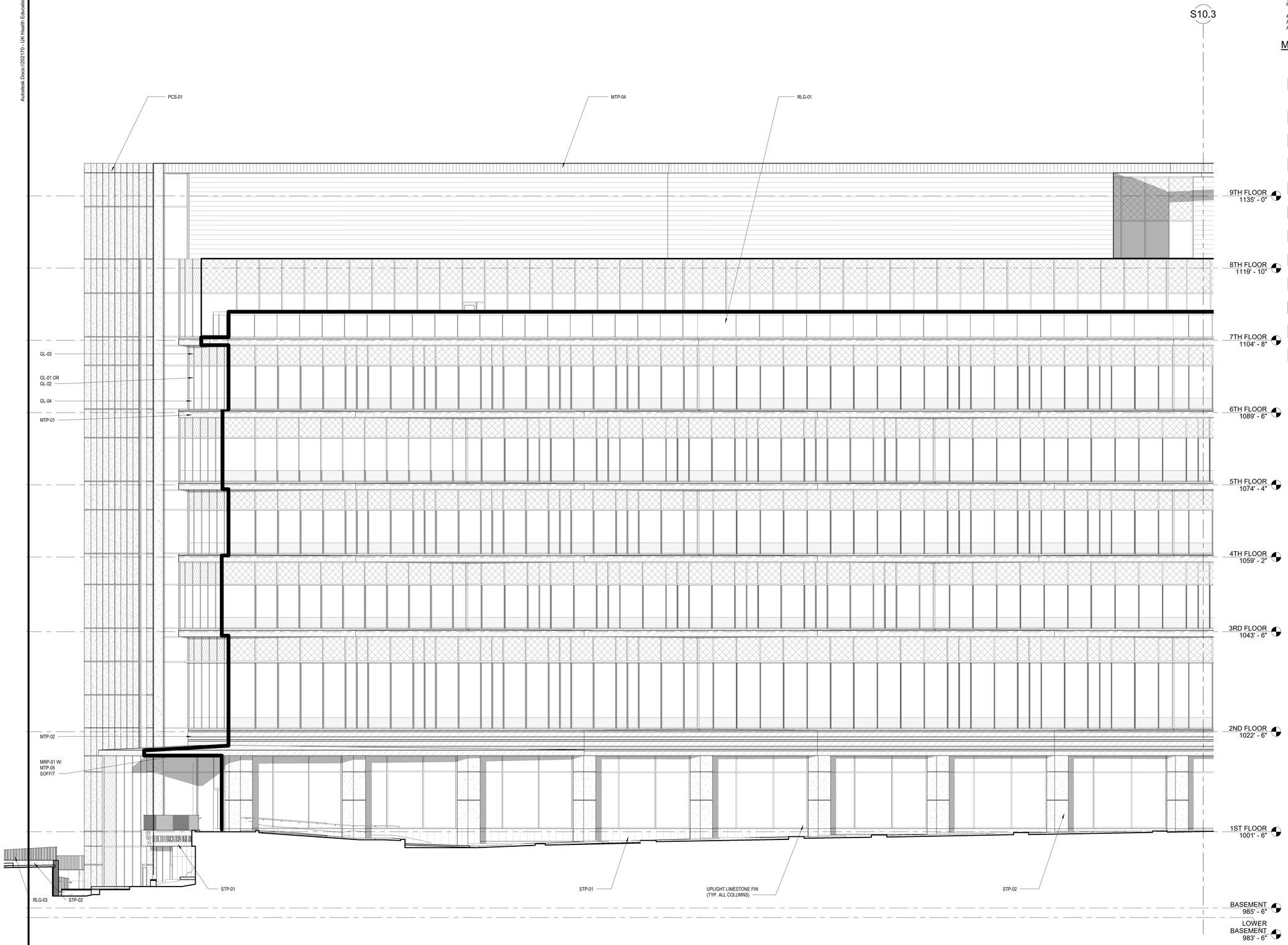

1 **BUILDING ELEVATION - EAST 1_8 B**
1/8" = 1'-0"

EXTERIOR ELEVATION GENERAL NOTES

1. SEE CIVIL DRAWINGS FOR FINAL GRADING PLANS
2. SEE SHEET A501 FOR EXTERIOR WALL TYPES DESIGNATIONS
3. SEE SHEET A502 FOR EXTERIOR CURTAIN WALL GLAZING AND FRAME TYPES
4. SEE MECHANICAL, PLUMBING AND ELECTRICAL SHEETS FOR ADDITIONAL INFORMATION RELATED TO FACADE EQUIPMENT AND/OR DEVICES

MATERIAL LEGEND

- MTP-01, METAL TRIM PANELS @ FLOOR LEVELS, MISC TRANSITIONS
  MTP-02, METAL PANEL RAINSCREEN W/ INTEGRATED REVEALS
  MTP-06: METAL PANEL @ PUNCHED OPENING
- MTP-03: PROFILE METAL PANEL @ PENTHOUSE & SCREENWALL
- MTP-04: METAL PANEL RAINSCREEN COPING @ PENTHOUSE
- GL-01: IGU VISION
  GL-02: IGU VISION BIRD SAFE GLASS
- GL-03: SPANDREL GLASS / SHADOWBOX
- GL-04: INSULATING GLASS W/ CUSTOM FRIT @ BASKET WEAVE
- GL-05: 1" INSULATING GLASS W/ CUSTOM FRIT @ LANTERN
- GL-06: 1" INSULATING CLEAR GLASS @ ENTRY VESTIBULE
- PCS-01: ARCHITECTURAL PRECAST CONCRETE - LIMESTONE LOOK
- PCS-02: ARCH. PRECAST W/ THIN BRICK VENEER
- STP-01: LIMESTONE BASE - MEDIUM GRAY
- STP-02: LIMESTONE
- RLG - 01: 6' GLASS GUARDRAIL
- RLG - 02: 42" GLASS GUARDRAIL
- RLG - 03: 42" METAL RAILING SYSTEM W/ VERTICAL PICKETS
- LVR-01: MECHANICAL LOUVER
- MRP-01 INVERTED FLAT SEAM METAL ROOF
- MTP-05 METAL PLANK SOFFIT W/ WOOD LOOK FINISH

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UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

ARCHITECTURAL

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REVISIONS

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BUILDING ENLARGED ELEVATIONS - EAST

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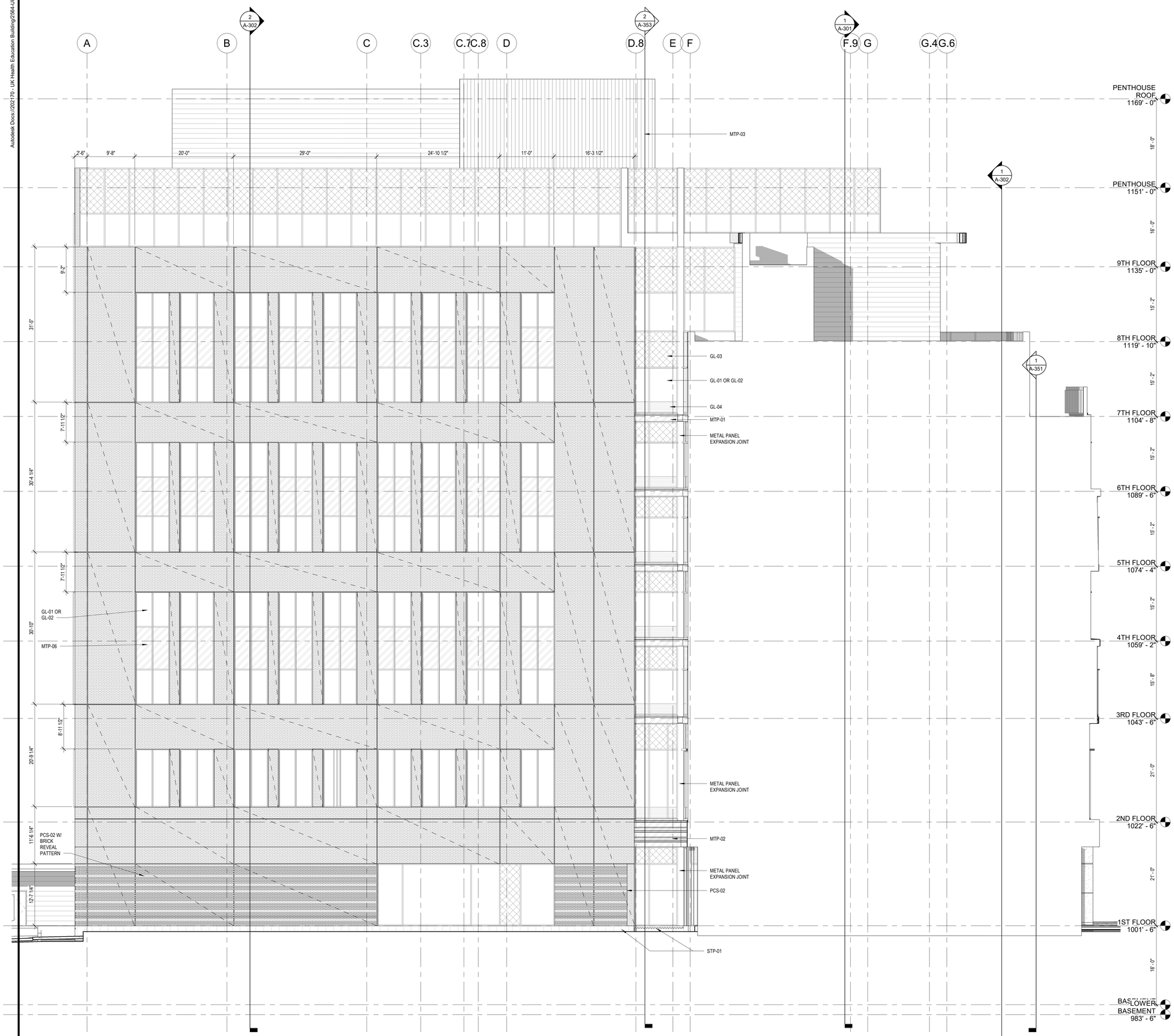

1 **BUILDING ELEVATION - SOUTH 1_8 A**
1/8" = 1'-0"

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1. DASHED LINE INDICATE PRECAST CONCRETE PANELIZATION

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BUILDING ENLARGED ELEVATIONS - SOUTH

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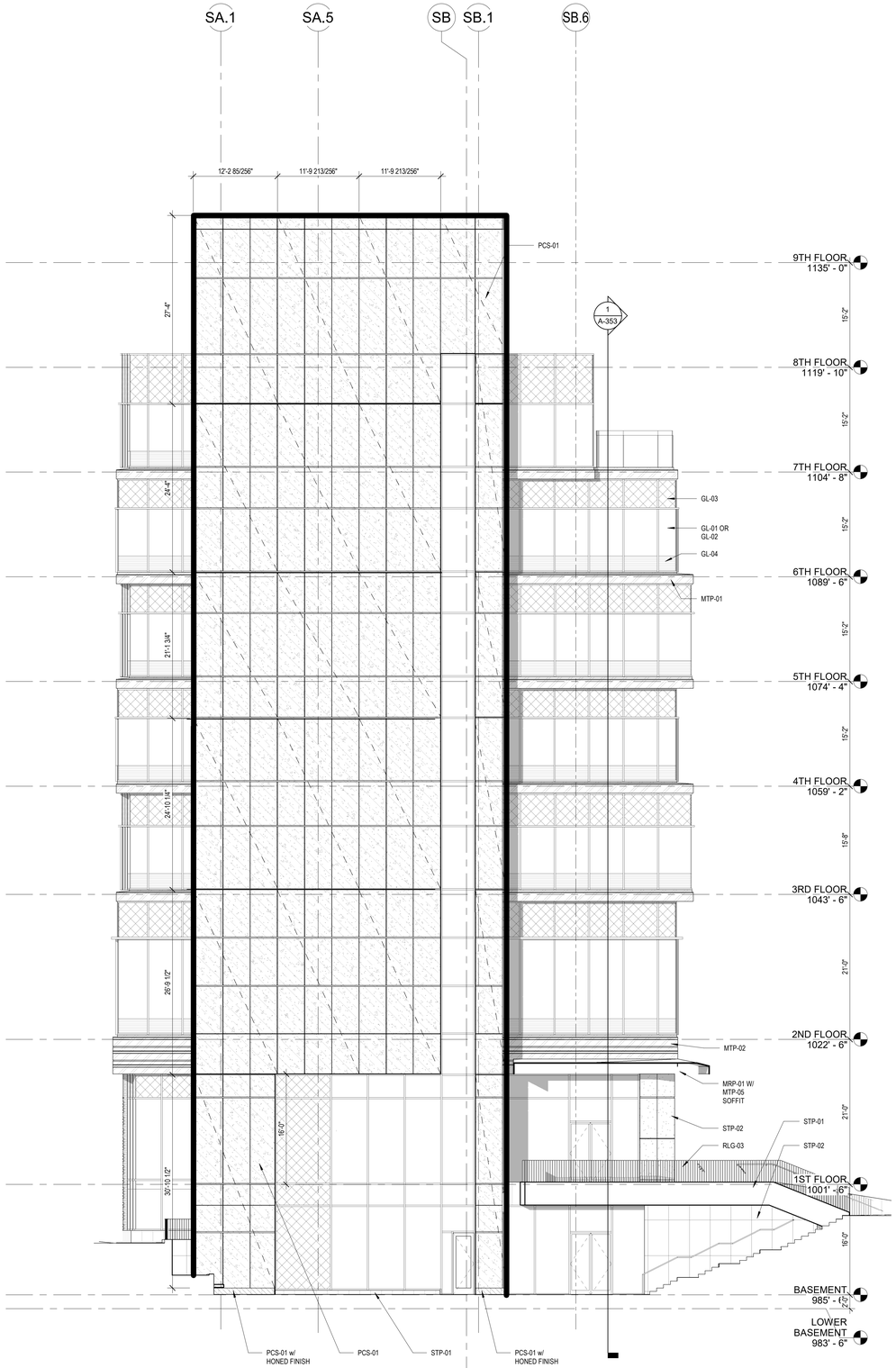

1 **BUILDING ELEVATION - SOUTH 1_8 B**
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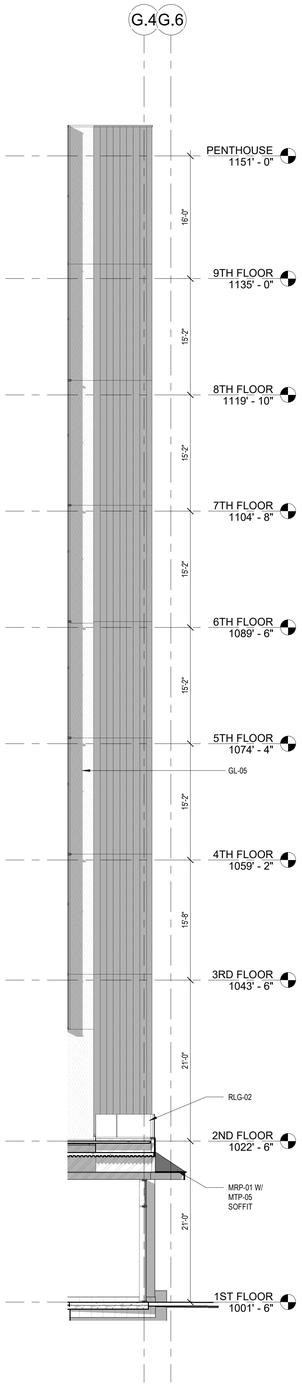
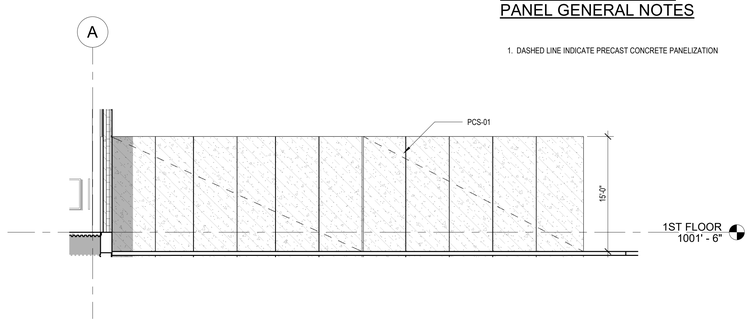
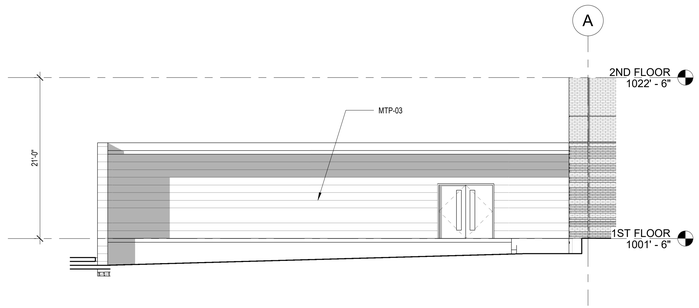


4 **BUILDING ELEVATION - SOUTH 1_8 D**
1/8" = 1'-0"



3 **BUILDING ELEVATION - NORTH 1_8 D**
1/8" = 1'-0"



2 **BUILDING ELEVATION - SOUTH 1_8 C**
1/8" = 1'-0"

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1. DASHED LINE INDICATE PRECAST CONCRETE PANELIZATION

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BUILDING ENLARGED ELEVATIONS - SOUTH

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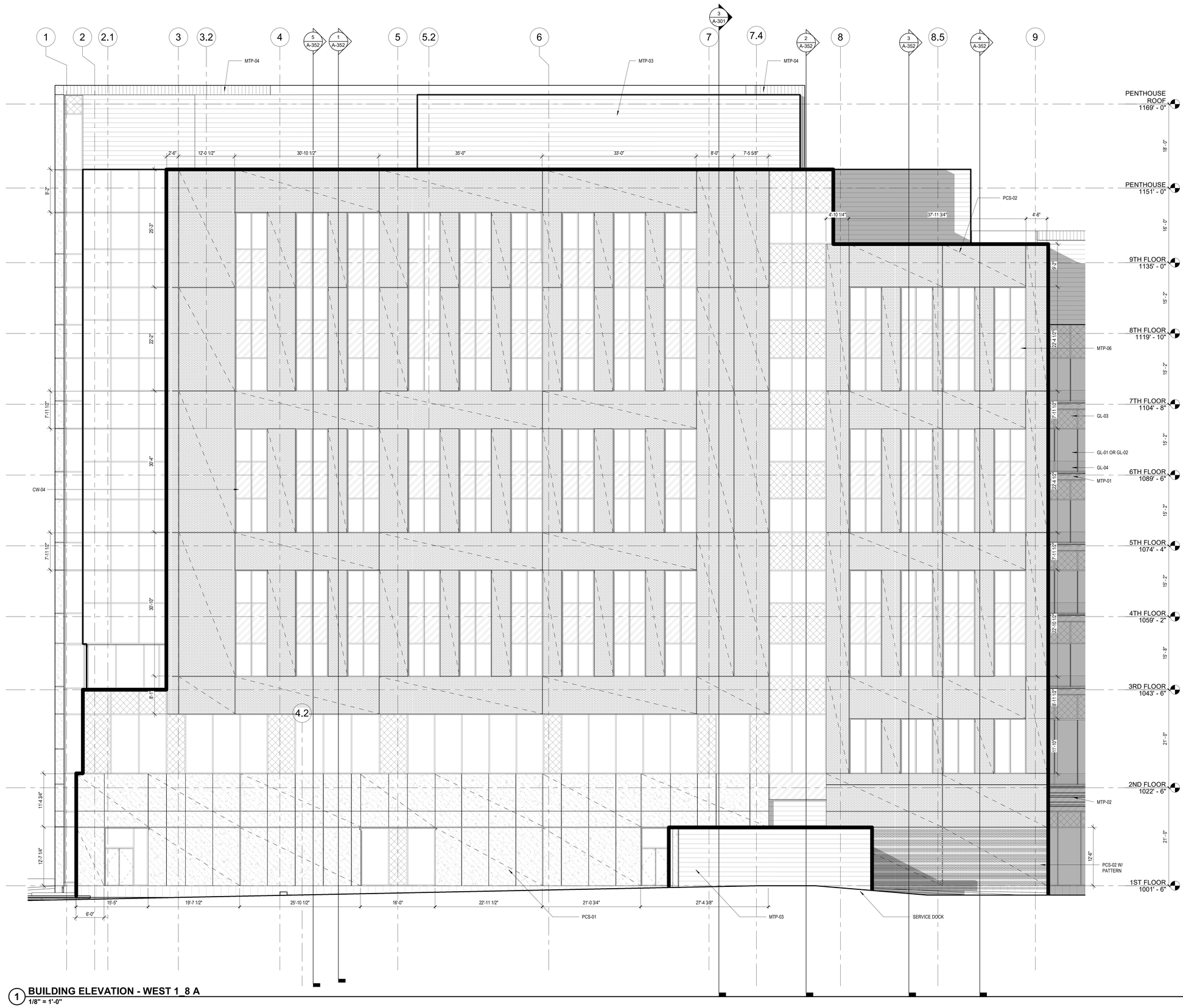

1 **BUILDING ELEVATION - WEST 1_8 A**
1/8" = 1'-0"

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BUILDING ENLARGED ELEVATIONS - WEST

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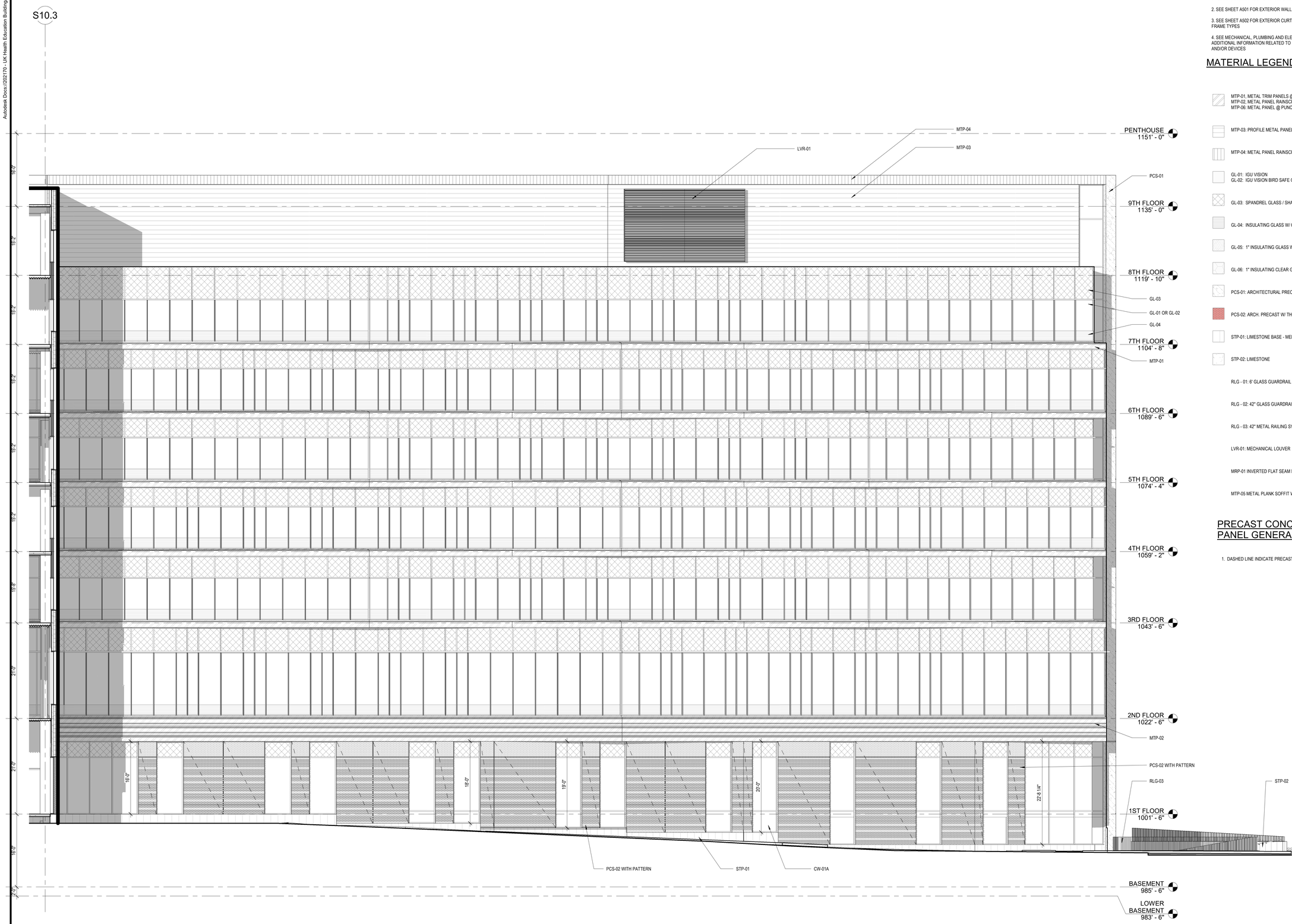

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BUILDING ENLARGED ELEVATIONS - WEST

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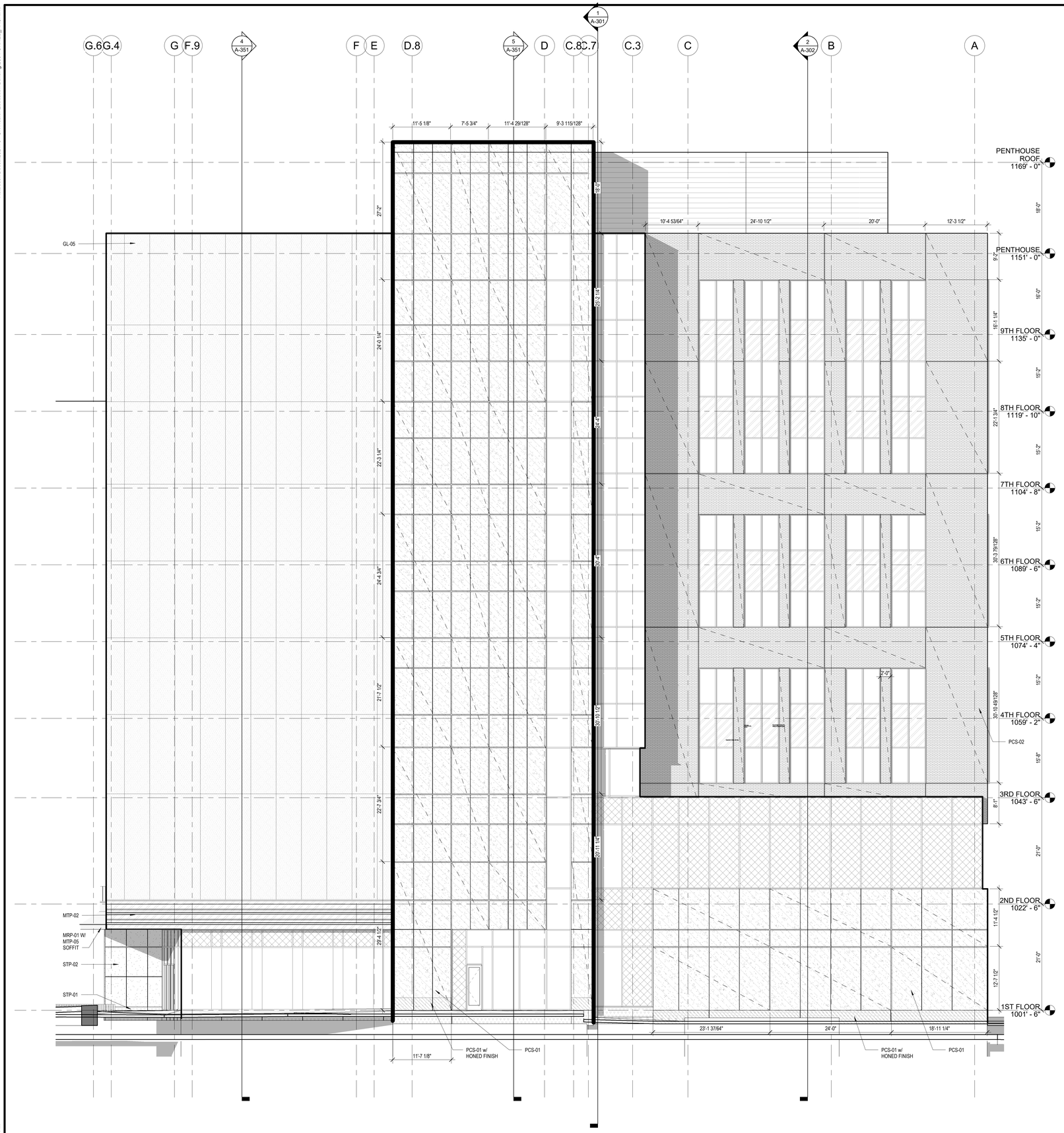

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BUILDING ENLARGED ELEVATIONS - NORTH

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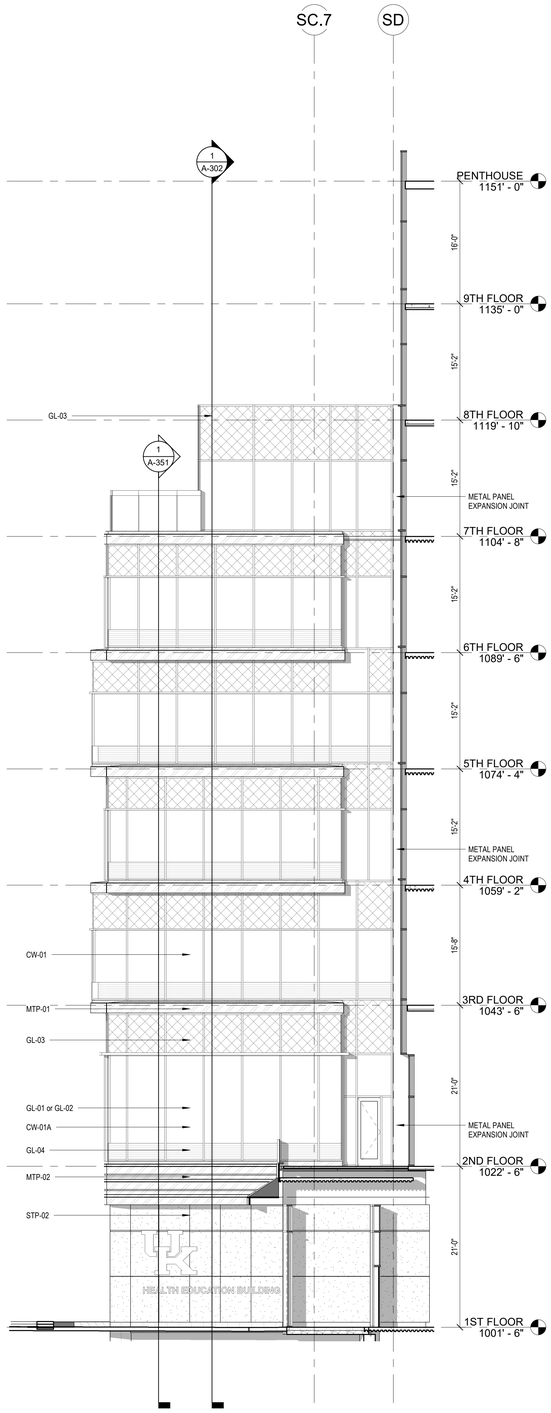

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2. SEE SHEET A501 FOR EXTERIOR WALL TYPES DESIGNATIONS
3. SEE SHEET A502 FOR EXTERIOR CURTAIN WALL GLAZING AND FRAME TYPES
4. SEE MECHANICAL, PLUMBING AND ELECTRICAL SHEETS FOR ADDITIONAL INFORMATION RELATED TO FACADE EQUIPMENT AND/OR DEVICES

MATERIAL LEGEND

- MTP-01, METAL TRIM PANELS @ FLOOR LEVELS, MISC TRANSITIONS
  MTP-02, METAL PANEL RAINSCREEN W/ INTEGRATED REVEALS
  MTP-06: METAL PANEL @ PUNCHED OPENING
- MTP-03: PROFILE METAL PANEL @ PENTHOUSE & SCREENWALL
- MTP-04: METAL PANEL RAINSCREEN COPING @ PENTHOUSE
- GL-01: IGU VISION
  GL-02: IGU VISION BIRD SAFE GLASS
- GL-03: SPANDREL GLASS / SHADOWBOX
- GL-04: INSULATING GLASS W/ CUSTOM FRIT @ BASKET WEAVE
- GL-05: 1" INSULATING GLASS W/ CUSTOM FRIT @ LANTERN
- GL-06: 1" INSULATING CLEAR GLASS @ ENTRY VESTIBULE
- PCS-01: ARCHITECTURAL PRECAST CONCRETE - LIMESTONE LOOK
- PCS-02: ARCH. PRECAST W/ THIN BRICK VENEER
- STP-01: LIMESTONE BASE - MEDIUM GRAY
- STP-02: LIMESTONE
- RLG - 01: 6' GLASS GUARDRAIL
- RLG - 02: 42" GLASS GUARDRAIL
- RLG - 03: 42" METAL RAILING SYSTEM W/ VERTICAL PICKETS
- LVR-01: MECHANICAL LOUVER
- MRP-01 INVERTED FLAT SEAM METAL ROOF
- MTP-05 METAL PLANK SOFFIT W/ WOOD LOOK FINISH

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ARCHITECTURAL

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BUILDING ENLARGED ELEVATIONS - NORTH

A-218

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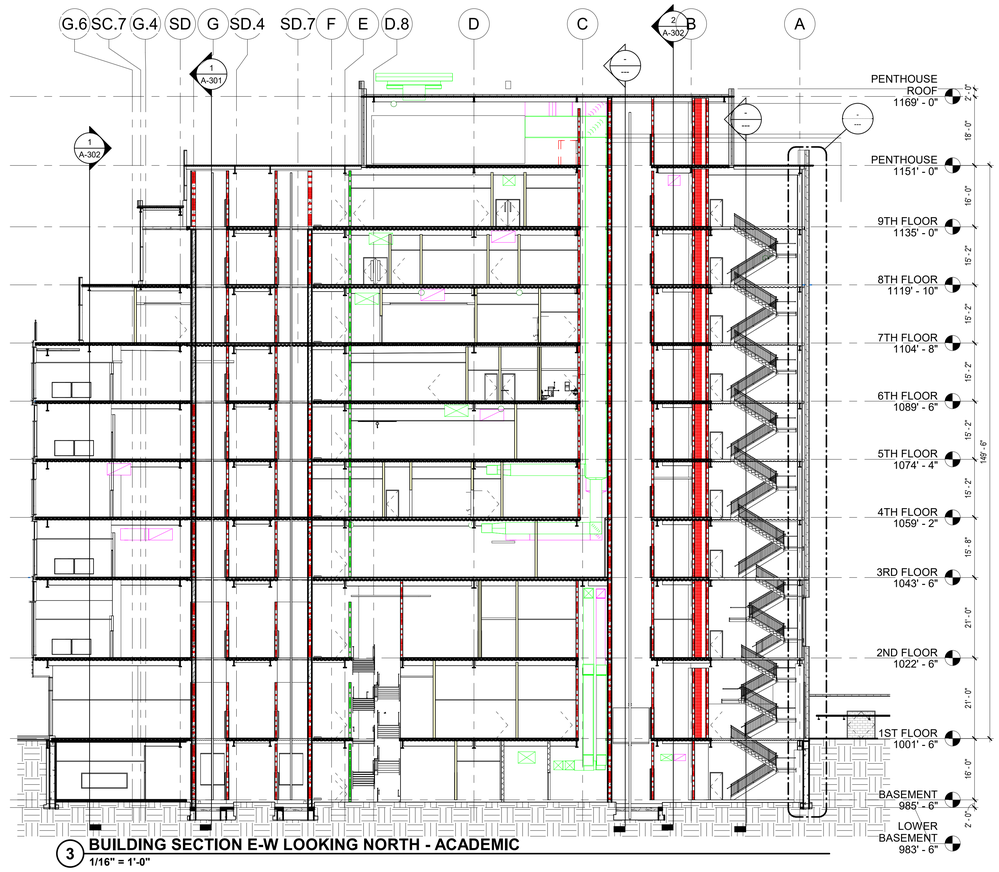
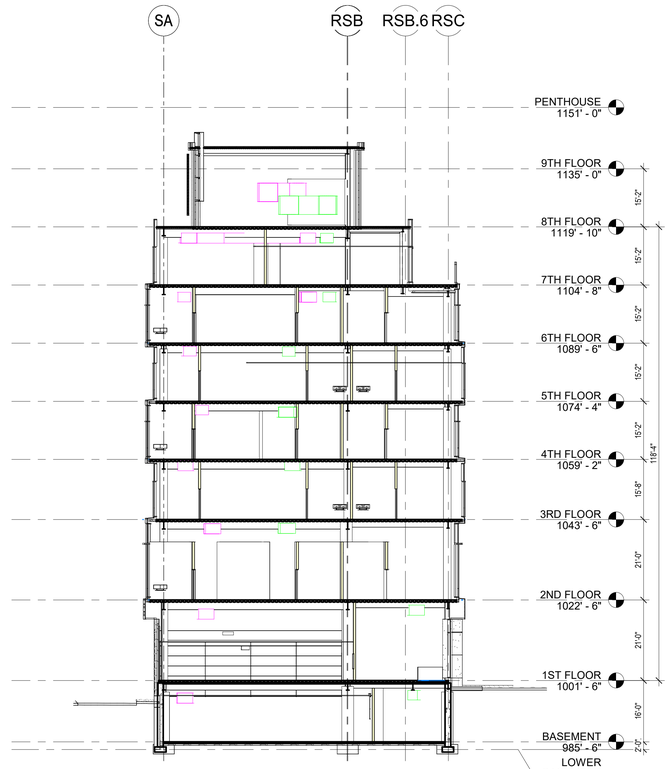


3 **BUILDING SECTION E-W LOOKING NORTH - ACADEMIC**
1/16" = 1'-0"



2 **BUILDING SECTION E-W LOOKING NORTH - WORKPLACE**
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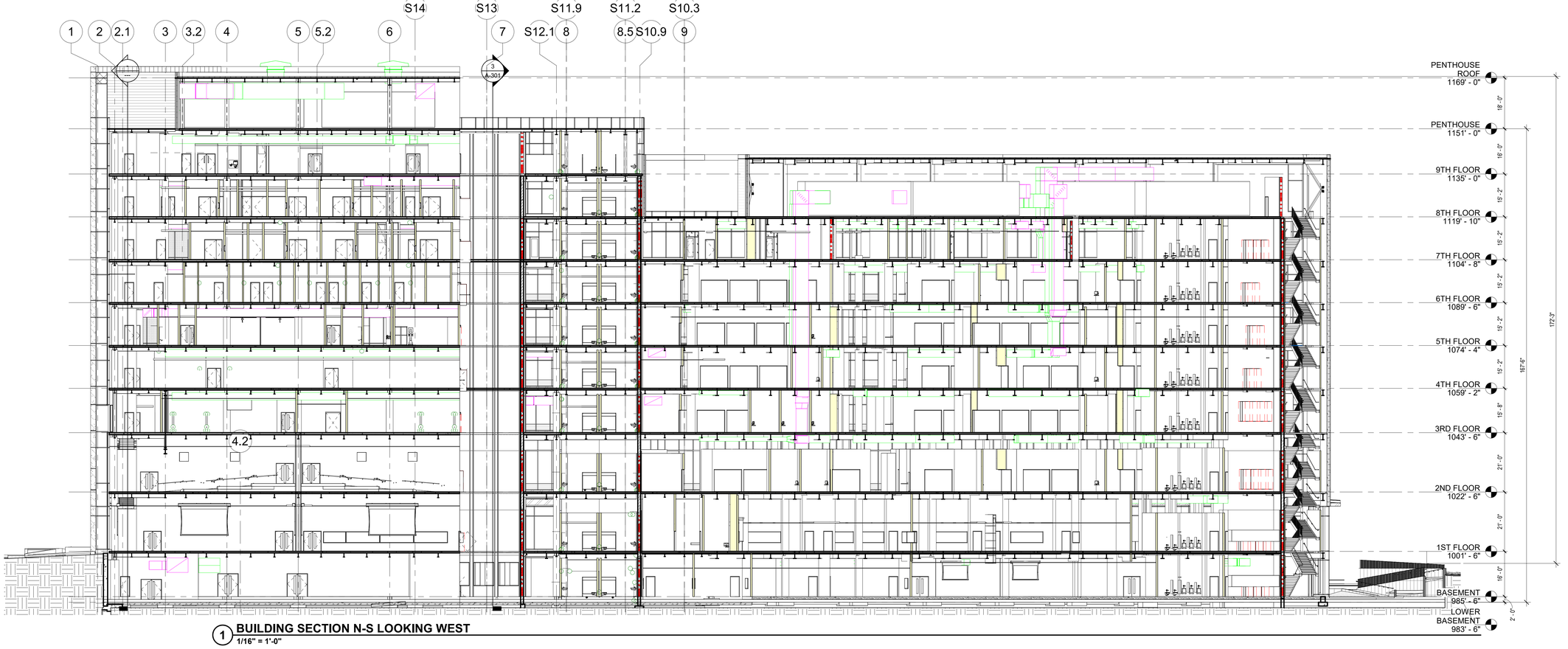

1 **BUILDING SECTION N-S LOOKING WEST**
1/16" = 1'-0"

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BUILDING SECTIONS

A-301

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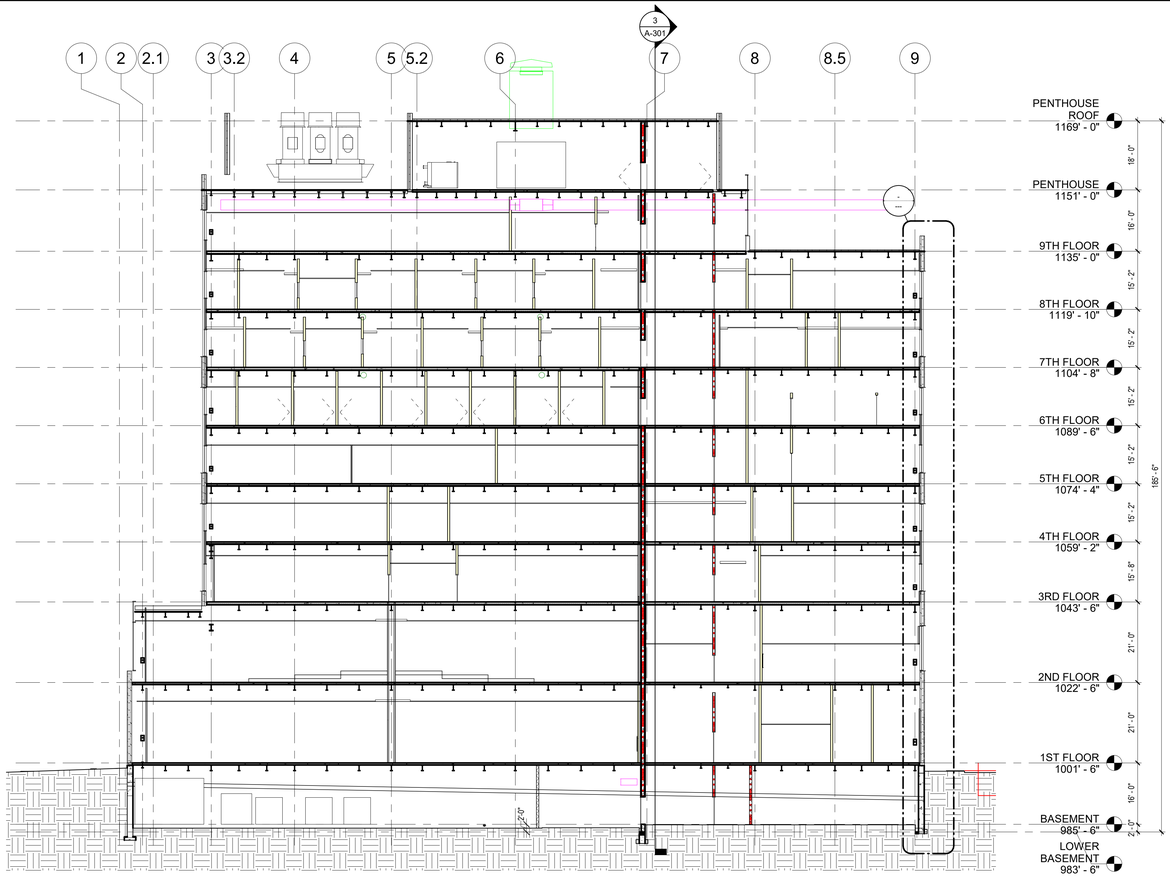

2 BUILDING SECTION N-S ACADEMIC
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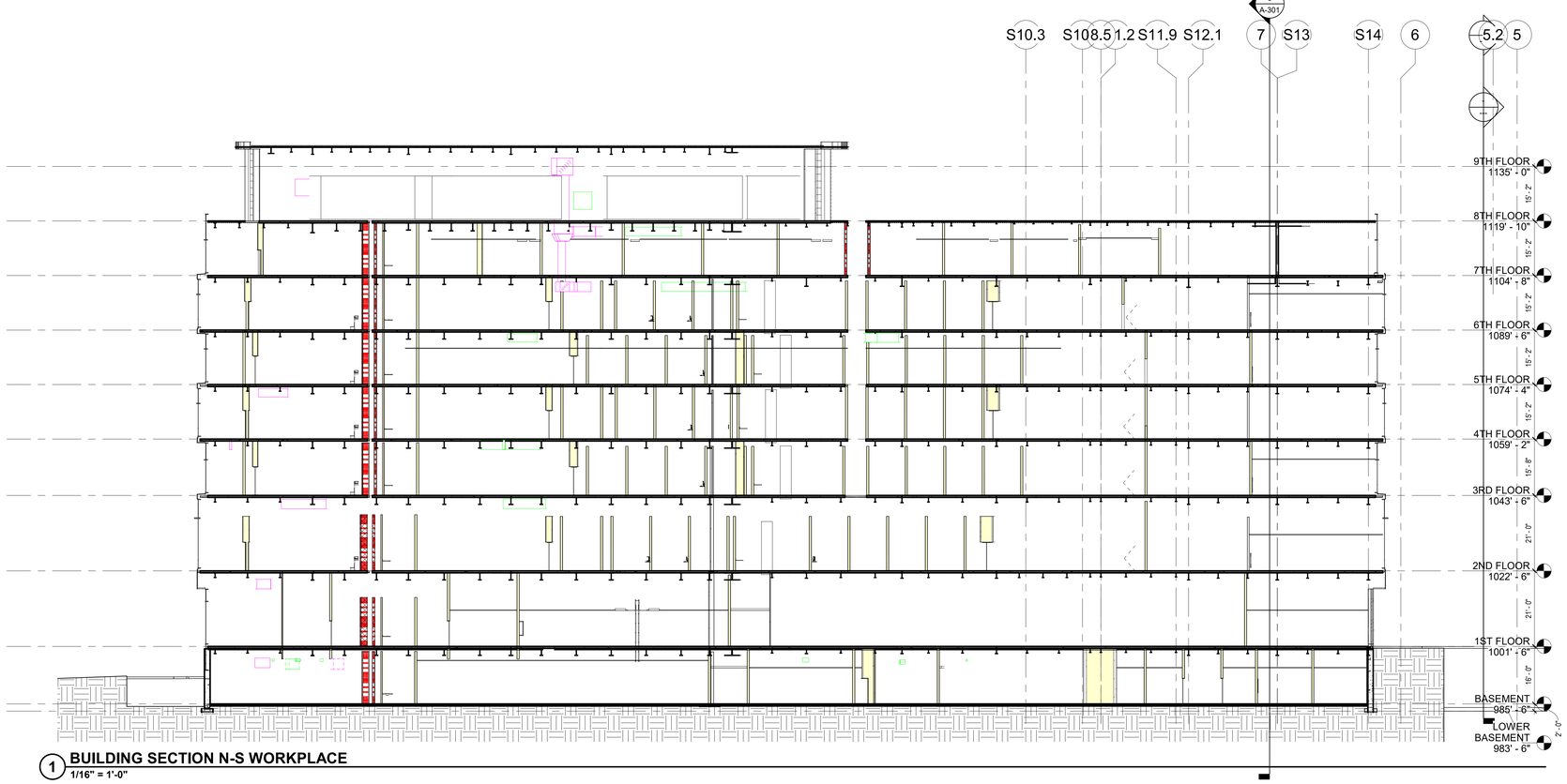

1 BUILDING SECTION N-S WORKPLACE
1/16" = 1'-0"

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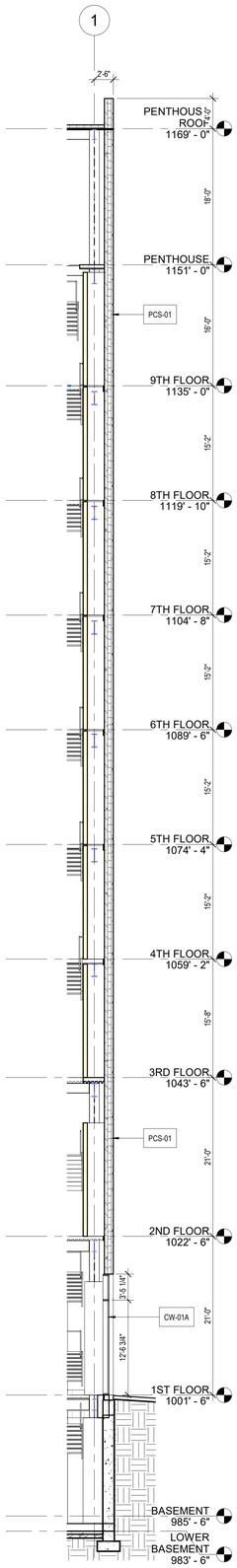
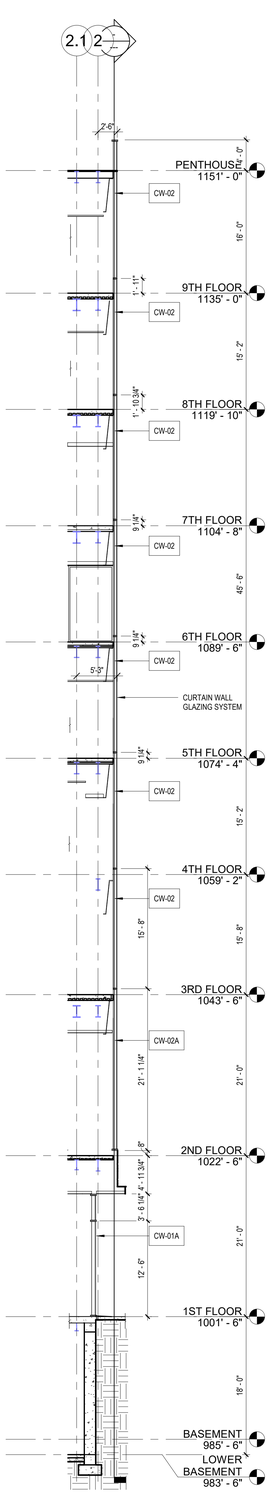


5 **Section N-002**
1/8" = 1'-0"



4 **WALL SECTION - GLAZING SYSTEM**
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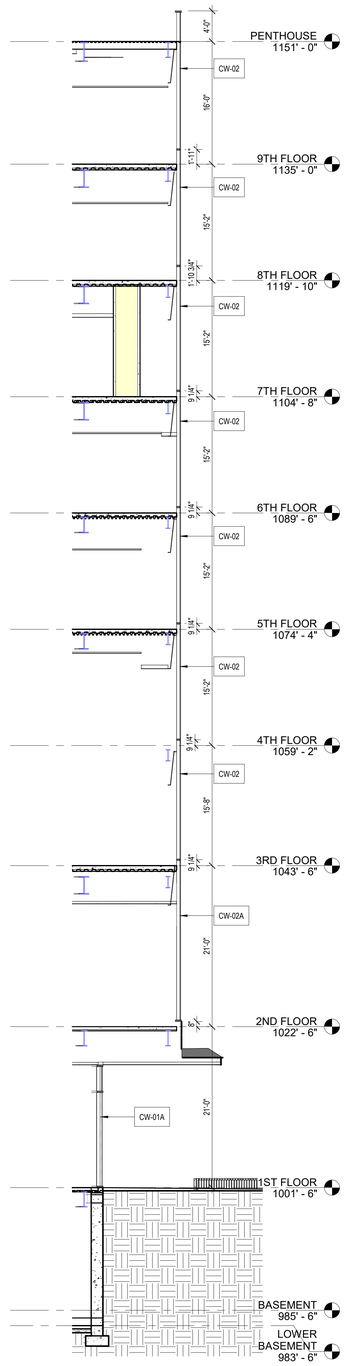
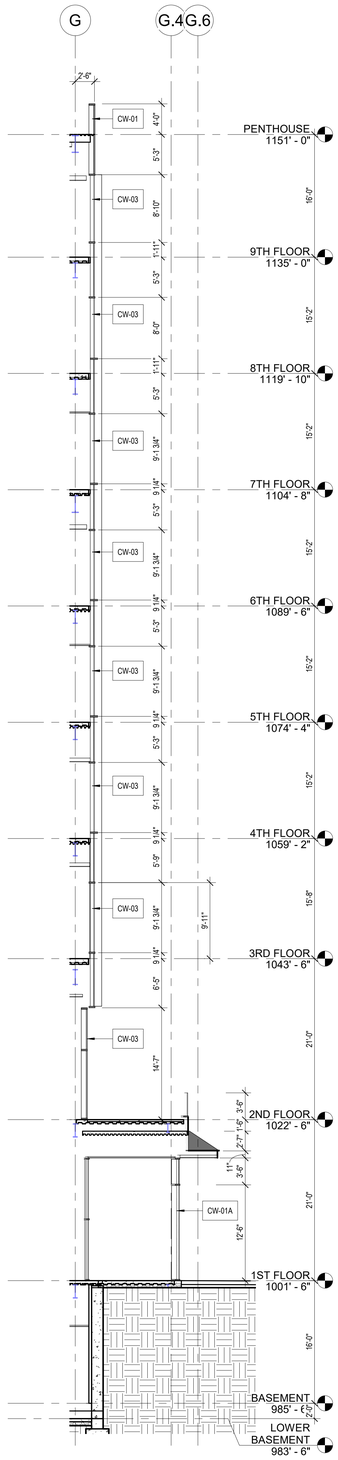
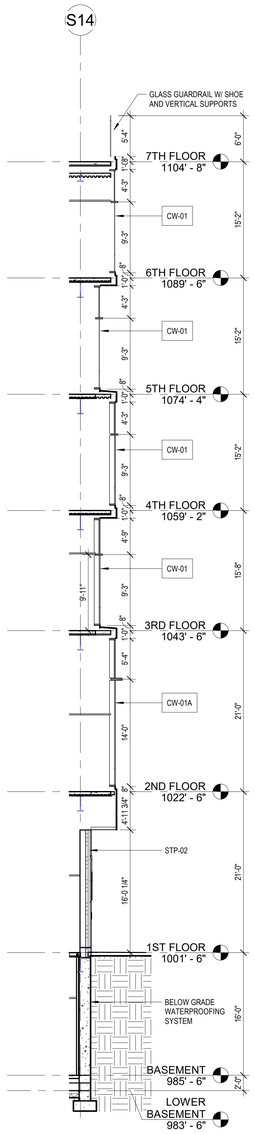


3 **Section E-001**
1/8" = 1'-0"



2 **Section E-002**
1/8" = 1'-0"



1 **Section N-001**
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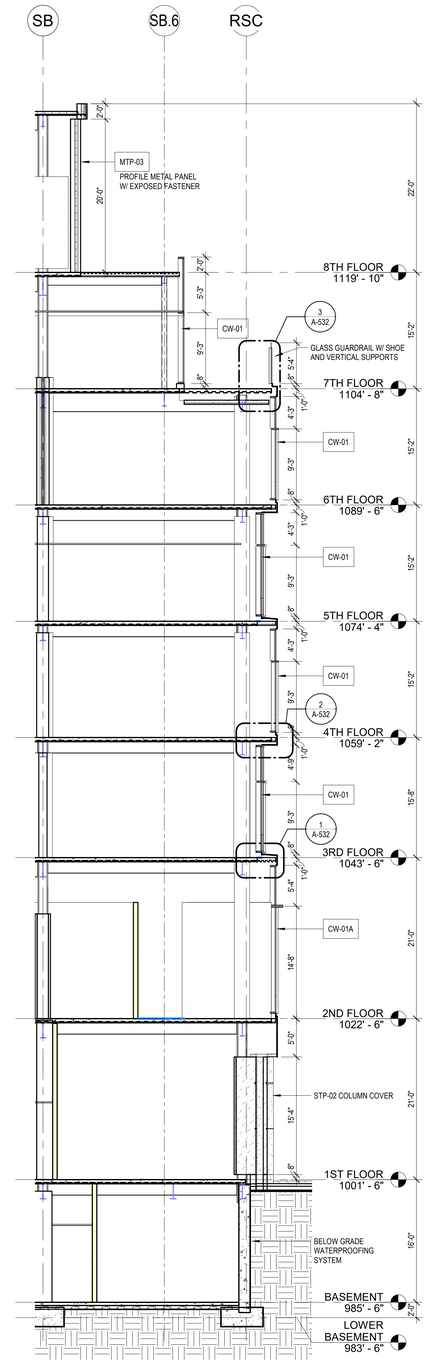

7 **WALL SECTION - GLAZING SYSTEM BASKET WEAVE**
1/8" = 1'-0"

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WALL SECTIONS

A-351

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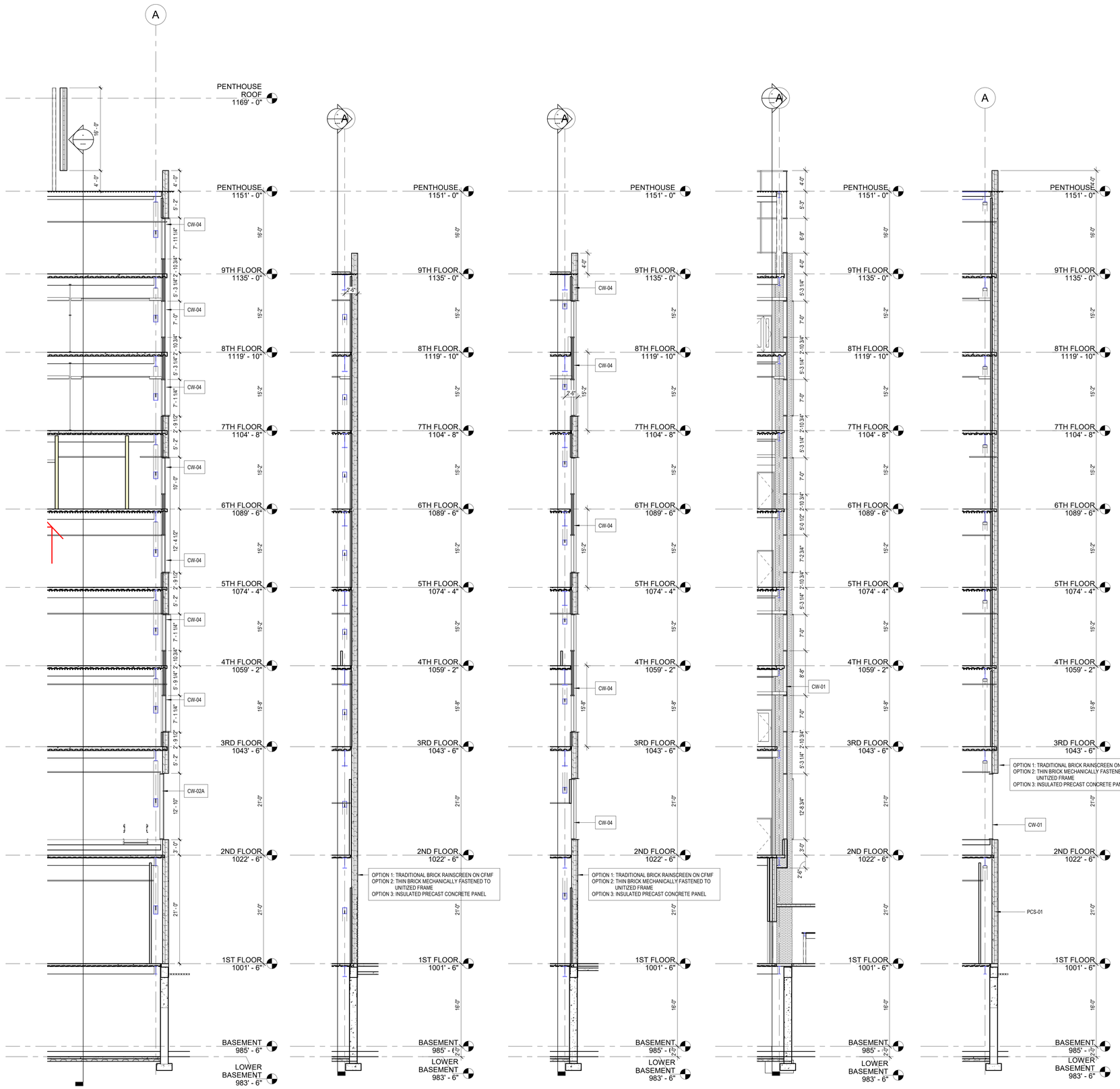

5 **Section W-006** 1/8" = 1'-0"

4 **Section W-003** 1/8" = 1'-0"

3 **Section W-002** 1/8" = 1'-0"

2 **Section W-004** 1/8" = 1'-0"

1 **Section W-005** 1/8" = 1'-0"

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WALL SECTIONS

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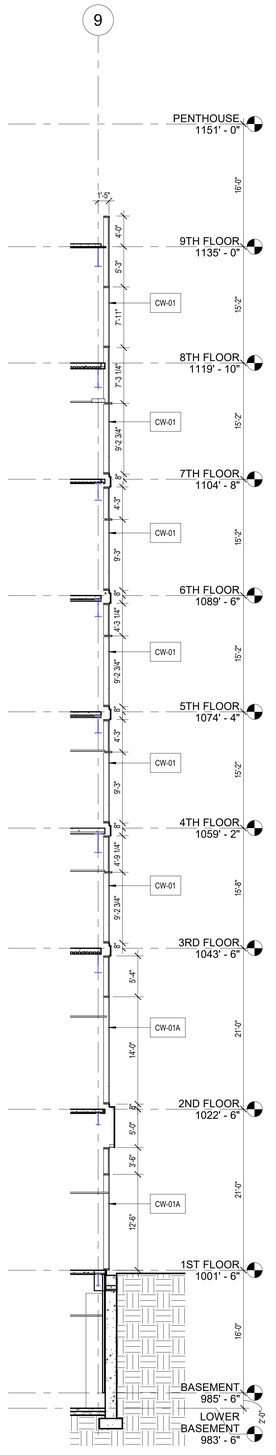
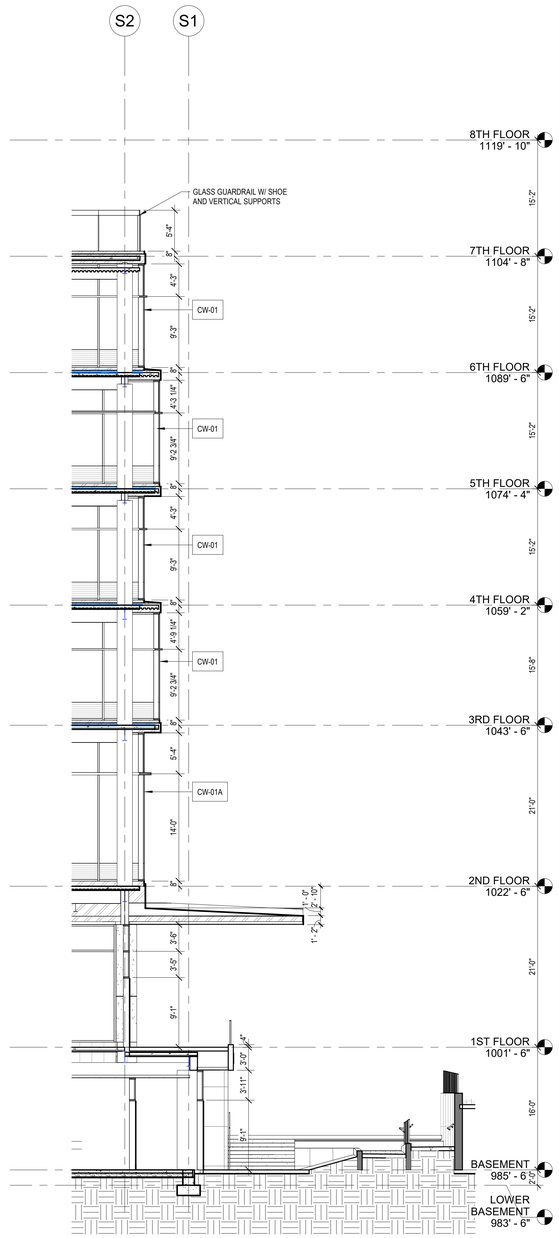


2 **Section S-005**
1/8" = 1'-0"



1 **Section S-004**
1/8" = 1'-0"

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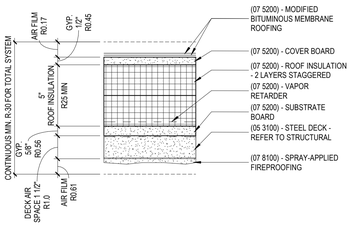
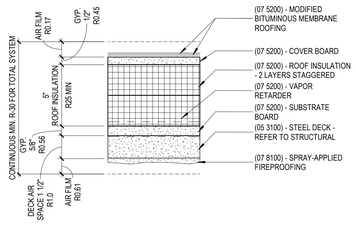
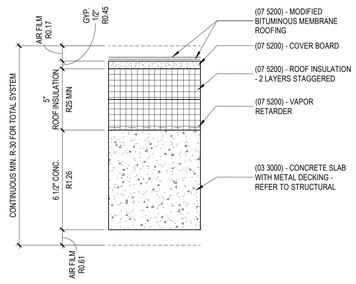


R1 - MODIFIED BITUMEN SLOPED METAL DECK

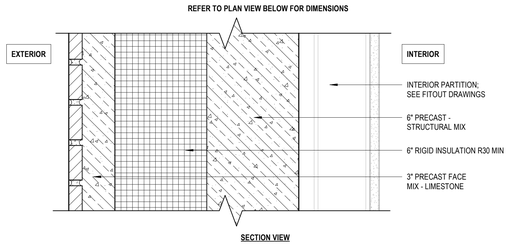


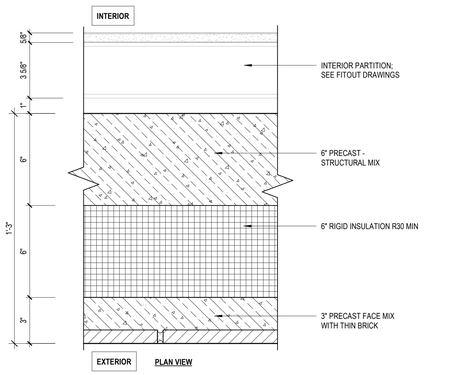
R2 - MODIFIED BITUMEN FLAT METAL DECK + TAPERED



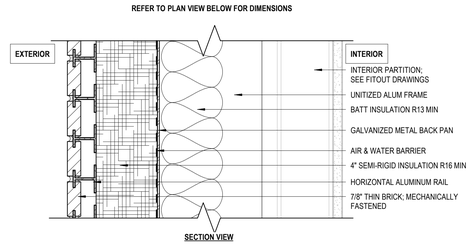
R3 - MODIFIED BITUMEN FLAT CONCRETE DECK + TAPERED

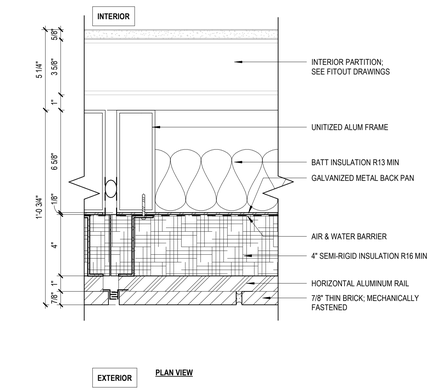
7 ROOF TYPES - HEB
3" = 1'-0"



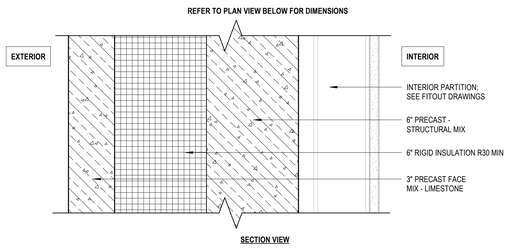


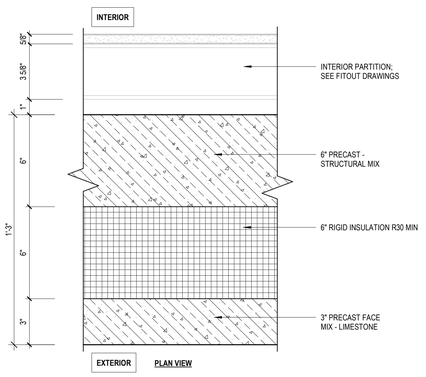
6 OPTION 3 - EXT WALL INSULATED PRECAST PANEL WITH THIN BRICK
3" = 1'-0"



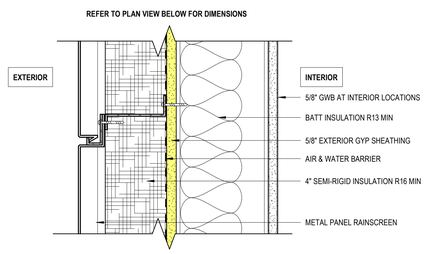


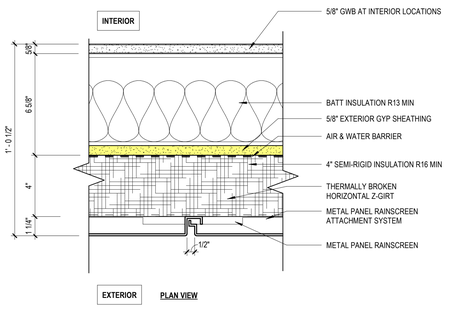
5 OPTION 2 - EXT WALL THIN BRICK ON UNITIZED FRAME
3" = 1'-0"



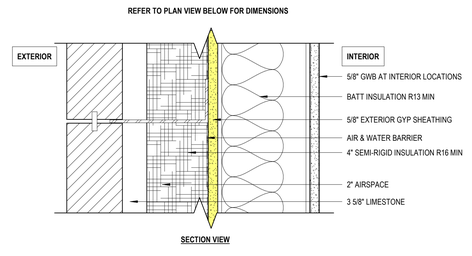


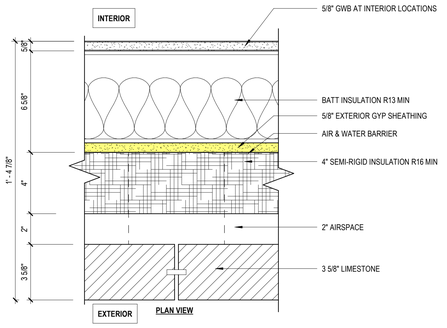
4 EXT WALL INSULATED PRECAST PANEL LIMESTONE LOOK
3" = 1'-0"



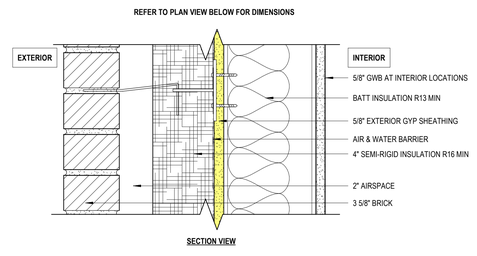


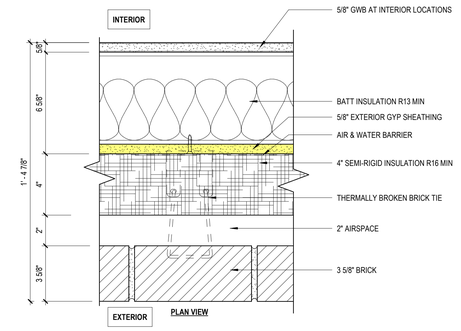
3 EXT WALL MTL PNL ON METAL STUD BACK-UP
3" = 1'-0"





2 EXT WALL LIMESTONE ON METAL STUD BACK-UP
3" = 1'-0"





1 OPTION 1 - EXT WALL BRICK ON METAL STUD BACK-UP
3" = 1'-0"

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UNIVERSITY OF KENTUCKY
HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
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ARCHITECTURAL

PROJECT	202170
DATE	10.20.2023

REVISIONS

No.	Description	Date

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EXTERIOR ASSEMBLIES

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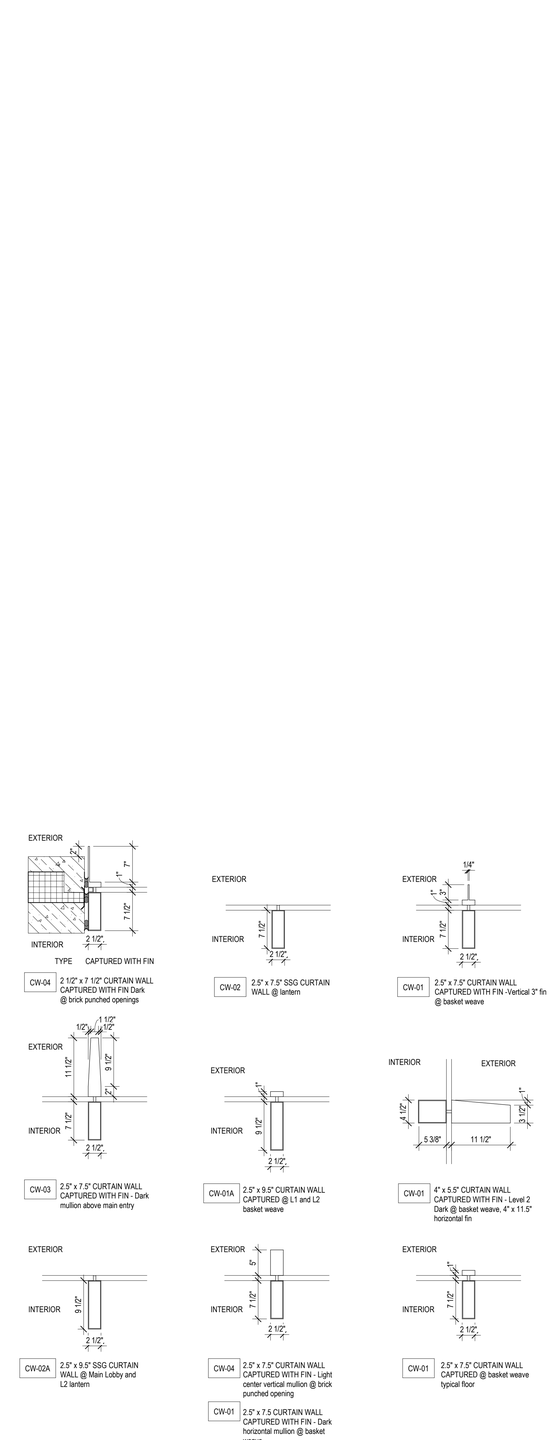
Glazing Types
1/4" = 1'-0"



1 ALUM FRAME PROFILE TYPES
1" = 1'-0"

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859.252.6781

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EXTERIOR CURTAIN WALL GLAZING AND FRAME TYPES

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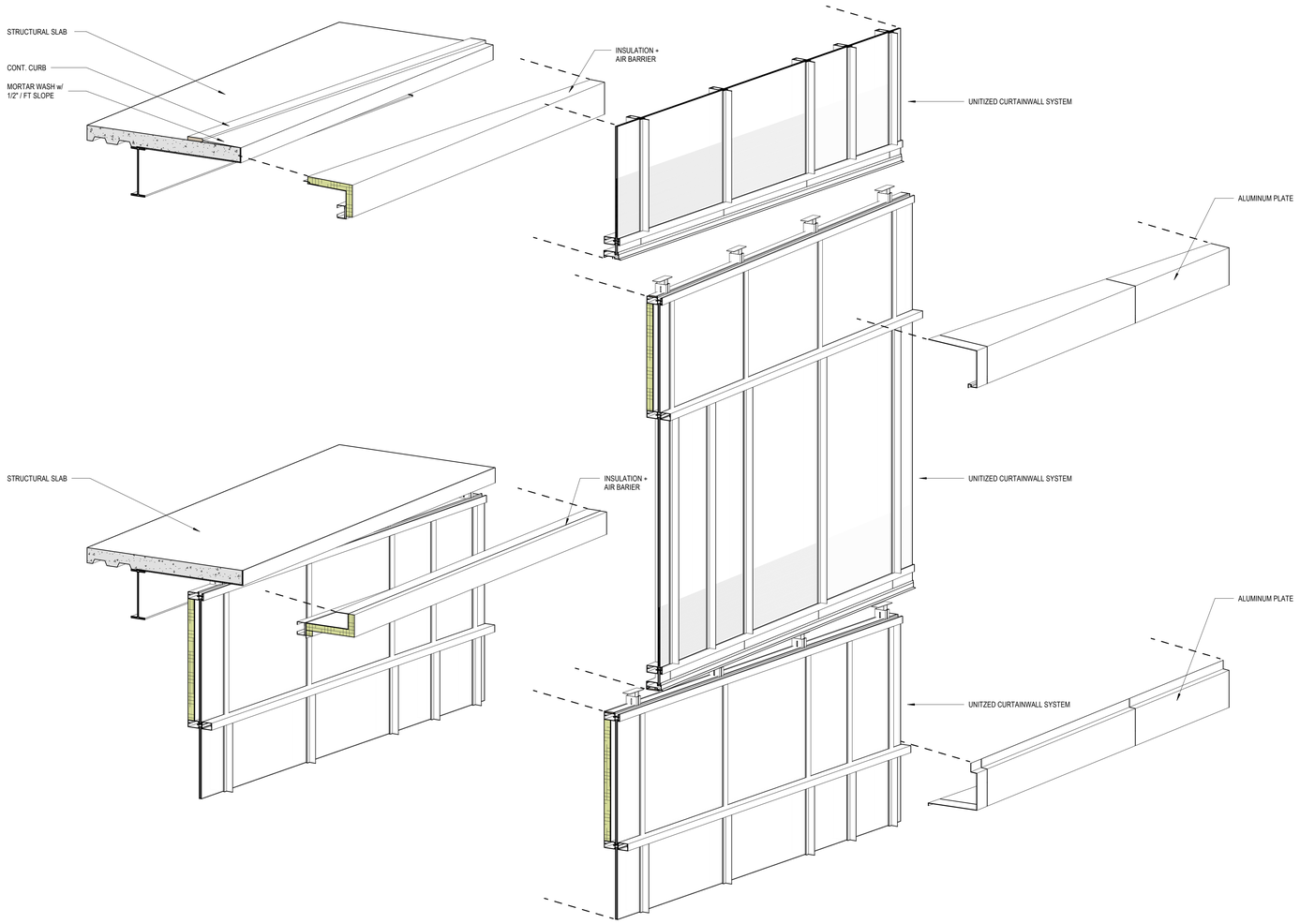
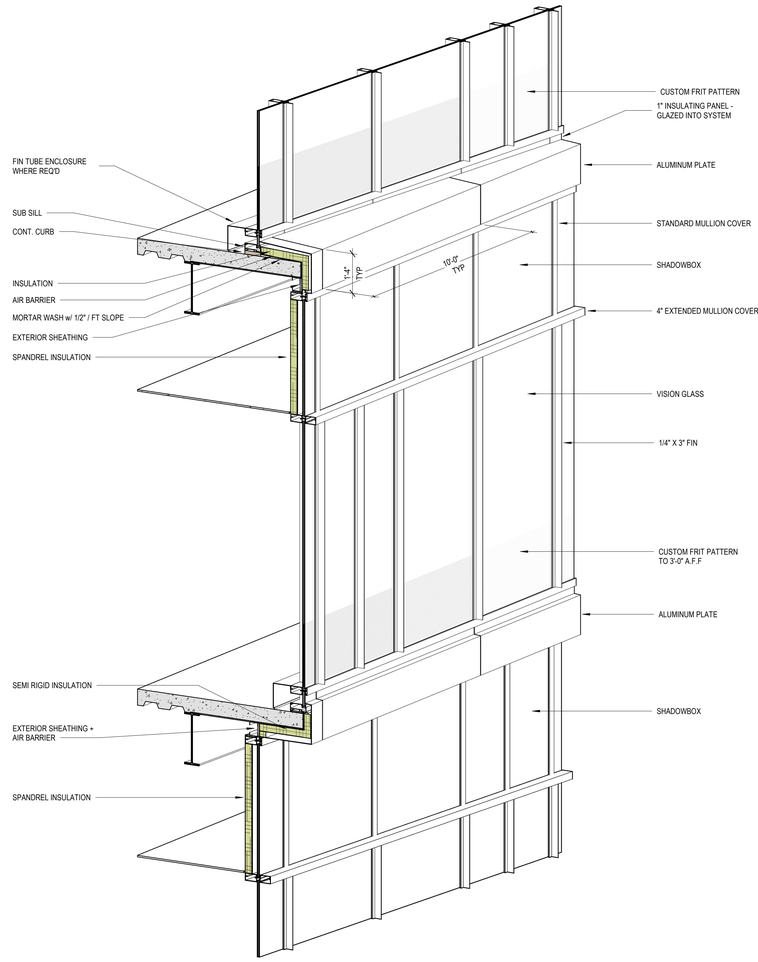


2 ISOMETRIC DETAIL AT BASKETWEAVE SILL-EXPLODED



1 ISOMETRIC DETAIL AT BASKETWEAVE SILL

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ISOMETRIC DETAILS

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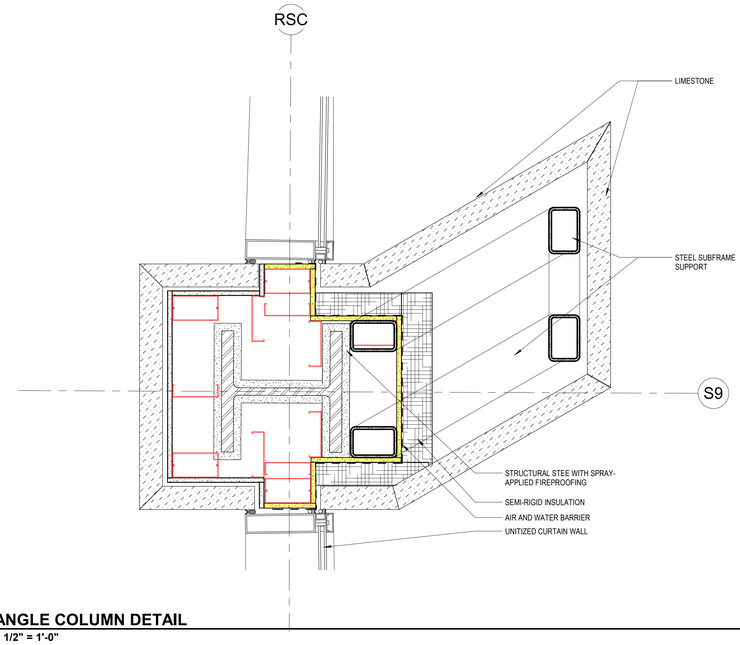

1 **ANGLE COLUMN DETAIL**
1 1/2" = 1'-0"

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PLAN DETAILS

A-521

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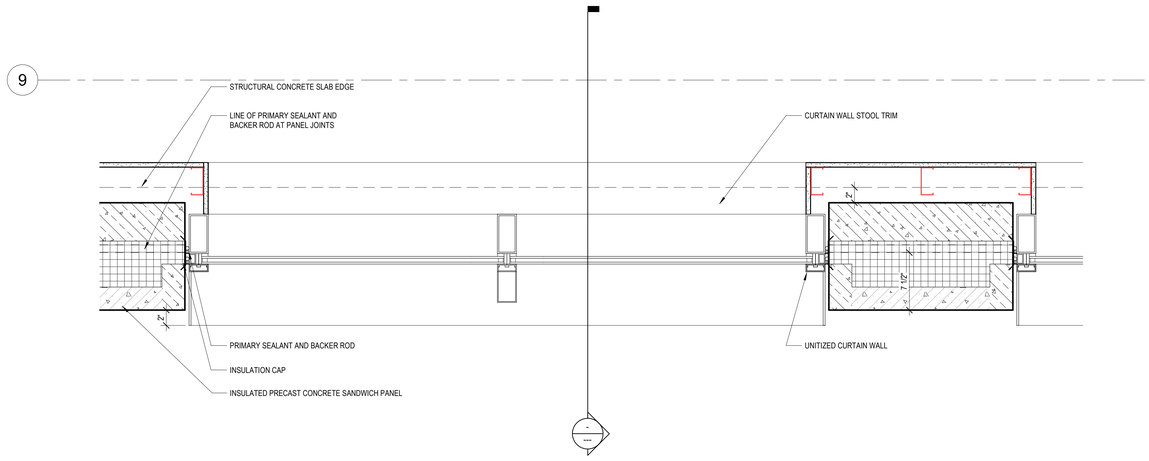
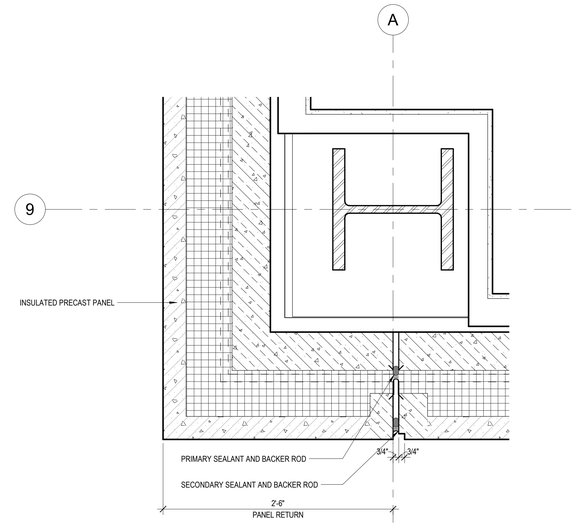
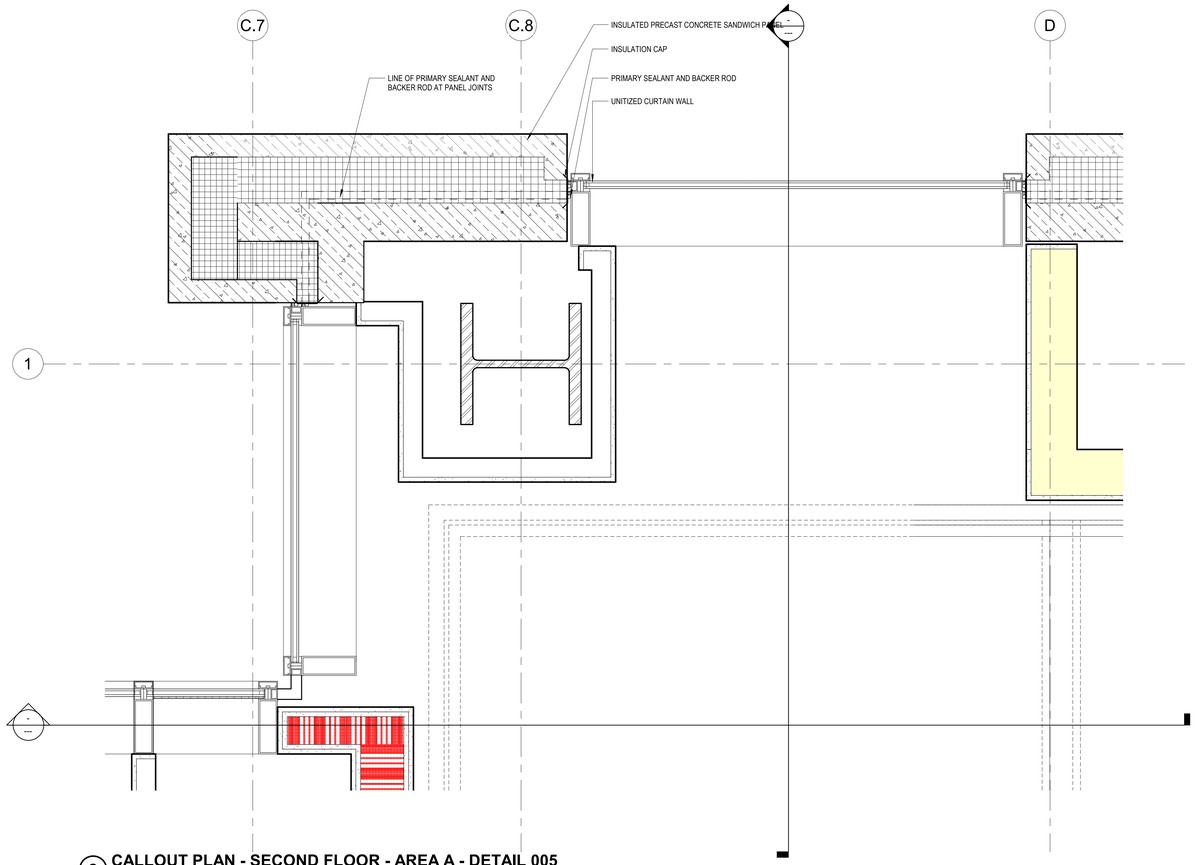


4 **CALLOUT PLAN - SECOND FLOOR - AREA B - DETAIL 002**
1 1/2" = 1'-0"



3 **CALLOUT PLAN - SECOND FLOOR - AREA B - DETAIL 001**
1 1/2" = 1'-0"



2 **CALLOUT PLAN - SECOND FLOOR - AREA A - DETAIL 005**
1 1/2" = 1'-0"

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ARCHITECTURAL

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PLAN DETAILS

A-522

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3 **EXTERIOR DETAIL - BRICK PRECAST WALL**
1 1/2" = 1'-0"

2 **EXTERIOR DETAIL - BRICK TO FOUNDATION WALL**
1 1/2" = 1'-0"

1 **FOUNDATION DETAILS - BASEMENT**
1 1/2" = 1'-0"

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ENLARGED SECTION DETAILS

A-531

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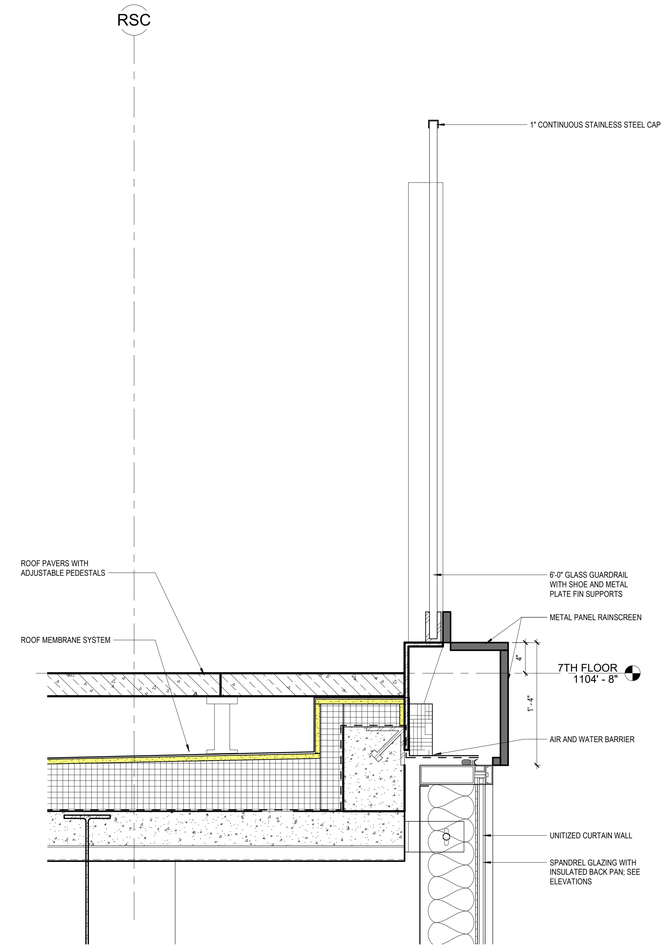
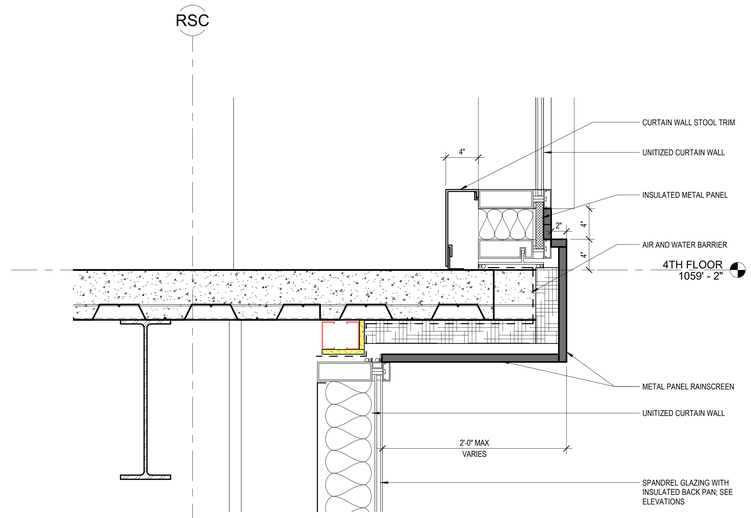
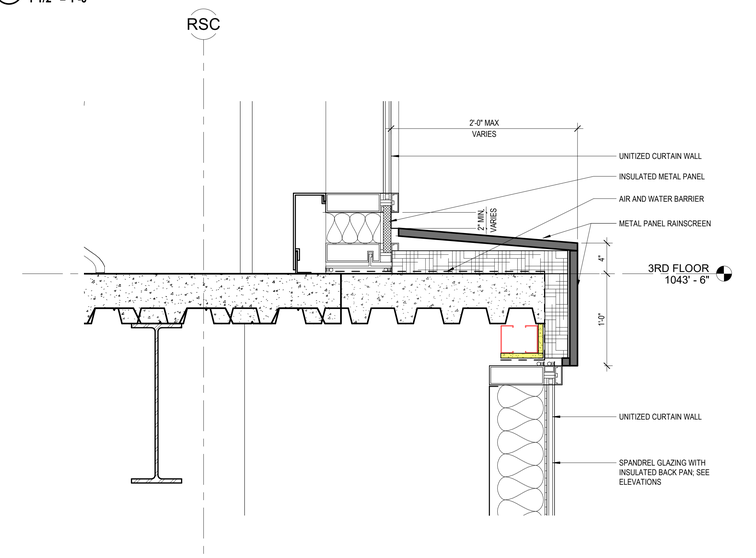


3 **SECTION DETAIL AT 6FT GLASS GUARDRAIL**
1 1/2" = 1'-0"



2 **SECTION DETAIL - BASKET WEAVE HEAD**
1 1/2" = 1'-0"



1 **SECTION DETAIL - BASKET WEAVE BASE**
1 1/2" = 1'-0"

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ARCHITECTURAL

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ENLARGED SECTION DETAILS

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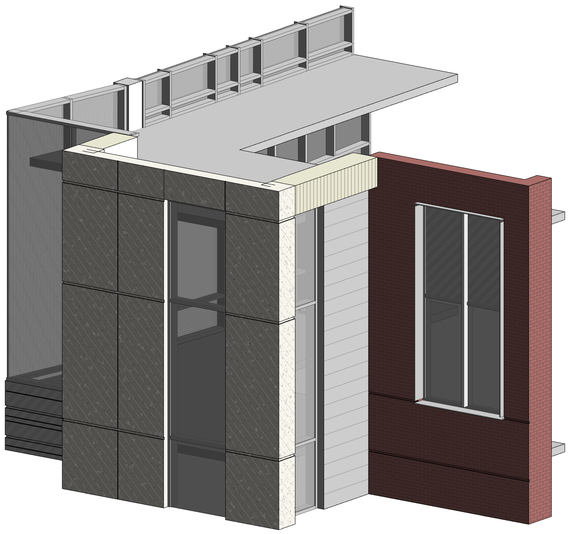
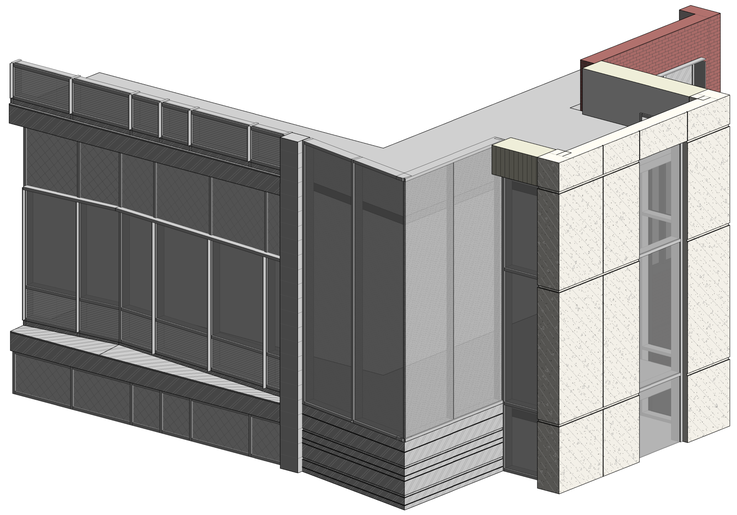
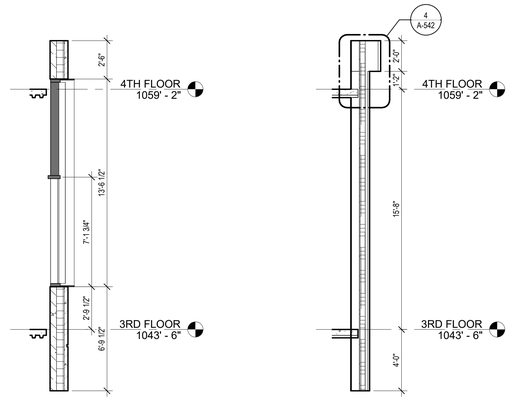


6 **Exterior Visual Mockup - North**



5 **Exterior Visual Mockup - East**

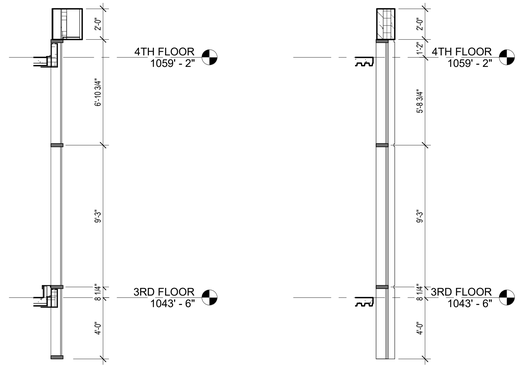


12 **WALL SECTION - BRICK ON PRECAST**
1/4" = 1'-0"

11 **WALL SECTION - MTL PANEL**
1/4" = 1'-0"

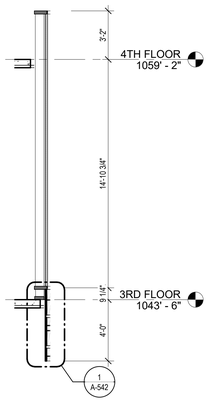
MATERIAL LEGEND

- MTP-01, METAL TRIM PANELS @ FLOOR LEVELS, MISC TRANSITIONS
  MTP-02, METAL PANEL RAINSCREEN W/ INTEGRATED REVEALS
  MTP-06: METAL PANEL @ PUNCHED OPENING
- MTP-03: PROFILE METAL PANEL @ PENTHOUSE & SCREENWALL
- MTP-04: METAL PANEL RAINSCREEN COPING @ PENTHOUSE
- GL-01: IGU VISION
  GL-02: IGU VISION BIRD SAFE GLASS
- GL-03: SPANDREL GLASS / SHADOWBOX
- GL-04: INSULATING GLASS W/ CUSTOM FRIT @ BASKET WEAVE
- GL-05: 1" INSULATING GLASS W/ CUSTOM FRIT @ LANTERN
- GL-06: 1" INSULATING CLEAR GLASS @ ENTRY VESTIBULE
- PCS-01: ARCHITECTURAL PRECAST CONCRETE - LIMESTONE LOOK
- PCS-02: ARCH. PRECAST W/ THIN BRICK VENEER
- STP-01: LIMESTONE BASE - MEDIUM GRAY
- STP-02: LIMESTONE
- RLG - 01: 6' GLASS GUARDRAIL
- RLG - 02: 42" GLASS GUARDRAIL
- RLG - 03: 42" METAL RAILING SYSTEM W/ VERTICAL PICKETS
- LVR-01: MECHANICAL LOUVER
- MRP-01 INVERTED FLAT SEAM METAL ROOF
- MTP-05 METAL PLANK SOFFIT W/ WOOD LOOK FINISH

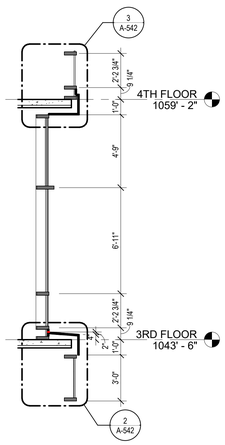


10 **WALL SECTION - CW AT BOOKEND RETURN**
1/4" = 1'-0"

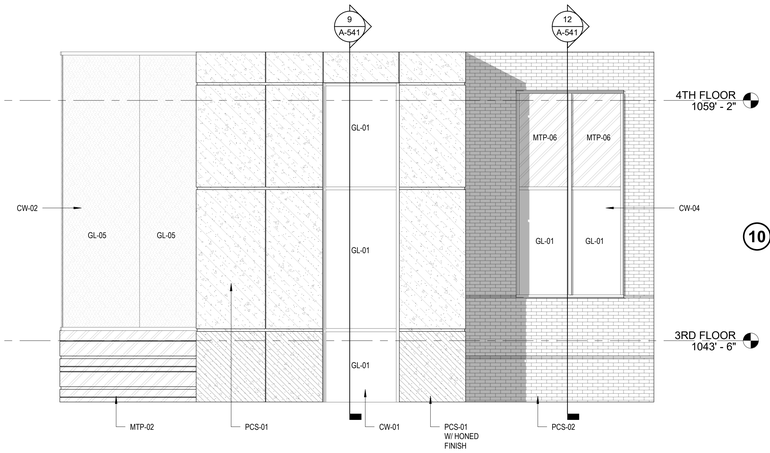
9 **WALL SECTION - CW AT BOOKEND PRECAST**
1/4" = 1'-0"



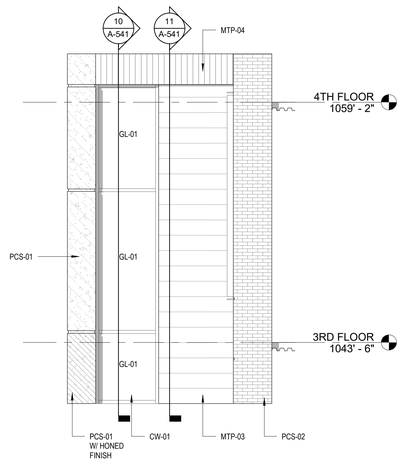
8 **WALL SECTION - LANTERN**
1/4" = 1'-0"



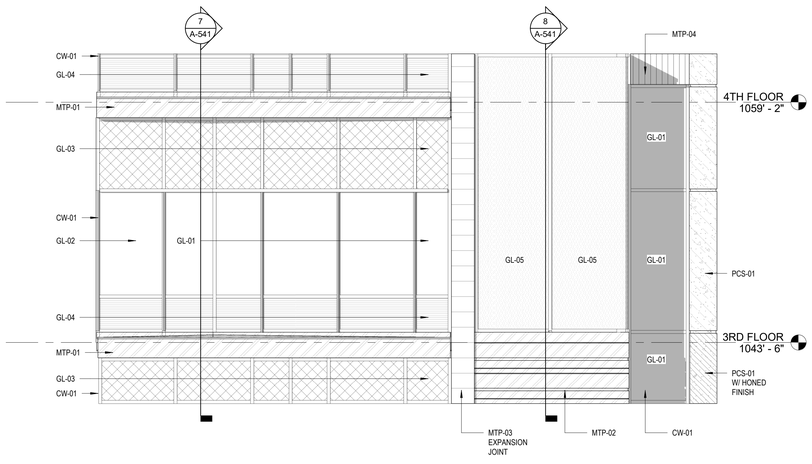
7 **WALL SECTION - BASKET WEAVE**
1/4" = 1'-0"



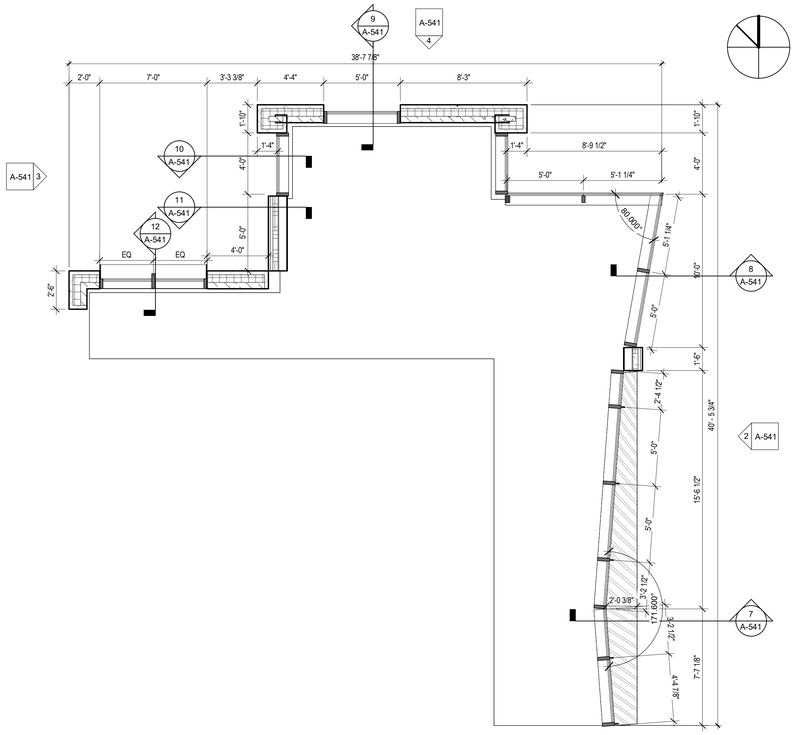
4 **ENLARGED ELEVATION - EXTERIOR MOCKUP - NORTH ELEVATION**
1/4" = 1'-0"



3 **ENLARGED ELEVATION - EXTERIOR MOCKUP - WEST ELEVATION**
1/4" = 1'-0"



2 **ENLARGED ELEVATION - EXTERIOR MOCKUP - EAST ELEVATION**
1/4" = 1'-0"



1 **ENLARGED PLAN - EXTERIOR MOCKUP**
1/4" = 1'-0"

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EXTERIOR MOCKUP

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MATERIAL LEGEND

- MTP-01, METAL TRIM PANELS @ FLOOR LEVELS, MISC TRANSITIONS
  MTP-02, METAL PANEL RAINSCREEN W/ INTEGRATED REVEALS
  MTP-06: METAL PANEL @ PUNCHED OPENING
- MTP-03: PROFILE METAL PANEL @ PENTHOUSE & SCREENWALL
- MTP-04: METAL PANEL RAINSCREEN COPING @ PENTHOUSE
- GL-01: IGU VISION
  GL-02: IGU VISION BIRD SAFE GLASS
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- GL-04: INSULATING GLASS W/ CUSTOM FRIT @ BASKET WEAVE
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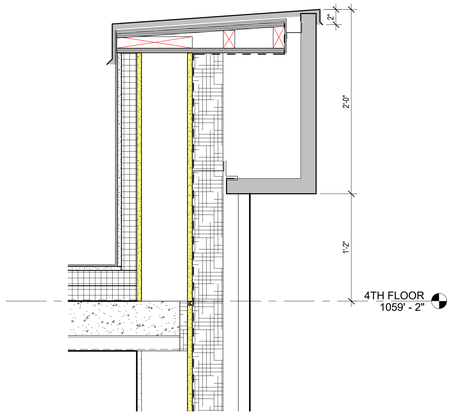
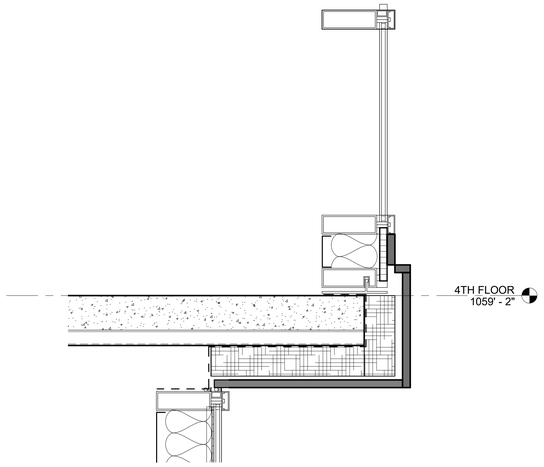
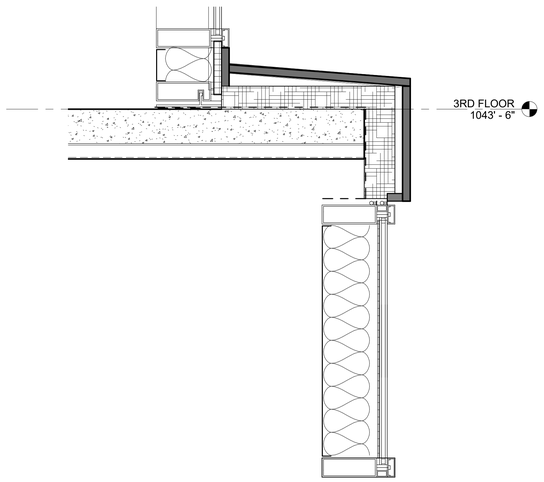
- PCS-01: ARCHITECTURAL PRECAST CONCRETE - LIMESTONE LOOK
- PCS-02: ARCH. PRECAST W/ THIN BRICK VENEER
- STP-01: LIMESTONE BASE - MEDIUM GRAY
- STP-02: LIMESTONE
- RLG - 01: 6' GLASS GUARDRAIL
- RLG - 02: 42" GLASS GUARDRAIL
- RLG - 03: 42" METAL RAILING SYSTEM W/ VERTICAL PICKETS
- LVR-01: MECHANICAL LOUVER
- MRP-01 INVERTED FLAT SEAM METAL ROOF
- MTP-05 METAL PLANK SOFFIT W/ WOOD LOOK FINISH



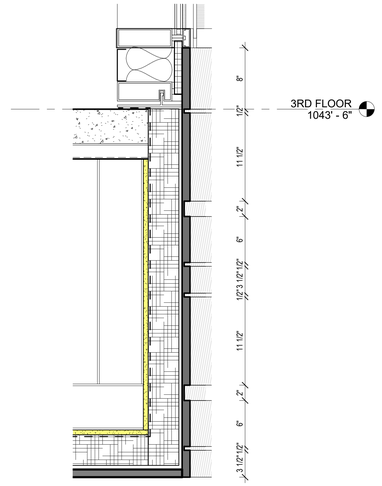
4 SECTION DETAIL - LIMESTONE LOOK METAL PANEL TRIM
1 1/2" = 1'-0"



3 SECTION DETAIL - BASKET WEAVE HEAD
1 1/2" = 1'-0"



2 SECTION DETAIL - BASKET WEAVE BASE
1 1/2" = 1'-0"



1 SECTION DETAIL - LANTERN BASE METAL PANEL
1 1/2" = 1'-0"

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UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY - BLDG NO. 0724
1149 UNIVERSITY DRIVE, LEXINGTON, KENTUCKY

ARCHITECTURAL

PROJECT	202170
DATE	11.06.2023

REVISIONS

No.	Description	Date

JRA ARCHITECTS HAS RETAINED AN ELECTRONIC VERSION OF THESE DRAWINGS. THE CLIENT AGREES NOT TO REUSE THESE DRAWINGS - IN ELECTRONIC OR ANY OTHER FORMAT - IN WHOLE, OR IN PART, FOR ANY PURPOSE OTHER THAN FOR THE CURRENT PROJECT. THE CLIENT AGREES TO TRANSFER THESE ELECTRONIC FILES TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF THE ARCHITECT. THE CLIENT FURTHER AGREES TO WAIVE ALL CLAIMS AGAINST THE ARCHITECT RESULTING IN ANY WAY FROM ANY UNAUTHORIZED CHANGES TO OR REUSE OF THE ELECTRONIC FILES FOR ANY OTHER PROJECT BY ANYONE OTHER THAN THE ARCHITECT.

EXTERIOR MOCKUP

A-542

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PLUMBING GENERAL NOTES

A. COORDINATE THE LOCATION OF DRAINS, THERMOSTATS, GAS OUTLETS, ETC., WITH ALL CASEWORK EQUIPMENT, MECHANICAL ROOM EQUIPMENT, ETC., PRIOR TO COMMENCING INSTALLATION. WORK NOT SO COORDINATED SHALL BE REMOVED AND PROPERLY INSTALLED AT THE EXPENSE OF THE CONTRACTOR.

B. THE CONTRACTOR SHALL EXERCISE EXTREME CARE IN THE COURSE OF THEIR WORK SO AS TO ENSURE THAT THEY DO NOT INTERRUPT ANY EXISTING SERVICE. FOR SAFETY PURPOSES, PAY PARTICULAR ATTENTION TO THIS PRECAUTION RELATIVE TO NATURAL GAS AND ELECTRICAL LINES. VERIFY THE LOCATION, SIZE, TYPE, ETC., OF EACH UNDERGROUND OR OVERHEAD UTILITY. ALL WORK SHALL BE PERFORMED IN ACCORD WITH ALL FEDERAL, STATE AND/OR LOCAL RULES, REGULATIONS, STANDARD AND SAFETY REQUIREMENTS. UTILITIES SHALL BE INSTALLED IN ACCORD WITH THE APPLICABLE MUNICIPALITY OR UTILITY COMPANY STANDARDS. IN ALL CASES, THE MOST STRINGENT REQUIREMENT SHALL APPLY.

C. WHERE WORK IS REQUIRED ABOVE EXISTING LAY-IN, PLASTER OR GYPSUM BOARD CEILINGS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL AND REINSTALLATION (OR REPLACEMENT, IF DAMAGED) OF ALL CEILING OR TILE AND GRID MEMBERS NECESSARY TO PERFORM HIS WORK. NEW TILE AND GRID SHALL MATCH THE SURROUNDING AREAS. ALL PATCHING WORK SHALL MATCH ADJACENT SURFACES.

D. ALL NEW WORK SHALL BE HUNG FROM STRUCTURE, NOT FROM THE WORK OF OTHER TRADES, WHETHER EXISTING OR NEW.

E. COORDINATE ALL WORK WITH PROJECT PHASING REQUIREMENTS.

F. PATCH, REPAIR AND PAINT OR PROVIDE WALL COVERING FOR (TO OWNER'S STANDARDS) EXISTING WALLS, CEILINGS, ETC., THAT ARE TO REMAIN IF DAMAGED DURING CONSTRUCTION. REPAIRS SHALL MATCH ADJACENT SURFACES TO THE SATISFACTION OF THE ARCHITECT AND OWNER.

G. OBSERVE ALL APPLICABLE CODES, RULES AND REGULATIONS THAT MAY APPLY TO THE WORK UNDER THIS CONTRACT. (CITY, COUNTY, LOCAL, FEDERAL, MUNICIPALITY, UTILITY COMPANY, COMMONWEALTH OF KENTUCKY, ETC.)

H. CONTRACTOR SHALL BE AWARE OF UNSEEN PLUMBING WORK DURING DEMOLITION. IF ITEMS ARE UNCOVERED DURING DEMOLITION THEN FIELD VERIFY THE USE OF THE ITEMS AND PLAN AN ALTERNATE ROUTE TO RUN THESE ITEMS. THEN CONTACT THE ENGINEERS TO REVIEW THE ROUTING.

I. IF AREA OF CONSTRUCTION HAS A POST TENSION FLOOR SLAB. CONTRACTOR SHALL USE ULTRA SOUND OR OTHER APPROVED METHODS TO SURVEY THE EXISTING FLOOR STRUCTURE BEFORE MAKING ANY AND ALL FLOOR PENETRATIONS.

J. WHERE FIRE PROOFING IS SPRAYED ON EXISTING STRUCTURE ALL EXISTING CONDUITS, WATER, HYDRONIC, STEAM, CHILLED WATER, FIRE PROTECTION LINES, MED GAS, ETC. SHALL BE LOWERED TO BE BELOW FULL THICKNESS OF FIRE PROOFING WITH NO INTERFERENCE.

K. ALL PENETRATIONS OF FIRE AND SMOKE RATED ASSEMBLIES SHALL BE APPROPRIATELY FIRE STOPPED PER AN APPROVED U.L. LISTED STANDARD. CONTRACTOR SHALL PAY PARTICULAR ATTENTION TO INSULATED PIPING PENETRATIONS.

L. ALL WORK REQUIRING DOWNTIME OF ANY AREA IN THE BUILDING SHALL BE SCHEDULED 2 WEEKS IN ADVANCE, AND SHALL COMPLY WITH INTERIM LIFE SAFETY MEASURES.

M. ALL PIPING IN ROOMS WITH CEILINGS SHALL BE ABOVE CEILING EXCEPT AS NOTED.

N. IN ACCORDANCE WITH K.R.S. ALL PLUMBING WORK SHALL BE CONSTRUCTED IN COMPLIANCE WITH PLANS APPROVED BY AND BEARING THE APPROVAL STAMP OF THE KENTUCKY DIVISION OF PLUMBING AND/OR THE DIVISION OF WATER. THE CONTRACTOR SHALL NOT BEGIN WORK UNTIL HE HAS RECEIVED SUCH APPROVED PLANS.

O. LOCATIONS OF PIPING AND EQUIPMENT ARE APPROXIMATE AND SUBJECT TO MINOR ADJUSTMENTS IN THE FIELD. DO NOT SCALE THE DRAWINGS.

P. ALL OFFSETS IN PIPING ARE NOT NECESSARILY SHOWN. PROVIDE ADDITIONAL OFFSETS WHERE NECESSARY.

Q. THE CONTRACTOR IS RESPONSIBLE FOR ALL UTILITY COMPANY FEES OR OTHER COSTS THAT ANY UTILITY COMPANY MAY REQUIRE TO COMPLETE THEIR WORK. (GAS, SEWER, WATER, ETC.).

R. INSTALL ALL PIPING AND EQUIPMENT IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTION. IF IN CONFLICT WITH THE DESIGN INDICATED IN CONTRACT DOCUMENTS, ADVISE THE ENGINEERS PRIOR TO INSTALLATION FOR CLARIFICATION. PROVIDE RECOMMENDED ACCESS AND SERVICE CLEARANCES FOR ALL EQUIPMENT.

S. SEAL AIRTIGHT AROUND ALL DUCTS AND PIPING PENETRATIONS THROUGH WALLS, FLOORS AND ROOF. PROVIDE FIRE STOPPING IN FIRE PARTITION.

T. THE CONTRACTOR SHALL RELOCATE OR AVOID ANY EXISTING EQUIPMENT APPURTENANCES, ETC., THAT CONFLICT WITH NEW WORK.

U. WHERE MOUNTING HEIGHTS ARE NOT INDICATED OR ARE IN CONFLICT WITH ANY OTHER BUILDING SYSTEM, CONTACT THE ENGINEERS BEFORE INSTALLATION. REFER ALSO TO ARCHITECTURAL WALL INTERIOR AND EXTERIOR WALL ELEVATIONS, CEILING HEIGHTS AND OTHER DETAIL OF THESE DOCUMENTS.

V. DOUBLE WIDTH TURNING VANES SHALL BE INSTALLED IN ALL SUPPLY, RETURN, AND EXHAUST DUCTWORK ELBOWS. TURNING VANES NOT REQUIRED FOR KITCHEN EXHAUSTS.

W. ANY VIBRATING, OSCILLATING OR OTHER NOISE OR MOTION PRODUCING EQUIPMENT SHALL BE ISOLATED FROM SURROUNDING SYSTEMS IN AN APPROVED MANNER. NOISY OR STRUCTURALLY DAMAGING INSTALLATIONS SHALL BE SATISFACTORILY REPLACED OR REPAIRED AT THE INSTALLING CONTRACTOR'S EXPENSE. THE FINAL DECISION ON THE SUITABILITY OF A PARTICULAR INSTALLATION'S ACCEPTABILITY SHALL BE THAT OF THE ENGINEER.

X. DEVIATIONS IN SIZE, CAPACITIES, FIT, FINISH, ETC. FOR EQUIPMENT FROM THAT USED AS BASIS OF DESIGN SHALL BE THE RESPONSIBILITY OF THE PURCHASER OF THAT EQUIPMENT. ANY PROVISIONS REQUIRED TO ACCOMMODATE A DEVIATION, WHETHER APPROVED BY THE ENGINEERS OR NOT, SHALL BE THE RESPONSIBILITY OF THE PURCHASER.

Y. VALVES, BALANCING DAMPERS OR ANY MECHANICAL/ELECTRICAL ITEM REQUIRING ACCESS SHALL NOT BE LOCATED ABOVE A HARD CEILING. IF THIS IS NOT POSSIBLE, THEN AN APPROPRIATELY SIZED ACCESS DOOR SHALL BE PLACED UNDER THE ITEM TO ALLOW EASY MAINTENANCE AND ADJUSTMENT. ADDITIONALLY ALL SUCH ITEMS SHALL NOT BE LOCATED AN UNREASONABLE DISTANCE ABOVE THE CEILINGS. IN GENERAL ALL SUCH ITEMS UNLESS INDICATED OTHERWISE SHALL BE MOUNTED SIX TO TWELVE INCHES ABOVE THE CEILING. IF IN DOUBT, CONTACT ENGINEER PRIOR TO INSTALLING.

Z. ALL MANHOLES, VAULTS AND SIMILAR UNDERGROUND STRUCTURES SHALL HAVE THE TOP ELEVATION SET FLUSH WITH FINISHED GRADE UNLESS SPECIFICALLY NOTED OTHERWISE.

AA. WHEN RUNNING ANY TYPE OF PIPING BELOW A FOOTER, OR IN THE ZONE OF INFLUENCE THE PIPING SHALL BE BACKFILLED WITH CEMENTITIOUS FLOWABLE FILL PER SPECIFICATIONS. WHENEVER POSSIBLE, LOCATE PIPING OUTSIDE OF THE ZONE OF INFLUENCE. THE ZONE OF INFLUENCE IS THE AREA UNDER THE FOOTER WITHIN A 45 DEGREE ANGLE PROJECTING DOWN FROM THE BOTTOM EDGE OF THE FOOTER OF ALL SIDES OF THE FOOTER. ADDITIONALLY, GREASE TRAPS, MANHOLES, VAULTS AND OTHER UNDERGROUND STRUCTURES SHALL BE HELD AWAY FROM BUILDING WALLS FAR ENOUGH TO BE OUTSIDE OF THE ZONE OF INFLUENCE.

AB. WORK IN CONFINED AREAS SHALL BE IN ACCORDANCE WITH THE OWNER'S SAFETY POLICY REQUIREMENTS.

MECHANICAL HAZARDOUS MATERIALS

A. THE CONTRACTOR IT IS HEREBY ADVISED THAT IS POSSIBLE THAT ASBESTOS AND/OR OTHER HAZARDOUS MATERIALS ARE OR WERE PRESENT IN THIS BUILDING(S). ANY WORKER, OCCUPANT, VISITOR, ETC., WHO ENCOUNTERS ANY MATERIAL OF WHOSE CONTENT THEY ARE NOT CERTAIN SHALL PROMPTLY REPORT THE EXISTENCE AND LOCATION OF THAT MATERIAL TO THE OWNER. FURTHERMORE, THE CONTRACTOR SHALL INSURE THAT NO ONE COMES NEAR TO OR IN CONTACT WITH ANY SUCH MATERIAL OR FUMES THEREFROM UNTIL ITS CONTENT CAN BE ASCERTAINED TO BE NON-HAZARDOUS.

B. CMTA, INC. HAS NO EXPERTISE IN THE DETERMINATION OF THE PRESENCE OF ANY HAZARDOUS MATERIAL. THEREFORE, NO ATTEMPT HAS BEEN MADE BY CMTA TO IDENTIFY THE EXISTENCE OR LOCATION OF ANY SUCH HAZARDOUS MATERIAL. FURTHERMORE, CMTA NOR ANY AFFILIATE HEREOF WILL NOT OFFER OR MAKE ANY RECOMMENDATIONS RELATIVE TO THE REMOVAL, HANDLING OR DISPOSAL OF SUCH MATERIAL.

C. IF THE WORK WHICH IS TO BE PERFORMED INTERFACES, CONNECTS OR RELATES IN ANY PHYSICAL WAY WITH OR TO EXISTING COMPONENTS WHICH CONTAIN OR BEAR ANY HAZARDOUS MATERIAL, ASBESTOS BEING ONE, THEN IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO CONTACT THE OWNER AND SO ADVISE HIM IMMEDIATELY.

D. THE CONTRACTOR BY EXECUTION OF THE CONTRACT FOR ANY WORK AND/OR BY THE ACCOMPLISHMENT OF ANY WORK THEREBY AGREE TO BRING NO CLAIM RELATIVE TO HAZARDOUS MATERIALS FOR NEGLIGENCE, BREACH OF CONTRACT, INDEMNITY, OR ANY OTHER SUCH ITEM AGAINST CMTA, ITS PRINCIPALS, EMPLOYEES, AGENTS OR CONSULTANTS. ALSO, THE CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD CMTA, ITS PRINCIPALS, EMPLOYEES, AGENTS AND CONSULTANTS HARMLESS FROM ANY SUCH RELATED CLAIMS WHICH MAY BE BROUGHT BY ANY SUBCONTRACTORS, SUPPLIERS OR ANY OTHER THIRD PARTIES.

E. THE CONTRACTOR IS DIRECTED TO THE SPECIFICATIONS FOR FURTHER INFORMATION.

ABBREVIATIONS

AC	ALTERNATING CURRENT
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AFR	ABOVE FINISHED ROOF
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY
AHJ	AUTHORITY HAVING JURISDICTION
AMP	AMPERE (AMP, AMPS)
ANSI	AMERICAN NATIONAL STANDARD INSTITUTE
APD	AIR PRESSURE DROP
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR-CONDITIONING ENGINEERS
AVG	AVERAGE
BAS	BUILDING AUTOMATION SYSTEM
BHP	BRAKE HORSEPOWER
BTU	BRITISH THERMAL UNIT
CAP	CAPACITY
CD	CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
C.I.	CAST IRON
CLG	CEILING
CLR	CLEAR
CO	CARBON MONOXIDE
COND	CONDENS (-ER, -ING, -ATION, -ATE)
CONT	CONTINU (-ED, -OUS)
CU FT	CUBIC FEET
CU IN	CUBIC INCHES
CV	VALVE FLOW COEFFICIENT
dB	DECIBEL
DB	DRY BULB
DC	DIRECT CURRENT
DD	DUCT SMOKE DETECTOR
DDC	DIRECT DIGITAL CONTROLS
DEG	DEGREE (-S)
DIA	DIAMETER (-S)
DN	DOWN
DWG	DRAWING
EC	ELECTRICAL CONTRACTOR
ELEV	ELEVA (-TION, -TOR)
ENGR	ENGINEER
EQ	EQUAL
ESP	EXTERNAL STATIC PRESSURE
ETR	EXISTING TO REMAIN
EVAP	EVAPORAT (-E, -ING, -ED, -OR, -ION)
EWT	ENTERING WATER TEMPERATURE
EXP	EXPANSION
EXT	EXTERIOR
FA	FREE AREA

ABBREVIATIONS (CONTINUED)

FL	FLOOR
FLA	FULL LOAD AMPS
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FPC	FIRE PROTECTION CONTRACTOR
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET **OR** FOOT
FUT	FUTURE
FV	FACE VELOCITY
GA	GAGE/GAUGE
GAL	GALLON (-S)
GC	GENERAL CONTRACTOR
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GR	GRAINS
H	HUMIDITY
HD	HEAD
HG	MERCURY
HORIZ	HORIZONTAL
HP	H (-ORSEPOWER, -EAT PUMP)
HR	HOUR (-S)
HVAC	HEATING, VENTILATING, & AIR-CONDITIONING
Hz	HERTZ
ID	I (-DENTIFICATION, -NSIDE DIAMETER, -NSIDE DIMENSION)
IN	INCH (-ES)
INSUL	INSULAT (-ED, -ION)
INT	INTER (-IOR, -ERVAL)
IPS	IRON PIPE SIZE
kW	KILOWATT
kWh	KILOWATT HOUR
LBS	POUNDS
LF	LINEAR FEET/FOOT
LRA	LOCKED ROTOR AMPS
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	BTU PER HOUR [THOUSANDS]
MCA	MINIMUM CIRCUIT AMPS
MFG	MANUFACTURER
MIN	MIN (-IMUM, -UTE)
MISC	MISCELLANEOUS
MOCP	MAXIMUM OVERCURRENT PROTECTION [AMPS]
MTG	MOUNTING
N/A	NOT APPLICABLE
NC	NOISE CRITERIA **OR** NORMALLY CLOSED
NEBB	NATIONAL ENVIRONMENTAL BALANCING BUREAU
NIC	NOT IN CONTRACT

ABBREVIATIONS (CONTINUED)

NO	NORMALLY OPEN **OR** NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DI (-AMETER, -MENSION)
OFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
OR	OPEN RECEPTACLE
OZ	OUNCE (-S)
PC	PLUMBING CONTRACTOR
PD	PRESSURE DROP
PH	PHASE [ELECTRICAL]
PLBG	PLUMBING
PPM	PARTS PER MILLION
PRS	PRESSURE REDUCING STATION
PRV	PRESSURE REDUCING VALVE (STEAM, WATER, GAS)
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIG	PSI GAUGE
RLA	RUNNING LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
SQ	SQUARE
SQ FT	SQUARE FEET **OR** FOOT
SQ IN	SQUARE INCH **OR** INCHES
TAB	TESTING AND BALANCING
TBD	TO BE DETERMINED
TE	TOP ELEVATION
TEMP	TEMPERATURE
TPA	TRAP PRIMER ADAPTER
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
V	VOLT (-AGE, -S)
VAR	VARI (-ABLE, -IES)
VAV	VARIABLE AIR VOLUME
VEL	VELOCITY
VFD	VARIABLE FEQUENCY DRIVE
W	WATT (-AGE, -S)
WB	WET BULB
WBT	WET BULB TEMPERATURE
WPD	WATER PRESSURE DROP
WT	WEIGHT
W/	WITH
W/O	WITHOUT
%	PERCENT
ΔP	DIFFERENTIAL PRESSURE
ΔT	TEMPERATURE DIFFERENCE
℄	CENTERLINE

MECHANICAL DEMOLITION NOTES

A. THE CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR AREAS IN WHICH THE CEILING IS REMAINING. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING THE EXISTING CEILING AS REQUIRED AND REINSTALLATION. TEMPORARILY SUPPORT LIGHTS, DIFFUSERS, CEILING ETC. REPLACE BROKEN CEILING TILES WITH NEW AT NO ADDITIONAL COST TO OWNER. FIELED VERIFY EXACT REQUIREMENTS.

B. DURING SPRINKLER SYSTEM OUTAGES THE CONTRACTORS SHALL PROVIDE FIRE WATCH OF AREAS WITH OUTAGES.

C. ALL WALLS AND FLOOR SLABS SHALL BE REPAIRED TO MATCH EXISTING AND TO A LIKE NEW CONDITION. ALL RATED WALLS AND FLOOR SLABS SHALL BE PATCHED AND REPAIRED TO MAINTAIN RATING.

D. ALL EXISTING BUILDING FINISHES SHALL BE PROTECTED DURING THE DEMOLITION PHASE.

E. HEAVY DASHED LINES INDICATE ITEMS FOR REMOVAL (UON) AND LIGHT SOLID LINES INDICATE EXISTING ITEMS TO REMAIN.

F. COORDINATE DISPOSAL OF ALL FIXTURES, DEVICES, ETC. (INDICATED FOR DEMOLITION) WITH THE OWNER.

G. ALL OUTAGES SHALL BE SCHEDULED THROUGH THE UK CPMD PROJECT REPRESENTATIVE FOR PROPER COORDINATION. A REQUEST FOR AN OUTAGE SHALL BE SUBMITTED IN WRITING A MINIMUM OF TWO WEEKS IN ADVANCE.

H. ALL DUCTWORK, PIPING, CONDUIT, ETC. SHALL BE INSTALLED A MINIMUM OF 4" ABOVE THE TOP OF THE CEILING GRID PER UK STANDARDS.

MECHANICAL PHASING NOTES

A. THIS PROJECT INTERFACES EXTENSIVELY WITH EXISTING BUILDING SERVICES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE AND PHASE ALL TIE-INS AND INTERRUPTIONS OF EXISTING SERVICES TO MINIMIZE OR ELIMINATE DOWNTIME. AS AN EXAMPLE, MAIN GAS SERVICE, WATER SERVICE, ELECTRICAL SERVICE, HVAC SERVICES, STEAM GENERATION, ETC., WILL BE AFFECTED AND REPLACED OR MOVED DURING THIS PROJECT. THE CONTRACTORS SHALL INSTALL ALL NEW SERVICES AND EQUIPMENT AND HAVE THEM TESTED AND FULLY AND RELIABLY FUNCTIONAL PRIOR TO INTERRUPTING, RELOCATING OR REMOVING ANY EXISTING SERVICES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO BARE ANY AND ALL COSTS ASSOCIATED WITH THIS PHASING, INCLUDING TEMPORARY SERVICES, TEMPORARY RELOCATION, PREMIUM TIME WORK, ETC. CONTRACTOR SHALL COORDINATE ALL SAID WORK WITH THE OWNER AND APPLICABLE UTILITIES PER THE CONTRACT DOCUMENTS.

GENERAL SYMBOLS

(#)	TAGGED NOTE DESIGNATOR
(A)	REVISION TRIANGLE
	ROOM TAG
TAG XXX-E / INSTANCE XXX	EQUIPMENT TAG
XXX / ##	DOMESTIC WATER RISER TAG
XXX / ##	SANITARY, WASTE, & VENT RISER TAG
XXX / ##	FIRE SUPPRESSION RISER TAG
	POINT OF CONNECTION / CONNECT TO EXISTING
	POINT OF DEMOLITION
D(XXX)	PIPING TO BE DEMOLISHED - (XXX) DENOTES SYSTEM
E(XXX)	EXISTING PIPING - (XXX) DENOTES SYSTEM
A(XXX)	ABANDONED IN PLACE PIPING - (XXX) DENOTES SYSTEM

VALVE SYMBOL LEGEND

	TWO-WAY CONTROL VALVE
	THREE-WAY CONTROL VALVE
	AUTOMATIC AIR VENT (AAV)
	MANUAL AIR VENT (MAV)
	MANUAL BALANCING VALVE (BV)
	BALL VALVE
	BUTTERFLY VALVE
	TRIPLE DUTY VALVE (TDV)
	STRAINER
	MANUAL ISOLATION VALVE
	GLOBE VALVE
	OS&Y (GATE) VALVE
	PRESSURE REDUCING VALVE (STEAM, GAS, WATER, ETC.)
	AUTO-FLOW CONTROL VALVE
	CHECK VALVE
	DOUBLE CHECK VALVE ASSEMBLY

PLUMBING PIPING LEGEND

	PIPE ELBOW TURNING UP
	PIPE ELBOW TURNING DOWN
	PIPE TEE; CONNECTION ON TOP
	PIPE TEE; CONNECTION ON BOTTOM
	PIPE CAP
AVT	ACID VENT
AW	ACID WASTE
CA	COMPRESSED AIR
CAI/E	COMBUSTION AIR INTAKE/EXHAUST
CBS/R	CHILLED BEAM SUPPLY/RETURN
CD	CONDENSATE DRAIN
CO2	CARBON DIOXIDE
LW	LAB WASTE
DCW	DOMESTIC COLD WATER (DCW)
DHW / DHW(#°F)	DOMESTIC HOT WATER (DHW)
DHR / DHR(#°F)	RECIRCULATED DOMESTIC HOT WATER (DHR)
HPC	HIGH PRESSURE STEAM CONDENSATE
HPS(#)	HIGH PRESSURE STEAM: (#) DENOTES PRESSURE
HPS/R	HEAT PUMP WATER SUPPLY/RETURN
HRS/R	HEAT RECOVERY SUPPLY/RETURN PIPING
HWS/R	HEATING WATER SUPPLY/RETURN
LPC	LOW PRESSURE STEAM CONDENSATE
LPS(#)	LOW PRESSURE STEAM: (#) DENOTES PRESSURE
MPC	MEDIUM PRESSURE STEAM RETURN
MPS(#)	MEDIUM PRESSURE STEAM: (#) DENOTES PRESSURE
SPD	STEAM CONDENSATE PUMPED DISCHARGE
SVT	STEAM VENT PIPING

PLUMBING SYMBOL LEGEND

	FLEXIBLE PIPE CONNECTION
	FLOW METER (VENTURI)
	PIPING UNION
FS	FLOW SWITCH
PS	PRESSURE SWTICH
TS	TAMPER SWITCH
	THERMOMETER
T	PETE'S PLUG; TEMPERATURE/PRESSURE PORT

APPLICABLE BUILDING CODES

APPLICABLE BUILDING CODES	DOCUMENT	YEAR
ACCESSIBLE AND USEABLE BUILDINGS AND FACILITIES	ANSI A117.1	2009
FIRE SPRINKLER CODE	NFPA 13	2013
INTERNATIONAL BUILDING CODE (IBC)	STATE EDITION	2015
INTERNATIONAL ENERGY CONSERVATION CODE (IECC) OR ASHRAE 90.1	STATE EDITION	2012
INTERNATIONAL FIRE CODE (IFC)	STATE EDITION	2015
INTERNATIONAL FUEL GAS CODE (IFGC)	STATE EDITION	2015
INTERNATIONAL MECHANICAL CODE (IMC)	STATE EDITION	2015
INTERNATIONAL PLUMBING CODE (IPC)	STATE EDITION	2015
INTERNATIONAL EXISTING BUILDING CODE (IEBC)	STATE EDITION	2009
NATIONAL ELECTRIC CODE (NEC)	NFPA 70	2017
NATIONAL FIRE ALARM & SIGNALING CODE	NFPA 72	2013
UNIFORM STATEWIDE BUILDING CODE		2018

Sheet List - Plumbing

SHEET #	SHEET NAME
MU-100	SITE MECHANICAL
MU-101	SITE MECHANICAL DEMOLITION PLAN
MU-201	SITE PLUMBING NEW WORK PLAN
MU-301	BASEMENT PLUMBING DEMOLITION PLAN
MU-401	BASEMENT PLUMBING NEW WORK PLAN
MU-501	DETAILS AND SCHEMATICS
MU-601	OVERALL PLUMBING RISER

RA
3225 Summit Square Place, Suite 200
Lexington, Kentucky 40509
859.252.6781

COMMONWEALTH OF KENTUCKY
CHRISTOPHER M. REEVES
25045
LICENSED PROFESSIONAL ENGINEER

CMTA
A LEIDOS Company
1321 Waddy Street | Louisville KY 40203 | 502.584.1984 | cmta.com

RESERVED FOR AHJ STAMP

10 S. Broadway Suite 200
St. Louis, MO 63102
314.421.2000

BP-01B DEMO, SITE UTILITES (PH1)

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

PROJECT	XKSM21
DATE	10/20/2023

REVISIONS

No.	Description	Date

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SITE MECHANICAL

MU-100

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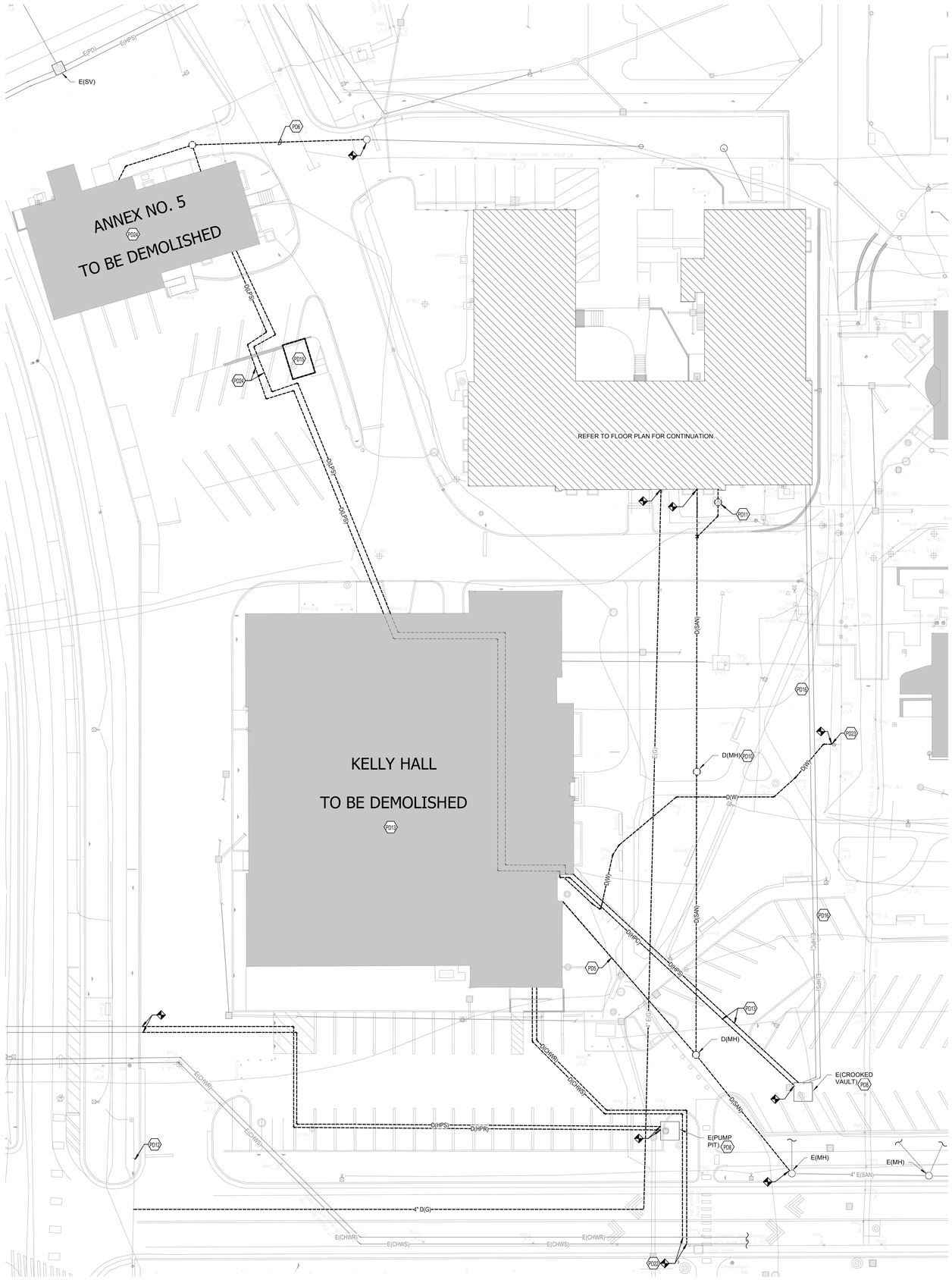

1 MU-101 **SITE PLUMBING DEMOLITION PLAN**
1" = 20'-0"

TAGGED NOTES

PD5	DEMOLISH SANITARY SEWER TO KELLY HALL. CAP PIPING AT MANHOLE AND SEAL WATERTIGHT.
PD6	DEMOLISH SANITARY SEWER TO ANNEX BUILDING.
PD8	EXISTING STEAM VAULT TO REMAIN. REFER TO VAULT DETAIL ON SHEET P-501.
PD10	TO MINIMIZE THE SEWER OUTAGE, ALL NEW EXTERIOR SANITARY PIPING SHALL BE INSTALLED PRIOR TO THE DEMOLITION OF EXISTING PIPING.
PD11	REMOVE EXISTING LAB WASTE DILUTION PIT.
PD12	DEMOLISH NATURAL GAS BACK TO MAIN.
PD13	DEMOLISH EXISTING STEAM PIPING TO KELLEY HALL AND ALL STEAM PIPING WITHIN KELLY HALL, INCLUDING PRESSURE REDUCING STATION, CONDENSATE PIPING, PUMPS, ETC.
PD15	DEMOLISH EXISTING ABANDONED STEAM VAULT.
PD16	EXISTING STEAM PIPING TO DIMMICK SHALL REMAIN IN SERVICE. PROTECT AS NECESSARY DURING CONSTRUCTION.
PD22	DEMOLISH CHILLED WATER PIPING BACK TO POINTS INDICATED AND CAP.
PD23	DEMOLISH DOMESTIC WATER PIPING BACK TO POINTS INDICATED AND CAP.
PD24	DEMOLISH EXISTING STEAM PIPING TO ANNEX NO. 5 AND ALL STEAM PIPING WITHIN ANNEX NO. 5 INCLUDING PRESSURE REDUCING STATION, CONDENSATE PIPING, PUMPS, ETC.

MECHANICAL SITE NOTES

A DO NOT SCALE FROM MECHANICAL AND ELECTRICAL DRAWINGS. FIELD VERIFY REQUIRED DIMENSIONS. ALL LOCATIONS ARE BASED UP SITE SURVEY AND MAY NOT BE EXACT FOR UNDERGROUND PIPING. CONTRACTOR TO CONFIRM.

B CONTRACTOR SHALL CUT AND PATCH ALL PAVEMENT, CURBING, etc. AS REQUIRED FOR WORK. CONTRACTOR SHALL REPAIR ALL LANDSCAPING THAT IS DAMAGED FOR WORK.

C FEDERAL, STATE, LOCAL, MUNICIPALITY AND UTILITY COMPANY CODES, RULES, REGULATIONS AND REQUIREMENTS APPLY UNLESS EXCEEDED BY THIS DESIGN.

D WHEN INTERRUPTION OF AN EXISTING UTILITY OR SERVICES IS PLANNED OR OCCURS ACCIDENTALLY, THE CONTRACTOR(S) SHALL WORK CONTINUOUSLY AS NEEDED TO RESTORE SAME PROVIDING PREMIUM TIME AS NEEDED AT NO INCREASE IN THE CONTRACT PRICE.

E PLANNED INTERRUPTION OF ANY SERVICE SHALL BE COORDINATED WITH THE APPROPRIATE MUNICIPALITY OR UTILITY COMPANY, THE ARCHITECT AND THE BUILDING OPERATORS AT LEAST TWO WEEKS IN ADVANCE OF ANTICIPATED INTERRUPTION . A SCHEDULE FOR THESE OUTAGES SHALL BE DEVELOPED AND AGREED UPON BETWEEN THE PARTIES MENTIONED TO AVOID UNNECESSARY INCONVENIENCE TO THE OWNER OR ANY AFFECTED PARTY. ALL OUTAGES SHALL BE SCHEDULED THROUGH THE UK PROJECT MANAGER. NOTIFY THE UTILITY COMPANY OF ANY ANTICIPATED SERVICES REQUIRED FROM THEM AT LEAST TWO WEEKS IN ADVANCE IN WRITING AND INSURE THAT THEY DO NOT DELAY WORK.

F LOCATIONS, DEPTHS, MATERIAL TYPES, ELEVATIONS, ETC. OF ALL APPURTENANCES, LINES, BUILDINGS, ETC. INDICATED ON THESE DRAWINGS WERE TAKEN FROM VARIOUS SOURCES, ARE DIAGRAMMATIC ONLY AND ARE SUBJECT TO SUBSTANTIAL VARIATION FROM EXISTING CONDITIONS. EXISTING UTILITIES LOCATIONS MAY VARY. CONSEQUENTLY ALL CONTRACTORS SHALL EXERCISE EXTREME CARE IN THE COURSE OF THEIR WORK SO AS INSURE THAT THEY DO NOT INTERRUPT ANY EXISTING SERVICE. FOR SAFETY PURPOSES, PAY PARTICULAR ATTENTION TO THIS PRECAUITION RELATIVE TO NATURAL GAS AND ELECTRICAL LINES. ALL WORK SHALL BE PERFORMED IN ACCORD WITH ALL FEDERAL, STATE, AND/OR LOCAL RULES, REGULATIONS, STANDARDS AND SAFETY REQUIREMENTS. UTILITIES SHALL ALSO BE INSTALLED IN ACCORD WITH THE APPLICABLE MUNICIPALITY OR UTILITY COMPANY STANDARDS. IN ALL CASES, THE MOST STRINGENT REQUIREMENT SHALL APPLY. IF ANY VARIATION OCCURS, CONSULT THE BUILDING ENGINEER AND THE MECHANICAL ENGINEER'S REPRESENTATIVE). CONTRACTOR SHALL VISIT SITE AND FIELD VERIFY THE ROUTING OF ALL UTILITIES

G CONTRACTOR SHALL VERIFY EXACT LOCATION OF OUTDOOR RECEPTACLES WITH OWNER PRIOR TO ROUGH-IN.

H CONTRACTOR SHALL REFER TO CIVIL PLANS FOR COORDINATION WITH OTHER UTILITIES.

I COORDINATE ELEVATION AND LOCATION OF ALL CONDUITS ENTERING BUILDING WITH STRUCTURAL FOUNDATION. CONDUIT SHALL PASS THROUGH STEM WALL OF FOUNDATION OR UNDER FOOTING AS REQUIRED.

J THE LOCATIONS OF UTILITIES SHOWN WITHIN THESE DRAWINGS ARE APPROXIMATE ONLY.

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L THE UTILITY/CONTRACTOR WILL PROVIDE ALL NECESSARY PROTECTIVE MEASURES TO SAFEGUARD OTHER EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION OF THIS PROJECT. IN THE EVENT THAT SPECIAL EQUIPMENT IS REQUIRED TO WORK OVER AND AROUND THE OTHER UTILITIES. THE UTILITY WILL BE REQUIRED TO FURNISH SUCH EQUIPMENT

M COORDINATE UNDERGROUND ELECTRICAL WITH ALL LANDSCAPING AND FENCING, ADJUST ELECTRICAL LINES TO AVOID CONFLICTS. REFER TO LANDSCAPING PLANS FOR FURTHER INFORMATION. AVOID ROUTING UNDERGROUND CONDUITS UNDER ROADWAYS OR PARKING LOTS, CROSS ROADWAYS WITH UNDERGROUND CONDUITS AT 90 ANGLES WHERE POSSIBLE.

N IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO INSURE THAT ANY ABANDONED PIPING UNCOVERED IN THE COURSE OF THEIR WORK SHALL BE CAPPED WATER TIGHT.

O TRENCHES FOR UTILITIES SHALL BE BACKFILLED PER MECHANICAL DETAILS AND SPECIFICATIONS. PAVEMENT, ASPHALT, AND OTHER SURFACE WORK SHALL BE PER CIVIL ENGINEERING DRAWINGS AND SPECIFICATIONS.

P THE CONTRACTOR SHALL ADJUST ALL EXISTING MANHOLE RINGS AND COVERS AFFECTED BY THIS PROJECT AS NECESSARY TO BE FLUSH WITH NEW GRADE.

Q CONTRACTOR SHALL COORDINATE RESPONSIBILITIES WITH CONSTRUCTION MANAGER. REFER TO SPECIFICATIONS FOR REQUIREMENTS.

R THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION AND SIZING OF ALL EXPANSION LOOPS PER PIPING MANUFACTURER'S REQUIREMENTS.

S REFER TO ARCHITECT'S PHASING PLAN FOR CONSTRUCTION PHASING REQUIREMENTS.

T ALL SITE WORK SHALL BE COORDINATED WITH UNIVERSITY OF KENTUCKY PHYSICAL PLANT DIVISION (PPD). ALL OUTAGES SHALL BE SCHEDULED A MINIMUM OF TWO WEEKS IN ADVANCE.

BEFORE YOU DIG

THE CONTRACTOR AND ALL SUBCONTRACTORS SHALL CONTACT "BUD (BEFORE YOU DIG)" AT 1-800-752-6007 TO OBTAIN UNDERGROUND UTILITY LOCATIONS PRIOR TO ANY CONSTRUCTION. ANY CONTRACTOR OR SUBCONTRACTOR PERFORMING ANY TYPE OF EXCAVATION ON THIS PROJECT SHALL CALL "BUD" TO OBTAIN AN AUTHORIZATION NUMBER.

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BP-01B DEMO, SITE UTILITES (PH1)

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

PROJECT	XKSM21
DATE	10/20/2023

REVISIONS

No.	Description	Date

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SITE MECHANICAL DEMOLITION PLAN

MU-101

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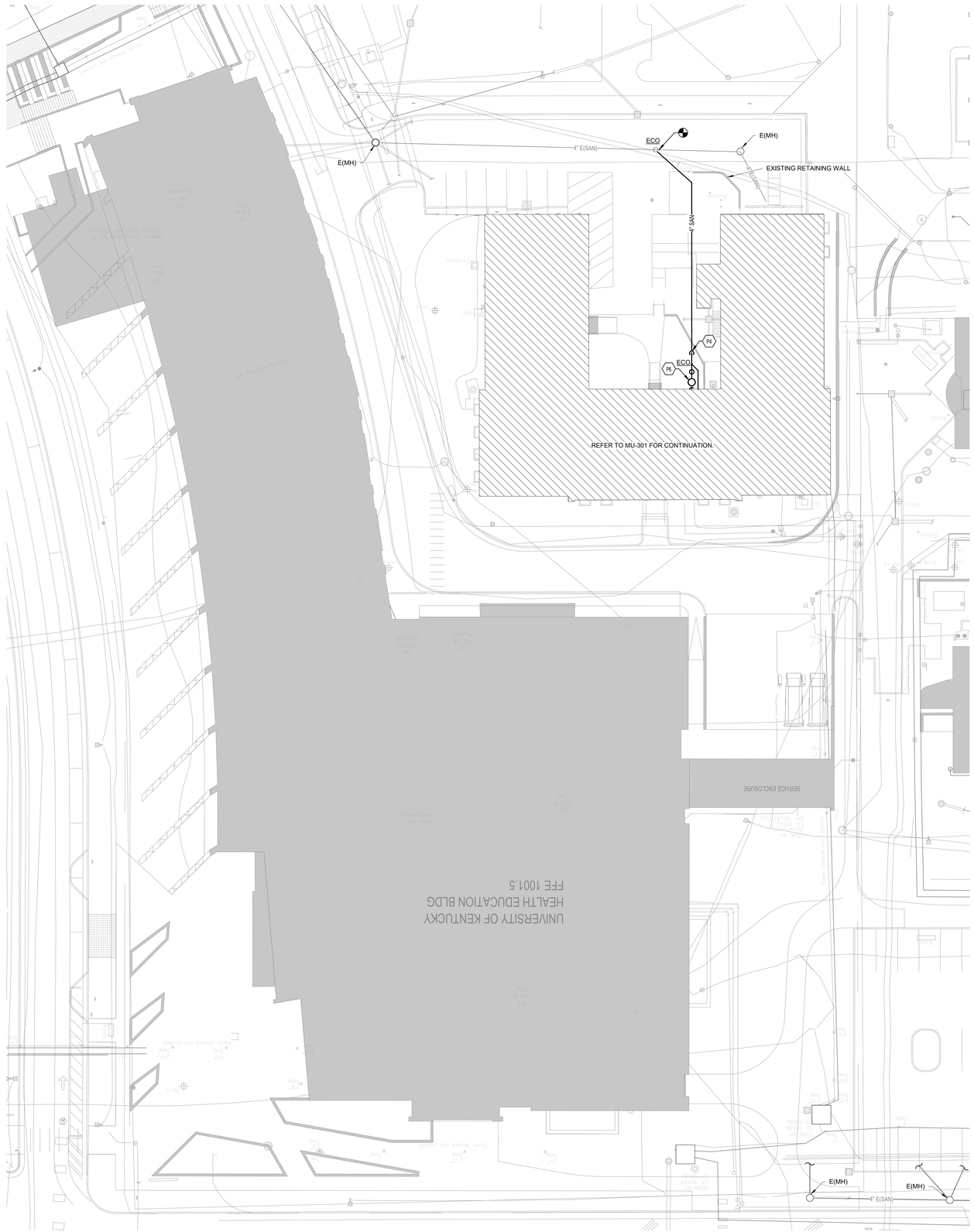

1 MU-201 **SITE PLUMBING NEW WORK PLAN**
1" = 20'-0"

TAGGED NOTES

P4	SANITARY PIPING SHALL DROP UNDER RETAINING WALL FOOTER AND 3 FOOT ON EITHER SIDE SHALL BE BACKFILLED WITH LEAN CONCRETE.
P6	PROVIDE LAB DILUTION MANHOLE. LOCATE OUTSIDE OF AREA OF INFLUENCE OF EXISTING BUILDING FOOTER.

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BP-01B DEMO, SITE UTILITIES (PH1)

UNIVERSITY OF KENTUCKY
HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

PROJECT	XKSM21
DATE	10/20/2023

REVISIONS

No.	Description	Date

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SITE PLUMBING NEW WORK PLAN

MU-201

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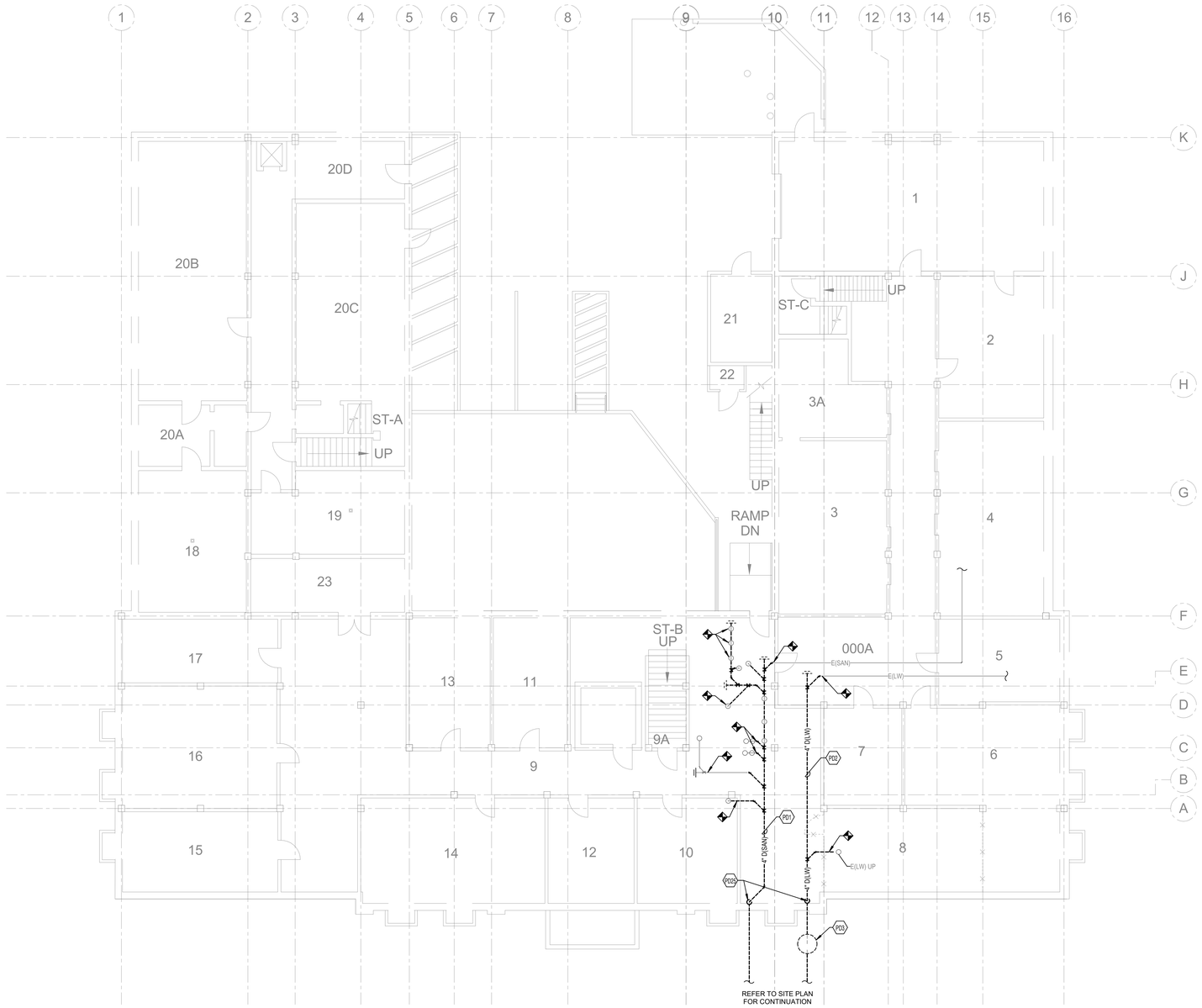
TAGGED NOTES

PD1	DEMOLISH EXISTING SANITARY PIPING TO EXTENTS INDICATED. EXISTING SANITARY AND VENT RISERS SHALL REMAIN. CAP REMAINING PIPE FOR FUTURE CONNECTION.
PD2	DEMOLISH EXISTING GLASS LAB WASTE PIPING TO EXTENTS INDICATED. CAP REMAINING PIPE FOR FUTURE CONNECTION.
PD3	DEMOLISH EXISTING LAB WASTE NEUTRALIZATION PIT.
PD25	SEAL WALL PENETRATIONS WATER TIGHT.



1 MU-301 **DIMMOCK BUILDING - PLUMBING DEMOLITION**
1/8" = 1'-0"

RA

3225 Summit Square Place, Suite 200
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859.252.6781

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BP-01B DEMO, SITE UTILITES (PH1)

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

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BASEMENT PLUMBING DEMOLITION PLAN

MU-301

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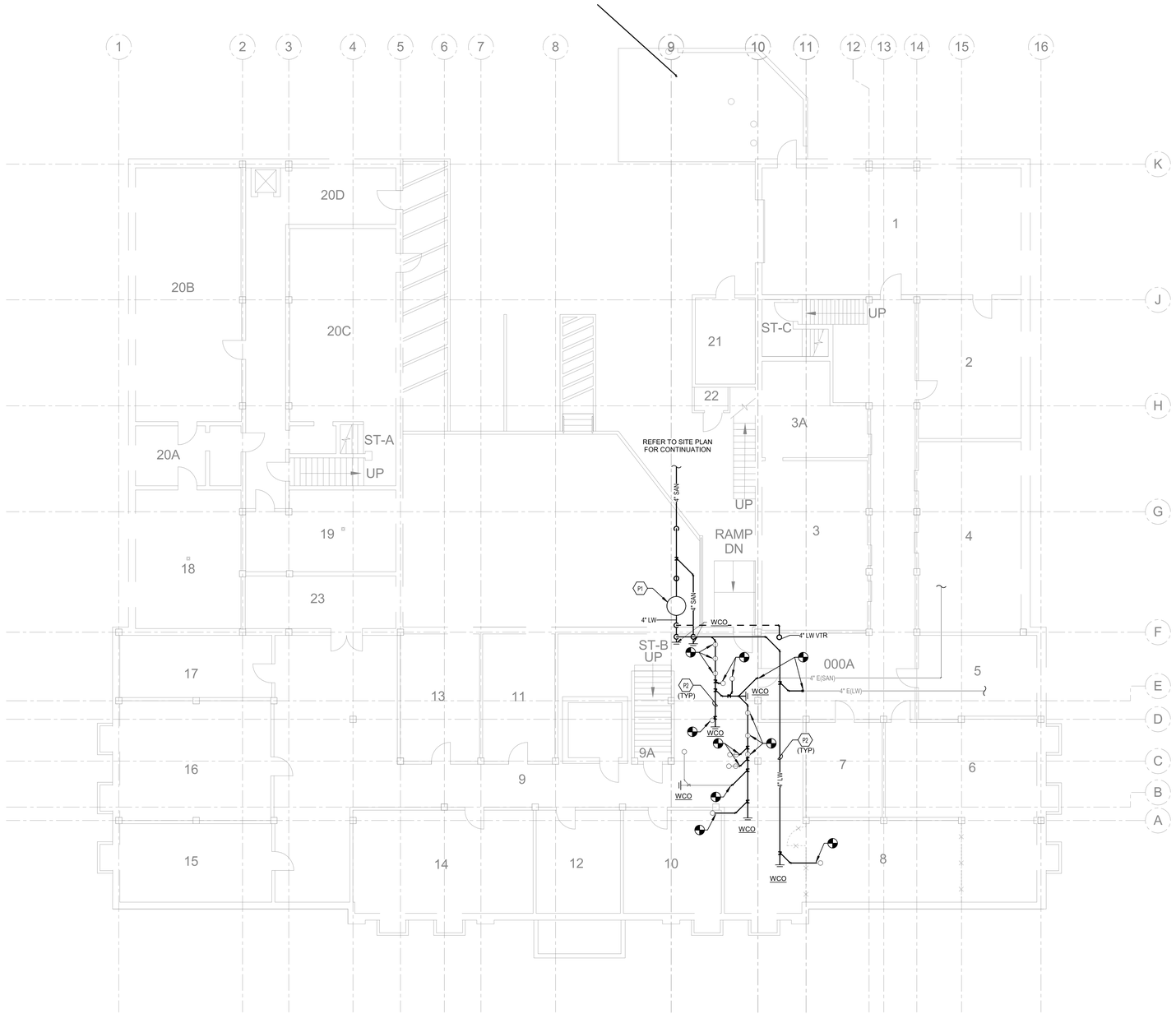
TAGGED NOTES

P1	PROVIDE NEW LAB WASTE DILUTION PIT. REFER TO DETAIL FOR ADDITIONAL REQUIREMENTS.
P2	RECONNECT ALL EXISTING PLUMBING CONNECTIONS WITH APPROPRIATE SLOPE ORIENTATION. ALL PIPING SHALL BE HELD AS TIGHT TO THE STRUCTURE AS POSSIBLE.



1 MU-401 **DIMMOCK BUILDING - PLUMBING NEW WORK**
1/8" = 1'-0"

RA

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Lexington, Kentucky 40509
859.252.6781

STATE OF KENTUCKY
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BP-01B DEMO, SITE UTILITES (PH1)

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

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BASEMENT PLUMBING NEW WORK PLAN

MU-401

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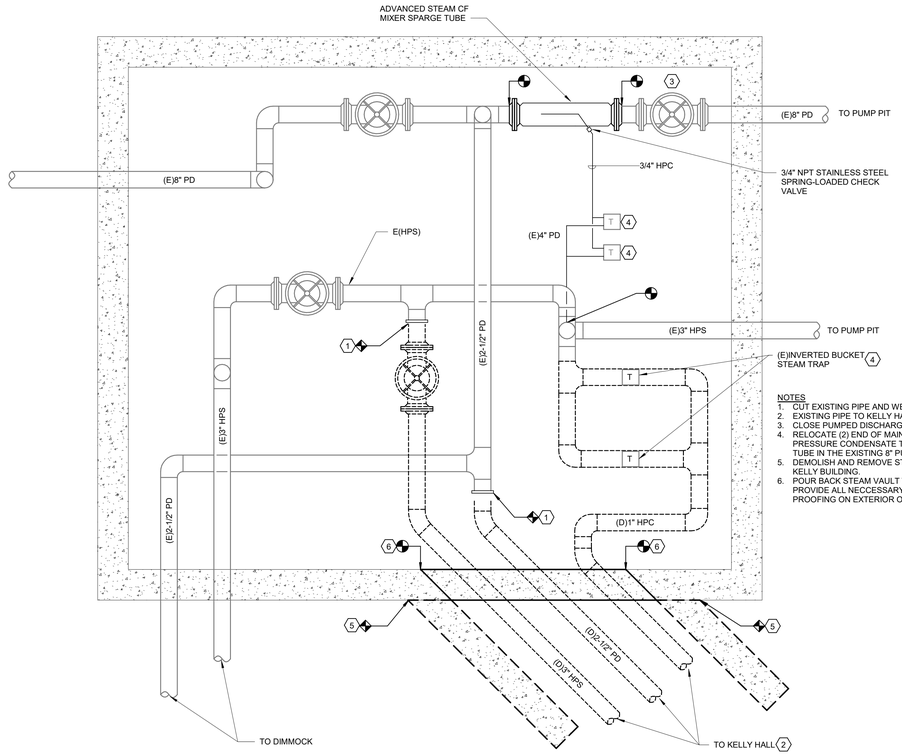
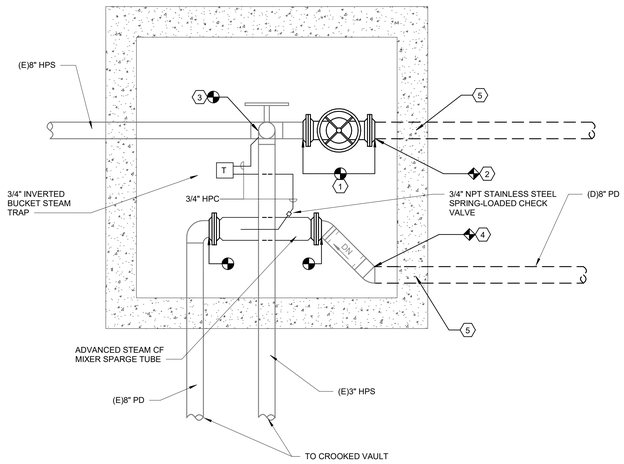


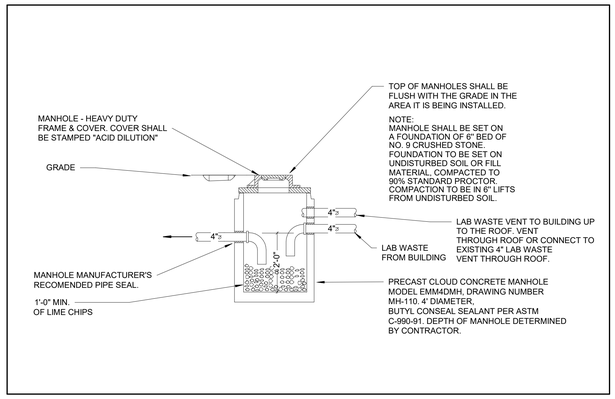
1 Steam Vault - Kelly & Dimmock
SCALE: NONE

NOTES
1. CUT EXISTING PIPE AND WELD ON CAP.
2. EXISTING PIPE TO KELLY HALL TO BE DEMOLISHED.
3. CLOSE PUMPED DISCHARGE VALVE TO PUMP PIT.
4. RELOCATE (2) END OF MAIN DRIP STEAM TRAPS AND ROUTE HIGH PRESSURE CONDENSATE TO AN ADVANCED STEAM CF MIXER SPARGE TUBE IN THE EXISTING 8" PUMPED DISCHARGE PIPE.
5. DEMOLISH AND REMOVE STEAM TUNNEL FROM CROOKED VAULT TO KELLY BUILDING.
6. POUR BACK STEAM VAULT WALL UTILIZIING 4,000 PSI CONCRETE. PROVIDE ALL NECCESSARY DOWLING AND PROVIDE EXTERTIOR WATER PROOFING ON EXTERIOR OF NEW VAULT WALL.



2 Steam Vault - Pump Pit
SCALE: NONE

NOTES
1. INSTALL NEW 8" ISOLATION VALVE (CONTRACTOR TO FIELD VERIFY SIZE PRIOR TO ORDERING VALVE)
2. DEMOLISH AND REMOVE HIGH PRESSURE STEAM PIPING TO POINTS INDICATED. NEW ISOLATION VALVE SHALL BE CLOSED AND BLANKED FLANGED
3. INSTALL FULL SIZE DIRT LEG (MIN. 12" IN LENGTH) WITH END OF MAIN 3/4" INVERTED BUCKET STEAM TRAP. ROUTE 3/4" STEAM TRAP DISCHARGE TO AN ADVANCED STEAM CF MIXER SPARGE TUBE IN THE EXISTING 8" PUMPED DISCHARGE PIPE.
4. DEMOLISH AND CAP PUMPED DISCHARGE PIPING TO POINTS INDICATED AND CAP.
5. TEMPORARILY SEAL PIPE PENETRATIONS AND MAKE WATER TIGHT.



3 Dilution Pit Detail
SCALE: NONE

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DETAILS AND SCHEMATICS

MU-501

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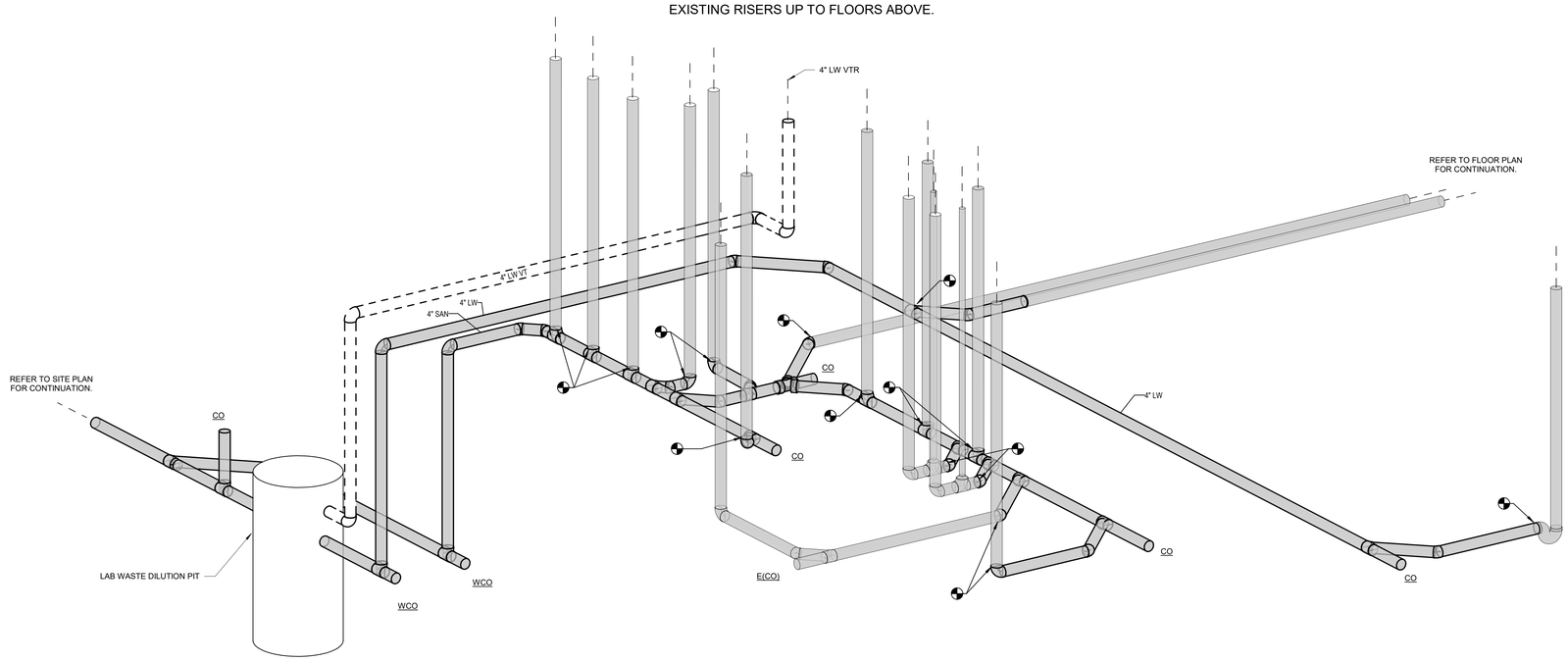

1 PLUMBING RISER
SCALE: NONE

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UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

PROJECT	XKSM21
DATE	10/20/2023

REVISIONS

No.	Description	Date

JRA ARCHITECTS HAS RETAINED AN ELECTRONIC VERSION OF THESE DRAWINGS. THE CLIENT AGREES NOT TO REUSE THESE DRAWINGS - IN ELECTRONIC OR ANY OTHER FORMAT - IN WHOLE, OR IN PART, FOR ANY PURPOSE OTHER THAN FOR THE PROJECT. THE CLIENT AGREES NOT TO TRANSFER THESE ELECTRONIC FILES TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF THE ARCHITECT. THE CLIENT FURTHER AGREES TO WAIVE ALL CLAIMS AGAINST THE ARCHITECT RESULTING IN ANY WAY FROM ANY UNAUTHORIZED CHANGES TO OR REUSE OF THESE ELECTRONIC FILES FOR ANY OTHER PROJECT BY ANYONE OTHER THAN THE ARCHITECT.

OVERALL PLUMBING RISER

MU-601

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DESCRIPTION	MOUNTING HEIGHT	SYMBOL
LIGHTING CONTROLS		
LIGHT SWITCH: LOW VOLTAGE (WHEN PRESENT, # INDICATES QUANTITY OF CHANNELS)	46"	$ #
EXAM LIGHT SWITCH	46"	$ X
NIGHT LIGHT SWITCH WITH CONSTANTLY ILLUMINATED HANDLE	46"	$ N
SURGICAL LIGHT INTENSITY CONTROL	46"	$ SL
LOW VOLTAGE DIMMER SWITCH (WHEN PRESENT, # INDICATES QUANTITY OF CHANNELS)	46"	$ D#
GRAPHIC TOUCHSCREEN CONTROL STATION	46"	$ G
LINE VOLTAGE SWITCH	46"	$ LV
LINE VOLTAGE THREE-WAY, FOUR-WAY SWITCH	46"	$ LV3 $ LV4
LINE VOLTAGE THREE-WAY, FOUR-WAY DIMMER SWITCH	46"	$ LV3D $ LV4D
KEYED SWITCH	46"	$ K
OCCUPANCY OR VACANCY SENSOR SWITCH	46"	$ OS $ VS
OCCUPANCY OR VACANCY SENSOR SWITCH WITH DIMMING	46"	$ DOS
LIGHT SWITCH FOR UNDER-CABINET LIGHTS	46"	$ U
ILLUMINATED HANDLE LIGHT SWITCH (ILLUMINATED WHEN LOAD IS OFF)	46"	$ IL
PILOT LIGHT SWITCH (ILLUMINATED WHEN LOAD IS ON)	46"	$ PL
TIMER SWITCH	46"	$ T
OCCUPANCY OR VACANCY SENSOR, CEILING MOUNT	CLG	OS VS
OCCUPANCY SENSOR, CORNER MOUNT	CLG	OS
DAYLIGHT SENSOR	AS NOTED	DS
PHOTOCELL	AS NOTED	PC
LIGHTING RELAY	AS NOTED	LR
EMERGENCY AUTOMATIC TRANSFER SWITCH FOR LIGHTING CONTROLS (REFER TO DETAIL)	CLG	ETS
POWER OUTLETS		
SIMPLEX RECEPTACLE (TEXT INDICATES NEMA TYPE)	1'-6"	
DUPLEX RECEPTACLE	1'-6"	
SLASH THROUGH ANY DEVICE INDICATES MOUNTING ABOVE COUNTERTOP 4" ABOVE BACKSPLASH		
'G' INDICATES INTEGRAL GROUND FAULT PROTECTION (GFCI)	1'-6"	
DEAD FRONT GFCI DEVICE, LABEL AND INSTALL IN READILY ACCESSIBLE LOCATION		
DUPLEX RECEPTACLE WITH TWO INTEGRAL USB CHARGING PORTS	1'-6"	
USB CHARGING OUTLET WITH FOUR INTEGRAL USB PORTS	1'-6"	
GANG RECEPTACLE IN COMBINATION WITH SWITCH (PROVIDE DIVIDER IF LIGHTING CIRCUIT IS 277V)	46"	C/S
DUPLEX RECEPTACLE, CEILING MOUNTED	CLG	
QUADRUPLEX RECEPTACLE	1'-6"	
JUNCTION BOX, CEILING OR WALL		
VOLTAGE/2 POLE RECEPTACLE, TEXT INDICATES NEMA TYPE	1'-6"	
VOLTAGE/3 POLE RECEPTACLE, TEXT INDICATES NEMA TYPE	1'-6"	
'T' INDICATES SAFETY TYPE, TAMPER RESISTANT OUTLET(S)		
SS INDICATES SURGE SUPPRESION TYPE OUTLET(S)		SS
GROUND FAULT PROTECTED DUPLEX WITH WEATHER-PROOF "WHILE IN USE" TYPE DIE-CAST METAL COVERPLATE WITH LOCKABLE ENCLOSURE AT OUTLET - SEE SPECIFICATIONS	2'-2"	WP
DUPLEX FOR ELECTRIC WATER COOLER: COORDINATE EXACT LOCATION WITH PLUMBING CONTRACTOR TO CONCEAL OUTLET BEHIND COOLER. PROVIDE READILY ACCESSIBLE GFI DEVICE AT 18" ADJACENT TO WATER COOLER		EWC
BOX ON ANY DEVICE INDICATES SURFACE MOUNTED BACKBOX/WIREMOLD		
CIRCLE ON ANY DEVICE INDICATES DEVICE FED FROM STUB UP CONDUIT		
FIRE ALARM		
MAIN CONTROL PANEL CENTRAL PROCESSING UNIT (CPU)	6'-6" TO TOP	FACP
REMOTE L.C.D. FIRE ALARM ANNUNCIATOR	54"	FAA
REMOTE FIRE ALARM ANNUNCIATOR W/ MICROPHONE	54"	FAAM
LOCAL OPERATOR CONSOLE	54"	LOC
SMOKE EVACUATION CONTROL PANEL	54"	SECP
POWER SUPPLY/CONTROL FOR AUDIO/VISUAL DEVICES	46"	VAC
TRANSPONDER CABINET	46"	TRAN
GRAPHICS DISPLAY TERMINAL		GDT
FIRE ALARM CONTROL EXTENDER		EXT
POST INDICATOR VALVE		PIV
PULL STATION : DOUBLE ACTION	46" TO LEVER	F
KEYED, LOCKED PULL STATION : DOUBLE ACTION. STATION SHALL ONLY BE OPERABLE VIA KEY IN POSSESSION OF STAFF.	46" TO LEVER	F K
AUDIO/VISUAL NOTIFICATION APPLIANCE	WALL, CLG	
AUDIO-ONLY NOTIFICATION APPLIANCE	WALL, CLG	
VISUAL-ONLY NOTIFICATION APPLIANCE	WALL, CLG	
BELL / LIGHT	80"	BL
BELL ONLY	80"	B
PHOTO-ELECTRIC SMOKE DETECTOR	CLG	SD
PHOTO-ELECTRIC SMOKE DETECTOR FOR PATIENT ROOM MONITORING (SEE RISER)	CLG	SD P
PROJECTED BEAM SMOKE DETECTOR; EMITTER (BE) AND RECEIVER (BR)		BE BR
HEAT DETECTOR	CLG	HD
CARBON MONOXIDE DUCT DETECTOR	ABOVE CEILING	CO
CARBON MONOXIDE ALARM: SINGLE STATION W/SOUNDER BASE	CLG	CM
CARBON MONOXIDE AUDIO/VISUAL NOTIFICATION APPLIANCE	WALL	CM
DOOR HOLDER : WALL TYPE	WALL	DH
DOOR HOLDER : CLOSURE TYPE	ABV DOOR	DH C
DUCT SMOKE DETECTOR	ABV CLG	DDT
CONNECTION TO SPRINKLER FLOW SWITCH WITH ADDRESSABLE MODULE		FS
CONNECTION TO SPRINKLER TAMPER SWITCH WITH ADDRESSABLE MODULE		TS
PRESSURE SWITCH		PS
ISOLATION MODULE	WALL	I
ZONE ADDRESSABLE MODULE		Z
H.V.A.C. SMOKE DAMPER CONNECTION		SM
FLUSH MOUNTED REMOTE ALARM INDICATING STATION/TEST SWITCH	7'-6"	RI
FIREMAN'S PHONE JACK	4'-6"	FP
FIREMAN'S KNOX BOX CONNECTION		KB
ADDRESSABLE RELAY MODULE		R
INDICATES VANDAL-PROOF POLYCARBONATE COVER. VANDAL PROOF COVERS SHALL BE UL LISTED FOR USE WITH THE SPECIFIC DEVICE THEY ARE PROTECTING		VR
INDICATES CHIME AUDIBLE NOTIFICATION		CH
DEVICE USED FOR ELEVATOR CONTROL		EL

DESCRIPTION	MOUNTING HEIGHT	SYMBOL
LIGHTING FIXTURES AND EQUIPMENT		
REFER TO LUMINAIRE SCHEDULE FOR EXACT FIXTURE SPECIFICATIONS, MOUNTING HEIGHTS, ETC.		
SURFACE OR SUSPENDED CEILING FIXTURE		
RECESSED CEILING FIXTURE		
POLE MOUNTED AREA LIGHT WITH CONCRETE BASE		
LIGHTED BOLLARD WITH CONCRETE BASE		
EMERGENCY BATTERY WALL-PACK		
WALL MOUNT FIXTURE		
TRACK COMPLETE WITH POWER SUPPLIES AND FIXTURE HEADS		
FLOODLIGHT		
EXIT LIGHT (CEILING, END, WALL MOUNT) WITH OR WITHOUT DIRECTIONAL ARROWS, WITH OR WITHOUT EGRESS HEADS		
STRIP FIXTURE		
CROSS-HATCHING INDICATES LIGHT IS POWERED FROM THE EMERGENCY-CRITICAL BRANCH		
PARALLEL-HATCHING INDICATES LIGHT IS POWERED FROM THE EMERGENCY-LIFE SAFETY BRANCH		
REMOTE LIGHT FIXTURE DRIVER	AS NOTED	RD
REMOTE BATTERY BACKUP	AS NOTED	RB
CENTRAL BATTERY INVERTER	AS NOTED	INV
MISCELLANEOUS		
CONDUIT CONCEALED IN WALLS OR IN CEILING SPACE: ARROWS (INDICATES) HOME RUN & # OF CIRCUITS: HASHMARKS INDICATE # OF CONDUCTORS.		PHASE, NEUTRAL, GROUND, #6
NON-REVERSING MOTOR STARTER SNAP SWITCH	AS NOTED	$ M
MOMENTARY CONTACT SWITCH	46"	$ MC
HAND-OFF-AUTO 3-POSITION SWITCH	46"	$ HOA
DISCONNECT SWITCH	5'-0"	
MAGNETIC STARTER	5'-0"	
MAGNETIC COMBINATION STARTER	5'-0"	
VARIABLE FREQUENCY DRIVE	5'-0"	
ENCLOSED FLUSH MTD. CIRCUIT BREAKER	5'-0"	
MUSHROOM SWITCH	46"	
PUSHBUTTON STATION WITH 1, 2, OR 3 BUTTONS.	46"	
PANELBOARD, SURFACE OR FLUSH MOUNTED, HATCHING INDICATES EMERGENCY	6'-6" TO TOP	
TRANSFORMER	AS NOTED	
EQUIPMENT HARDWIRE CONNECTION (SEE DETAIL)		
KITCHEN EQUIPMENT OUTLET COUPLING CONNECTION (SEE DETAIL)		
MOTOR CONNECTION, REFER TO EQUIPMENT CONNECTION SCHEDULE		
PLUMBING FIXTURE SOLENOID VALVE/ELECTRIC EYE SENSOR CONNECTION. COORDINATE EXACT CONNECTION REQUIREMENTS WITH MANUFACTURER.		
PLUMBING FIXTURE ELECTRIC EYE TRANSFORMER CONNECTION. TRANSFORMER SHALL BE 120V-24V. MOUNT ABOVE SUSPENDED ACCESSIBLE CEILING IN J-BOX. PROVIDE ADDITIONAL TRANSFORMERS OF SAME TYPE AS#F NEEDED		
PROVIDE CONNECTION TO HAND DRYER (SEE ARCHITECTURAL SPECIFICATIONS)	VERIFY WITH ARCHITECT	
SURGE PROTECTION DEVICE (SURFACE OR FLUSH MOUNTED)		SPD
GENERATOR ANNUNCIATOR PANEL (SURFACE OR FLUSH MOUNTED) - SEE SPECIFICATIONS	46"	GEN-A
CONDUIT UP		
CONDUIT DOWN		
FLEXIBLE CONDUIT		
GROUND BUS BAR ON INSULATED STANDOFFS	2'-0"	
BUS DUCT, AMPERAGES AS NOTED	AS SHOWN	
WIREWAY WITH REMOVABLE COVER (SIZE AS NOTED)	AS SHOWN	
TRENCH DUCT (SIZE AS NOTED)	AS SHOWN	
WIRE BASKET CABLE TRAY, SIZE AS NOTED	AS SHOWN	
LADDER CABLE TRAY, SIZE AS NOTED	AS SHOWN	
SOLID BOTTOM CABLE TRAY, SIZE AS NOTED	AS SHOWN	
J-HOOK PATHWAY		
EQUIPMENT TAG, REFER TO EQUIPMENT SCHEDULE		EQUIP-#
MECHANICAL EQUIPMENT DESIGNATOR (SEE MECH. SCHEDULES)		EQUIP-#
TAGGED NOTE		
REVISION TAG		
PANEL FURNITURE		
PANEL FURNITURE DUPLEX RECEPTACLE. PROVIDE ALL WIRING AS REQUIRED, COORDINATE EXACT INSTALLATION REQUIREMENTS AND LOCATIONS WITH OWNER'S PANEL FURNITURE VENDOR		
PANEL FURNITURE QUADRUPLEX RECEPTACLE. PROVIDE ALL WIRING AS REQUIRED, COORDINATE EXACT INSTALLATION REQUIREMENTS AND LOCATIONS WITH OWNER'S PANEL FURNITURE VENDOR		
PANEL FURNITURE DATA-VOICE OUTLET. PROVIDE ALL WIRING AS REQUIRED, COORDINATE EXACT INSTALLATION REQUIREMENTS AND LOCATIONS WITH OWNER'S PANEL FURNITURE VENDOR		2D
POWER CONNECTION TO PANEL FURNITURE. PROVIDE SEAL-TIGHT CONDUIT CONNECTION FROM RECESSED WALL BOX TO PANEL FURNITURE. PROVIDE FINAL CONNECTIONS TO PANEL FURNITURE AS REQUIRED BY PANEL FURNITURE VENDOR	1'-6"	FP
COMBINATION POWER AND LOW VOLTAGE CONNECTION TO PANEL FURNITURE. PROVIDE SEAL-TIGHT CONDUIT CONNECTION FROM RECESSED WALL BOX TO PANEL FURNITURE. PROVIDE FINAL CONNECTIONS TO PANEL FURNITURE AS REQUIRED BY PANEL FURNITURE VENDOR	1'-6"	FF
ABBREVIATIONS		
UNLESS OTHERWISE NOTED		UON
OWNER FURNISHED CONTRACTOR INSTALLED		OFCI
OWNER FURNISHED OWNER INSTALLED		OFOI
CONTRACTOR FURNISHED CONTRACTOR INSTALLED		CFCI
CONTRACTOR FURNISHED OWNER INSTALLED		CFOI
INDICATES EMERGENCY POWER		EM
WIREGUARD - PROVIDE MANUFACTURER'S SPECIFIC GUARD FOR DEVICE NOTED		WG
WEATHERPROOF - NEMA-3R, WET LOCATION LISTED. PROVIDE COVERS, RATINGS, ETC, AS SUITABLE FOR OUTDOORS.		WP
EXPLOSION PROOF - PROVIDE WIRING METHODS, ENCLOSURES, RATINGS, ETC. AS SUITABLE FOR HAZARDOUS LOCATION.		XP

DESCRIPTION	MOUNTING HEIGHT	SYMBOL
SPECIAL OUTLETS		
FLOORBOX, AS SCHEDULED	FLOOR	FBX
POKE-THRU, AS SCHEDULED	FLOOR	PO
WALLBOX, AS SCHEDULED	WALL	WBX
AUDIO/VISUAL SYSTEM OUTLET WITH DUPLEX RECEPTACLE, REFER TO ASSOCIATED DETAIL FOR ADDITIONAL INFORMATION	1'-6"	AV
COMBINATION POWER AND DATA OUTLET LOCATION, REFER TO ASSOCIATED DETAIL FOR ADDITIONAL INFORMATION	1'-6"	
COMBINATION POWER AND DATA OUTLET LOCATION, GFCI DUPLEX RECEPTACLE, REFER TO ASSOCIATED DETAIL FOR ADDITIONAL INFORMATION	1'-6"	
OVERHEAD PROJECTOR: PROVIDE DUPLEX RECEPTACLE, ONE DATA, HDMI, 3.5mm AUDIO, AND VGA OUTLET ON (S)PLATES	CLG	
SPECIAL VIDEO SYSTEM SIGNAL INPUT		-NA-
SURFACE PLUG-MOLD		
SURFACE WIRE-MOLD		
POWER POLE AS NOTED		PP
TELEVISION		
TELEVISION HEADEND (SPLITTERS/AMPLIFIERS/DISTRIBUTION)	46"	TV
TELEVISION SYSTEM OUTLET WITH DUPLEX RECEPTACLE, COORDINATE LOCATION WITH WALL BRACKET WHERE APPLICABLE	7'-0"	T
OVERHEAD PAGING		
PAGING SPEAKER: CEILING	CLG	
PAGING SPEAKER W/ VOLUME CONTROL	CLG	
PAGING SPEAKER: WALL	8'-0"	
RECESSED WALL MOUNTED PAGING SPEAKER DUKANE 5A606 SPEAKER. ATLAS 417-8WD	8'-0"	
VANDAL PROOF / WEATHERPROOF WALL MOUNTED PAGING SPEAKER. QUAM VP1	SEE FLOOR PLANS	V
EXTERIOR VANDAL PROOF / WEATHERPROOF WALL MOUNTED PAGING SPEAKER, SHALL BE PAINTED COLOR SELECTED BY ARCHITECT/OWNER. QUAM VP6	SEE FLOOR PLANS	WP
WALL MOUNTED PAGING HORN	9'-0"	
CALL INITIATION STATION	46"	
WALL VOLUME CONTROL	46"	
PAGING MICROPHONE	1'-6"	
PANIC BUTTON (MOUNTING PER DRAWINGS)	46", UNDER DESK	
NOTIFICATION LIGHT (MOUNTING PER DRAWINGS)	7'-6", CLG	
LCD WALL DISPLAY		LCD
PAGING SYSTEM HEADEND	46"	PA
CLOCKS		
TYPICAL CLOCK MOUNTING HEIGHTS: FOR CEILING HEIGHTS < 9'-8": MOUNT CENTER OF BACKBOX AT 8" BELOW CEILING. FOR CEILING HEIGHTS >= 9'-8" MOUNT CENTER OF BACKBOX AT 9'-0" AFF.		
ANALOG CLOCK: SINGLE FACE	SEE ABOVE	
ANALOG CLOCK: DUAL FACE	SEE ABOVE	
DIGITAL CLOCK: SINGLE FACE	SEE ABOVE	
DIGITAL CLOCK: DUAL FACE	SEE ABOVE	
CLOCK SYSTEM HEAD END	84"	CLOCK
AV SYSTEMS		
PROJECTOR WITH MOUNT (CEILING OR WALL AS INDICATED)	REFER TO DRAWINGS	P
LOCAL SOUND SPEAKER: CEILING	CLG	LS
WIRELESS MICROPHONE ANTENNA	CLG	MA
LOCAL SOUND SPEAKER: WALL	REFER TO SPECS.	LS
MICROPHONE INPUT: # INDICATES NUMBER OF INPUTS.	1'-6"	M
WIRELESS MICROPHONE ANTENNA, WALL MOUNT	REFER TO SPECS.	MA
AV INPUT (OR OUTPUT) WALL PLATE. REFER TO DRAWINGS AND SPECIFICATIONS FOR TYPE AND QUANTITY OF CONNECTIONS.	1'-6"	AV
BLUETOOTH INPUT MODULE	1'-6"	BT
AV TOUCHSCREEN CONTROL STATION	46"	CS
LOCAL SOUND SYSTEM HEADEND	REFER TO SPECS.	LS
LINETYPE LEGEND		
	EXISTING	
	DEMOLISHED	
	NEW	
SECURITY CCTV VIDEO SURVEILLANCE		
CCTV CAMERA: CEILING MOUNT DOME (TEXT INDICATES TYPE) REFER TO SCHEDULE FOR TYPES	CLG	
CCTV CAMERA: WALL MOUNT DOME (TEXT INDICATES TYPE) REFER TO SCHEDULE FOR TYPES	WALL	
INDICATES EXTERIOR CAMERA RATED FOR CONDITIONS, WET LOCATION LISTED, WITH AUXILLARY HEATER		WP
INDICATES CAMERA WITH PAN/TILT/ZOOM FUNCTION		PTZ
CCTV HEAD END	SEE DRAWINGS	SECC
SECURITY INTRUSION DETECTION		
MOTION DETECTOR (WALL OR CEILING MOUNT)	CLG	M
GLASS BREAK SENSOR (WALL OR CEILING MOUNT)	CLG	GB
LOCAL SOUNDER	SEE DRAWINGS	LS
INTRUSION DETECTION KEYPAD CONTROLLER	46"	IC
SECURITY SYSTEM HEAD END	5'-0"	SEC
DATA / VOICE		
DATA OUTLET : NUMBER BESIDE OUTLET INDICATES NUMBER OF DATA JACKS. NO NUMBER INDICATES 1 JACK.	1'-6"	2D
VOICE OUTLET : NUMBER BESIDE OUTLET INDICATES NUMBER OF VOICE JACKS. NO NUMBER INDICATES 1 JACK.	1'-6"	
COMBINATION OUTLET : NUMBER BESIDE OUTLET INDICATES NUMBER OF DATA/VOICE JACKS	1'-6"	2D1V
SLASH THROUGH ANY DEVICE INDICATES MOUNTING ABOVE COUNTERTOP 4" ABOVE BACKSPLASH		
OUTLET (VOICE ONLY) : PAYPHONE TYPE	AS REQ'D.	PAY
DATA RACK: TWO POST. REFER TO COMMUNICATIONS RISERS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.		
DATA RACK: FOUR POST. REFER TO COMMUNICATIONS RISERS AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.		
TELECOMMUNICATIONS SYSTEM BACKBOARD. PROVIDE 96"H x 3/4"D FIRE-RETARDENT PLYWOOD BACKBOARD WITH TWO (2) COATS OF NON-CONDUCTIVE, FIRE-RETARDANT LIGHT GRAY PAINT. #3/0 TO GROUND BAR AT MAIN SERVICE SWITCHBOARD, 30-PT GROUND BAR AND A 6'-0", #3 AWG PIGTAIL AT BACKBOARD. INSTALL BOARD AT 2' AFF. (LENGTH OF BOARD AS INDICATED ON FLOOR PLAN)		
WIRELESS ACCESS POINT OUTLET WITH PROVISIONS FOR (2 DATA OUTLET FOR ANTENNA. PROVIDE A COMPLETE DATA OUTLET WITH FACEPLATE ABOVE CEILING, MOUNTED AT AN ACCESSIBLE HEIGHT NO MORE THAN 24" ABOVE CEILING. AT EACH OUTLET, PROVIDE A 20' COIL OF CABLE AHEAD OF THE OUTLET FOR ADJUSTMENT OF FINAL OUTLET LOCATION. THE CONTRACTOR SHALL COORDINATE EXACT LOCATIONS WITH THE OWNER AND ADJUST OUTLET LOCATIONS AT SUBSTANTIAL COMPLETION TO ACCOMMODATE OWNER'S WAP LOCATIONS.	CEILING	WAP
	WALL	WAP

DESCRIPTION	MOUNTING HEIGHT	SYMBOL
SECURITY PANIC ALARM		
PANIC ALARM BUTTON	SEE DRAWINGS	
PANIC ALARM ANNUNCIATOR	46"	
PANIC ALARM STROBE - REFER TO SPECIFICATIONS FOR LENS AND HOUSING COLOR	SAME AS FIRE ALARM	
PANIC ALARM POWER SUPPLY CABINET	5'-0"	SECP
SECURITY INTERCOM		
AUDIO/VIDEO INTERCOM STATION: MASTER WITH SELECTIVE DOOR CONTROLS, POWER SUPPLIES & DOOR RELAY CONTACTS AS REQUIRED FOR OPERATION OF ANY DOOR IN THE SYSTEM AND VIEWING OF ANY AUDIO/VIDEO INTERCOM REMOTE ON THE SYSTEM. AIPHONEIX-MV W/DESK STAND - COLOR BY ARCHITECT.	DESK MOUNT	IM
AUDIO/VIDEO INTERCOM STATION: REMOTE WITH FLUSH-MTD S.S. ENCLOSURE. AIPHONE #IX-DVF.	46"	
SECURITY ACCESS CONTROL		
DOOR ALARM	DOOR FRAME	DA
DOOR POSITION SWITCH	DOOR FRAME	DP
MAGNETIC LOCK(S)	ABV DOOR	ML
ELECTRIC LOCKSET	AT LATCH	EL
DOOR DELAYED EGRESS/ELECTRIFIED PANIC MECHANISM	ABV DOOR	EL
ELECTRIC STRIKE	AT LATCH	ES
AUTOMATIC DOOR CONNECTION (MAY ALSO HAVE ELECTRIC STRIKE/MAG-LOCK/ELECTRIFIED PANIC CONNECTION - SEE ARCHITECTURAL HARDWARE SPECIFICATIONS)	CLG	
DOOR RELEASE PUSH-PLATE / INFRA-RED OPERATOR STATION. PROVIDE ANY ADDITIONAL ROUGH-IN FOR "EMERGENCY RELEASE" OPERATOR STATIONS AS REQUIRED.	46"	
DOOR RELEASE KEYSWITCH STATION	6'-0"	
DOOR RELEASE KEYPAD STATION	46"	
DOOR RELEASE PROXIMITY READER STATION. PROVIDE ANY ADDITIONAL ROUGH-IN FOR "EMERGENCY RELEASE" OPERATOR STATIONS AS REQUIRED.	46"	
SAME AS "PR" EXCEPT MULLION MOUNT	46"	M
MOTION SENSOR DOOR CONTROL	CLG	
PUSH-TO-EXIT BUTTON	46"	
REMOTE DOOR RELEASE PUSH-BUTTON	8" ACT	
RECESSED JUNCTION BOX	SEE DRAWINGS	
ACCESS CONTROL HEADEND	5'-0"	SECA

SITE UTILITIES LEGEND

	EXISTING, DEMOLITION, NEW WORK
	LIGHT POLE
MH MH E	MANHOLE - 'E' DENOTES ELECTRICAL - 'C' DENOTES COMMUNICATIONS
H H C	HAND HOLE - 'E' DENOTES ELECTRICAL - 'C' DENOTES COMMUNICATIONS
	PAD MOUNTED TRANSFORMER
—USL—	UNDERGROUND STREET LIGHTING
—(E)USL—	EXISTING UNDERGROUND STREET LIGHTING
— —(D)USL— —	DEMOLISHED UNDERGROUND STREET LIGHTING
—UC—	UNDERGROUND COMMUNICATIONS
—(E)UC—	EXISTING UNDERGROUND COMMUNICATIONS
— —(D)UC— —	DEMOLISHED UNDERGROUND COMMUNICATIONS
—US—	UNDERGROUND ELECTRICAL - SECONDARY
—(E)US—	EXISTING UNDERGROUND ELECTRICAL - SECONDARY
— —(D)US— —	DEMOLISHED UNDERGROUND ELECTRICAL - SECONDARY
—UP—	UNDERGROUND ELECTRICAL 12KV DISTRIBUTION (UK)
—(E)UP—	EXISTING UNDERGROUND ELECTRICAL 12KV DISTRIBUTION (UK)
— —(D)UP— —	DEMOLISHED UNDERGROUND ELECTRICAL 12KV DISTRIBUTION (UK)
—(E)UE—	EXISTING UNDERGROUND ELECTRICAL

ELECTRICAL GENERAL NOTES

A EACH CONTRACTOR, PROPOSER, SUPPLIER AND/OR MANUFACTURER SHALL REFER TO ALL DOCUMENTS PERTAINING TO THIS PROJECT AND COORDINATE ACCORDINGLY SO AS TO ENSURE ADEQUACY OF FIT, COMPLIANCE WITH SPECIFICATIONS, PROPER VOLTAGE AND CURRENT CHARACTERISTICS TO AVOID CONFLICT WITH ANY OTHER BUILDINGS SYSTEMS. VERIFY SAME WITH SHOP DRAWINGS.

B ADDITIONAL ELECTRICAL REQUIREMENTS MAY BE SHOWN ON PLANS FROM OTHER DISCIPLINES IN THIS SET. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW ALL PLANS AND SPECIFICATIONS FOR A COMPLETE UNDERSTANDING OF THE PROJECT REQUIREMENTS.

C WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ALL LOCAL, STATE, AND NATIONAL CODES. INCLUDING BUT NOT LIMITED TO NFPA 70 (NEC), NFPA 72, INTERNATIONAL BUILDING CODES, ETC.

D CONTRACTOR SHALL FOLLOW SEISMIC RESTRAINT AND DESIGN REQUIREMENTS CONTAINED IN LATEST ADOPTED STATE AND INTERNATIONAL BUILDING CODES, WITH ALL AMENDMENTS AS ADOPTED BY THE CURRENT LEGISLATION. REFER TO ELECTRICAL AND STRUCTURAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.

E ALL OFFSETS, TURNS, FITTINGS, TRIM, DETAIL, ETC. MAY NOT BE INDICATED, BUT SHALL BE PROVIDED AS REQUIRED. ADDITIONAL ALLOWANCES SHALL BE INCLUDED FOR SAME AT EACH PROPOSER'S DISCRETION.

F INSTALL NO PIPING, CONDUIT, DUCTWORK, ETC. IN A LOCATION OR IN A MANNER WHICH WILL ALLOW FREEZING OR THE COLLECTION OF CONDENSATION THEREON. IF IN DOUBT, CONTACT THE ENGINEER.

G ADVISE THE ENGINEER OF ANY CONFLICTS, ERRORS, OMISSIONS, ETC. AT LEAST TEN DAYS PRIOR TO BID DATE, TO ALLOW CLARIFICATION BY WRITTEN ADDENDUM.

H WHERE CONFLICTS ARE FOUND BETWEEN DRAWINGS, DETAILS, OR SPECIFICATIONS, THE MORE STRINGENT REQUIREMENT SHALL APPLY. NOTIFY ARCHITECT OF DISCREPANCY IN WRITING.

I DEVIATION FROM SPECIFICATIONS OR PLANS REQUIRES PRIOR WRITTEN APPROVAL FROM THE ENGINEERS AND MUST BE SUBMITTED IN WRITING NO LATER THAN TEN DAYS PRIOR TO THE BID DATE.

J OBSERVE ALL APPLICABLE CODES, RULES AND REGULATIONS THAT MAY APPLY TO THE WORK UNDER THIS CONTRACT. (CITY, COUNTY, LOCAL, STATE, FEDERAL, MUNICIPALITY, UTILITY COMPANY, OSHA, ETC.).

K MOUNTING HEIGHTS FOR WALL MOUNTED DEVICES INDICATED ABOVE FINISHED FLOOR ARE TO CENTER OF DEVICE UON. MOUNTING HEIGHTS TO CEILING SUSPENDED DEVICES ARE TO BOTTOM OF DEVICE UON.

L INSTALL EQUIPMENT, MATERIALS, ETC. IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND DIRECTIONS. IF IN CONFLICT WITH THE DESIGN INDICATED IN CONTRACT DOCUMENTS, ADVISE THE ENGINEER PRIOR TO INSTALLATION FOR CLARIFICATION.

M DO NOT RECESS PANELBOARD TUBS OR OTHER FLUSH-MOUNTED EQUIPMENT IN WALLS THAT HAVE A FIRE RATING. NO INSTALLATION SHALL DIMINISH OR VOID FIRE RESISTIVE RATINGS IN ANYWAY.

N THE PURPOSE AND INTENT OF ALL OF THE DOCUMENTS PERTAINING TO THIS PROJECT IS TO PROVIDE A COMPLETE, FUNCTIONAL, SAFE, LIKE-NEW FACILITY. ANYTHING LESS SHALL BE UNACCEPTABLE.

O ALL SYSTEMS, EQUIPMENT AND MATERIALS ARE TO BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. WORK NOT MEETING THIS CRITERION SHALL BE REMOVED AND REINSTALLED SATISFACTORILY. FINAL DETERMINATION OF THE ACCEPTABILITY OF THE QUALITY OF WORK RESIDES WITH THE ENGINEER

P ALL WORK, MATERIALS, EQUIPMENT, ETC. SHALL BE FULLY GUARANTEED FOR ONE FULL CALENDAR YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION AS DOCUMENTED BY THE ENGINEER, UNLESS LONGER WARRANTY PERIODS FOR EQUIPMENT ARE SPECIFIED.

Q UNLESS OTHERWISE SPECIFIED OR INDICATED, ALL EQUIPMENT AND/OR MATERIALS WITHIN OCCUPIED SPACES OR EXPOSED TO VIEW ON THE BUILDING EXTERIOR SHALL BE PRIMED AND FINISHED SO AS TO COMPLEMENT ADJACENT SURFACE, UNLESS OTHERWISE NOTED. COORDINATE WORK AND COLORS WITH ARCHITECT.

R WHERE PENETRATING ROOFING MEMBRANE OR OTHER MATERIALS USED FOR WEATHERPROOFING THE BUILDING, MAKE SUCH PENETRATION IN A WAY THAT WILL NOT VOID OR DIMINISH THE ROOFING WARRANTY OR INTEGRITY IN ANYWAY. COORDINATE ALL SUCH PENETRATIONS WITH THE ROOFING MANUFACTURER AND ARCHITECT.

S THE CONTRACTOR IS RESPONSIBLE FOR ALL UTILITY COMPANY FEES, CASH CONTRIBUTIONS OR OTHER COSTS THAT THE UTILITY COMPANY MAY REQUIRE TO COMPLETE THEIR WORK. (ELECTRIC, TELEPHONE, TELEVISION, DATA, ETC.).

T COORDINATE WITH ARCHITECTURAL FLOOR PLANS, ELEVATIONS AND CASEWORK DETAILS FOR LOCATION OF ADDITIONAL RECEPTACLES, UTILITY OUTLETS, ELECTRICAL DEVICES, ETC.

U CEILING-MOUNTED ELECTRICAL DEVICES SHALL BE CENTERED IN 2'X2' CEILING TILE AND INSTALLED CENTERED ON 2' DIMENSION OF 2'X4' TILE AND ON CENTERLINE OR A QUARTER POINT ON 4' DIMENSION.

V ANY VIBRATING, OSCILLATING OR OTHER NOISE OR MOTION PRODUCING EQUIPMENT SHALL BE ISOLATED FROM SURROUNDING SYSTEMS IN AN APPROVED MANNER. NOISY OR STRUCTURALLY DAMAGING INSTALLATIONS SHALL BE SATISFACTORILY REPLACED OR REPAIRED AT THE INSTALLING CONTRACTORS' EXPENSE. THE FINAL DECISION ON THE SUITABILITY OF A PARTICULAR INSTALLATION'S ACCEPTABILITY SHALL BE THAT OF THE ENGINEER.

W CHECK ALL THREE PHASE MOTORS WITH A PHASE ROTATION METER, PRIOR TO PLACING IN SERVICE.

X PROVIDE DETAILED SHOP DRAWINGS TO ENGINEER PRIOR TO PURCHASING OR INSTALLING ANY EQUIPMENT

Y DEVIATIONS IN SIZES, CAPACITIES, FIT, FINISH, ETC. FOR EQUIPMENT FROM THAT PRIME SPECIFIED SHALL BE THE RESPONSIBILITY OF THE PURCHASER OF THAT EQUIPMENT. ANY PROVISIONS REQUIRED TO ACCOMMODATE A DEVIATION, WHETHER APPROVED BY THE ENGINEER OR NOT, SHALL BE THE RESPONSIBILITY OF THE PURCHASER.

Z THE CONSTRUCTION MANAGER, GENERAL CONTRACTOR, OR WHOMEVER HOLDS THE PRIME CONTRACT(S) FOR THIS CONSTRUCTION IS RESPONSIBLE FOR THE COORDINATION, APPEARANCE, SCHEDULING AND TIMELINESS OF THE WORK OF ALL TRADES, CONTRACTORS, SUPPLIERS, INSTALLERS, ETC. POOR OR UNTIMELY WORK ON THE PART OF ANY SUBCONTRACTOR SHALL BE RESOLVED BY THE PARTY WHO ENGAGED THEM ON THIS PROJECT.

AA WHERE MOUNTING HEIGHTS ARE NOT INDICATED OR ARE I

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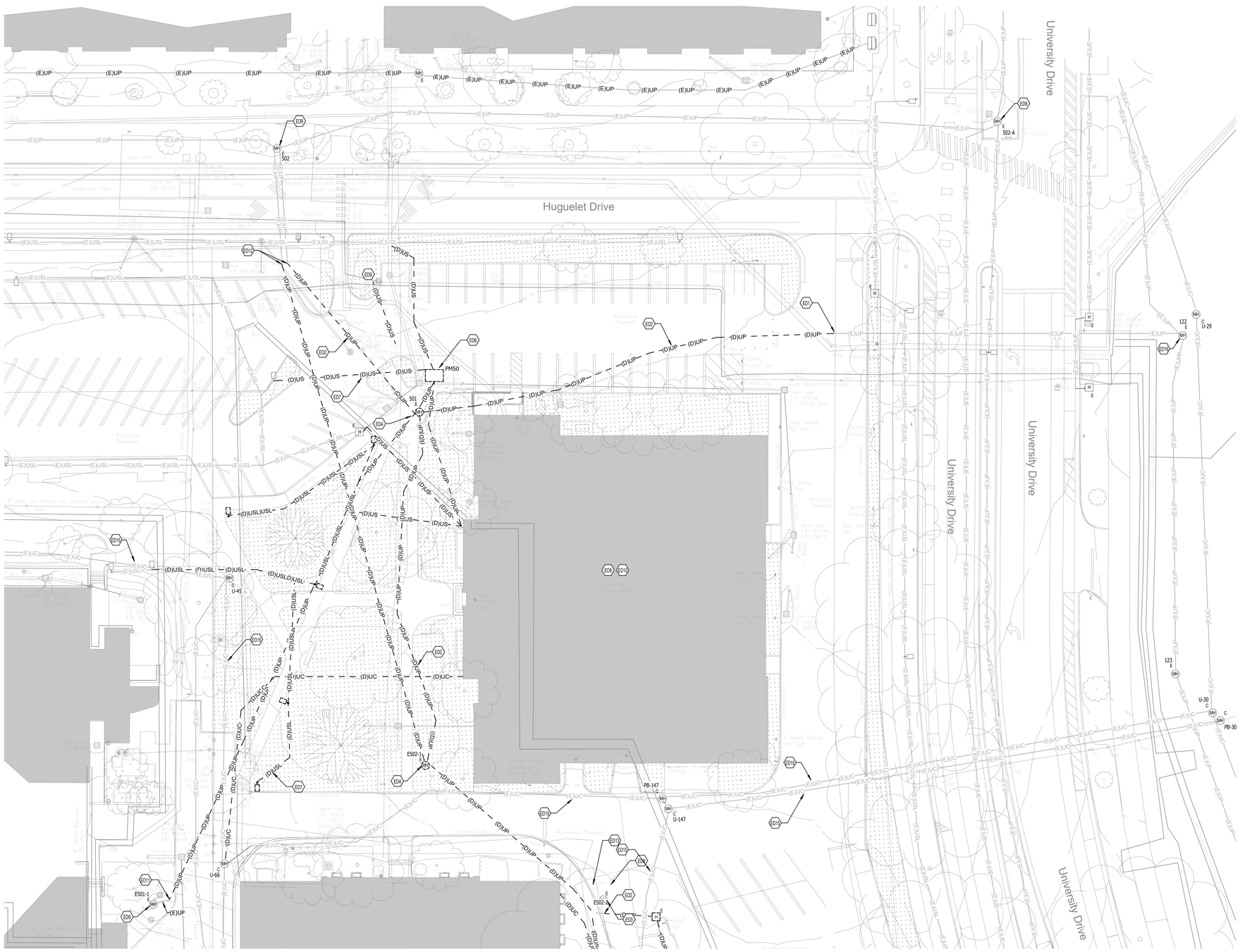

SITE UTILITY PLAN AREA A - ELECTRICAL DEMOLITION

1 SCALE: 1" = 20'-0"

0 10' 20' 40' 60' 80'

BEFORE YOU DIG

THE CONTRACTOR AND ALL SUBCONTRACTORS SHALL CONTACT "BUD (BEFORE YOU DIG)" AT 1-800-752-6007 TO OBTAIN UNDERGROUND UTILITY LOCATIONS PRIOR TO ANY CONSTRUCTION. ANY CONTRACTOR OR SUBCONTRACTOR PERFORMING ANY TYPE OF EXCAVATION ON THIS PROJECT SHALL CALL "BUD" TO OBTAIN AN AUTHORIZATION NUMBER.

AREA A

AREA B

KEY PLAN

ELECTRICAL SITE NOTES

A DO NOT SCALE FROM MECHANICAL AND ELECTRICAL DRAWINGS. FIELD VERIFY REQUIRED DIMENSIONS AND COORDINATE WITH CIVIL DRAWINGS AND SURVEYS.

B REFER ALSO TO ALL OTHER PLANS AND THE SPECIFICATION, BUT ESPECIALLY TO: THE SITE SURVEY, THE ARCHITECTURAL SITE PLAN, THE SITE GRADING PLAN, THE PLANTING PLAN (WHERE AVAILABLE), FOUNDATION PLAN(S), APPROPRIATE MECHANICAL & ELECTRICAL FLOOR PLANS FOR SERVICE CONTINUATIONS, THE SITE UTILITY PLAN - MECHANICAL & ELECTRICAL. WHERE THERE ARE CONFLICTS AMONG THESE PLANS AND/OR RELATED SPECIFICATIONS, ADVISE THESE ENGINEERS AT LEAST TEN DAYS PRIOR TO SUBMISSION OF BIDS.

C FEDERAL, STATE, LOCAL, MUNICIPALITY AND UTILITY COMPANY CODES, RULES, REGULATIONS AND REQUIREMENTS APPLY UNLESS EXCEEDED BY THIS DESIGN.

D WHEN INTERRUPTION OF AN EXISTING UTILITY OR SERVICE IS PLANNED OR OCCURS ACCIDENTALLY, THE CONTRACTOR(S) SHALL WORK CONTINUOUSLY AS NEEDED TO RESTORE SAME PROVIDING PREMIUM TIME AS NEEDED AT NO INCREASE IN THE CONTRACT PRICE.

E LOCATIONS, DEPTHS, MATERIAL TYPES, ELEVATIONS, ETC. OF ALL APPURTENANCES, LINES, BUILDINGS, ETC. INDICATED ON THESE DRAWINGS WERE TAKEN FROM VARIOUS SOURCES, ARE DIAGRAMMATIC ONLY AND ARE SUBJECT TO SUBSTANTIAL VARIATION FROM EXISTING CONDITIONS, EXISTING UTILITIES LOCATIONS MAY VARY. CONSEQUENTLY ALL CONTRACTORS SHALL EXERCISE EXTREME CARE IN THE COURSE OF THEIR WORK SO AS TO ENSURE THAT THEY DO NOT INTERRUPT ANY EXISTING SERVICE. FOR SAFETY PURPOSES, PAY PARTICULAR ATTENTION TO THIS PRECAUTION RELATIVE TO NATURAL GAS AND ELECTRICAL LINES. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL FEDERAL, STATE, AND/OR LOCAL RULES, REGULATIONS, STANDARDS AND SAFETY REQUIREMENTS.

F PROVIDE LONG RADIUS ELBOWS FOR UNDERGROUND CONDUIT BENDS. WHERE SERVING A UTILITY OWNED TRANSFORMER, THE UTILITY STANDARDS SHALL TAKE PRECEDENCE.

G UTILITIES SHALL BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE UNIVERSITY STANDARDS. IN ALL CASES, THE MOST STRINGENT REQUIREMENT SHALL APPLY. IF ANY VARIATION OCCURS, CONSULT THE ENGINEER. CONTRACTOR SHALL VISIT THE SITE AND FIELD VERIFY THE ROUTING OF ALL UTILITIES NEW AND EXISTING PRIOR TO SUBMISSION OF BIDS. SUBMISSION OF A BID PROPOSAL INDICATES THAT THE CONTRACTOR IS FULLY AWARE OF ALL OBSTRUCTIONS AND WILL INSTALL ALL OF THE NEW UTILITIES WITHOUT REQUESTS FOR ANY ADDITIONAL CHANGES.

H PROVIDE GALVANIZED RIGID CONDUIT FOR EXTERIOR UNDERGROUND TRANSITIONS TO ABOVE GRADE; EXTEND CONDUIT A MINIMUM OF 6" ABOVE GRADE.

I PROVIDE SURVEY DATA INCLUDING DEPTH, FOR ALL TERMINATION POINTS AND CHANGES IN ELEVATION, SLOPE OR DIRECTION. DATA SHALL BE IN THE FORMAT NECESSARY FOR INCLSUION IN THE UNIVERSITY'S GIS SYSTEM.

J CONTRACTOR SHALL CONTACT ENGINEER FOR INSPECTION OF TRENCHES PRIOR TO INSTALLATION OF CONDUITS OR RACEWAYS. AFTER RACEWAY INSTALLATION AND PRIOR TO CONCRETE PLACEMENT, NO CONCRETE OR BACKFILL SHALL BE DONE WITHOUT EXPLICIT APPROVAL OF OWNER AND ENGINEER.

K CONTRACTOR SHALL CUT AND PATCH ALL PAVEMENT, CURBING, ETC. AS REQUIRED FOR WORK. CONTRACTOR SHALL REPAIR ALL LANDSCAPING THAT IS DAMAGED FOR WORK. FINISH GRADE, SEED AND STRAW ALL DISTURBED GREEN SPACES. ALL PATCH AND REPAIR WORK SHALL BE IN ACCORDANCE WITH BOTH CIVIL AND LANDSCAPE DRAWINGS AND SPECIFICATIONS.

L COORDINATE UNDERGROUND ELECTRICAL WITH ALL LANDSCAPING AND FENCING, ADJUST ELECTRICAL LINES TO AVOID CONFLICTS. REFER TO LANDSCAPING PLANS FOR FURTHER INFORMATION. AVOID ROUTING UNDERGROUND CONDUITS UNDER ROADWAYS OR PARKING LOTS, CROSS ROADWAYS WITH UNDERGROUND CONDUITS AT 90 ANGLES WHERE POSSIBLE.

M PLANNED INTERRUPTION OF ANY SERVICE SHALL BE COORDINATED WITH THE APPROPRIATE MUNICIPALITY OR UTILITY COMPANY, THE ARCHITECT, AND THE BUILDING OPERATORS AT LEASTE ONE WEEK IN ADVANCE OF ANTICIPATED INTERRUPTION. A SCHEDULE FOR THESE OUTAGES SHALL BE DEVELOPED AND AGREED UPON BETWEEN THE PARTIES MENTIONED TO AVOID UNNECESSARY INCONVENIENCE TO THE OWNER OR ANY AFFECTED PARTY. NOTIFY THE UTILITY COMPANY OF ANY ANTICIPATED SERVICES REQUIRED FROM THEM AT LEAST TWO WEEKS IN ADVANCE IN WRITING AND INSURE THAT THEY DO NOT DELAY WORK.

N THE LOCATIONS OF UTILITIES SHOWN WITHIN THESE DRAWINGS ARE APPROXIMATE ONLY.

O THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY EXCAVATION WORK REQUIRED TO LOCATE UNDERGROUND UTILITIES. THE CONTRACTOR IS ALSO REQUIRED TO NOTIFY ANY OTHER AFFECTED UTILITY OWNERS PRIOR TO DIGGING. IN THE EVENT OF ACCIDENTAL INTERRUPTION OF SERVICE, CONTRACTOR WILL IMMEDIATELY NOTIFY THE OTHER UTILITY OWNERS.

P THE CONTRACTOR WILL PROVIDE ALL NECESSARY PROTECTIVE MEASURES TO SAFEGUARD OTHER EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION OF THIS PROJECT. IN THE EVENT THAT SPECIAL EQUIPMENT IS REQUIRED TO WORK OVER AND AROUND THE OTHER UTILITIES, THE UTILITY WILL BE REQUIRED TO FURNISH SUCH EQUIPMENT.

Q CONTRACTOR SHALL PAY ALL TAP FEES, UTILITY COST, UTILITY CONNECTION COSTS, METER FEES, EXTENSION AND DEVELOPMENT CHARGES. REFER TO THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

R REATTACH ALL TAPS AND TRANSFORMERS AS TO MAINTAIN EXISTING PHASE CONNECTIONS.

S CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DOWNSTREAM SERVICE FROM REMOVED EQUIPMENT ON SITE, INCLUDING BUT NOT LIMITED TO SITE LIGHTING, TRANSFORMERS, ETC.

T REMOVE ALL ASSOCIATED PULLBOXES, CONDUIT AND CONDUCTORS FOR DEVICES/FIXTURES/ETC. BEING REMOVED (BACK TO SOURCE), WHETHER INDICATED OR NOT (UON).

U COORDINATE DISPOSAL OF ALL FIXTURES, DEVICES, ETC. (INDICATED FOR DEMOLITION) WITH OWNER. TURN OVER ITEMS REMOVED TO OWNER AT THEIR OPTION.

V COORDINATE WITH OTHER TRADES FOR THE REMOVAL AND/OR RELOCATION OF ELECTRICAL DEVICES AND CONNECTIONS ASSOCIATED WITH THEIR EQUIPMENT.

W REFER TO THE MEDIUM-VOLTAGE WORK SEQUENCE FOR ORDER OF NEW WORK AND DEMOLITION. THE CONTRACTOR SHALL DEVELOP A DETAILED WORK PROCEDURE FOR REVIEW. OBTAIN APPROVAL FROM THE ENGINEER AND OWNER PRIOR TO BEGINNING ANY WORK. DURATION OF OUTAGES AND LOSS OF REDUNDANT SOURCES IS TO BE MINIMIZED.

X ALL EXCAVATION WITHIN THE CANOPIES OF REMAINING TREES SHALL BE BY AIR EXCAVATOR TO MINIMIZE DAMAGE TO ROOTS. REFER TO THE UNIVERSITY'S TREE PROTECTION REQUIREMENTS FOR OTHER REQUIREMENTS.

TAGGED NOTES

(##)

ED1 EXISTING DUCT FROM E122 TO E510 CONSISTS OF 4EA 5" CONDUITS WITH ONE ACTIVE CIRCUIT. AFTER DE-ENERGIZATION OF CIRCUIT, INTERCEPT CONDUIT TO E122 AND EXTEND TO NEW MANHOLE E501-1A AS SHOWN ON NEW WORK PLANS.

ED2 REMOVE ALL CABLING IN DUCT BANK. REMOVE DUCT BANK TO POINT INDICATED. PROTECT REMAINING CONDUIT FOR EXTENSION TO NEW LOCATION AS SHOWN ON NEW WORK PLANS.

ED3 MANHOLE TO REMAIN. WHERE EXISTING DUCTBANK IS INDICATED FOR DEMOLITION, CUT AND CAP DUCT APPROXIMATELY 5 FEET FROM MANHOLE FOR POTENTIAL FUTURE USE.

ED4 REMOVE ELECTRIC MANHOLE AFTER ALL FEEDERS HAVE BEEN REMOVED

ED6 REMOVE PAD-MOUNTED SWITCH AFTER ALL FEEDERS HAVE BEEN RECONFIGURED. DELIVER SWITCH TO OWNER'S STOCK LOCATION.

ED7 REMOVE SITE LIGHTING AND MISCELLANEOUS ELECTRICAL CIRCUITS ON SITE WHERE AFFECTED BY CONSTRUCTION. PROVIDE TEMPORARY POWER FOR REMAINING FIXTURES AND DEVICES.

ED8 PRIOR TO BUILDING DEMOLITION, CONTRACTOR SHALL DISCONNECT POWER AND COMMUNICATIONS SERVICES AND MAKE SAFE. COORDINATE DISCONNECTIONS WITH UK PPD AND UK ITS.

ED9 DISCONNECT CIRCUIT FOR MANHOLE POWER PRESENTLY SUPPLIED FROM KELLY HALL. CONTRACTOR SHALL PROVIDE TEMPORARY POWER CIRCUIT FROM CONSTRUCTION POWER AS NECESSARY TO ENERGIZE ALL AFFECTED MANHOLES. CIRCUIT SIZES SHALL MATCH THE EXISTING CIRCUITS SUPPLIED FROM KELLY HALL.

ED10 PRIOR TO DISCONNECTING POWER TO KELLY HALL OR ANNEX #5, THE CONTRACTOR SHALL POSITIVELY IDENTIFY ALL CIRCUITS SUPPLYING SITE LIGHTING, MANHOLE POWER, AND OTHER SITE EQUIPMENT. THE CONTRACTOR SHALL PROVIDE TEMPORARY CONSTRUCTION POWER AND CONNECTIONS TO ALL LIGHTS, MANHOLES AND EQUIPMENT TO MAINTAIN OPERATION FOR THE DURATION OF THIS PROJECT. MATCH CIRCUIT SIZE TO EXISTING BREAKER SIZE. KNOWN SITE LIGHTING CIRCUITS ARE INDICATED ON THE PLANS. KNOWN MANHOLE POWER INCLUDES 3 STEAM VAULTS ALONG HUGUELET DR. (30A/2P) AND 5 MANHOLE CIRCUITS: E125-1, E125-2, E502A - E502, E503 - E402-1 - E904-1, E904-2, E904-3 - E501-1, E502-2 (60A/2P).

ED11 EXISTING DUCT FROM E501 TO E501-1 CONSISTS OF 4EA 5" CONDUITS WITH TWO ACTIVE CIRCUITS.

ED12 EXISTING DUCT FROM E502 TO E502-1 CONSISTS OF 4EA 5" UNUSED CONDUITS. EXISTING DUCT FROM E502 TO E501 CONSISTS OF 4EA 5" CONDUITS WITH ONE ACTIVE CIRCUIT.

ED13 EXISTING DUCT FROM E501 TO E502-1 TO E502-2 CONSISTS OF 4EA 5" CONDUITS WITH TWO ACTIVE CIRCUITS. ONE CIRCUIT SUPPLIES DIMOCK ANIMAL PATHOLOGY AND THE OTHER SUPPLIES ANNEX 5 AND BEHAVIORIAL SCIENCE.

ED15 EXISTING COMMUNICATION LINES ON SITE SHALL BE MARKED AND PROTECTED FROM DAMAGE FOR THE DURATION OF THE PROJECT.

ED16 FOR EXISTING FEEDER FROM SW124 TO SW501-1: AFTER CABLE IS REMOVED FROM SERVICE, PULL BACK APPROXIMATELY 20' OF CABLE FROM E501, CUT AND SEAL ENDS MOISTURE-TIGHT. BUNDLE AND COIL IN MANHOLE E122 FOR FUTURE USE.

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BP-01B DEMO, SITE UTILITES (PH1)

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING

UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

ELECTRICAL

PROJECT	XKSM21
DATE	10/20/2023

REVISIONS

No.	Description	Date

JRA ARCHITECTS HAS RETAINED AN ELECTRONIC VERSION OF THESE DRAWINGS. THE CLIENT AGREES NOT TO REUSE THESE DRAWINGS - IN ELECTRONIC OR ANY OTHER FORMAT - IN WHOLE, OR IN PART, FOR ANY PURPOSE OTHER THAN FOR THE PROJECT. THE CLIENT AGREES NOT TO TRANSFER THESE DRAWINGS TO OTHERS WITHOUT THE PRIOR, WRITTEN CONSENT OF THE ARCHITECT. THE CLIENT FURTHER AGREES TO WAIVE ALL CLAIMS AGAINST THE ARCHITECT RESULTING IN ANY WAY FROM ANY UNAUTHORIZED CHANGES TO OR REUSE OF THE ELECTRONIC FILES FOR ANY OTHER PROJECT BY ANYONE OTHER THAN THE ARCHITECT.

SITE UTILITY PLAN AREA A - MEP DEMOLITION

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SITE UTILITY PLAN AREA B - ELECTRICAL DEMOLITION

1 SCALE: 1" = 20'-0"

0 10' 20' 40' 60' 80'

AREA A

AREA B

KEY PLAN

ELECTRICAL SITE NOTES

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R REATTACH ALL TAPS AND TRANSFORMERS AS TO MAINTAIN EXISTING PHASE CONNECTIONS.

S CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DOWNSTREAM SERVICE FROM REMOVED EQUIPMENT ON SITE, INCLUDING BUT NOT LIMITED TO SITE LIGHTING, TRANSFORMERS, ETC.

T REMOVE ALL ASSOCIATED PULLBOXES, CONDUIT AND CONDUCTORS FOR DEVICES/FIXTURES/ETC. BEING REMOVED (BACK TO SOURCE), WHETHER INDICATED OR NOT (UON).

U COORDINATE DISPOSAL OF ALL FIXTURES, DEVICES, ETC. (INDICATED FOR DEMOLITION) WITH OWNER. TURN OVER ITEMS REMOVED TO OWNER AT THEIR OPTION.

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W REFER TO THE MEDIUM-VOLTAGE WORK SEQUENCE FOR ORDER OF NEW WORK AND DEMOLITION. THE CONTRACTOR SHALL DEVELOP A DETAILED WORK PROCEDURE FOR REVIEW. OBTAIN APPROVAL FROM THE ENGINEER AND OWNER PRIOR TO BEGINNING ANY WORK. DURATION OF OUTAGES AND LOSS OF REDUNDANT SOURCES IS TO BE MINIMIZED.

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TAGGED NOTES

ED2	REMOVE ALL CABLING IN DUCT BANK. REMOVE DUCT BANK TO POINT INDICATED. PROTECT REMAINING CONDUIT FOR EXTENSION TO NEW LOCATION AS SHOWN ON NEW WORK PLANS.
ED3	MANHOLE TO REMAIN. WHERE EXISTING DUCTBANK IS INDICATED FOR DEMOLITION, CUT AND CAP DUCT APPROXIMATELY 5 FEET FROM MANHOLE FOR POTENTIAL FUTURE USE.
ED5	REMOVE OIL-FILLED TRANSFORMER AND DELIVER TO OWNER'S STOCK LOCATION.
ED7	REMOVE SITE LIGHTING AND MISCELLANEOUS ELECTRICAL CIRCUITS ON SITE WHERE AFFECTED BY CONSTRUCTION. PROVIDE TEMPORARY POWER FOR REMAINING FIXTURES AND DEVICES.
ED8	PRIOR TO BUILDING DEMOLITION, CONTRACTOR SHALL DISCONNECT POWER AND COMMUNICATIONS SERVICES AND MAKE SAFE. COORDINATE DISCONNECTIONS WITH UK PPD AND UK ITS.
ED9	DISCONNECT CIRCUIT FOR MANHOLE POWER PRESENTLY SUPPLIED FROM KELLY HALL. CONTRACTOR SHALL PROVIDE TEMPORARY POWER CIRCUIT FROM CONSTRUCTION POWER AS NECESSARY TO ENERGIZE ALL AFFECTED MANHOLES. CIRCUIT SIZES SHALL MATCH THE EXISTING CIRCUITS SUPPLIED FROM KELLY HALL.
ED10	PRIOR TO DISCONNECTING POWER TO KELLY HALL OR ANNEX #5, THE CONTRACTOR SHALL POSITIVELY IDENTIFY ALL CIRCUITS SUPPLYING SITE LIGHTING, MANHOLE POWER, AND OTHER SITE EQUIPMENT. THE CONTRACTOR SHALL PROVIDE TEMPORARY CONSTRUCTION POWER AND CONNECTIONS TO ALL LIGHTS, MANHOLES AND EQUIPMENT TO MAINTAIN OPERATION FOR THE DURATION OF THIS PROJECT. MATCH CIRCUIT SIZE TO EXISTING BREAKER SIZE. KNOWN SITE LIGHTING CIRCUITS ARE INDICATED ON THE PLANS. KNOWN MANHOLE POWER INCLUDES 3 STEAM VAULTS ALONG HUGUELET DR. (30A/2P) AND 5 MANHOLE CIRCUITS: E125-1, E125-2, E502A - E502, E503 - E402-1 - E904-1, E904-2, E904-3 - E501-1, E502-2 (60A/2P).
ED11	EXISTING DUCT FROM E501 TO E501-1 CONSISTS OF 4EA 5" CONDUITS WITH TWO ACTIVE CIRCUITS.
ED13	EXISTING DUCT FROM E501 TO E502-1 TO E502-2 CONSISTS OF 4EA 5" CONDUITS WITH TWO ACTIVE CIRCUITS. ONE CIRCUIT SUPPLIES DIMOCK ANIMAL PATHOLOGY AND THE OTHER SUPPLIES ANNEX 5 AND BEHAVIORIAL SCIENCE.
ED14	REMOVE EXISTING PRIMARY CONDUIT SUPPLYING THE BEHAVIORIAL SCIENCE PAD-MOUNTED TRANSFORMER AFTER THE NEW FEEDER IS INSTALLED.
ED15	EXISTING COMMUNICATION LINES ON SITE SHALL BE MARKED AND PROTECTED FROM DAMAGE FOR THE DURATION OF THE PROJECT.
ED17	FOR EXISTING FEEDER FROM SW124 TO SW501-1: AFTER CABLE IS REMOVED FROM SERVICE DISCONNECT ELBOWS FROM SWITCH AND SECURE NEAR MANHOLE CEILING FOR FUTURE USE.

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BP-01B DEMO, SITE UTILITES (PH1)

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

ELECTRICAL

PROJECT	XKSM21
DATE	10/20/2023

REVISIONS

No.	Description	Date

JRA ARCHITECTS HAS RETAINED AN ELECTRONIC VERSION OF THESE DRAWINGS. THE CLIENT AGREES NOT TO REUSE THESE DRAWINGS - IN ELECTRONIC OR PRINTED FORM - ON ANY OTHER PROJECT OR PART FOR ANY PURPOSE OTHER THAN FOR THE PROJECT. THE CLIENT AGREES NOT TO TRANSFER THESE ELECTRONIC FILES TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF THE ARCHITECT. THE CLIENT FURTHER AGREES TO WAIVE ALL CLAIMS AGAINST THE ARCHITECT RESULTING IN ANY WAY FROM ANY UNAUTHORIZED CHANGES TO OR REUSE OF THE ELECTRONIC FILES FOR ANY OTHER PROJECT BY ANYONE OTHER THAN THE ARCHITECT.

SITE UTILITY PLAN AREA B - MEP DEMOLITION

EU102

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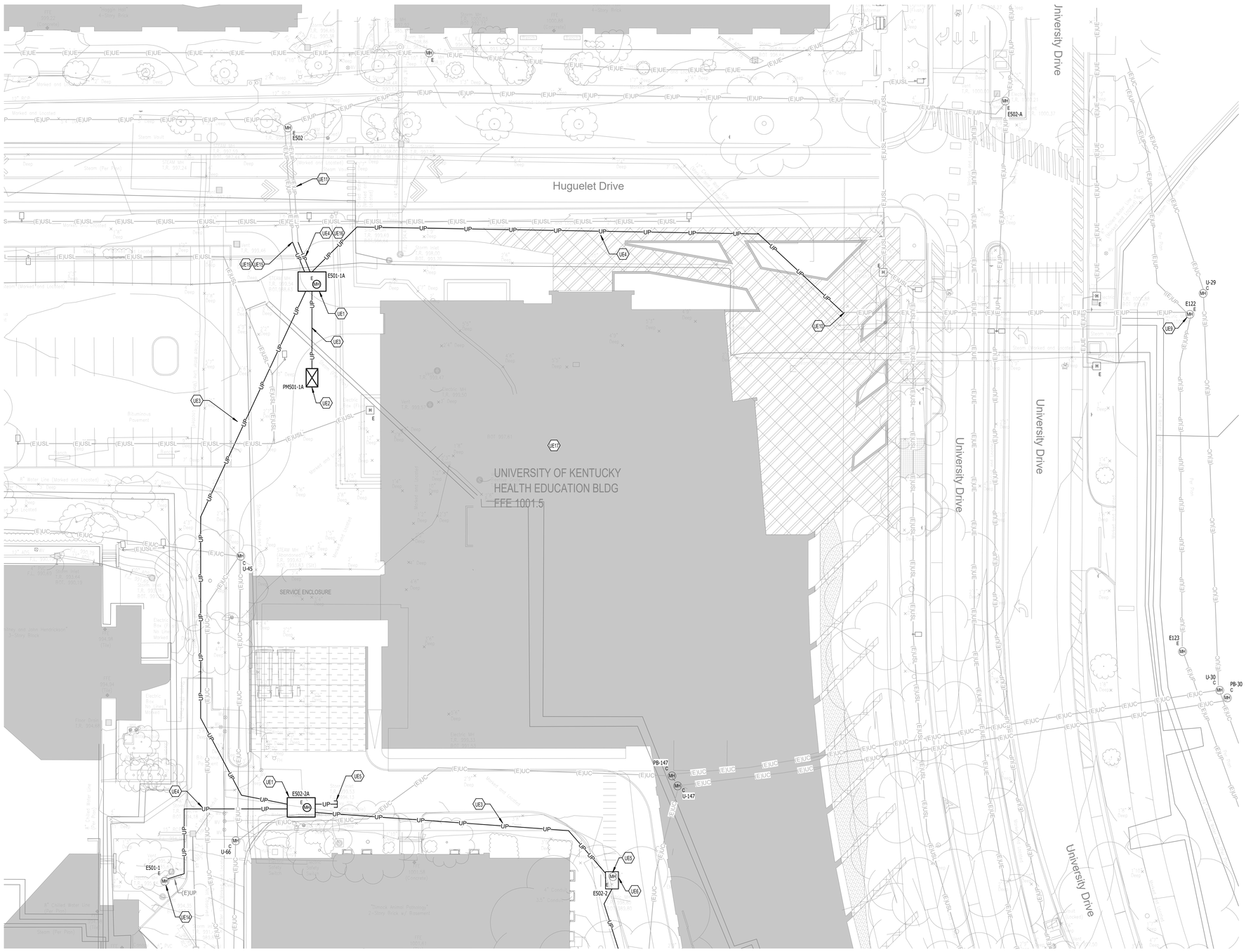

SITE UTILITY PLAN - AREA A - ELECTRICAL NEW WORK

1 SCALE: 1" = 20'-0"

0 10' 20' 40' 60' 80'

ELECTRICAL SITE NOTES

A DO NOT SCALE FROM MECHANICAL AND ELECTRICAL DRAWINGS. FIELD VERIFY REQUIRED DIMENSIONS AND COORDINATE WITH CIVIL DRAWINGS AND SURVEYS.

B REFER ALSO TO ALL OTHER PLANS AND THE SPECIFICATION, BUT ESPECIALLY TO: THE SITE SURVEY, THE ARCHITECTURAL SITE PLAN, THE SITE GRADING PLAN, THE PLANTING PLAN (WHERE AVAILABLE), FOUNDATION PLAN(S), APPROPRIATE MECHANICAL & ELECTRICAL FLOOR PLANS FOR SERVICE CONTINUATIONS, THE SITE UTILITY PLAN - MECHANICAL & ELECTRICAL WHERE THERE ARE CONFLICTS AMONG THESE PLANS AND/OR RELATED SPECIFICATIONS, ADVISE THESE ENGINEERS AT LEAST TEN DAYS PRIOR TO SUBMISSION OF BIDS.

C FEDERAL, STATE, LOCAL MUNICIPALITY AND UTILITY COMPANY CODES, RULES, REGULATIONS AND REQUIREMENTS APPLY UNLESS EXCEEDED BY THIS DESIGN.

D WHEN INTERRUPTION OF AN EXISTING UTILITY OR SERVICE IS PLANNED OR OCCURS ACCIDENTALLY, THE CONTRACTOR(S) SHALL WORK CONTINUOUSLY AS NEEDED TO RESTORE SAME PROVIDING PREMIUM TIME AS NEEDED AT NO INCREASE IN THE CONTRACT PRICE.

E LOCATIONS, DEPTHS, MATERIAL TYPES, ELEVATIONS, ETC. OF ALL APPURTENANCES, LINES, BUILDINGS, ETC. INDICATED ON THESE DRAWINGS WERE TAKEN FROM VARIOUS SOURCES, ARE DIAGRAMMATIC ONLY AND ARE SUBJECT TO SUBSTANTIAL VARIATION FROM EXISTING CONDITIONS, EXISTING UTILITIES LOCATIONS MAY VARY. CONSEQUENTLY ALL CONTRACTORS SHALL EXERCISE EXTREME CARE IN THE COURSE OF THEIR WORK SO AS TO ENSURE THAT THEY DO NOT INTERRUPT ANY EXISTING SERVICE. FOR SAFETY PURPOSES, PAY PARTICULAR ATTENTION TO THIS PRECAUTION RELATIVE TO NATURAL GAS AND ELECTRICAL LINES. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL FEDERAL, STATE, AND/OR LOCAL RULES, REGULATIONS, STANDARDS AND SAFETY REQUIREMENTS.

F PROVIDE LONG RADIUS ELBOWS FOR UNDERGROUND CONDUIT BENDS. WHERE SERVING A UTILITY OWNED TRANSFORMER, THE UTILTY STANDARDS SHALL TAKE PRECEDENCE.

G UTILITIES SHALL BE INSTALLED IN ACCORDANCE WITH THE APPLICABLE UNIVERSITY STANDARDS. IN ALL CASES, THE MOST STRINGENT REQUIREMENT SHALL APPLY. IF ANY VARIATION OCCURS, CONSULT THE ENGINEER. CONTRACTOR SHALL VISIT THE SITE AND FIELD VERIFY THE ROUTING OF ALL UTILITIES NEW AND EXISTING PRIOR TO SUBMISSION OF BIDS. SUBMISSION OF A BID PROPOSAL INDICATES THAT THE CONTRACTOR IS FULLY AWARE OF ALL OBSTRUCTIONS AND WILL INSTALL ALL OF THE NEW UTILITIES WITHOUT REQUESTS FOR ANY ADDITIONAL CHANGES.

H PROVIDE GALVANIZED RIGID CONDUIT FOR EXTERIOR UNDERGROUND TRANSITIONS TO ABOVE GRADE; EXTEND CONDUIT A MINIMUM OF 6" ABOVE GRADE.

I PROVIDE SURVEY DATA INCLUDING DEPTH, FOR ALL TERMINATION POINTS AND CHANGES IN ELEVATION, SLOPE OR DIRECTION. DATA SHALL BE IN THE FORMAT NECESSARY FOR INCLSUION IN THE UNIVERSITY'S GIS SYSTEM.

J CONTRACTOR SHALL CONTACT ENGINEER FOR INSPECTION OF TRENCHES PRIOR TO INSTALLATION OF CONDUITS OR RACEWAYS. AFTER RACEWAY INSTALLATION AND PRIOR TO CONCRETE PLACEMENT, NO CONCRETE OR BACKFILL SHALL BE DONE WITHOUT EXPLICIT APPROVAL OF OWNER AND ENGINEER.

K CONTRACTOR SHALL CUT AND PATCH ALL PAVEMENT, CURBING, ETC. AS REQUIRED FOR WORK. CONTRACTOR SHALL REPAIR ALL LANDSCAPING THAT IS DAMAGED FOR WORK. FINISH GRADE, SEED AND STRAW ALL DISTURBED GREEN SPACES. ALL PATCH AND REPAIR WORK SHALL BE IN ACCORDANCE WITH BOTH CIVIL AND LANDSCAPE DRAWINGS AND SPECIFICATIONS.

L COORDINATE UNDERGROUND ELECTRICAL WITH ALL LANDSCAPING AND FENCING. ADJUST ELECTRICAL LINES TO AVOID CONFLICTS. REFER TO LANDSCAPING PLANS FOR FURTHER INFORMATION. AVOID ROUTING UNDERGROUND CONDUITS UNDER ROADWAYS OR PARKING LOTS, CROSS ROADWAYS WITH UNDERGROUND CONDUITS AT 90 ANGLES WHERE POSSIBLE.

M PLANNED INTERRUPTION OF ANY SERVICE SHALL BE COORDINATED WITH THE APPROPRIATE MUNICIPALITY OR UTILITY COMPANY, THE ARCHITECT, AND THE BUILDING OPERATORS AT LEASTE ONE WEEK IN ADVANCE OF ANTICIPATED INTERRUPTION. A SCHEDULE FOR THESE OUTAGES SHALL BE DEVELOPED AND AGREED UPON BETWEEN THE PARTIES MENTIONED TO AVOID UNNECESSARY INCONVENIENCE TO THE OWNER OR ANY AFFECTED PARTY. NOTIFY THE UTILITY COMPANY OF ANY ANTICIPATED SERVICES REQUIRED FROM THEM AT LEAST TWO WEEKS IN ADVANCE IN WRITING AND INSURE THAT THEY DO NOT DELAY WORK.

N THE LOCATIONS OF UTILITIES SHOWN WITHIN THESE DRAWINGS ARE APPROXIMATE ONLY.

O THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY EXCAVATION WORK REQUIRED TO LOCATE UNDERGROUND UTILITIES. THE CONTRACTOR IS ALSO REQUIRED TO NOTIFY ANY OTHER AFFECTED UTILITY OWNERS PRIOR TO DIGGING. IN THE EVENT OF ACCIDENTAL INTERRUPTION OF SERVICE, CONTRACTOR WILL IMMEDIATELY NOTIFY THE OTHER UTILITY OWNERS.

P THE CONTRACTOR WILL PROVIDE ALL NECESSARY PROTECTIVE MEASURES TO SAFEGUARD OTHER EXISTING UTILITIES FROM DAMAGE DURING CONSTRUCTION OF THIS PROJECT. IN THE EVENT THAT SPECIAL EQUIPMENT IS REQUIRED TO WORK OVER AND AROUND THE OTHER UTILITIES. THE UTILITY WILL BE REQUIRED TO FURNISH SUCH EQUIPMENT.

Q CONTRACTOR SHALL PAY ALL TAP FEES, UTILITY COST, UTILITY CONNECTION COSTS, METER FEES, EXTENSION AND DEVELOPMENT CHARGES. REFER TO THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

R REATTACH ALL TAPS AND TRANSFORMERS AS TO MAINTAIN EXISTING PHASE CONNECTIONS.

S CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DOWNSTREAM SERVICE FROM REMOVED EQUIPMENT ON SITE. INCLUDING BUT NOT LIMITED TO SITE LIGHTING, TRANSFORMERS, ETC.

T REMOVE ALL ASSOCIATED PULLBOXES, CONDUIT AND CONDUCTORS FOR DEVICES/FIXTURES/ETC. BEING REMOVED (BACK TO SOURCE), WHETHER INDICATED OR NOT (UON).

U COORDINATE DISPOSAL OF ALL FIXTURES, DEVICES, ETC. (INDICATED FOR DEMOLITION) WITH OWNER. TURN OVER ITEMS REMOVED TO OWNER AT THEIR OPTION.

V COORDINATE WITH OTHER TRADES FOR THE REMOVAL AND/OR RELOCATION OF ELECTRICAL DEVICES AND CONNECTIONS ASSOCIATED WITH THEIR EQUIPMENT.

W REFER TO THE MEDIUM-VOLTAGE WORK SEQUENCE FOR ORDER OF NEW WORK AND DEMOLITION. THE CONTRACTOR SHALL DEVELOP A DETAILED WORK PROCEDURE FOR REVIEW. OBTAIN APPROVAL FROM THE ENGINEER AND OWNER PRIOR TO BEGINNING ANY WORK. DURATION OF OUTAGES AND LOSS OF REDUNDANT SOURCES IS TO BE MINIMIZED.

X ALL EXCAVATION WITHIN THE CANOPIES OF REMAINING TREES SHALL BE BY AIR EXCAVATOR TO MINIMIZE DAMAGE TO ROOTS. REFER TO THE UNIVERSITY'S TREE PROTECTION REQUIREMENTS FOR OTHER REQUIREMENTS.

TAGGED NOTES

(##)

UE1 PROVIDE NEW POWER MANHOLE AND ACCESSORIES/FITTINGS PER DETAIL AND UK SPECIFICATIONS. PROVIDE 2" CONDUIT STUBOUT FOR MANHOLE POWER CIRCUIT. MANHOLE LIGHTS, FAN AND PUMP ARE TO BE OPERATIONAL ON TEMPORARY POWER PRIOR TO PLACING MEDIUM-VOLTAGE CABLE IN SERVICE. POWER CIRCUIT WILL BE REFED FROM THE NEW BUILDING IN A FUTURE BID PACKAGE. PROVIDE 2" SUMP PUMP DISCHARGE PIPE TO NEAREST STORMWATER CATCH BASIN, MINIMUM 18" BFG.

UE2 PROVIDE NEW 6-WAY 12KV PAD-MOUNT SWITCH AND PAD. CONTRACTOR SHALL UTILIZE UNIVERSITY STOCK SWITCHES FOR INITIAL INSTALLATION DUE TO DELIVERY TIMES. TURN OVER REPLACEMENT SWITCHES TO THE OWNER UPON DELIVERY.

UE3 PROVIDE NEW CONCRETE ENCASED DUCTBANK WITH SIX 5" AND ONE 2" CONDUIT. PROVIDE UTILITY MARKERS AT ALL CROSSINGS AND TURNS. PROVIDE FEEDERS AS SHOWN ON ONE-LINE DIAGRAM AND MEDIUM-VOLTAGE SEQUENCING PLAN.

UE4 PROVIDE NEW CONCRETE ENCASED DUCTBANK WITH FOUR 5" AND ONE 2" CONDUIT. PROVIDE UTILITY MARKERS AT ALL CROSSINGS AND TURNS. PROVIDE FEEDERS AS SHOWN ON ONE-LINE DIAGRAM AND MEDIUM-VOLTAGE SEQUENCING PLAN.

UE5 PROVIDE NEW CONCRETE ENCASED DUCTBANK WITH TWO 5" CONDUITS. STUB DUCT 5' FROM MANHOLE AND CAP FOR EXTENSION TO NEW BUILDING IN A FUTURE BID PACKAGE.

UE6 PROVIDE NEW POWER MANHOLE AND ACCESSORIES/FITTINGS PER DETAIL AND UK SPECIFICATIONS. CONSTRUCT MANHOLE ADJACENT TO EXISTING MANHOLE AND PROVIDE SIX 5" CONDUIT SLEEVES BETWEEN NEW MANHOLE AND EXISTING MANHOLE. PROVIDE 2" CONDUIT STUBOUT FOR MANHOLE POWER CIRCUIT. MANHOLE LIGHTS, FAN AND PUMP ARE TO BE OPERATIONAL ON TEMPORARY POWER PRIOR TO PLACING MEDIUM-VOLTAGE CABLE IN SERVICE. POWER CIRCUIT WILL BE REFED FROM THE NEW BUILDING IN A FUTURE BID PACKAGE. PROVIDE 2" SUMP PUMP DISCHARGE PIPE TO NEAREST STORMWATER CATCH BASIN, MINIMUM 18" BFG.

UE9 EXISTING SWITCH SW122, LOCATED IN MANHOLE E122. REPLACE FEEDER TO SWITCH AS SHOWN ON ONE-LINE DIAGRAM AND MEDIUM-VOLTAGE SEQUENCING PLAN.

UE10 UTILIZE EXISTING DUCTBANK TO PROVIDE NEW CABLE FROM NEW PM501-A1 TO EXISTING SW122 AS SHOWN ON THE ONE-LINE DIAGRAM AND MEDIUM-VOLTAGE SEQUENCING PLAN.

UE11 UTILIZE EXISTING DUCTBANK TO PROVIDE NEW CABLE FROM NEW PM501-1A TO EXISTING JUNCTION IN E502 AS SHOWN ON THE ONE-LINE DIAGRAM AND MEDIUM-VOLTAGE SEQUENCING PLAN.

UE14 EXISTING SWITCH SW501-1, LOCATED IN MANHOLE E501-1. REPLACE FEEDER TO SWITCH AS SHOWN ON ONE-LINE DIAGRAM AND MEDIUM-VOLTAGE SEQUENCING PLAN.

UE15 INTERCEPT EXISTING EMPTY DUCTBANK BETWEEN MANHOLES E502 AND E502-1. REROUTE DUCT TO NEW MANHOLE E501-1A AND INSTALL NEW FEEDER TO SWITCH PM501-1A AS SHOWN ON ONE-LINE DIAGRAM AND MEDIUM-VOLTAGE SEQUENCING PLAN.

UE16 INTERCEPT EXISTING DUCTBANK BETWEEN MANHOLES E502 AND E501 AFTER CABLE REMOVAL. REROUTE DUCT TO NEW MANHOLE E501-1A.

UE17 FUTURE HEALTH EDUCATION BUILDING.

UE19 PROVIDE NEW CONCRETE ENCASED DUCTBANK WITH FOUR 4" AND ONE 2" CONDUIT. PROVIDE UTILITY MARKERS AT ALL CROSSINGS AND TURNS. PROVIDE FEEDERS AS SHOWN ON ONE-LINE DIAGRAM AND MEDIUM-VOLTAGE SEQUENCING PLAN.

AREA A

AREA B

KEY PLAN

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SITE UTILITY PLAN AREA A - MEP NEW WORK

EU201

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V COORDINATE WITH OTHER TRADES FOR THE REMOVAL AND/OR RELOCATION OF ELECTRICAL DEVICES AND CONNECTIONS ASSOCIATED WITH THEIR EQUIPMENT.

W REFER TO THE MEDIUM-VOLTAGE WORK SEQUENCE FOR ORDER OF NEW WORK AND DEMOLITION. THE CONTRACTOR SHALL DEVELOP A DETAILED WORK PROCEDURE FOR REVIEW. OBTAIN APPROVAL FROM THE ENGINEER AND OWNER PRIOR TO BEGINNING ANY WORK. DURATION OF OUTAGES AND LOSS OF REDUNDANT SOURCES IS TO BE MINIMIZED.

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TAGGED NOTES

UE1 PROVIDE NEW POWER MANHOLE AND ACCESSORIES/FITTINGS PER DETAIL AND UK SPECIFICATIONS. PROVIDE 2" CONDUIT STUBOUT FOR MANHOLE POWER CIRCUIT. MANHOLE LIGHTS, FAN AND PUMP ARE TO BE OPERATIONAL ON TEMPORARY POWER PRIOR TO PLACING MEDIUM-VOLTAGE CABLE IN SERVICE. POWER CIRCUIT WILL BE REFED FROM THE NEW BUILDING IN A FUTURE BID PACKAGE. PROVIDE 2" SUMP PUMP DISCHARGE PIPE TO NEAREST STORMWATER CATCH BASIN, MINIMUM 18" BFG.

UE2 PROVIDE NEW 6-WAY 12KV PAD-MOUNT SWITCH AND PAD. CONTRACTOR SHALL UTILIZE UNIVERSITY STOCK SWITCHES FOR INITIAL INSTALLATION DUE TO DELIVERY TIMES. TURN OVER REPLACEMENT SWITCHES TO THE OWNER UPON DELIVERY.

UE3 PROVIDE NEW CONCRETE ENCASED DUCTBANK WITH SIX 5" AND ONE 2" CONDUIT. PROVIDE UTILITY MARKERS AT ALL CROSSINGS AND TURNS. PROVIDE FEEDERS AS SHOWN ON ONE-LINE DIAGRAM AND MEDIUM-VOLTAGE SEQUENCING PLAN.

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UE7 EXISTING SWITCH SW124, LOCATED IN MANHOLE E124. REPLACE FEEDER TO SWITCH AS SHOWN ON ONE-LINE DIAGRAM AND MEDIUM-VOLTAGE SEQUENCING PLAN.

UE12 PROVIDE NEW CONCRETE ENCASED DUCTBANK WITH TWO 4" CONDUITS. EXTEND DUCT FROM NEW MANHOLE TO EXISTING PAD-MOUNT TRANSFORMER. REPLACE TRANSFORMER FEEDER AS SHOWN ON THE ONE-LINE DIAGRAM AND MEDIUM-VOLTAGE SEQUENCING PLAN.

UE13 INTERCEPT EXISTING FEEDER FROM SW124 TO THE BOSOMWORTH BUILDING IN THIS MANHOLE. REROUTE TO NEW SWITCH PM124-1 AS SHOWN ON THE ONE-LINE DIAGRAM AND MEDIUM-VOLTAGE SEQUENCING PLAN.

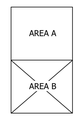
UE14 EXISTING SWITCH SW501-1, LOCATED IN MANHOLE E501-1. REPLACE FEEDER TO SWITCH AS SHOWN ON ONE-LINE DIAGRAM AND MEDIUM-VOLTAGE SEQUENCING PLAN.

UE18 PROVIDE NEW POWER MANHOLE AND ACCESSORIES/FITTINGS PER DETAIL AND UK SPECIFICATIONS. THIS MANHOLE SHALL BE CAST-IN PLACE. COORDIANTE EXACT LOCATION AND ORIENTATION TO INCORPORATE THE EXISTING DUCTBANKS. LOCATE MANHOLE AT THE CROSSING POINT OF THE TWO PRIMARY DUCTS SHOWN. REMOVE CONCRETE ENCASEMENT OF EXISTING DUCTS WITHIN THE MANHOLE AND CUT CONDUIT BACK TO MANHOLE WALL. COORDINATE WITH UKPPD TO DE-ENERGIZE FEEDERS WITHIN THIS DUCT DURING CUTTING. PROTECT CABLE DURING CUTTING. PROVIDE BELL ENDS FOR ALL CONDUIT. PROVIDE RACKING FOR EXISTING CABLE AS NECESSARY FOR SUPPORT. INTERCEPT FOR MANHOLE POWER CIRCUIT AND CONNECT MANHOLE DEVICES TO EXISTING CIRCUIT. PROVIDE 2" SUMP PUMP DISCHARGE PIPE TO NEAREST STORMWATER CATCH BASIN, MINIMUM 18" BFG.

SITE UTILITY PLAN - AREA B - ELECTRICAL
NEW WORK

1 SCALE: 1" = 20'-0"

0 10' 20' 40' 60' 80'



KEY PLAN

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JRA ARCHITECTS HAS RETAINED AN ELECTRONIC VERSION OF THESE DRAWINGS. THE CLIENT AGREES NOT TO REUSE THESE DRAWINGS - IN ELECTRONIC OR ANY OTHER FORMAT - IN WHOLE, OR IN PART, FOR ANY PURPOSE OTHER THAN FOR THE PROJECT. THE CLIENT AGREES NOT TO TRANSFER THESE ELECTRONIC FILES TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF THE ARCHITECT. THE CLIENT FURTHER AGREES TO INDEMNIFY THE ARCHITECT AGAINST THE ARCHITECT RESULTING IN ANY WAY FROM ANY UNAUTHORIZED CHANGES TO OR REUSE OF THE ELECTRONIC FILES FOR ANY OTHER PROJECT BY ANYONE OTHER THAN THE ARCHITECT.

SITE UTILITY PLAN AREA B - MEP NEW WORK

EU202

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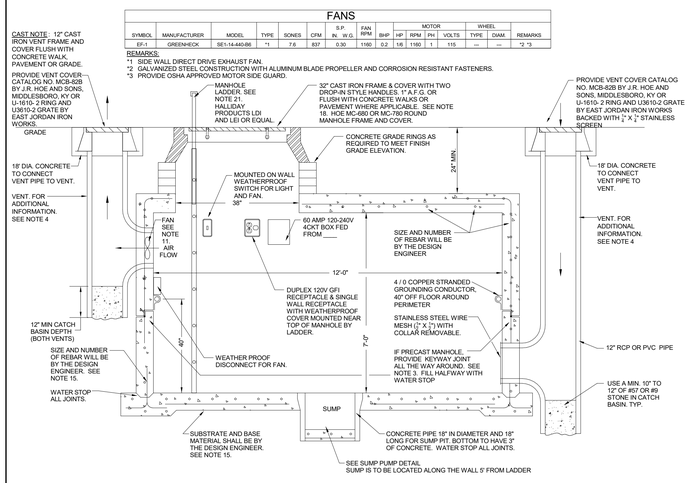
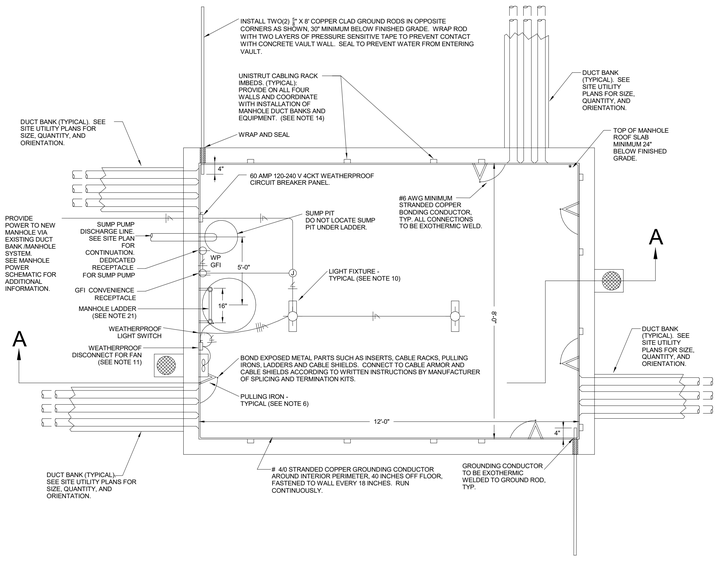
FANS														
SYMBOL	MANUFACTURER	MODEL	TYPE	SONES	S.P. CFM	S.P. IN. W.G.	FAN RPM	MOTOR BHP	MOTOR HP	MOTOR RPM	MOTOR PH	MOTOR VOLTS	WHEEL TYPE	WHEEL DIAM.	REMARKS
EF-1	GREENHECK	SET-14-445-B6	*1	7.6	837	0.30	1160	0.2	1/6	1160	1	115	---	---	*2 *3

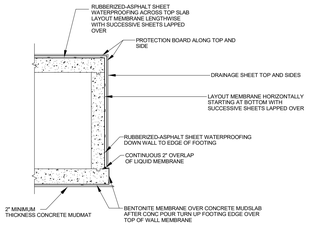
REMARKS:
*1 SIDE WALL DIRECT DRIVE EXHAUST FAN.
*2 GALVANIZED STEEL CONSTRUCTION WITH ALUMINUM BLADE PROPELLER AND CORROSION RESISTANT FASTENERS.
*3 PROVIDE OSHA APPROVED MOTOR SIDE GUARD.



1 PRIMARY POWER MANHOLE SECTION
SCALE: NONE



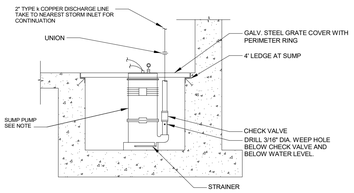
**NOTE: THIS WATERPROOFING METHOD IS TO BE USED ON BOTH CAST-IN-PLACE AND PRECAST MANHOLE STRUCTURES.



TYPICAL WATERPROOFING DETAIL

SUMP PUMP FOR VAULT AND MANHOLE

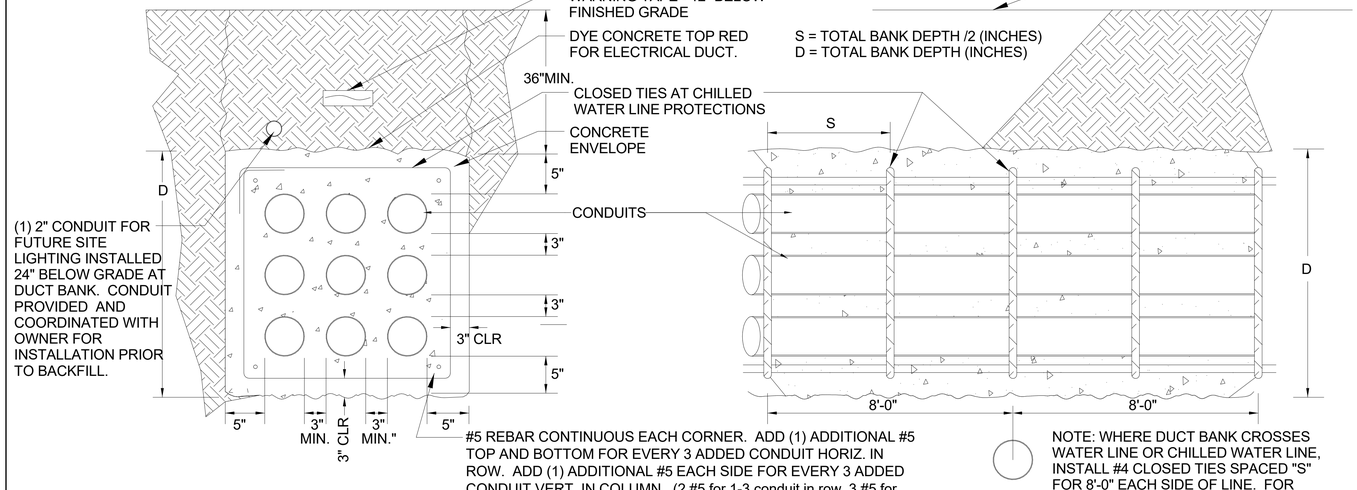
NOTE: SUMP-PUMP – ZOELLER PUMP MODEL NO 2137.
1½" SUBMERSIBLE SUMP PUMP RATED FOR HIGH TEMPERATURES - 200°F
INTERMITTED, 50 GPM @ 15 FT. HEAD, 0.5 HP, 120V/1□ POWER. PROVIDE WITH FLOAT SWITCH. PUMP SHALL BE SELF-VENTING.



MANHOLE SUMP PUMP DETAIL

MANHOLE GENERAL NOTES:

1. MANHOLES MAY BE POURED-IN-PLACE OR PRECAST.
2. FOR POURED-IN-PLACE MANHOLES, BOTTOM IS ONE POUR, SIDES ARE ONE POUR, AND TOP IS ONE POUR, ALL WITH KEYED JOINTS, AND APPROPRIATE WATER STOP.
3. PRECAST MANHOLES SHALL BE A BOTTOM HALF AND A TOP HALF WITH KEYWAY BUILT INTO EACH HALF. AT INSTALLATION BOTTOM KEYWAY SHALL BE FILLED HALFWAY WITH WATER STOP CAULK ALL WAY ROUND THE BOTTOM HALF BEFORE PLACING TOP HALF IN PLACE.
4. PROVIDE A HIGH VENT AND A LOW VENT. HIGH VENT IS OUTLET, LOW VENT IS INLET. MATERIAL TO BE RCP OR PVC.
5. TOTAL SIZE OF MANHOLE SHALL BE 12'x8'x7' INSIDE (UNLESS NOTED OTHERWISE).
6. PROVIDE PULLING EYES, ONE IN THE WALL OPPOSITE EACH DUCT BANK AND ONE RECESSED IN THE CENTER OF THE MANHOLE FLOOR.
7. PROVIDE BELL ENDS ON ALL CONDUITS.
8. ALL CONDUIT AND BOXES SHALL BE SCH 40 PVC.
9. ELECTRICAL DISCONNECTS SHALL BE NEMA 4 AND DEVICES SHALL BE NEMA 3R.
10. PROVIDE TWO VAPOR PROOF, 5000° K, LED LIGHT FIXTURES AS INDICATED. FIXTURES SHALL BE A SYLVANIA VAPOR TIGHT LED SERIES SIMILAR TO ITEM NUMBER 74531 OR EQUAL.
11. EXHAUST FAN TO MEET OSHA REQUIREMENTS SHALL BE SIMILAR TO GREENHECK FAN CORP MODEL NUMBER SE1-12-432-D OR EQUAL. CONNECT FAN TO OPERATE WHEN LIGHT SWITCH IS TURNED ON.
12. PROVIDE A NON-GFI SINGLE USE RECEPTACLE WITH WEATHERPROOF COVER FOR SUMP PUMP USE.
13. PROVIDE A GFI DUPLEX RECEPTACLE WITH WEATHERPROOF COVER FOR GENERAL USE.
14. PROVIDE AND INSTALL CABLING RACKS ON ALL FOUR WALLS FROM TOP TO BOTTOM WITH BRACKETS AS REQUIRED TO SUPPORT CABLING. RACKS SHALL BE COMPRISED OF GALVANIZED STEEL UNISTRUT EMBEDDED INTO THE CONCRETE WALLS.
15. MANHOLE REBAR SPACING AND CONCRETE THICKNESSES ARE ESTIMATED. MANHOLE IS TO BE CONSTRUCTED BASED ON THE DIMENSIONS AND FEATURES OUTLINED IN THESE DETAILS. THE SHOP DRAWINGS SHALL BE STAMPED BY A STRUCTURAL ENGINEER REGISTERED IN THE STATE OF KENTUCKY.
16. CABLES ARE TO BE SUPPORTED FROM BRACKETS WITH PLASTIC OR FIBERGLASS DONUT STYLE INSULATORS TO ENCOMPASS ALL FOUR CABLES TOGETHER PER CIRCUIT.
17. H-20 TRUCK LOADING ON ALL MANHOLES.
18. COVER SHALL BE 32" DIAMETER MINIMUM. 32" DIA. CLEAR OPENING MUST BE MAINTAINED. HOE MC-680 OR MC-780 ROUND MANHOLE FRAME AND COVER.
19. WATERPROOF EXTERIOR SURFACES BELOW GRADE PORTION OF SIDES AND TOPS OF MANHOLES. SEE DETAILS.
20. ALL DUCT BANKS SHALL BE DOWELED INTO THE MANHOLE WALL WHICH THEY ENTER WITH AT LEAST SIX 12" LONG #4 REBAR.
21. MANHOLE LADDER AND LADDERS EXTENSIONS SHALL BE FACE MOUNT ALUMINUM WITH LADDER EXTENSION (HALLIDAY PRODUCTS LD1 AND LE1 OR EQUAL).
22. PROVIDE INJECTABLE HYDROPHOBIC WATERSTOP AROUND ALL UNDERGROUND PENETRATIONS THROUGH VAULT.
23. ALL POST-INSTALLED ANCHORS SHALL BE OF STAINLESS STEEL AND RATED FOR ATTACHMENT TO CRACKED CONCRETE.
24. PROVIDE DIELECTRIC SEPARATOR BETWEEN ALL ALUMINUM AND CONCRETE.
25. ANY EXCAVATION THAT UNDERMINES BELOW DUCT BANK MORE THAT 15 FOOT CONTINUOUSLY SHALL BE SHORED.
26. EXCAVATIONS AROUND VAULTS SHALL BE BACKFILLED IN 8-INCH MAXIMUM DEPTH LOOSE LIFTS AND CONSOLIDATED TO 98 PERCENT OF THE ASTM D698 MAXIMUM DRY UNIT WEIGHT. OPEN GRADED STONE BACKFILLS SHALL BE PLACED IN 8 INCH MAXIMUM LIFTS AND TAMPED IN PLACE.
27. ALL REBAR SHALL BE CHAIRED INTO PLACE.
28. CONTRACTOR SHALL PROVIDE FOR AN INDEPENDENT TESTING AGENCY MEETING THE REQUIREMENTS OF ASTM E329 TO PROVIDE CONTINUOUS OBSERVATION OF CONCRETE PLACEMENT TO VERIFY PROPER PLACEMENT TECHNIQUES AND TO PROVIDE FOR COMPRESSIVE STRENGTH TESTS OF (VAULT ONLY) CONCRETE PER ASTM C 31 AND C 39 WITH ONE SAMPLE FOR EACH DAYS POUR LESS THAN 25 CU YD, PLUS ONE SET FOR EACH ADDITIONAL 50 CU YD. SUBMIT ALL REPORTS TO OWNER AND ENGINEER OF RECORD.



#5 REBAR CONTINUOUS EACH CORNER. ADD (1) ADDITIONAL #5 TOP AND BOTTOM FOR EVERY 3 ADDED CONDUIT HORIZ. IN ROW. ADD (1) ADDITIONAL #5 EACH SIDE FOR EVERY 3 ADDED CONDUIT VERT. IN COLUMN. (2 #5 for 1-3 conduit in row, 3 #5 for 4-6 conduit in row, ...)

FOR CHILLED WATER AND WATER LINE PROTECTION, USE #6 REBAR SPACED AS STATED ABOVE AND WITH #4 CLOSED TIES SPACED AT (TOTAL BANK DEPTH/2 INCHES)

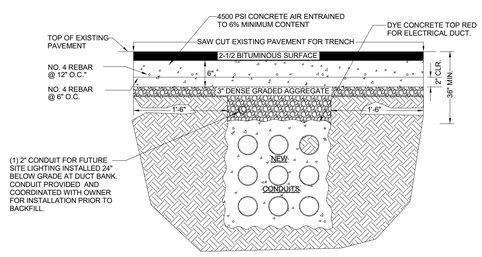
NOTE: WHERE DUCT BANK CROSSES WATER LINE OR CHILLED WATER LINE, INSTALL #4 CLOSED TIES SPACED "S" FOR 8'-0" EACH SIDE OF LINE. FOR KNOWN KARST FEATURES, DUCT BANK SHALL BE DESIGNED BY REGISTERED PROFESSIONAL STRUCTURAL ENGINEER BASED ON SITE / GEOTECHNICAL DATA.

GENERAL NOTES:

DUCT BANKS AND CONDUIT SYSTEMS ARE ELECTRICAL FACILITIES FOR POWER DISTRIBUTION. IN ORDER FOR THE ELECTRICAL SYSTEM TO PERFORM AT ITS FULL CAPACITY, THESE SYSTEMS SHALL BE CONSTRUCTED IN A NEAT AND WORKMANLIKE MANNER TO ENSURE THAT:

1. ALL JOINTS ARE TIGHTLY SEALED AGAINST WATER INTRUSION.
2. ALL JOINTS ARE PROPERLY ALIGNED, SQUARE AND HAVE ADEQUATE CURE TIME.
3. ALL EDGES ARE DEBURRED AND BEVELED TO PREVENT DAMAGE TO CABLES.
4. CONDUIT RUNS ARE ADEQUATELY SUPPORTED SO THEY DO NOT BECOME DISTORTED DURING ENCASEMENT OR BACKFILL.
5. CONCRETE TO BE 3,000 PSI DESIGN COMPRESSIVE STRENGTH WITH ASTM C150 CEMENT, MAXIMUM 20 % TYPE C OR F FLYASH, 1 /2" MAXIMUM AGGREGATE SIZE, AND POTABLE WATER.
6. REINFORCING TO BE ASTM A615, GRADE 60 LAPPED MINIMUM 48" FOR #5 AND 56" FOR #6. PROVIDE MINIMUM 3" CLEAR BETWEEN CONDUIT AND 3" COVER TO TRENCH/ EARTH.
7. DEPOSIT CONCRETE CONTINUOUSLY IN ONE LAYER OR IN HORIZONTAL LAYERS OF SUCH THICKNESS THAT NO NEW CONCRETE IS PLACED ON CONCRETE THAT IS HARDENED ENOUGH TO CAUSE SEAMS OR PLANES OF WEAKNESS. CONSOLIDATE PLACED CONCRETE BY MECHANICAL VIBRATING EQUIPMENT USING EQUIPMENT AND PROCEDURES COMPLYING WITH ACI 301. DO NOT USE VIBRATORS TO TRANSPORT CONCRETE INSIDE TRENCH. INSERT AND WITHDRAW VIBRATORS AT UNIFORM SPACED LOCATIONS NO FARTHER THAN THE VISIBLE EFFECTIVENESS OF THE MACHINE. LIMIT DURATION OF VIBRATION TO TIME NECESSARY TO CONSOLIDATE CONCRETE WITHOUT CAUSING MIX TO SEGREGATE.
8. DUCTS SHALL BE TEMPORARILY HELD IN PLACE WITH HIGH DENSITY POLYETHYLENE SPACERS WITH MINIMUM 50% OPEN AREA TO ALLOW FOR FLOW AND INTERLOCK OF CONCRETE ACROSS SPACER.

2 PRIMARY POWER MANHOLE SECTION
SCALE: NONE



NOTES:

1. SEE SITE UTILITY PLANS FOR NUMBER AND SIZE OF CONDUITS IN EACH DUCT BANK. SEE ALSO DUCT BANK SECTIONS FOR ADDITIONAL INFORMATION.
2. ALL DUCT BANKS SHALL BE DOWELED INTO THE MANHOLE WALL WHICH THEY ENTER WITH AT LEAST SIX 12-INCH LONG #4 REBAR.
3. PROVIDE PROTECTIVE FENCE IF TRENCH IS OUTSIDE CONSTRUCTION AREA.
4. WATERPROOF DOWEL PENETRATIONS.

3 PRIMARY POWER MANHOLE SECTION
SCALE: NONE

JRA architects
3225 Summit Square Place, Suite 200
Lexington, Kentucky 40509
859.252.6781

STATE OF KENTUCKY ALAN R. HELLUMS 20166 LICENSED PROFESSIONAL ENGINEER

CMTA
A LEGENCE Company
10475 Meeting Street | Louisville, KY 40059 | 502.326.3400 | cmtaweb.com

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314.421.2000

BP-01B DEMO, SITE UTILITES (PH1)

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

ELECTRICAL

PROJECT	XKSM21
DATE	10/20/2023

REVISIONS

No.	Description	Date

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ELECTRICAL SITE DETAILS

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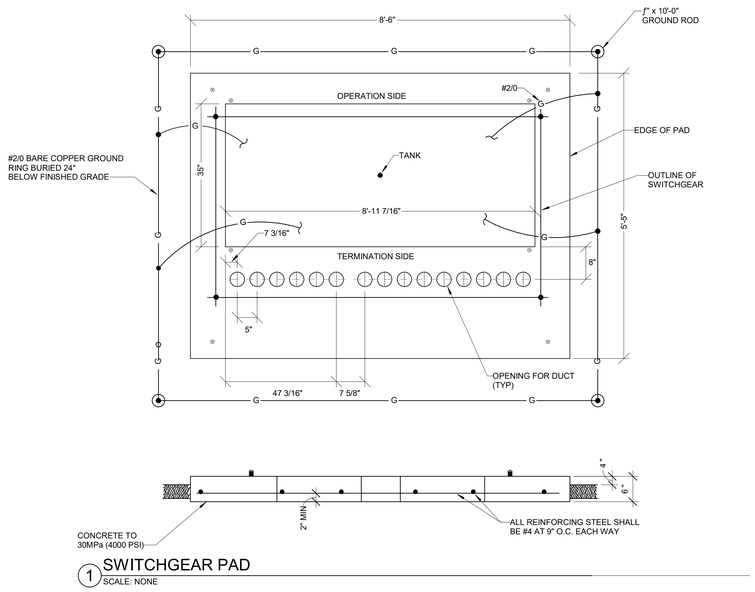

1 SWITCHGEAR PAD
SCALE: NONE

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UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

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ELECTRICAL SITE DETAILS

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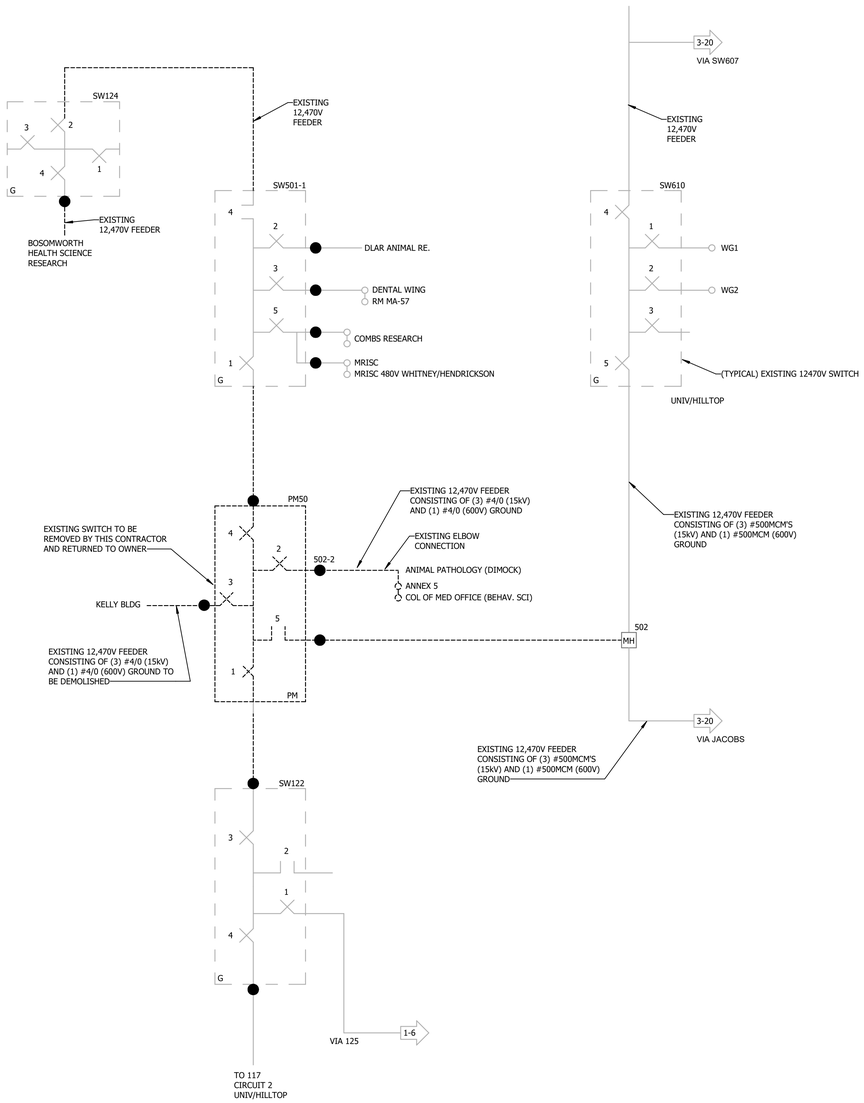
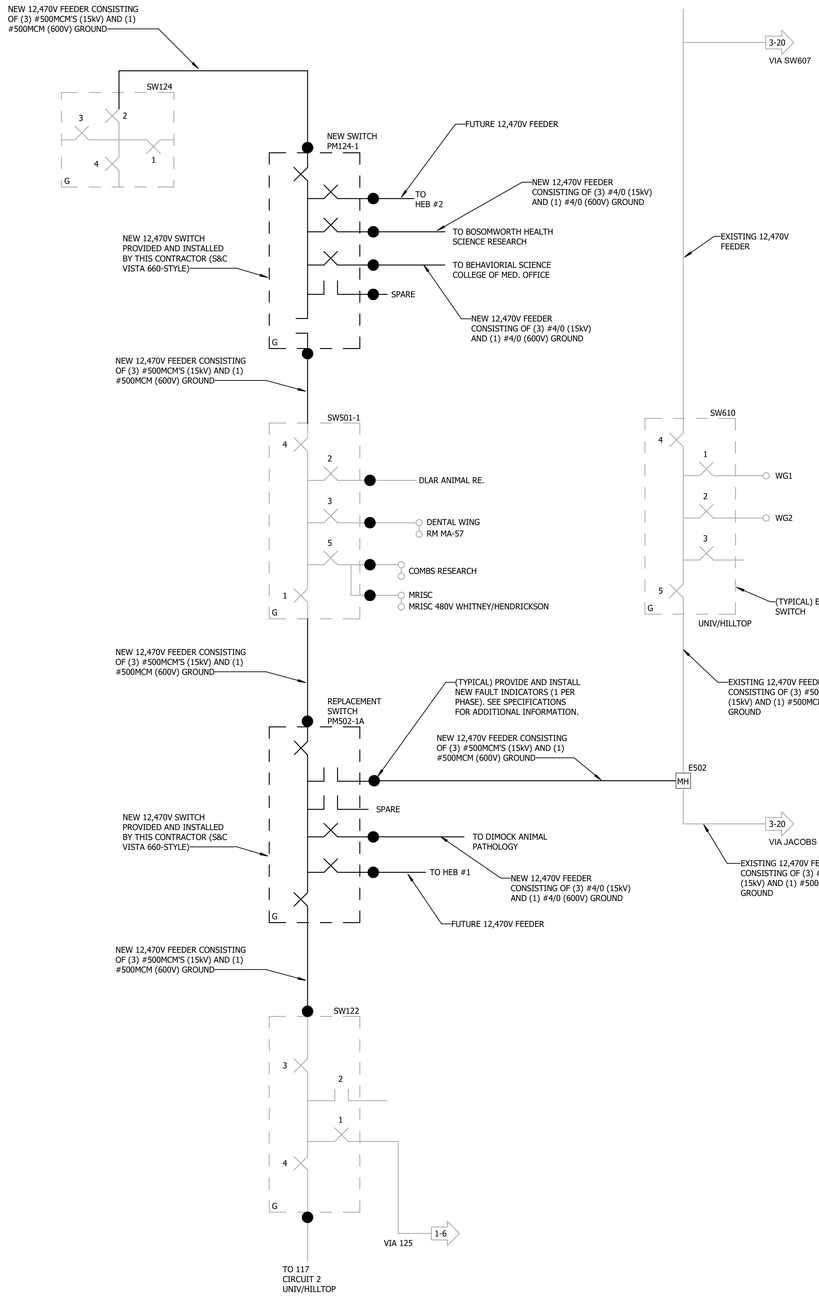


1 SITE UTILITY SCHEMATIC - EXISTING
SCALE: NONE



2 SITE UTILITY SCHEMATIC - NEW WORK
SCALE: NONE

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BP-01B DEMO, SITE UTILITES (PH1)

UNIVERSITY OF KENTUCKY HEALTH EDUCATION BUILDING
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

ELECTRICAL

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SITE UTILITY SCHEMATICS

EU600

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JRA PROJECT NO. 202170
UK PROJECT NO. 2564.0

UK HEALTH EDUCTION BUILDING

LEXINGTON, KENTUCKY

UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

BP-01A / BP-01B

TECHNICAL SPECIFICATIONS
VOLUME 1

JRA ARCHITECTS
HOK
CMTA CONSULTAING ENGINEERS
BACON FARMER WORKMAN
CARMAN
PALADIN

PROJECT MANUAL

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01 3126 Existing Hazardous Material Information
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01 3233 Photographic Documentation
01 4110 Structural Special Inspections and Contractor Responsibility
01 4339 Mockups
01 7419 Demolition Waste Management and Disposal

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DIVISION 03 – CONCRETE

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DOCUMENT 01 3119 - EXISTING CONDITION INFORMATION

1.1 EXISTING CONDITION INFORMATION

A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of the Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.

B. Existing drawings that include information on existing conditions including previous construction at Project site are available for viewing at the office of Construction Manager.

C. Survey information that includes information on existing conditions, prepared by Endris Engineering, dated March 8, 2022, is available for viewing as part of Drawings.

D. Related Requirements:

1. Document 00 3126 "Existing Hazardous Material Information" for hazardous materials reports that are made available to bidders.
2. Document 00 3132 "Geotechnical Data" for reports and soil-boring data from geotechnical investigations that are made available to bidders.

END OF DOCUMENT 01 3119

DOCUMENT 00 3126 - EXISTING HAZARDOUS MATERIAL INFORMATION

1.1 EXISTING HAZARDOUS MATERIAL INFORMATION

A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.

B. An existing asbestos report for Project, prepared by S&ME, dated October 16, 2023, is available for viewing as appended to this Document.

C. An existing PCB (Polychlorinate Biphenyl) information report for Project, prepared by S&ME, dated October 16, 2023, is available for viewing as appended to this Document.

D. Related Requirements:

1. Document 00 3119 "Existing Condition Information" for information about existing conditions that is made available to bidders.
2. Document 00 3132 "Geotechnical Data" for reports and soil-boring data from geotechnical investigations that are made available to bidders.
3. Section 02 4116 "Structure Demolition"" for notification requirements if materials suspected of containing hazardous materials are encountered.

END OF DOCUMENT 01 3126

October 16, 2023

University of Kentucky
Environmental Quality Management
355 Cooper Drive, Suite
Lexington, Kentucky 40508

Attention: Mr. Bob Kjelland, P.G., CHMM

Reference: **Report of Limited Hazardous Materials Assessment**
University of Kentucky – Kelley Hall
Lexington, Kentucky
S&ME Project No. 23830110

Dear Mr. Bob Kjelland:

S&ME, Inc. (S&ME) is pleased to provide this report detailing the results of our limited hazardous materials survey services at the referenced site. The purpose was to perform a limited assessment for the presence of polychlorinated biphenyls (PCBs) in caulk, asbestos, and universal wastes prior to the demolition of Kelley Hall on the University of Kentucky campus in Lexington, Kentucky. Our services were performed in general accordance with S&ME *Proposal No. 23-83-0110* dated June 21, 2023, and authorized under the Per Diem Agreement for Civil-Structural-Geotechnical Engineering Services Contract No. A231030 dated July 1, 2022, between the University of Kentucky and S&ME. The following report includes the project background, sampling and analysis procedures, findings, results, and conclusions.

This report is provided for the sole use of Mr. Bob Kjelland and the University of Kentucky. Use of this report by any other parties will be at such party's sole risk and S&ME disclaims liability for any such use or reliance by third parties. The results presented in this report are indicative of conditions only during the time of the assessment and of the specific areas referenced.

S&ME appreciates this opportunity to provide our services to you. Please contact us if you have questions concerning this report or any of our services.

Sincerely,
S&ME, Inc.

Vincent J. Epps, RG
Operations Manager

Thomas M. Reed, PG
Project Manager

Senior Reviewed by: R. Bruce

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Appendix VI – PCB Analytical Laboratory Report

Executive Summary

S&ME, Inc. (S&ME) conducted a limited hazardous materials assessment for Kelley Hall on the University of Kentucky campus in Lexington, Kentucky. The limited hazardous materials assessments included a survey of asbestos-containing materials (ACM), regulated materials and universal waste inventories, and polychlorinated biphenyls (PCB) in caulk. The purpose of the assessment was to identify hazardous materials that may require removal prior to implementation of proposed demolition activities at Kelley Hall. A summary of the results of the limited hazardous materials assessment is provided below.

Asbestos-containing Materials

Asbestos was detected greater than one percent in samples of the following materials:

- 12" x 12" white floor tile on the first and second floors of the offices;
- 12" x 12" tan tile with dark brown streaks in Room 121C;
- Silver caulk and paper on the warehouse skylight roof housing;
- Roof tar on the second from bottom layer of the flat roof;
- Pipe wrap above the drop ceiling in Rooms 112 and 100B; and
- Mudded elbows (assumed) above the drop ceiling in Rooms 112 and 100B.

Other Regulated Materials and Universal Wastes

- Polychlorinated biphenyls (PCBs): Approximately 286 fluorescent light ballasts (FLBs) were observed in this building.
- Chlorofluorocarbons (CFCs): Approximately nine items that potentially contain CFCs were observed in the building.
- Universal Wastes: Various quantities of battery-containing equipment, air conditioning units, fluorescent bulbs, and miscellaneous cleaning/household style chemicals were present in the building. Tritium-containing exit signs or pesticides were not observed.

Polychlorinated Biphenyls (PCB)-Containing Caulk

- The PCB-caulk samples submitted for chemical analysis revealed the presence of PCBs in concentrations below the Toxic Substances Contral Act (TSCA) action level of 50 milligrams per kilogram (mg/kg).

1.0 Introduction

Mr. Bob Kjelland retained S&ME, Inc. (S&ME) to conduct a limited hazardous materials assessment of suspect asbestos-containing materials (ACMs), polychlorinated biphenyls (PCB) containing materials, and universal wastes on the University of Kentucky (UK) campus in Lexington, Kentucky. Mr. Vincent Epps of S&ME performed the assessment on August 25, 2023 in general accordance with S&ME *Proposal No. 23-83-0110* dated June 21, 2023.

2.0 Purpose and Site Description

2.1 Purpose

The purpose of the limited assessment was to identify the presence of PCBs in caulk, ACMs in building materials, and universal wastes prior to the demolition of the building. The assessment included the interior and exterior portions of the structure. An assessment strategy believed by S&ME to be appropriate for this purpose was presented in our proposal and is described in this report. The report should be interpreted only with regard to the specific location and materials referenced.

2.2 Site Description

Kelley Hall is located at 360 Huguelet Drive on the UK campus. Kelley Hall is an approximately 20,500-square-foot maintenance and office building completed in 1959. The maintenance portion of the building is one story with a basement. The office portion of the building is two stories with a basement. According to the provided information, the building is scheduled for demolition. It is understood that this project is to include the assessment of potential ACMs, PCB-containing caulk, and regulated and universal waste. A site location map is included as **Figure 1** in **Appendix I**.

3.0 Asbestos-containing Materials Sampling

3.1 Scope of Services

Demolition and renovation in public and commercial buildings is regulated by the Occupational Safety and Health Administration (OSHA), the United States Environmental Protection Agency (EPA) and the Kentucky Department for Environmental Protection (KDEP). The EPA and KDEP require asbestos assessments, conducted by licensed and accredited individuals, prior to implementation of renovation and demolition projects. Code 40 of Federal Regulations Part 61, Subpart M, Final Rule, National Emissions Standards for Hazardous Air Pollutants (NESHAP) and KDEP require asbestos assessments, followed by the proper removal, and disposal of ACM that is affected by demolition. Identification of ACM is also required by the OSHA 1926.1101. The identification of ACMs will aid in the prevention of occupational exposures and/or environmental releases of airborne asbestos. The EPA, OSHA and KDEP define ACM as materials containing greater than one percent asbestos in a representative sample. However, OSHA also regulates materials containing less than or equal to one percent asbestos.

S&ME performed a visual assessment of the referenced building to determine the homogenous areas (HAs) of suspect ACMs. Based on EPA definitions used in the Asbestos Hazard Emergency Response Act (AHERA), 40 CFR 763, an HA of asbestos-suspect building material has the same color and texture and is thought to be installed within the same timeframe. S&ME assessed the interior and exterior of the building (except for the roof) for suspect ACMs, including thermal system insulation (TSI), surfacing, and miscellaneous materials. S&ME collected representative samples of suspect ACMs from each HA in accordance with the US EPA AHERA protocol and applicable state regulations.

S&ME provided a KDEP licensed, and EPA accredited, Asbestos Inspector to conduct the asbestos survey and sample collection of the referenced building. On August 25th 2023, Mr. Vincent Epps conducted the asbestos survey in the building. A copy of Mr. Epps' asbestos inspector credentials area included in **Appendix II**. Bulk materials collected included, but were not limited to plaster, ceiling tile, drywall and joint compound, floor tile, cove base, pipe/joint insulation, caulk, window glazing, and various mastics and adhesives. During the survey, representative photographs of the interior and exterior finishes of the building were collected. A selection of these photographs with descriptions is included in **Appendix III**.

3.2 Methods

The asbestos survey was performed to comply with the NESHAP regulations (40 CFR 61 (M)) issued by the US EPA as they pertain to requirements for an asbestos inspection prior to demolition projects. KDEP regulations are equivalent to the NESHAP regulations regarding pre-demolition asbestos inspection requirements.

Information regarding the bulk samples of each HA was collected, recorded on a chain-of-custody record, and submitted to the SanAir Technologies in Cincinnati, Ohio for analysis by Polarized Light Microscopy (PLM), coupled with dispersion staining in general accordance with the EPA 600/R-93/116 Method. SanAir Technologies is an accredited laboratory by the National Voluntary Laboratory Accreditation (NVLAP), which is administered by the National Institute of Standards and Technology (NIST). The laboratory analysis reports the specific type of asbestos mineral identified (if any) and the percentage present in each sample.

Wall finishes composed of drywall finished with joint compound observed only at drywall seams and fastener holes were sampled as a composite sample (samples include both the drywall and the joint compound). Current EPA interpretations allow that the components of these drywall systems may be considered as a single HA/material. Accordingly, the presence of greater than one percent asbestos in a composite sample analysis identifies the sample as ACM. If the composite sample analysis (both joint compound and drywall) is reported as "trace" or less than, or equal to one percent asbestos, the sample must be further analyzed using the Point Count Method or be considered to be ACM under US EPA and state regulations.

3.3 Results

Based on the results of the assessment, six building components were identified to contain asbestos at a concentration greater than one percent. **Table 3-1** below contains a summary of the identified materials.

Table 3-1 Identified ACM

Material Description	Material Location	Quantity	Category (F/I/II)	Type	Condition / Potential for Disturbance	Type and Percent Asbestos
12" x 12" White Floor Tile with Gray Streaks and Yellow Mastic	**Rooms 200A, 207, 100, and 100A**	**1,850 SF**	**I**	**Misc.**	**Good/High**	**2% CH Tile ND Mastic**
12" x 12" Tan Floor Tile with Dark Brown Streaks and Yellow Mastic	**Room 121C**	**350 SF**	**I**	**Misc.**	**Good/High**	**2% CH Tile ND Mastic**
Silver Caulk and Paper	**Warehouse Skylights Roof Housing**	**300 LF**	**II**	**Misc.**	**Good/High**	**10% CH Caulk 85% CH Paper**
Flat Roofing Tar	**Flat Roof of Warehouse – Second Layer Above Decking**	**17,500 SF**	**I**	**Misc.**	**Good/High**	**5% CH**
Black Roof Selant	**Parapet Walls on Flat Roof**	**200 LF**	**II**	**Misc.**	**Good/High**	**3% CH**
Pipe Wrap (6" pipe)	**Rooms 112 and 100B Above Drop Ceiling**	**60 LF**	**F**	**TSI**	**Good/High**	**60% CH**
Mudded Elbows	**Rooms 112 and 100B Above Drop Ceiling**	**3 Units**	**F**	**TSI**	**Good/High**	**Assumed**

SF = Square feet LF = Linear feet CH = Chrysotile Asbestos F=Friable I=Category I, Non-Friable II=Category II, Non-Friable
Misc. = Miscellaneous TSI = Thermal System Insulation
Quantities are approximate and should not be used for cost estimates or biding purposes

The quantities of ACM provided in the report are for informational purposes only and should not be used for abatement contractor bidding purposes. Actual field measurements and quantity calculation should be performed by the prospective asbestos abatement contractor for bid purposes. If materials were assumed to contain asbestos and were not sampled, these materials must be treated as asbestos unless sampling indicates the materials are not ACM. Sample locations are depicted on **Figures 2-4 in Appendix I**. The summary of bulk asbestos results is provided in the Summary of Asbestos Sampling tables in **Appendix IV**. The laboratory report and chain-of-custody records are provided in **Appendix V**.

4.0 Other Regulated Materials and Universal Wastes

4.1 Regulated Waste

4.1.1 PCBs

Approximately 286 fluorescent light ballasts (FLBs) were observed to be present in the building. FLBs manufactured before July 1, 1979, may contain PCBs. FLBs manufactured between July 1, 1979, and July 1, 1998, that do not contain PCBs must be labeled "NO PCBs." If a FLB is *not* labeled "NO PCBs," it should be assumed to contains PCBs. FLBs manufactured after 1998 are not required to be labeled. If date of manufacture cannot be determined or verified on ballasts with no labeling indicating PCB content, they should be assumed to contain PCBs. S&ME did not observe "NO PCB" labels on the FLBs that were observed. For the purposes of this assessment, S&ME assumes all FLBs present on the building to contain PCBs.

PCB-containing fluid or oil has historically been used in various electrical components outside of FLBs, in switches, dampeners, and most commonly wet transformers either found on power poles or ground mounted on a concrete pad. We observed five pole-mounted transformers around the building. Labels indicating the presence of PCB fluids in the transformers were not observed; therefore, these transformers should be treated as potentially containing PCB fluid.

Along with PCB fluid/oil in electrical components, it has also been stated that PCBs have been found in older style door closers which are noted as being "kettle shaped." S&ME observed 32 of this type of door closer during this assessment.

4.2 Chlorofluorocarbons (CFCs)

Potential CFC-containing equipment may include drinking fountains, window or portable air conditioning units, refrigerators, freezers, and exterior condenser units. A summary of the items and approximate quantities is presented in **Table 4-2** below.

Table 4-2 – CFC Inventory Summary

Drinking Fountains	Refrigerators/Freezers	A/C Units	Exterior Condenser Units
0	5	1	3

4.3 Universal Wastes

The federal universal waste regulations are set forth in Part 273 Title 40 of the Code of Federal Regulations (40 C.F.R. 273). Materials regulated under this rule include batteries or battery-containing equipment (exit signs, smoke detectors, and emergency lights), cleaning/household chemicals, pesticides, mercury-containing equipment (thermostats and switches), and bulbs (lamps). Management and disposal of fluorescent light bulbs are regulated under the Resource Conservation and Recovery Act (RCRA), the Universal Waste Rule (UWR), and

Subtitle C Hazardous Waste regulations. A standard fluorescent bulb contains eight to 14 milligrams of mercury. Fluorescent light bulbs that are not marked with green aluminum end caps are generally considered to be regulated universal waste after their useful life. Fluorescent bulbs with green end caps contain less mercury than standard fluorescent bulbs and are also generally considered to be regulated universal waste after their useful life. A summary of the items and approximate quantities is presented in **Table 4-3** below.

Table 4-3 – Universal Waste Summary

Exit Signs/Emergency Lights	Smoke Detectors	Tritium-containing Exit Signs	Fluorescent Bulbs	Mercury-containing Equipment	Cleaning/ Household Chemicals	Pesticides
17	13	0	450	10	12	0

5.0 PCB-Containing Caulk

PCBs are a group of organic chemicals known as chlorinated hydrocarbons. These chemicals were manufactured between 1929 and 1979 and were used in a variety of building materials for their non-flammability, chemical stability, high boiling point, plasticizing, and electrical insulating properties. Specifically, PCBs in caulk may be present in buildings that were constructed or renovated during the 1950s through the 1970s. PCB caulk inspection and sampling methods are not regulated; however, the TSCA has established an action level of 50 milligrams per kilogram (mg/kg) or 50 parts per million (ppm).

The PCB-containing caulk assessment included the interior and exterior of the building. A visual assessment and sampling strategy was developed and representative samples of each type of caulk identified during the visual assessment were collected. Each sample consisted of an approximately 10-gram (4-inch long) piece of caulk that was collected using a utility knife with a new blade for each sample. A total of three caulk samples were collected as part of this assessment. Each caulk sample was placed in a laboratory-provided two-ounce unpreserved glass jar with a Teflon-lined lid. The samples were shipped overnight to a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory under chain-of-custody.

The samples were analyzed for the presence of PCBs using United States EPA Method 8082A. A copy of the laboratory analytical report is included in **Appendix VI** and a summary of results from the samples collected is provided in **Table 5-1** below. Please note that if multiple PCB compounds were identified in a sample, the total concentration of all identified PCB types in that sample is presented in the table below.

Table 5-1 – PCB Caulk Sampling Summary

Sample No.	Material Description and Location	Color	Result (mg/kg)	Action Level (mg/kg)
KH-17	Window Caulk	White	4.2	50
KH-22	Caulk	Silver	8.2	50
KH-24	Caulk	Gray	ND	50
KH-31	Door & Window Caulk	White	ND	50
KH-32	Caulk	White	ND	50

ND = Not Detected above laboratory detection limits

The PCB-caulk samples submitted for analysis did not reveal the presence of PCBs above the TSCA action level of 50 mg/kg.

6.0 Conclusions and Recommendations

6.1 Asbestos

ACM was identified in areas to be affected by the planned demolition. We recommend removal and disposal of the ACM by a KDEP licensed and EPA accredited asbestos abatement contractor, prior to activities that may disturb an ACM. State and federal regulations should be carefully considered in order to verify compliance before any actions are initiated that may disturb an ACM. If additional suspect ACMs not included in this report are discovered and will be disturbed by renovation activities, bulk samples must be collected by a KDEP licensed and EPA accredited asbestos inspector and analyzed for asbestos content, prior to disturbance of the suspect material(s).

Asbestos removal requires written notification to KDEP, specific removal procedures, proper transportation, and disposal per state and federal regulations. The identification and proper removal of ACM prior to demolition will aid in the prevention of occupational exposures and/or environmental releases of airborne asbestos. If ACMs are managed in place, OSHA requirements apply to employees that may contact or disturb ACMs, including maintenance and custodial workers.

Removal of Category I Non-friable ACM may not be required by state and federal regulations if the probability is low that it will be rendered friable during demolition. Likewise, removal of Category II Non-friable ACM may not be required if the probability is low that the material will become crumbled, pulverized, or reduced to powder during demolition. The demolition procedures must follow NESHAP and KDEP regulations and the debris contaminated with asbestos must be disposed of as regulated asbestos-containing waste.

While there are numerous Category I and II Non-friable flooring and other materials found within the building, it is anticipated that contractors will not be able to remove these materials without rendering them friable, since they are multi-layered and/or attached to wooden or other porous substrates. Therefore, we recommend the removal of all asbestos-containing Category I and II Non-friable materials as regulated materials, prior to demolition activities and that air monitoring and 3rd-party observation be conducted during removal activities. Additionally, due to the quantities of ACMs to be removed, a project design will need to be prepared and transmission electron microscopy (TEM) clearance will need to be conducted at the end of the abatement process.

If non-sampled suspect materials are discovered that are similar to the sampled materials in appearance, age, or use, they should be treated the same as the similarly sampled materials.

6.2 Other Regulated Materials and Universal Wastes

It is recommended that the other regulated materials and universal wastes identified in Section 4.0 of this report be removed by qualified waste disposal contractor and properly recycled or disposed prior to renovation activities that may impact them in accordance with the applicable EPA regulations regarding these materials.

6.3 PCB-Containing Caulk

The PCB-caulk samples submitted for analysis did not reveal the presence of PCBs above the TSCA action level of 50 mg/kg and do not require removal before demolition activities.

7.0 Limitations

This report is provided for the sole use Mr. Bob Kjelland and the University of Kentucky. Use of this report by any other parties will be at such party's sole risk, and S&ME disclaims liability for any such use or reliance by third parties. The results presented in this report are indicative of conditions only during the time of the sampling and of the specific areas referenced. Under no circumstances is this report to be used as a bidding document, or as a project design or specification.

S&ME performed the services in accordance with generally accepted practices of reputable environmental consultants undertaking similar studies at the same time and in the same geographical area. S&ME has endeavored to meet this standard of care. No other warranty, expressed or implied, is intended or made with respect to this report or S&ME's services. Users of this report should consider the scope and limitations related to these services when developing opinions as to risks associated with the site.

The findings of the hazardous materials survey are based largely on visual observations within the amount of time available. The findings do not warrant that all hazardous materials have been identified; hazardous materials could be present in areas not readily accessible to observation. In addition, the actual locations and quantities of materials determined to contain asbestos will vary from those herein. Apparent homogeneous sampling areas may vary in actual asbestos content due to previous renovations, maintenance, or related operations.

If additional suspect materials are found, our firm should be notified so that our findings can be reviewed for modification or verification.

7.1 Asbestos

This report is not intended for use as an asbestos abatement specification. ***The quantities of ACM provided in this report are estimates for sample collection purposes and should not be used for asbestos abatement bidding purposes. The Asbestos Abatement Contractor is responsible for verifying the quantities of ACM for asbestos abatement purposes.*** It is not within the scope of this project to describe all appropriate precautions, safeguards and regulations relating to asbestos.

The possibility exists that suspect materials were undetected in inaccessible or concealed areas such as under carpeting or multiple flooring layers, and inside pipe chases or wall voids or were not observed during the assessment. If additional suspect materials are discovered during the planned renovation activities, bulk samples must be collected by a KDEP licensed and EPA accredited asbestos inspector and analyzed for asbestos content.

7.2 Other Regulated Materials and Universal Wastes

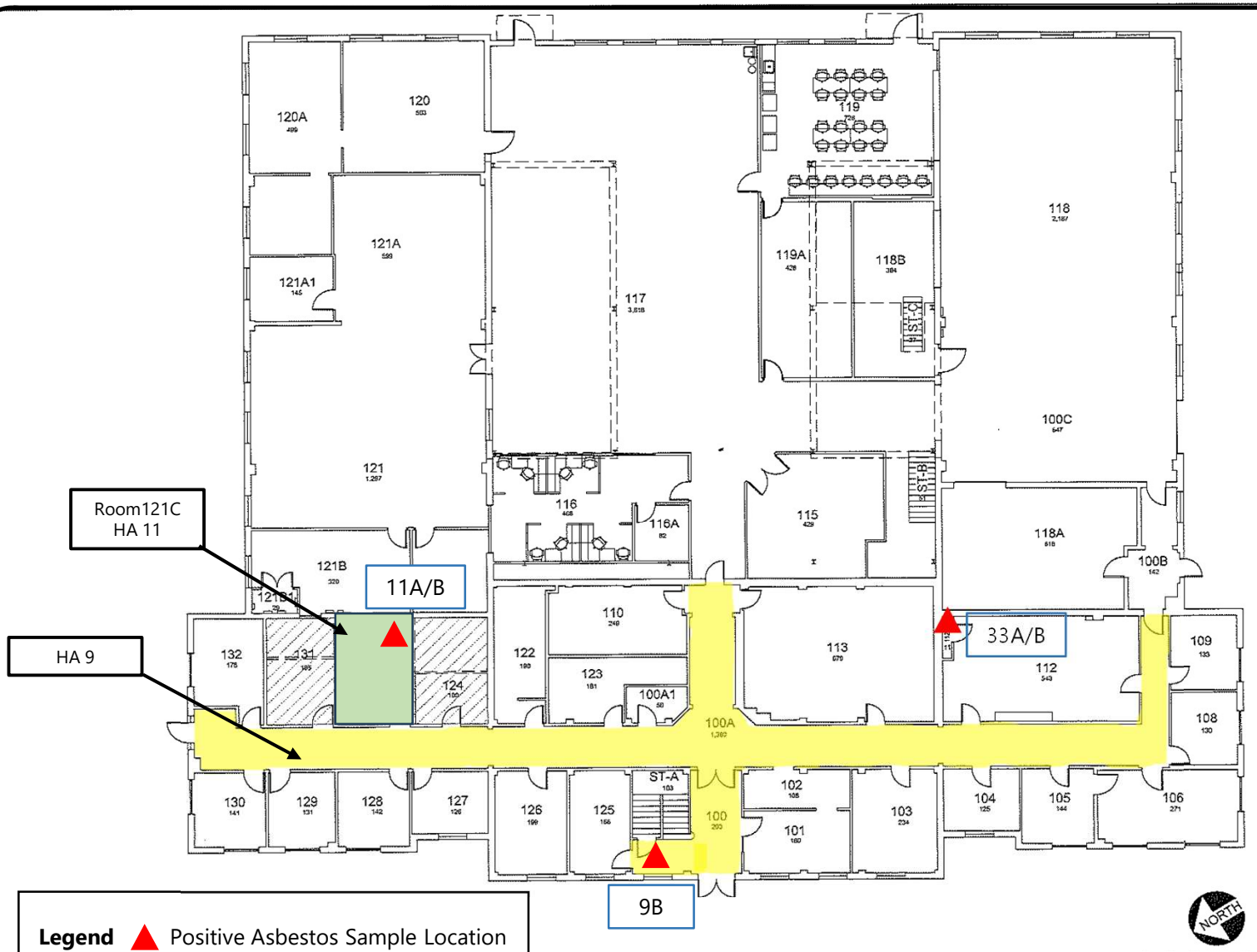
S&ME tried to identify hazardous materials or potentially hazardous wastes that should be removed prior to renovation or demolition and disposed of in accordance with state and federal regulations. Other hazardous materials or potentially hazardous waste may be present and identified during renovation or demolition. If additional hazardous materials or potentially hazardous wastes are identified, they should be disposed of in accordance with state and federal regulations pertaining to Universal Waste and hazardous waste.

Appendices

Appendix I – Figures

IMAGERY REFERENCE: ©2023 CNES/Airbus, Maxar Technologies. U.S. Geological Survey, ©Google
COORDINATE REFERENCE SYSTEM: EPSG:3089 - NAD83 / Kentucky Single Zone (ftUS)

	PROJECT LOCATION MAP	SCALE: Not to Scale ‘	FIGURE NO. 1
	Kelley Hall 360 Huguelet Drive Lexington, Kentucky	DATE: 10-16-2023 PROJECT NUMBER: 23830110	



University of Kentucky

BLDG #: 0075

KELLY HALL

DRAWN BY: KS
DATE: 10-25-2007

REVISED BY: JLH
DATE: 11-09-2021

SHEET 2 OF 5

POSITIVE SAMPLE LOCATION MAP – FIRST FLOOR

Kelley Hall
360 Huguelet Drive
Lexington, Kentucky

SCALE: Not to Scale
DATE: 10-16-2023
PROJECT NUMBER: 23830110

FIGURE NO. 2

Legend ▲ Positive PCB Caulk Sample Location

10A Sample ID

University of Kentucky

BLDG #: 0075

KELLY HALL

DRAWN BY: KS
DATE: 10-25-2007

REVISED BY: JES
DATE: 07-05-2016

SHEET 3 OF 5

POSITIVE SAMPLE LOCATION MAP – SECOND FLOOR

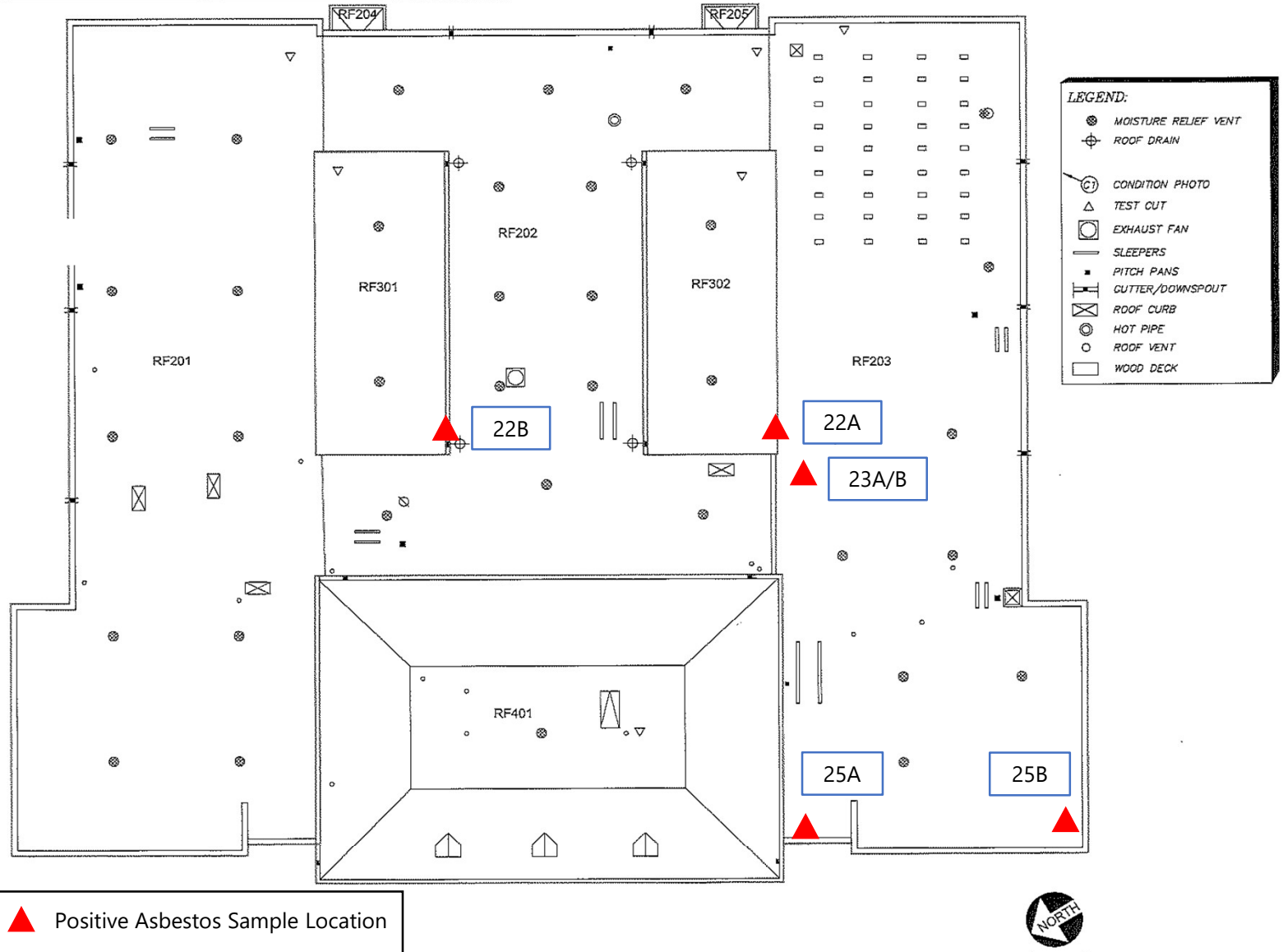
Kelley Hall
360 Huguelet Drive
Lexington, Kentucky

SCALE: Not to Scale

DATE: 10-16-2023

PROJECT NUMBER: 23830110

FIGURE NO. 3



Legend ▲ Positive Asbestos Sample Location

10A Sample ID

University of Kentucky

BLDG #: 0075

KELLY HALL

DRAWN BY: KS
DATE: 10-25-2007

REVISED BY: JCS
DATE: 06-04-2013

SHEET 5 OF 5

POSITIVE SAMPLE LOCATION MAP – ROOF FLOOR

Kelley Hall
360 Huguelet Drive
Lexington, Kentucky

SCALE: Not to Scale
DATE: 10-16-2023
PROJECT NUMBER: 23830110

FIGURE NO. 4

Appendix II – Asbestos Inspector Credentials

Andy Beshear
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
300 Sower Boulevard
Frankfort, Kentucky 40601
Phone: (502) 564-2150
Fax: 502-564-4245

Rebecca W. Goodman
SECRETARY

Anthony R. Hatton
COMMISSIONER

March 8, 2023

Vincent J Epps
862 E Crescentville Rd
Cincinnati, Ohio 45246

Asbestos Management Planner
AI Number: 155508
License Number: 63211
Expires: December 21, 2023

Dear Vincent J Epps:

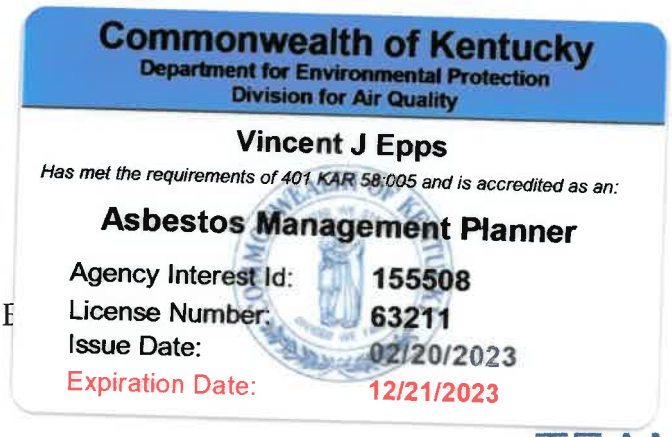
This is to acknowledge receipt of your application for accreditation as an asbestos abatement professional. Your application has been approved and the above-referenced card is enclosed.

Initial accreditation fee is $100.00 per person per discipline, except for abatement worker ($20.00). Renewal fees for accreditations within one year of the expiration date are one-half of the initial fees. Renewals for accreditations expired over one year require the initial fee. There is a $10.00 duplication charge to replace a lost card. Please also note that the expiration date on your license is determined by the expiration date on the training certificate submitted with your application.

When submitting application packets, please note the following:

- do not staple any of the application materials;
- make sure to fill out the application completely, including your signature; and
- include current proof of training for the discipline(s) for which you are applying

If you have any questions regarding this matter, please call our office at (502) 782-6717.

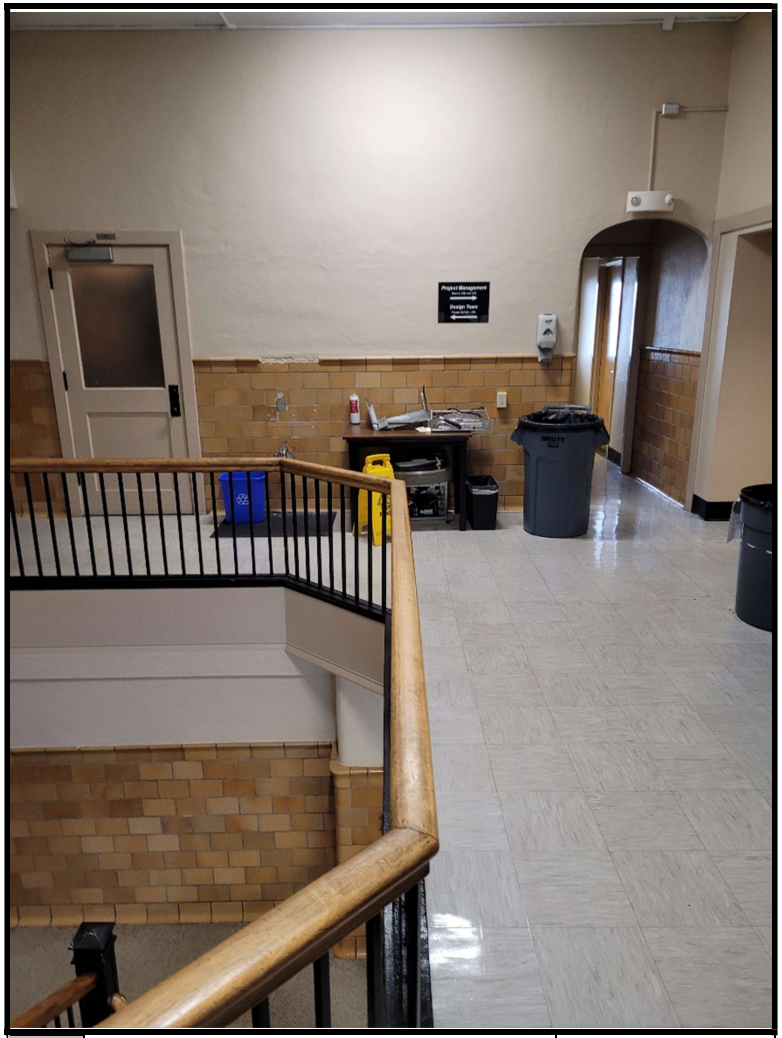


Sincerely,

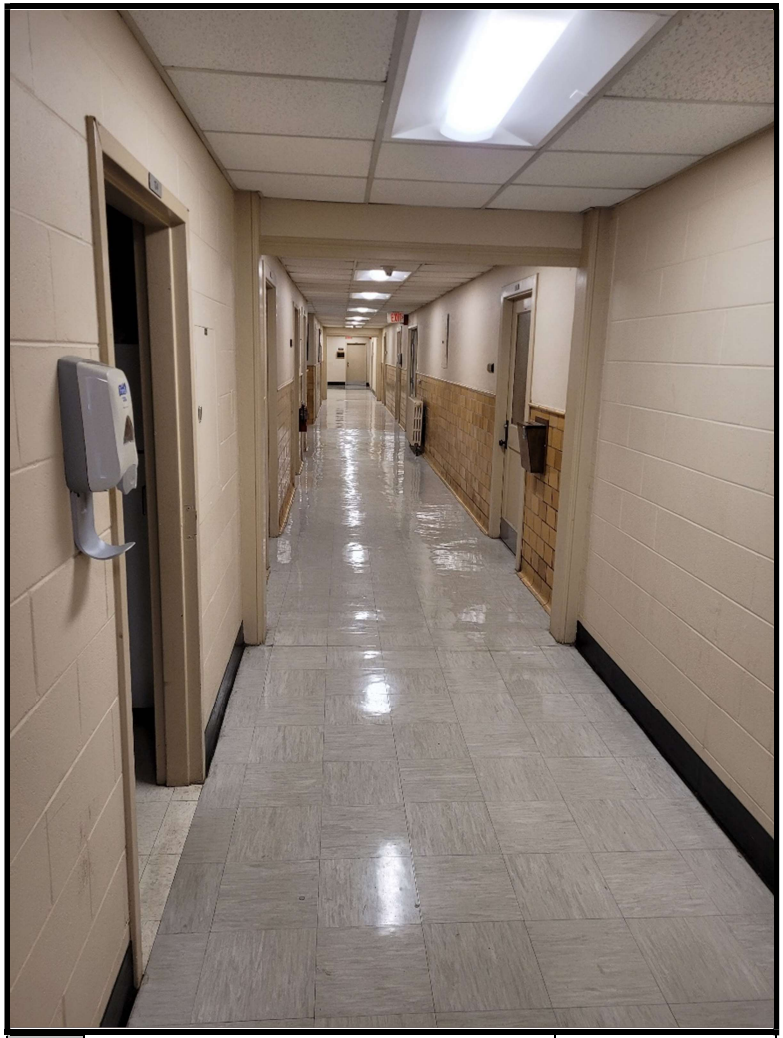
Emma Moreo

Emma Moreo
Field Support Section
Field Operations Branch

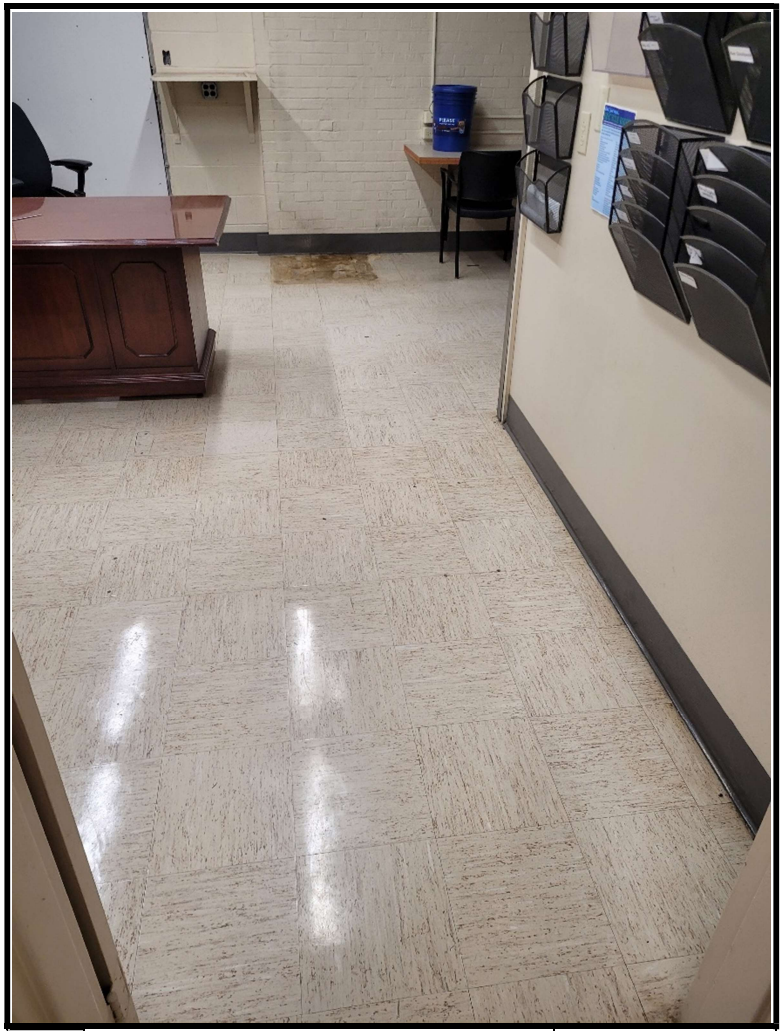
Appendix III – Photographic Log



1	HA 9 Second Floor	**Date:** 08/25/2023 **Photographer:** VE



2	HA 9 First Floor	**Date:** 08/25/2023 **Photographer:** VE

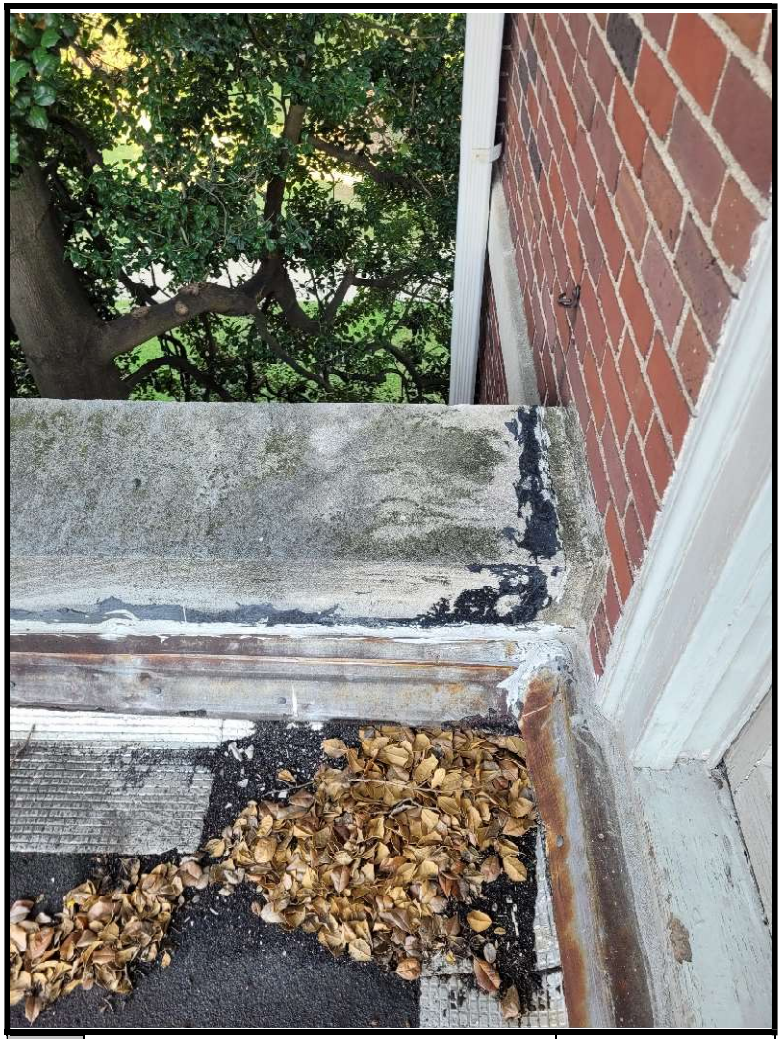


3	HA 11	**Date:** 08/25/2023 **Photographer:** VE

4	HA 11 Close Up	**Date:** 08/25/2023 **Photographer:** VE

5	HA 22 Roof Housing	**Date:** 08/24/2023 **Photographer:** CR

6	HA 23 ACM Tar Layer	**Date:** 08/24/2023 **Photographer:** CR



7	HA 25	**Date:** 08/24/2023 **Photographer:** CR

8	HAs 33 and 34	**Date:** 08/24/2023 **Photographer:** CR

Appendix IV – ACM Summary Table

Summary of Asbestos Sampling

Project Name: UK Kelley Hall	**Project Number:** 23830110
Location: Lexington, KY	**Sampling Date(s):** 8/25/2023

HOMOGENEOUS AREA **SAMPLE DATA**

HA Area	Material Description	Material Location	Quantity	[1]Cat (F/I/II)	[2]Type	Condition / Potential for Disturbance	Sample Number	Sample Location	Type and Percent Asbestos
1	Yellow Carpet Glue	Throughout Second Floor	NQ	NA	Misc.	Good/Low	1A	Room 204	ND
							1B	Room 206	
2	Black/Grey Cove Base with Yellow and Black Mastic	Throughout First and Second Floor	NQ	NA	Misc.	Good/Low	2A	Room 201	ND
							2B	Room 133	
3	2' x 4' Drop in Ceiling Tiles	Throughout First and Second Floor	NQ	NA	Misc.	Good/Low	3A	Room 206	ND
							3B	Room 112	
4	Plaster	Throughout Building	NQ	NA	Sur.	Good/Low	4A	Room 204	ND
							4B	Room 206	
							4C	Room 201	
							4D	Room 209	ND
							4E	Room 125	
							4F	Hallway, 100A	ND
							4G	Room 113	
5	Gray Duct Selant	HVAC System Throughout	NQ	NA	Misc.	Good/Low	5A	Room 206A	ND
							5B	Room 115	

NQ = Not Quantified ND = Asbestos Not Detected SF = Square feet LF = Linear feet CF = Cubic Feet CH = Chrysotile NA = Not Applicable

[1]Category: F=Friable I=Category I, Non-Friable II=Category II, Non-Friable

[2]Type; Misc. = Miscellaneous Sur = Surfacing TSI = Thermal System Insulation

Quantities are approximate and should not be used for cost estimates or biding purposes

Summary of Asbestos Sampling

Project Name: UK Kelley Hall	**Project Number: 23830110**
Location: Lexington, KY	**Sampling Date(s): 8/25/2023**

HOMOGENEOUS AREA **SAMPLE DATA**

HA Area	Material Description	Material Location	Quantity	[1]Cat (F/I/II)	[2]Type	Condition / Potential for Disturbance	Sample Number	Sample Location	Type and Percent Asbestos
6	Drywall, Joint Compound, and Tape	Throughout First and Second Floor Offices	NQ	NA	Misc.	Good/Low	6A	Room 209	ND
							6B	Room 112	
7	2' x 2' Drop in Ceiling Tiles	Rooms 208 and 209	NQ	NA	Misc.	Good/Low	7A	Room 209	ND
							7B	Room 208	
8	Canvas Pipe Wrap Over Fiberglass	Throughout Building	NQ	NA	TSI	Good/Low	8A	Room 207	ND
							8B	Room 115	
9	**12" x 12" White Floor Tile with Gray Streaks and Yellow Mastic**	**Rooms 200A, 207, 100, and 100A**	**1,850 SF**	**I**	**Misc.**	**Good/High**	**9A**	**Foyer, Room 200A**	**2% CH Tile Mastic ND**
							9B	**Hallway, Room 100**	
10	Terrazzo	Front Stairs from First to Second Floors	NQ	NA	Misc.	Good/Low	10A	Top of Stairs	ND
							10B	Top of Stairs	
11	**12" x 12" Tan Tile with Dark Brown Streaks and Yellow Mastic**	**Room 121C**	**350 SF**	**I**	**Misc.**	**Good/High**	**11A**	**Room 121C**	**2% CH Mastic ND**
							11B	**Room 121C**	
12	12" x 12" White Tile with Lt. Brown Streaks and Yellow Mastic	Room 124	NQ	NA	Misc.	Good/Low	12A	Room 124	ND
							12B	Room 124	
13	Black/Gray Cove Bae with Yellow Mastic	Throughout First Floor Except Shop	NQ	NA	Misc.	Good/Low	13A	124	ND
							13B	121C	

NQ = Not Quantified ND = Asbestos Not Detected SF = Square feet LF = Linear feet CF = Cubic Feet CH = Chrysotile NA = Not Applicable

[1]Category: F=Friable I=Category I, Non-Friable II=Category II, Non-Friable

[2]Type; Misc. = Miscellaneous Sur = Surfacing TSI = Thermal System Insulation

Quantities are approximate and should not be used for cost estimates or biding purposes

Summary of Asbestos Sampling

Project Name: UK Kelley Hall	**Project Number: 23830110**
Location: Lexington, KY	**Sampling Date(s): 8/25/2023**

HOMOGENEOUS AREA **SAMPLE DATA**

HA Area	Material Description	Material Location	Quantity	[1]Cat (F/I/II)	[2]Type	Condition / Potential for Disturbance	Sample Number	Sample Location	Type and Percent Asbestos
14	12" x 12" Tan Tile with Brown/White Streaks and Brown Mastic with Floor Leveling Compound	Men's and Women's Restrooms First Floor	NQ	NA	Misc.	Good/Low	14A	Men's Restroom (110)	ND
							14B	Women's Restroom (123)	
15	12" x 12" Black Floor Tile with Yellow Mastic	In-between Offices 105 and 106	NQ	NA	Misc.	Good/Low	15A	North Hallway (100A)	ND
							15B	North Hallway (100A)	
16	12" x 12" Black Rubber Tile with Yellow Mastic	Room 100B	NQ	NA	Misc.	Good/Low	16A	Room 100B	ND
							16B	Room 100B	
17	White Window Caulk	Interior Windows	NQ	NA	Misc	Good/Low	17A	Room 100B	ND
							17B	Room 118	
18	SAMPLE NOT SUBMITTED FOR ANALYSIS - FIBERGLASS								
19	Drywall, Joint Compound, and Tape	Wearhouse Office and Mechanical Room	NQ	NA	Misc.	Good/Low	19A	Mechanical Room (115)	ND
							19B	Office (116)	
20	Wood Pattern Vinyl Flooring with Gray Mastic and Floor Leveling Compound	Break Room (119)	NQ	NA	Misc.	Good/Low	20A	Room 119	ND
							20B	Room 119	

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Summary of Asbestos Sampling

Project Name: UK Kelley Hall	**Project Number: 23830110**
Location: Lexington, KY	**Sampling Date(s): 8/25/2023**

HOMOGENEOUS AREA **SAMPLE DATA**

HA Area	Material Description	Material Location	Quantity	[1]Cat (F/I/II)	[2]Type	Condition / Potential for Disturbance	Sample Number	Sample Location	Type and Percent Asbestos
21	Window Glazing	Warehouse Skylights	NQ	NA	Misc.	Good/Low	21A	Warehouse Skylight	<1% CH Sample 21A ND Sample 21B
							21B	Warehouse Skylight	
22	**Silver Caulk and Paper**	**Warehouse Skylights Roof Housing**	**300 LF**	**II**	**Misc.**	**Good/High**	**22A**	**Near Access Door**	**10% CH Caulk 85% CH Paper**
							22B	**Near Access Door**	
23	**Flat Roofing Tar (multiple layers)**	**Flat Roof of Warehouse – Second Layer Above Decking**	**17,500 SF**	**I**	**Misc.**	**Good/High**	**23A**	**Near Access Door**	**5% CH**
							23B	**Near Access Door**	
24	Gray Caulk	Flat Roof at Wall Edges	NQ	NA	Misc.	Good/Low	24A	Original Building	ND
							24B	Parapet Wall	
25	**Black Roof Selant**	**Along Parapet Walls on Flat Roof**	**200 LF**	**II**	**Misc.**	**Good/High**	**25A**	**Parapet wall**	**3% CH**
							25B	**Parapet wall**	
26	Window Glazing (Original Building)	Exterior Windows	NQ	NA	Misc.	Good/Low	26A	Southwest Corner	ND
							26B	Northwest Corner	
27	Silver Roof Flashing	Flat Roof Edge Seams	NQ	NA	Misc.	Good/Low	27A	Near Access Door	ND
							27B	Original Building	

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Summary of Asbestos Sampling

Project Name: UK Kelley Hall	**Project Number: 23830110**
Location: Lexington, KY	**Sampling Date(s): 8/25/2023**

HOMOGENEOUS AREA **SAMPLE DATA**

HA Area	Material Description	Material Location	Quantity	[1]Cat (F/I/II)	[2]Type	Condition / Potential for Disturbance	Sample Number	Sample Location	Type and Percent Asbestos
28	HVAC Duct Wrap	Room 115	NQ	NA	Misc.	Good/Low	28A	Room 115	ND
							28B	Room 115	
29	12" x 12" White Tile with Clear Mastic	Room 116	NQ	NA	Misc.	Good/Low	29A	Room 116	ND
							29B	Room 116	
30	12" x 12" Gray Floor Tile with Yellow Mastic	Basement Room 002	NQ	NA	Misc.	Good/Low	30A	Room 002	ND
							30B	Room 002	
31	White Caulk	Exterior Doors and Windows of Addition	NQ	NA	Misc.	Good/Low	31A	South Side	ND
							31B	East Side	
32	White Caulk	Exterior Windows and of Original Building	NQ	NA	Misc.	Good/Low	32A	West Side	ND
							32B	North Side	
33	**Pipe Wrap (6" Pipe)**	**Rooms 112 and 100B Above Drop Ceiling**	**60 LF**	**F**	**TSI**	**Good/High**	**33A**	**Room 112 Closet**	**60% CH**
							33B	**Room 112**	
34	**Mudded Elbows**	**Rooms 112 and 100B Above Drop Ceiling**	**3 Units**	**F**	**TSI**	**Good/High**	**34A**	**Assumed – No Access**	**Assumed**
							34B	**Assumed – No Access**	
35	Roofing Felt and Shingles	Pitched Roof	NQ	NA	Misc.	Good/Low	35A	Pitched Roof	ND
							35B	Pitched Roof	

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Appendix V – Asbestos Analytical Laboratory Report

SanAir Technologies Laboratory

The Identification Specialists

Analysis Report prepared for S&ME, Inc.

Report Date: 9/5/2023

Project Name: UK-Kelley Hall

Project #: 23830110

SanAir ID#: 23047441

NVLAP TESTING

NVLAP LAB CODE 200870-0

10501 Trade Court | North Chesterfield, Virginia 23236
888.895.1177 | 804.897.1177 | fax: 804.897.0070 | IAQ@SanAir.com | SanAir.com

SanAir Technologies Laboratory

SanAir ID Number
23047441
FINAL REPORT
9/5/2023 6:05:43 PM

Name: S&ME, Inc.
Address: 6190 Enterprise Court
Dublin, OH 43016
Phone: 6147932226

Project Number: 23830110
P.O. Number: 23830110
Project Name: UK-Kelley Hall
Collected Date: 8/25/2023
Received Date: 8/28/2023 2:00:00 PM

Dear Jamie Bailey,

We at SanAir would like to thank you for the work you recently submitted. The 71 sample(s) were received on Monday, August 28, 2023 via Drop Box. The final report(s) is enclosed for the following sample(s): 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B, 4C, 4D, 4E, 4F, 4G, 5A, 5B, 6A, 6B, 7A, 7B, 8A, 8B, 9A, 9B, 10A, 10B, 11A, 11B, 12A, 12B, 13A, 13B, 14A, 14B, 15A, 15B, 16A, 16B, 17A, 17B, 19A, 19B, 20A, 20B, 21A, 21B, 22A, 22B, 23A, 23B, 24A, 24B, 25A, 25B, 26A, 26B, 27A, 27B, 28A, 28B, 29A, 29B, 30A, 30B, 31A, 31B, 32A, 32B, 33A, 33B, 35A, 35B.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

Sandra Sobrino
Asbestos & Materials Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

Sample conditions:
- 71 samples in Good condition.

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Project Number: 23830110
P.O. Number: 23830110
Project Name: UK-Kelley Hall
Collected Date: 8/25/2023
Received Date: 8/28/2023 2:00:00 PM

Analyst: Hogrefe, Sarah | Drakes, Renaldo | Sanchez, Meivis

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
1A / 23047441-001 Carpet Glue	Various Non-Fibrous Homogeneous		100% Other	None Detected
1B / 23047441-002 Carpet Glue	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
2A / 23047441-003 Cove Base w/ Adhesive, Cove Base	Black Non-Fibrous Homogeneous		100% Other	None Detected
2A / 23047441-003 Cove Base w/ Adhesive, Adhesive	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
2A / 23047441-003 Cove Base w/ Adhesive, Mastic	Black Non-Fibrous Homogeneous		100% Other	None Detected
2B / 23047441-004 Cove Base w/ Adhesive, Cove Base	Black Non-Fibrous Homogeneous		100% Other	None Detected
2B / 23047441-004 Cove Base w/ Adhesive, Adhesive	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
2B / 23047441-004 Cove Base w/ Adhesive, Mastic	Black Non-Fibrous Homogeneous		100% Other	None Detected
3A / 23047441-005 Ceiling Tile	White Fibrous Homogeneous	45% Cellulose 35% Glass	20% Other	None Detected
3B / 23047441-006 Ceiling Tile	White Fibrous Homogeneous	45% Cellulose 35% Glass	20% Other	None Detected

Analyst: Renaldo A. Drakes
Analysis Date: 9/5/2023

Approved Signatory: Sandra Sobrino
Date: 9/5/2023

SanAir Technologies Laboratory

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Analyst: Hogrefe, Sarah | Drakes, Renaldo | Sanchez, Meivis

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
4A / 23047441-007 Plaster, Plaster	Grey Fibrous Homogeneous		100% Other	None Detected
4A / 23047441-007 Plaster, Skim Coat			< 1% Other	None Detected
4B / 23047441-008 Plaster	Grey Non-Fibrous Homogeneous	< 1% Hair	100% Other	None Detected
4C / 23047441-009 Plaster, Plaster	Grey Non-Fibrous Homogeneous	< 1% Hair	100% Other	None Detected
4C / 23047441-009 Plaster, Skim Coat	White Non-Fibrous Homogeneous		100% Other	None Detected
4D / 23047441-010 Plaster, Plaster	Grey Non-Fibrous Homogeneous	< 1% Hair	100% Other	None Detected
4D / 23047441-010 Plaster, Skim Coat	White Non-Fibrous Homogeneous		100% Other	None Detected
4E / 23047441-011 Plaster, Plaster	Grey Non-Fibrous Homogeneous	< 1% Hair	100% Other	None Detected
4E / 23047441-011 Plaster, Skim Coat	White Non-Fibrous Homogeneous		100% Other	None Detected
4F / 23047441-012 Plaster, Plaster	Grey Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: Renaldo A. Drakes
Analysis Date: 9/5/2023

Approved Signatory: Sandra Sobrino
Date: 9/5/2023

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Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
4F / 23047441-012 Plaster, Skim Coat	White Non-Fibrous Homogeneous		100% Other	None Detected
4G / 23047441-013 Plaster, Plaster	Grey Non-Fibrous Homogeneous		100% Other	None Detected
4G / 23047441-013 Plaster, Skim Coat	White Non-Fibrous Homogeneous		100% Other	None Detected
5A / 23047441-014 Duct Sealant	Grey Non-Fibrous Homogeneous		100% Other	None Detected
5B / 23047441-015 Duct Sealant	Grey Non-Fibrous Homogeneous		100% Other	None Detected
6A / 23047441-016 DW/ JC/ Tape, Drywall	White Non-Fibrous Homogeneous	12% Cellulose	88% Other	None Detected
6A / 23047441-016 DW/ JC/ Tape, Joint Compound	White Non-Fibrous Homogeneous		100% Other	None Detected
6A / 23047441-016 DW/ JC/ Tape, Tape	White Fibrous Homogeneous		100% Other	None Detected
6B / 23047441-017 DW/ JC/ Tape, Drywall	White Non-Fibrous Homogeneous	12% Cellulose	88% Other	None Detected
6B / 23047441-017 DW/ JC/ Tape, Joint Compound	White Non-Fibrous Homogeneous		100% Other	None Detected

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Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
6B / 23047441-017 DW/ JC/ Tape, Tape	White Fibrous Homogeneous		100% Other	None Detected
7A / 23047441-018 Ceiling Tile	White Fibrous Homogeneous	45% Cellulose 35% Glass	20% Other	None Detected
7B / 23047441-019 Ceiling Tile	White Fibrous Homogeneous	45% Cellulose 35% Glass	20% Other	None Detected
8A / 23047441-020 Pipe Wrap	Brown Fibrous Homogeneous	55% Cellulose	45% Other	None Detected
8B / 23047441-021 Pipe Wrap	Grey Fibrous Homogeneous	65% Cellulose	35% Other	None Detected
9A / 23047441-022 Floor Tile w/ Mastic, Tile	White Non-Fibrous Homogeneous		98% Other	2% Chrysotile
9A / 23047441-022 Floor Tile w/ Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
9B / 23047441-023 Floor Tile w/ Mastic, Tile	White Non-Fibrous Homogeneous		98% Other	2% Chrysotile
9B / 23047441-023 Floor Tile w/ Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
10A / 23047441-024 Terrazzo	Gray Non-Fibrous Heterogeneous		100% Other	None Detected

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Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
10B / 23047441-025 Terrazzo	Gray Non-Fibrous Heterogeneous		100% Other	None Detected
11A / 23047441-026 Floor Tile w/ Mastic, Floor Tile	Gray Non-Fibrous Homogeneous		98% Other	2% Chrysotile
11A / 23047441-026 Floor Tile w/ Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
11B / 23047441-027 Floor Tile w/ Mastic, Floor Tile	Gray Non-Fibrous Homogeneous		98% Other	2% Chrysotile
11B / 23047441-027 Floor Tile w/ Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
12A / 23047441-028 Floor Tile w/ Mastic, Floor Tile	White Non-Fibrous Homogeneous		100% Other	None Detected
12A / 23047441-028 Floor Tile w/ Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
12B / 23047441-029 Floor Tile w/ Mastic, Floor Tile	White Non-Fibrous Homogeneous		100% Other	None Detected
12B / 23047441-029 Floor Tile w/ Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
13A / 23047441-030 Cove Base w/ Adh., Cove Base	Gray Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: Renaldo A. Drakes
Analysis Date: 9/5/2023

Approved Signatory: Sandra Sobrino
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Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
13A / 23047441-030 Cove Base w/ Adh., Adhesive	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
13B / 23047441-031 Cove Base w/ Adh., Cove Base	Gray Non-Fibrous Homogeneous		100% Other	None Detected
13B / 23047441-031 Cove Base w/ Adh., Adhesive	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
14A / 23047441-032 Floor Tile w/ Mastic, Floor Tile	Tan Non-Fibrous Homogeneous		100% Other	None Detected
14A / 23047441-032 Floor Tile w/ Mastic, Mastic	Brown Non-Fibrous Homogeneous		100% Other	None Detected
14A / 23047441-032 Floor Tile w/ Mastic, Leveler	Gray Non-Fibrous Homogeneous		100% Other	None Detected
14B / 23047441-033 Floor Tile w/ Mastic, Floor Tile	Tan Non-Fibrous Homogeneous		100% Other	None Detected
14B / 23047441-033 Floor Tile w/ Mastic, Mastic	Brown Non-Fibrous Homogeneous		100% Other	None Detected
14B / 23047441-033 Floor Tile w/ Mastic, Leveler	Gray Non-Fibrous Homogeneous		100% Other	None Detected
15A / 23047441-034 Floor Tile w/ Mastic, Floor Tile	Black Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: Renaldo A. Drakes
Analysis Date: 9/5/2023

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Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
15A / 23047441-034 Floor Tile w/ Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
15B / 23047441-035 Floor Tile w/ Mastic, Floor Tile	Black Non-Fibrous Homogeneous		100% Other	None Detected
15B / 23047441-035 Floor Tile w/ Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
16A / 23047441-036 Rubber Tile w/ Mastic, Floor Tile	Black Non-Fibrous Homogeneous		100% Other	None Detected
16A / 23047441-036 Rubber Tile w/ Mastic, Mastic	Brown Non-Fibrous Homogeneous		100% Other	None Detected
16B / 23047441-037 Rubber Tile w/ Mastic, Floor Tile	Black Non-Fibrous Homogeneous		100% Other	None Detected
16B / 23047441-037 Rubber Tile w/ Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
17A / 23047441-038 Caulk	White Non-Fibrous Homogeneous		100% Other	None Detected
17B / 23047441-039 Caulk	White Non-Fibrous Homogeneous		100% Other	None Detected
19A / 23047441-040 DW/ JC/ Tape, Drywall	White Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: Renaldo A. Drakes
Analysis Date: 9/5/2023

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Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
19A / 23047441-040 DW/ JC/ Tape, Joint Compound	White Non-Fibrous Homogeneous		100% Other	None Detected
19A / 23047441-040 DW/ JC/ Tape, Tape	Brown Fibrous Homogeneous	99% Cellulose	1% Other	None Detected
19B / 23047441-041 DW/ JC/ Tape, Drywall	White Non-Fibrous Homogeneous		100% Other	None Detected
19B / 23047441-041 DW/ JC/ Tape, Joint Compound	White Non-Fibrous Homogeneous		100% Other	None Detected
19B / 23047441-041 DW/ JC/ Tape, Tape	Brown Fibrous Homogeneous	99% Cellulose	1% Other	None Detected
20A / 23047441-042 Vinyl Plank Flooring w/ Adhesive, Flooring	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
20A / 23047441-042 Vinyl Plank Flooring w/ Adhesive, Adhesive	Tan Non-Fibrous Homogeneous		100% Other	None Detected
20A / 23047441-042 Vinyl Plank Flooring w/ Adhesive, Leveler	Gray Non-Fibrous Homogeneous		100% Other	None Detected
20B / 23047441-043 Vinyl Plank Flooring w/ Adhesive, Flooring	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
20B / 23047441-043 Vinyl Plank Flooring w/ Adhesive, Adhesive	Tan Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: Renaldo A. Drakes
Analysis Date: 9/5/2023

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Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
20B / 23047441-043 Vinyl Plank Flooring w/ Adhesive, Leveler	Gray Non-Fibrous Homogeneous		100% Other	None Detected
21A / 23047441-044 Window Glazing	White Non-Fibrous Homogeneous		100% Other	< 1% Chrysotile
21B / 23047441-045 Window Glazing	White Non-Fibrous Homogeneous		100% Other	None Detected
22A / 23047441-046 Caulk	Silver Non-Fibrous Heterogeneous		90% Other	10% Chrysotile
22B / 23047441-047 Caulk, Caulk	Silver Non-Fibrous Heterogeneous		90% Other	10% Chrysotile
22B / 23047441-047 Caulk, Paper	White Fibrous Homogeneous		15% Other	85% Chrysotile
23A / 23047441-048 Flat Roof Layers, Shingle	Black Non-Fibrous Heterogeneous	10% Glass	90% Other	None Detected
23A / 23047441-048 Flat Roof Layers, Tar	Black Non-Fibrous Homogeneous		100% Other	None Detected
23A / 23047441-048 Flat Roof Layers, Tar Paper	Black Fibrous Homogeneous	50% Glass	50% Other	None Detected
23A / 23047441-048 Flat Roof Layers, Tar	Black Non-Fibrous Homogeneous		95% Other	5% Chrysotile

Analyst: Renaldo A. Drakes
Analysis Date: 9/5/2023

Approved Signatory: Sandra Sobrino
Date: 9/5/2023

SanAir Technologies Laboratory

SanAir ID Number
23047441
FINAL REPORT
9/5/2023 6:05:43 PM

Name: S&ME, Inc.
Address: 6190 Enterprise Court
Dublin, OH 43016
Phone: 6147932226

Project Number: 23830110
P.O. Number: 23830110
Project Name: UK-Kelley Hall
Collected Date: 8/25/2023
Received Date: 8/28/2023 2:00:00 PM

Analyst: Hogrefe, Sarah | Drakes, Renaldo | Sanchez, Meivis

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
23A / 23047441-048 Flat Roof Layers, Insulation	Brown Fibrous Homogeneous	80% Cellulose	20% Other	None Detected
23B / 23047441-049 Flat Roof Layers, Shingle	Black Non-Fibrous Heterogeneous	10% Glass	90% Other	None Detected
23B / 23047441-049 Flat Roof Layers, Tar	Black Non-Fibrous Homogeneous		100% Other	None Detected
23B / 23047441-049 Flat Roof Layers, Tar Paper	Black Fibrous Homogeneous	50% Glass	50% Other	None Detected
23B / 23047441-049 Flat Roof Layers, Tar	Black Non-Fibrous Homogeneous		95% Other	5% Chrysotile
23B / 23047441-049 Flat Roof Layers, Insulation	Brown Fibrous Homogeneous	80% Cellulose	20% Other	None Detected
24A / 23047441-050 Caulk	Gray Non-Fibrous Homogeneous		100% Other	None Detected
24B / 23047441-051 Caulk	Gray Non-Fibrous Homogeneous		100% Other	None Detected
25A / 23047441-052 Roof Sealant	Black Non-Fibrous Heterogeneous		97% Other	3% Chrysotile
25B / 23047441-053 Roof Sealant	Black Non-Fibrous Heterogeneous		97% Other	3% Chrysotile

Analyst: Renaldo A. Drakes
Analysis Date: 9/5/2023

Approved Signatory: Sandra Sobrino
Date: 9/5/2023

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Received Date: 8/28/2023 2:00:00 PM

Analyst: Hogrefe, Sarah | Drakes, Renaldo | Sanchez, Meivis

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
26A / 23047441-054 Window Glazing	White Non-Fibrous Homogeneous		100% Other	None Detected
26B / 23047441-055 Window Glazing	White Non-Fibrous Homogeneous		100% Other	None Detected
27A / 23047441-056 Roof Flashing	Silver Non-Fibrous Heterogeneous	5% Glass	95% Other	None Detected
27B / 23047441-057 Roof Flashing	Silver Non-Fibrous Heterogeneous	5% Glass	95% Other	None Detected
28A / 23047441-058 HVAC Duct Wrap, Wrap	White Non-Fibrous Heterogeneous	50% Cellulose	50% Other	None Detected
28A / 23047441-058 HVAC Duct Wrap, Insulation	Brown Fibrous Homogeneous	99% Glass	1% Other	None Detected
28B / 23047441-059 HVAC Duct Wrap, Wrap	White Non-Fibrous Heterogeneous	50% Cellulose	50% Other	None Detected
28B / 23047441-059 HVAC Duct Wrap, Insulation	Brown Fibrous Homogeneous	99% Glass	1% Other	None Detected
29A / 23047441-060 Floor Tile w/ Mastic, Floor Tile	White Non-Fibrous Homogeneous		100% Other	None Detected
29A / 23047441-060 Floor Tile w/ Mastic, Mastic	Clear Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: Renaldo A. Drakes
Analysis Date: 9/5/2023

Approved Signatory: Sandra Sobrino
Date: 9/5/2023

SanAir Technologies Laboratory

SanAir ID Number
23047441
FINAL REPORT
9/5/2023 6:05:43 PM

Name: S&ME, Inc.
Address: 6190 Enterprise Court
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Project Number: 23830110
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Project Name: UK-Kelley Hall
Collected Date: 8/25/2023
Received Date: 8/28/2023 2:00:00 PM

Analyst: Hogrefe, Sarah | Drakes, Renaldo | Sanchez, Meivis

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
29B / 23047441-061 Floor Tile w/ Mastic, Floor Tile	White Non-Fibrous Homogeneous		100% Other	None Detected
29B / 23047441-061 Floor Tile w/ Mastic, Mastic	Clear Non-Fibrous Homogeneous		100% Other	None Detected
30A / 23047441-062 Floor Tile w/ Mastic, Floor Tile	White Non-Fibrous Homogeneous		100% Other	None Detected
30A / 23047441-062 Floor Tile w/ Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
30A / 23047441-062 Floor Tile w/ Mastic, Level Compounding	Grey Non-Fibrous Homogeneous		100% Other	None Detected
30B / 23047441-063 Floor Tile w/ Mastic, Floor Tile	White Non-Fibrous Homogeneous		100% Other	None Detected
30B / 23047441-063 Floor Tile w/ Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
30B / 23047441-063 Floor Tile w/ Mastic, Level Compounding	Grey Non-Fibrous Homogeneous		100% Other	None Detected
31A / 23047441-064 Caulk	White Non-Fibrous Homogeneous		100% Other	None Detected
31B / 23047441-065 Caulk	White Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: Renaldo A. Drakes
Analysis Date: 9/5/2023

Approved Signatory: Sandra Sobrino
Date: 9/5/2023

SanAir Technologies Laboratory

SanAir ID Number
23047441
FINAL REPORT
9/5/2023 6:05:43 PM

Name: S&ME, Inc.
Address: 6190 Enterprise Court
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Project Number: 23830110
P.O. Number: 23830110
Project Name: UK-Kelley Hall
Collected Date: 8/25/2023
Received Date: 8/28/2023 2:00:00 PM

Analyst: Hogrefe, Sarah | Drakes, Renaldo | Sanchez, Meivis

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
32A / 23047441-066 Caulk	White Non-Fibrous Homogeneous		100% Other	None Detected
32B / 23047441-067 Caulk	White Non-Fibrous Homogeneous		100% Other	None Detected
33A / 23047441-068 Pipe Insulation	Grey Fibrous Homogeneous	30% Cellulose	10% Other	60% Chrysotile
33B / 23047441-069 Pipe Insulation	Grey Fibrous Homogeneous	30% Cellulose	10% Other	60% Chrysotile
35A / 23047441-070 Roof Shingles + Felt, Shingle	Various Non-Fibrous Homogeneous	5% Glass	95% Other	None Detected
35A / 23047441-070 Roof Shingles + Felt, Felt	Black Fibrous Homogeneous	90% Synthetic	10% Other	None Detected
35B / 23047441-071 Roof Shingles + Felt, Shingle	Various Non-Fibrous Homogeneous	5% Glass	95% Other	None Detected
35B / 23047441-071 Roof Shingles + Felt, Felt	Black Fibrous Homogeneous	90% Synthetic	10% Other	None Detected

Analyst: Renaldo A. Drakes
Analysis Date: 9/5/2023

Approved Signatory: Sandra Robins
Date: 9/5/2023

Disclaimer

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NYELAP Disclaimer:
Polarized- light microscopy is not consistently reliable in detecting asbestos in floor covering and similar non-friable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.

Asbestos Accreditations
National Voluntary Laboratory Accreditation Program (NVLAP) Lab Code 200870-0
City of Philadelphia Department of Public Health Air Management Services, Certification#ALL-460
Commonwealth of Pennsylvania Department of Environmental Protection Number 68-05397
California State Environmental Laboratory Accreditation Program Certificate Number 2915
Colorado Department of Public Health and Environment Registration Number AL-23143
Connecticut Department of Public Health Environmental Laboratory Registration Number PH-0105
Massachusetts Department of Labor Standards Asbestos Analytical Services License Number: AA000222
State of Maine Department of Environmental Protection License Number: LB-0075, LA-0084
New York State Department of Health Laboratory ID: 11983
State of Rhode Island Department of Health Certification No.: PCM00126, PLM00126, TEM00126
Texas Department of State Health Services License Number: 300440
Commonwealth of Virginia Department of Professional and Occupational Regulation Number: 3333000323
State of Washington Department of Ecology Laboratory ID: C989
State of West Virginia Bureau for Public Health Analytical Laboratory Number: LT000616
Vermont Department of Health License Number: Asb-Co-An-000006
Louisiana Department of Environmental Quality AI Number 212253, Certificate #05088

SanAir Technologies Laboratory

1551 Oakbridge Dr. STE B
Powhatan, VA 23139
804.897.1177 / 888.895.1177
Fax 804.897.0070
sanair.com

Asbestos Chain of Custody

Form 140, Rev 2, 5/18/18

SanAir ID Number: 23047441

Company: S+ME	Project #: 23830110	Collect by: Vince Epps
Address: Rd 2 E. Crescentville Rd.	Project Name: UK - Kelley Hall	Phone #: 513-591-8375
City, St., Zip: Cinci, OH 45246	Date Collected: 8/25/2023	Fax #: —
State of Collection: KY Account#:	P.O. Number: 23830110	Email: vepps@sme.incom

Bulk

ABB	PLM EPA 600/R-93/116	X
	Positive Stop	
ABEPA	PLM EPA 400 Point Count	
ABB1K	PLM EPA 1000 Point Count	
ABBEN	PLM EPA NOB**	
ABBCH	TEM Chatfield**	
ABBTM	TEM EPA NOB**	
ABQ	PLM Qualitative	

** Available on 24-hr. to 5-day TAT

Air

ABA	PCM NIOSH 7400	
ABA-2	OSHA w/ TWA*	
ABTEM	TEM AHERA	
ABATN	TEM NIOSH 7402	
ABT2	TEM Level II	
Other:		

New York ELAP

ABEPA2	NY ELAP 198.1	
ABENY	NY ELAP 198.6 PLM NOB	
ABBNY	NY ELAP 198.4 TEM NOB	

Soil

ABSE	PLM EPA 600/R-93/116 (Qual.)	

Vermiculite & Soil

ABSP	PLM CARB 435 (LOD <1%)	
ABSP1	PLM CARB 435 (LOD 0.25%)	
ABSP2	PLM CARB 435 (LOD 0.1%)	

Dust

ABWA	TEM Wipe ASTM D-6480	
ABDMV	TEM Microvac ASTM D-5755	

Water

ABHE	EPA 100.2	

Matrix	Other

Turn Around Times	3 HR (4 HR TEM)	6 HR (8HR TEM)	12 HR	24 HR
	2 Days	3 Days	4 Days	X 5 Days

Special Instructions

Sample #	Sample Identification/Location	Volume or Area	Sample Date	Flow Rate*	Start – Stop Time*
1 A-B	Yellow carpet glue	—	8/25/23		
2 A-B	Cove base w/ black adh.	—			
3 A-B	Ceiling tile	—			
4 A-G	Plaster	—			
5 A-B	Duct sealant	—			
6 A-B	DW/JC/Tape	—			
7 A-B	Ceiling tile	—			
8 A-B	Pipe wrap	—			
9 A-B	Floor tile w/ yellow mastic	—			
10 A-B	Terrazzo	—			
11 A-B	Floor tile w/ yellow mastic	—			
12 A-B	Floor tile w/ yellow mastic	—	↓		

Relinquished by	Date	Time	Received by	Date	Time
[signature]	8/28/23	1330	RMB	AUG 28 2023	2:00pm
RMB	AUG 29 2023	1:10pm	SA	8/30/23	10:35am

If no technician is provided, then the primary contact for your account will be selected. Unless scheduled, the turnaround time for all samples received after 3 pm EST will be logged in the next business day. Weekend or holiday work must be scheduled ahead of time and is charged at 150% of the 3hr TAT or a minimum charge of $150. A courier charge will be applied for same day and one-day turnaround times for offsite work. SanAir covers Standard Overnight FedEx shipping. Shipments billed to SanAir with a faster shipping rate will result in additional charges.

2307441

Form 140, Revision 1, 1/20/2017

Sample #	Sample Identification/Location	Volume or Area	Sample Date	Flow Rate*	Start – Stop Time*	
13 A-B	Cove base w/ wht. + yellow adh.	–	8/25/23			
14 A-B	Floor tile w/ brown mastic	–				
15 A-B	Black floor tile w/ yellow mastic	–				
16 A-B	Rubber tile w/ yellow mastic	–				
17 A-B	white caulk	–				
19 A-B	Duct/JC/Tape	–				
20 A-B	Vinyl plank flooring w/ gray adh.	–				
21 A-B	Window glazing	–				
22 A-B	Silver caulk	–				
23 A-B	Flat roof layers	–				
24 A-B	Gray caulk	–				
25 A-B	Black roof sealant	–				
26 A-B	Window glazing	–				
27 A-B	Silver roof flashing	–				
28 A-B	HVAC duct wrap	–				
29 A-B	Floor tile w/ clear mastic	–				
30 A-B	Floor tile w/ yellow mastic	–				
31 A-B	White caulk	–				
32 A-B	White caulk	–				
33 A-B	Pipe insulation	–	↓			
~~34 A-B~~						
35 A-B	Roof shingles + felt	–	8/28/23			

Special Instructions	Samples 18 A-B not submitted, Samples 34 A-B not submitted

Relinquished by	Date	Time	Received by	Date	Time
	8/28/23	13:30	RMB	AUG 28 2023	2:00pm
RMB	AUG 29 2023	1:10pm	EA	8/30/23	10:35am

If no technician is provided, then the primary contact for your account will be selected. Unless scheduled, the turnaround time for all samples received after 3 pm EST will be logged in the next business day. Weekend or holiday work must be scheduled ahead of time and is charged at 150% of the 3hr TAT or a minimum charge of $150. A courier charge will be applied for same day and one-day turnaround times for offsite work. SanAir covers Standard Overnight FedEx shipping. Shipments billed to SanAir with a faster shipping rate will result in additional charges.

Appendix VI – PCB Analytical Laboratory Report

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

September 06, 2023

Vince Epps
S&ME, Inc.
862 East Crescentville Rd
Cincinnati, OH 45246

RE: Project: 23830109 MI King Library KH
Pace Project No.: 50352688

Dear Vince Epps:

Enclosed are the analytical results for sample(s) received by the laboratory on August 29, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Indianapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Regina Bedel
regina.bedel@pacelabs.com
(317)228-3100
Project Manager

Enclosures

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

CERTIFICATIONS

Project: 23830109 MI King Library KH
Pace Project No.: 50352688

Pace Analytical Services Indianapolis
7726 Moller Road, Indianapolis, IN 46268
Illinois Accreditation #: 200074
Indiana Drinking Water Laboratory #: C-49-06
Kansas/TNI Certification #: E-10177
Kentucky UST Agency Interest #: 80226
Kentucky WW Laboratory ID #: 98019
Michigan Drinking Water Laboratory #9050
Ohio VAP Certified Laboratory #: CL0065
Oklahoma Laboratory #: 9204
Texas Certification #: T104704355
Wisconsin Laboratory #: 999788130
USDA Foreign Soil Permit #: 525-23-13-23119
USDA Compliance Agreement #: IN-SL-22-001

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

SAMPLE SUMMARY

Project: 23830109 MI King Library KH
Pace Project No.: 50352688

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50352688001	**KH-22**	Solid	08/25/23 11:30	08/29/23 09:30
50352688002	**KH-24**	Solid	08/25/23 11:35	08/29/23 09:30
50352688003	**KH-31**	Solid	08/25/23 11:45	08/29/23 09:30
50352688004	**KH-32**	Solid	08/25/23 11:50	08/29/23 09:30
50352688005	**KH-17**	Solid	08/25/23 12:30	08/29/23 09:30

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(317)228-3100

SAMPLE ANALYTE COUNT

Project: 23830109 MI King Library KH
Pace Project No.: 50352688

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50352688001	**KH-22**	EPA 8082	AM	8	PASI-I
50352688002	**KH-24**	EPA 8082	AM	8	PASI-I
50352688003	**KH-31**	EPA 8082	AM	8	PASI-I
50352688004	**KH-32**	EPA 8082	AM	8	PASI-I
50352688005	**KH-17**	EPA 8082	AM	8	PASI-I

PASI-I = Pace Analytical Services - Indianapolis

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Indianapolis, IN 46268
(317)228-3100

SUMMARY OF DETECTION

Project: 23830109 MI King Library KH
Pace Project No.: 50352688

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50352688001	**KH-22**					
EPA 8082	PCB-1260 (Aroclor 1260)	8.2	mg/kg	2.7	09/06/23 10:15	
50352688005	**KH-17**					
EPA 8082	PCB-1254 (Aroclor 1254)	4.2	mg/kg	1.1	09/01/23 04:08	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: 23830109 MI King Library KH
Pace Project No.: 50352688

Sample: KH-22 **Lab ID: 50352688001** Collected: 08/25/23 11:30 Received: 08/29/23 09:30 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082 PCB Solids	Analytical Method: EPA 8082 Preparation Method: EPA 3546 Pace Analytical Services - Indianapolis							
PCB-1016 (Aroclor 1016)	ND	mg/kg	2.7	2	08/30/23 16:34	09/06/23 10:15	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	mg/kg	2.7	2	08/30/23 16:34	09/06/23 10:15	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	mg/kg	2.7	2	08/30/23 16:34	09/06/23 10:15	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	mg/kg	2.7	2	08/30/23 16:34	09/06/23 10:15	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	mg/kg	2.7	2	08/30/23 16:34	09/06/23 10:15	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	mg/kg	2.7	2	08/30/23 16:34	09/06/23 10:15	11097-69-1	
PCB-1260 (Aroclor 1260)	**8.2**	mg/kg	2.7	2	08/30/23 16:34	09/06/23 10:15	11096-82-5	
Surrogates								
Tetrachloro-m-xylene (S)	97	%.	10-133	2	08/30/23 16:34	09/06/23 10:15	877-09-8	

REPORT OF LABORATORY ANALYSIS

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7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: 23830109 MI King Library KH
Pace Project No.: 50352688

Sample: KH-24 **Lab ID: 50352688002** Collected: 08/25/23 11:35 Received: 08/29/23 09:30 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082 PCB Solids	Analytical Method: EPA 8082 Preparation Method: EPA 3546 Pace Analytical Services - Indianapolis							
PCB-1016 (Aroclor 1016)	ND	mg/kg	0.94	1	08/30/23 16:34	09/06/23 10:19	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	mg/kg	0.94	1	08/30/23 16:34	09/06/23 10:19	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	mg/kg	0.94	1	08/30/23 16:34	09/06/23 10:19	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	mg/kg	0.94	1	08/30/23 16:34	09/06/23 10:19	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	mg/kg	0.94	1	08/30/23 16:34	09/06/23 10:19	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	mg/kg	0.94	1	08/30/23 16:34	09/06/23 10:19	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	mg/kg	0.94	1	08/30/23 16:34	09/06/23 10:19	11096-82-5	
Surrogates								
Tetrachloro-m-xylene (S)	51	%.	10-133	1	08/30/23 16:34	09/06/23 10:19	877-09-8	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: 23830109 MI King Library KH
Pace Project No.: 50352688

Sample: KH-31 **Lab ID: 50352688003** Collected: 08/25/23 11:45 Received: 08/29/23 09:30 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082 PCB Solids	Analytical Method: EPA 8082 Preparation Method: EPA 3546 Pace Analytical Services - Indianapolis							
PCB-1016 (Aroclor 1016)	ND	mg/kg	1.2	1	08/30/23 16:34	09/06/23 10:24	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	mg/kg	1.2	1	08/30/23 16:34	09/06/23 10:24	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	mg/kg	1.2	1	08/30/23 16:34	09/06/23 10:24	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	mg/kg	1.2	1	08/30/23 16:34	09/06/23 10:24	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	mg/kg	1.2	1	08/30/23 16:34	09/06/23 10:24	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	mg/kg	1.2	1	08/30/23 16:34	09/06/23 10:24	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	mg/kg	1.2	1	08/30/23 16:34	09/06/23 10:24	11096-82-5	
Surrogates								
Tetrachloro-m-xylene (S)	50	%.	10-133	1	08/30/23 16:34	09/06/23 10:24	877-09-8	

REPORT OF LABORATORY ANALYSIS

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Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: 23830109 MI King Library KH
Pace Project No.: 50352688

Sample: KH-32 **Lab ID: 50352688004** Collected: 08/25/23 11:50 Received: 08/29/23 09:30 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082 PCB Solids	Analytical Method: EPA 8082 Preparation Method: EPA 3546 Pace Analytical Services - Indianapolis							
PCB-1016 (Aroclor 1016)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 03:53	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 03:53	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 03:53	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 03:53	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 03:53	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 03:53	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 03:53	11096-82-5	
Surrogates								
Tetrachloro-m-xylene (S)	94	%.	10-133	1	08/30/23 16:34	09/01/23 03:53	877-09-8	

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ANALYTICAL RESULTS

Project: 23830109 MI King Library KH
Pace Project No.: 50352688

Sample: KH-17 **Lab ID: 50352688005** Collected: 08/25/23 12:30 Received: 08/29/23 09:30 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082 PCB Solids	Analytical Method: EPA 8082 Preparation Method: EPA 3546 Pace Analytical Services - Indianapolis							
PCB-1016 (Aroclor 1016)	ND	mg/kg	1.1	1	08/30/23 16:34	09/01/23 04:08	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	mg/kg	1.1	1	08/30/23 16:34	09/01/23 04:08	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	mg/kg	1.1	1	08/30/23 16:34	09/01/23 04:08	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	mg/kg	1.1	1	08/30/23 16:34	09/01/23 04:08	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	mg/kg	1.1	1	08/30/23 16:34	09/01/23 04:08	12672-29-6	
PCB-1254 (Aroclor 1254)	**4.2**	mg/kg	1.1	1	08/30/23 16:34	09/01/23 04:08	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	mg/kg	1.1	1	08/30/23 16:34	09/01/23 04:08	11096-82-5	
Surrogates								
Tetrachloro-m-xylene (S)	53	%.	10-133	1	08/30/23 16:34	09/01/23 04:08	877-09-8	

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QUALITY CONTROL DATA

Project: 23830109 MI King Library KH
Pace Project No.: 50352688

QC Batch: 750693
QC Batch Method: EPA 3546
Analysis Method: EPA 8082
Analysis Description: 8082 PCB Solids
Laboratory: Pace Analytical Services - Indianapolis
Associated Lab Samples: 50352688001, 50352688002, 50352688003, 50352688004, 50352688005

METHOD BLANK: 3440409 Matrix: Solid
Associated Lab Samples: 50352688001, 50352688002, 50352688003, 50352688004, 50352688005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	mg/kg	ND	0.10	08/31/23 11:43	
PCB-1221 (Aroclor 1221)	mg/kg	ND	0.10	08/31/23 11:43	
PCB-1232 (Aroclor 1232)	mg/kg	ND	0.10	08/31/23 11:43	
PCB-1242 (Aroclor 1242)	mg/kg	ND	0.10	08/31/23 11:43	
PCB-1248 (Aroclor 1248)	mg/kg	ND	0.10	08/31/23 11:43	
PCB-1254 (Aroclor 1254)	mg/kg	ND	0.10	08/31/23 11:43	
PCB-1260 (Aroclor 1260)	mg/kg	ND	0.10	08/31/23 11:43	
Tetrachloro-m-xylene (S)	%.	89	10-133	08/31/23 11:43	

LABORATORY CONTROL SAMPLE: 3440410

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	mg/kg	0.33	0.35	104	50-120	
PCB-1260 (Aroclor 1260)	mg/kg	0.33	0.33	99	40-122	
Tetrachloro-m-xylene (S)	%.			96	10-133	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3440411 3440412

Parameter	Units	50351723012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
PCB-1016 (Aroclor 1016)	mg/kg	ND	1.1	0.97	1.0	1.0	95	105	10-154	1	20	
PCB-1260 (Aroclor 1260)	mg/kg	ND	1.1	0.97	0.99	0.96	92	99	10-165	4	20	
Tetrachloro-m-xylene (S)	%.						92	95	10-133			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 23830109 MI King Library KH
Pace Project No.: 50352688

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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(317)228-3100

METHOD CROSS REFERENCE TABLE

Project: 23830109 MI King Library KH
Pace Project No.: 50352688

Parameter	Matrix	Analytical Method	Preparation Method
8082 PCB Solids	Solid	SW-846 8082A	SW-846 3546

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 23830109 MI King Library KH
Pace Project No.: 50352688

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50352688001	**KH-22**	EPA 3546	750693	EPA 8082	750828
50352688002	**KH-24**	EPA 3546	750693	EPA 8082	750828
50352688003	**KH-31**	EPA 3546	750693	EPA 8082	750828
50352688004	**KH-32**	EPA 3546	750693	EPA 8082	750828
50352688005	**KH-17**	EPA 3546	750693	EPA 8082	750828

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Pace® Location Requested (City/State):
Pace Analytical Indianapolis
7726 Moller Road, Indianapolis, IN 46268

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

WO# : 50352688

50352688

Company Name:	S&ME, Inc.-OH	Contact/Report To:	Epps, Vince
Street Address:	862 East Crescentville Rd, Cincinnati, OH 45246	Phone #:	513-771-8471
		E-Mail:	vepps@smeinc.com
		Cc E-Mail:	
Customer Project #:	~~23~~ 23830109	Invoice To:	
Project Name:	PCB Caulk-MI King Library, Kelly Medical Annex #5	Invoice E-Mail:	
Site Collection Info/Facility ID (as applicable):	Kelley Hall	Purchase Order # (if applicable):	
		Quote #:	
Time Zone Collected: [ ] AK [ ] PT [ ] MT [ ] CT ~~[ ] ET~~		County / State origin of sample(s):	Kentucky

Data Deliverables:
[ ] Level II [ ] Level III [ ] Level IV
[ ] EQUIS
[ ] Other_____

Regulatory Program (DW, RCRA, etc.) as applicable:

Rush (Pre-approval required):
[ ] 2 Day [ ] 3 day [ ] 5 day [ ] Other_____
Date Results Requested:

DW PWSID # or WW Permit # as applicable:
Field Filtered (if applicable): [ ] Yes [ ] No
Analysis:

Specify Container Size **
Identify Container Preservative Type***
Analysis Requested

**Container Size: (1) 1L, (2) 500mL, (3) 250mL, (4) 125mL, (5) 100mL, (6) 40mL vial, (7) EnCore, (8) TerraCore, (9) Other

*** Preservative Types: (1) None, (2) HNO3, (3) H2SO4, (4) HCl, (5) NaOH, (6) Zn Acetate, (7) NaHSO4, (8) Sod. Thiosulfate, (9) Ascorbic Acid, (10) MeOH, (11) Other

Lab Use Only
Proj. Mgr: **Regina Bedel**
AcctNum / Client ID:
Table #:
Profile / Template: **9257-22**
Prelog / Bottle Ord. ID: **1137855**

Preservation non-conformance identified for sample.

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Waste Water (WW), Product (P), Soil/Solid (SS), Oil (OL), Wipe (WP), Tissue (TS), Bioassay (B), Vapor (V), Other (OT), Surface Water (SW), Sediment (SED), Sludge (SL), Caulk

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res. Cl2	Number & Type of Containers Plastic	Number & Type of Containers Glass	PCB by 8082	Sample Comment
KH-22		G	8/25/23	1130					X	X	001
KH-24		G	8/25/23	1135					X	X	002
KH-31		G	8/25/23	1145					X	X	003
KH-32		G	8/25/23	1150					X	X	004
KH-17		G	8/25/23	1230					X	X	005

Customer Remarks / Special Conditions / Possible Hazards:

Collected By: Vince Epps
Printed Name:
Signature:

Additional Instructions from Pace®:

# Coolers:	Thermometer ID:	Correction Factor (°C):	Obs. Temp. (°C)	Corrected Temp. (°C)
1	H	0.0	20.2	20.2

	Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Tracking Number:
1	S&ME	8/28/23 1300	fedex	8/28/23 1300	
2	fedex	8/29/23 0930	CR	8/29/23 0930	Delivered by: [ ] In-Person [ ] Courier
3	Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	[✓] FedEX [ ] UPS [ ] Other
4	Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Page: of

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace® Terms and Conditions found at https://www.pacelabs.com/resource-library/resource/pace-terms-and-conditions/

Pace

SAMPLE CONDITION UPON RECEIPT FORM

Date/Time and Initials of person examining contents: 8/29/23 1046 CRE

1. **Courier:** ☑ FED EX ☐ UPS ☐ CLIENT ☐ PACE ☐ NOW/JETT ☐ OTHER _____

2. **Custody Seal on Cooler/Box Present:** ☑ Yes ☐ No

(If yes)Seals Intact: ☑ Yes ☐ No **(leave blank if no seals were present)**

3. **Thermometer:** 1 2 3 4 5 6 7 8 A B C D E F G H

4. **Cooler Temperature(s):** 20.2/20.2 | | | |
(Initial/Corrected) RECORD TEMPS OF ALL COOLERS RECEIVED (use Comments below to add more)

5. **Packing Material:** ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other _____

6. **Ice Type:** ☐ Wet ☐ Blue ☑ None

7. **If temp. is over 6°C or under 0°C, was the PM notified?:** ☑ Yes ☐ No
Cooler temp should be above freezing to 6°C

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
USDA Regulated Soils? (HI, ID, NY, WA, OR,CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		—	All containers needing acid/base preservation have been pH CHECKED?: **Exceptions: VOA, coliform, LLHg, O&G, RAD CHEM, and any container with a septum cap or preserved with HCl.** **Circle:** **HNO3 (<2) H2SO4 (<2) NaOH (>10) NaOH/ZnAc (>9)** Any non-conformance to pH recommendations will be noted on the container count form			
Short Hold Time Analysis (48 hours or less)? Analysis:		—				—
Time 5035A TC placed in Freezer or Short Holds To Lab	Time:			Present	Absent	N/A —
Rush TAT Requested (4 days or less):		—	Residual Chlorine Check (SVOC 625 Pest/PCB 608)			
Custody Signatures Present?	—		Residual Chlorine Check (Total/Amenable/Free Cyanide)			—
Containers Intact?:	—		Headspace Wisconsin Sulfide?			—
Sample Label (IDs/Dates/Times) Match COC?: Except TCs, which only require sample ID	—		Headspace in VOA Vials (>6mm): See Containter Count form for details	Present	Absent	No VOA Vials Sent —
Extra labels on Terracore Vials? (soils only)			Trip Blank Present?		—	
			Trip Blank Custody Seals?:			—

COMMENTS:

COC PAGE ____ of ____

Sample Container Count

** Place a RED dot on containers that are out of conformance **

									AMBER GLASS							PLASTIC									OTHER						
			MeOH (only)																											
			SBS		VOA VIAL HS >6mm																									
			DI	DG9H VG9H		VG9U DG9U	VG9T		AG1H	AG1U	AG3U	AG3S	AG3SF	AG3B	BP1U	BP1N	BP2U	BP3U	BP3N	BP3F	BP3S	BP3B	BP3Z	CG3H	CG3F	Syringe Kit				
COC Line Item	WGFU	WGKU BG1U	R					AG0U																			Matrix			
1	I																										SL			
2	I																										SL			
3	I																										SL			
4	I																										SL			
5	I																										SL			
6																														
7																														
8																														
9																														
10																														
11																														
12																														

Nitric	Sulfuric	Sodium Hydroxide	Sodium Hydroxide/ ZnAc
Red	Yellow	Green	Black
HNO3 <2	H2SO4 <2	NaOH >10	NaOH/Zn Ac >9

Container Codes

Glass

DG9H	40mL HCl amber voa vial	BG1T	glass
DG9P	40mL TSP amber vial	BG1U	1L unpreserved glass
DG9S	40mL H2SO4 amber vial	CG3U	250mL Unpres Clear Glass
DG9T	40mL Na Thio amber vial	AG0U	100mL unpres amber glass
DG9U	40mL unpreserved amber vial	AG1H	1L HCl amber glass
VG9H	40mL HCl clear vial	AG1S	1L H2SO4 amber glass
VG9T	40mL Na Thio. clear vial	AG1T	1L Na Thiosulfate amber glass
VG9U	40mL unpreserved clear vial	AG1U	1liter unpres amber glass
I	40mL w/hexane wipe vial	AG2N	500mL HNO3 amber glass
WGKU	8oz unpreserved clear jar	AG2S	500mL H2SO4 amber glass
WGFU	4oz clear soil jar	AG2U	500mL unpres amber glass
JGFU	4oz unpreserved amber wide	AG3S	250mL H2SO4 amber glass
CG3H	250mL clear glass HCl	AG3SF	250mL H2SO4 amb glass -field filtered
CG3F	250mL clear glass HCl, Field Filter	AG3U	250mL unpres amber glass
BG1H	1L HCl clear glass	AG3B	250mL NaOH amber glass
BG1S	1L H2SO4 clear glass		

Plastic

BP1B	1L NaOH plastic	BP4U	125mL unpreserved plastic
BP1N	1L HNO3 plastic	BP4N	125mL HNO3 plastic
BP1S	1L H2SO4 plastic	BP4S	125mL H2SO4 plastic
BP1U	1L unpreserved plastic		
BP1Z	1L NaOH, Zn, Ac		
BP2N	500mL HNO3 plastic		
BP2C	500mL NaOH plastic		
BP2S	500mL H2SO4 plastic		
BP2U	500mL unpreserved plastic		
BP2Z	500mL NaOH, Zn Ac		
BP3B	250mL NaOH plastic		
BP3N	250mL HNO3 plastic		
BP3F	250mL HNO3 plastic-field filtered		
BP3U	250mL unpreserved plastic		
BP3S	250mL H2SO4 plastic		
BP3Z	250mL NaOH, ZnAc plastic		
BP3R	250mL Unpres FF SO4/OH buffer		

Miscellaneous

Syringe Kit	LL Cr+6 sampling kit
ZPLC	Ziploc Bag
R	Terracore Kit
SP5T	120mL Coliform Sodium Thiosulfate
GN	General Container
U	Summa Can (air sample)
WT	Water
SL	Solid
OL:	Oil
NAL	Non-aqueous liquid
WP	Wipe

October 16, 2023

University of Kentucky
Environmental Quality Management
355 Cooper Drive, Suite
Lexington, Kentucky 40508

Attention: Mr. Bob Kjelland, P.G., CHMM

Reference: **Report of Limited Hazardous Materials Assessment**
University of Kentucky – Medical Annex #5
Lexington, Kentucky
S&ME Project No. 23830110

Dear Mr. Bob Kjelland:

S&ME, Inc. (S&ME) is pleased to provide this report detailing the results of our limited hazardous materials survey services at the referenced site. The purpose was to perform a limited assessment for the presence of polychlorinated biphenyls (PCBs) in caulk, asbestos in caulk, and universal wastes prior to the demolition of the Medical Annex on the University of Kentucky campus in Lexington, Kentucky. Our services were performed in general accordance with S&ME *Proposal No. 23-83-0110* dated June 21, 2023, and authorized under the Per Diem Agreement for Civil-Structural-Geotechnical Engineering Services Contract No. A231030 dated July 1, 2022, between the University of Kentucky and S&ME. The following report includes the project background, sampling and analysis procedures, findings, results, and conclusions.

This report is provided for the sole use of Mr. Bob Kjelland and the University of Kentucky. Use of this report by any other parties will be at such party's sole risk and S&ME disclaims liability for any such use or reliance by third parties. The results presented in this report are indicative of conditions only during the time of the assessment and of the specific areas referenced.

S&ME appreciates this opportunity to provide our services to you. Please contact us if you have questions concerning this report or any of our services.

Sincerely,
S&ME, Inc.

Vincent J. Epps, RG
Operations Manager

Thomas M. Reed, PG
Project Manager

Senior Reviewed by: R. Bruce

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Appendix VI – PCB Analytical Laboratory Report

Executive Summary

S&ME, Inc. (S&ME) conducted a limited hazardous materials assessment for Medical Annex #5 on the University of Kentucky campus in Lexington, Kentucky. The limited hazardous materials assessments included a supplemental survey of asbestos-containing materials (ACM), regulated materials and universal waste inventories, and polychlorinated biphenyl-containing caulk (PCB) assessment. The purpose of the assessment was to identify hazardous materials that may require removal prior to implementation of proposed demolition activities at Medical Annex #5. A summary of the results of the limited hazardous materials assessment is provided below.

Asbestos-containing Materials

Asbestos was detected greater than one percent in samples of the following materials:

- Pipe wrap on piping above the ceiling in Room 105;
- Mudded elbows on piping system above the ceiling in Room 105;
- Brown and tan floor tile with black mastic in Room 103;
- Transite panels in Room 300B (attic);
- Yellow flooring in Room 205;
- Roofing tar on flat roof (1st layer above roof deck);
- Plaster throughout the building; and
- Window putty on the exterior windows of the original part of the building.

Other Regulated Materials and Universal Wastes

- Polychlorinated biphenyls (PCBs): Approximately 105 fluorescent light ballasts (FLBs) were observed in this building.
- Chlorofluorocarbons (CFCs): Approximately 14 items that potentially contain CFCs were observed in the building.
- Universal Wastes: Various quantities of battery-containing equipment, air conditioning units, fluorescent bulbs, and miscellaneous cleaning/household style chemicals were present in the building. Tritium-containing exit signs or pesticides were not observed.

Polychlorinated Biphenyls (PCB)-Containing Caulk

- The PCB-caulk samples submitted for chemical analysis did not reveal the presence of PCBs above the Toxic Substances Contral Act (TSCA) action level of 50 milligrams per kilogram (mg/kg).

1.0 Introduction

The University of Kentucky (UK) retained S&ME, Inc. (S&ME) to conduct a limited hazardous materials assessment of suspect asbestos-containing materials (ACMs), polychlorinated biphenyl (PCB) containing materials, and universal wastes on the UK campus in Lexington, Kentucky. Mr. Vincent Epps of S&ME performed the assessment on August 24, 2023 in general accordance with S&ME Proposal No. 23830110 dated June 21, 2023.

2.0 Purpose and Site Description

2.1 Purpose

The purpose of the assessment was to identify the presence of PCBs, ACMs in building materials, and universal wastes prior to the demolition of the building. The assessment included the interior and exterior portions of the structure. An assessment strategy believed by S&ME to be appropriate for this purpose was presented in our proposal and is described in this report. The report should be interpreted only with regard to the specific location and materials referenced.

2.2 Site Description

The Medical Annex #5 is located at 1096 Veterans Drive and is an approximately 4,000 square-foot classroom and learning center. This building is two stories with a basement and attic. According to the provided information, the building is scheduled for demolition. It is understood that this project is to include the assessment of potential ACMs, PCB-containing caulk, and regulated and universal waste. A site location map is included as **Figure 1** in **Appendix I**.

3.0 Supplemental Asbestos-containing Materials Sampling

3.1 Scope of Services

Demolition and renovation in public and commercial buildings is regulated by the Occupational Safety and Health Administration (OSHA), the United States Environmental Protection Agency (EPA) and the Kentucky Department for Environmental Protection (KDEP). The EPA and KDEP require asbestos assessments, conducted by licensed and accredited individuals, prior to implementation of renovation and demolition projects. Code 40 of Federal Regulations Part 61, Subpart M, Final Rule, National Emissions Standards for Hazardous Air Pollutants (NESHAP) and KDEP require asbestos assessments, followed by the proper removal, and disposal of ACM that is affected by demolition. Identification of ACM is also required by the OSHA 1926.1101. The identification of ACMs will aid in the prevention of occupational exposures and/or environmental releases of airborne asbestos. The EPA, OSHA and KDEP define ACM as materials containing greater than one percent asbestos in a representative sample. However, OSHA also regulates materials containing less than or equal to one percent asbestos.

S&ME performed a visual assessment of the referenced building to determine the homogenous areas (HAs) of suspect ACMs. Based on EPA definitions used in the Asbestos Hazard Emergency Response Act (AHERA), 40 CFR

763, an HA of asbestos-suspect building material has the same color and texture and is thought to be installed within the same timeframe. S&ME assessed the interior and exterior of the building (except for the roof) for suspect ACMs, including thermal system insulation (TSI), surfacing, and miscellaneous materials. S&ME collected representative samples of suspect ACMs from each HA in accordance with the US EPA AHERA protocol and applicable state regulations.

This building was previously inspected by UK personnel. At the request of UK, the previously collected sample data is included in this report and summarized on the ACM Summary Table in **Appendix IV**.

S&ME provided KDEP-licensed, and an EPA-accredited, Asbestos Inspector to conduct the asbestos survey and sample collection of the referenced building. On August 24th 2023, Mr. Vincent Epps conducted the supplemental asbestos survey in the building. A copy of Mr. Epps' asbestos inspector credentials area included in **Appendix II**. Bulk materials collected included, but were not limited to plaster, ceiling tile, drywall and joint compound, floor tile, cove base, pipe/joint insulation, caulk, window glazing, and various mastics and adhesives. During the survey, representative photographs of the interior and exterior finishes of the building were collected. A selection of these photographs with descriptions is included in **Appendix III**.

3.2 Methods

The asbestos survey was performed to comply with the NESHAP regulations (40 CFR 61 (M)) issued by the US EPA as they pertain to requirements for an asbestos inspection prior to demolition projects. KDEP regulations are equivalent to the NESHAP regulations regarding pre-demolition asbestos inspection requirements.

Information regarding the bulk samples of each HA was collected, recorded on a chain-of-custody record, and submitted to the SanAir Technologies in Cincinnati, Ohio for analysis by Polarized Light Microscopy (PLM), coupled with dispersion staining in general accordance with the EPA 600/R-93/116 Method. SanAir Technologies is an accredited laboratory by the National Voluntary Laboratory Accreditation (NVLAP), which is administered by the National Institute of Standards and Technology (NIST). The laboratory analysis reports the specific type of asbestos mineral identified (if any) and the percentage present in each sample.

Wall finishes composed of drywall finished with joint compound observed only at drywall seams and fastener holes were sampled as a composite sample (samples include both the drywall and the joint compound). Current EPA interpretations allow that the components of these drywall systems may be considered as a single HA/material. Accordingly, the presence of greater than one percent asbestos in a composite sample analysis identifies the sample as ACM. If the composite sample analysis (both joint compound and drywall) is reported as "trace" or less than, or equal to one percent asbestos, the sample must be further analyzed using the Point Count Method or be considered to be ACM under US EPA and state regulations.

3.3 Results

Based on the results of the assessment, six building components were identified to contain asbestos at a concentration greater than one percent. **Table 3-1** below contains a summary of the identified materials.

Table 3-1 Identified ACM

Material Description	Material Location	Quantity	Category (F/I/II)	Type	Condition / Potential for Disturbance	Type and Percent Asbestos
Pipe Wrap	**Room 105 Above Drop Ceiling**	**120 LF**	**F**	**TSI**	**Good/High**	**70% CH**
Mudded Elbows	**Room 105 Above Drop Ceiling**	**9 Units**	**F**	**TSI**	**Good/High**	**50% CH**
Brown & Tan Floor Tile with Black Mastic	**Room 103 Under Carpet**	**200 SF**	**I**	**Misc.**	**Good/High**	**3% CH Tile 2% CH Mastic**
Flat Roofing (multiple layers)	**Flat Roof – First Layer Above Decking**	**2,500 SF**	**I**	**Misc.**	**Good/High**	**10% CH**
Transite	**Room 300B (Attic) East Wall**	**140 SF**	**II**	**Misc.**	**Good/High**	**10% Chrysotile**
Yellow Flooring with Tan Mastic*	**Room 205 Under Carpet**	**100 SF**	**I**	**Misc.**	**Good/High**	**5% CH Tile ND Mastic**
Plaster*	**Throughout Building**	**9,361**	**F**	**Surf.**	**Good/High**	**1.84% CH by TEM**
Window Putty*	**Exterior Windows Original Structure**	**14 Units**	**F**	**Misc.**	**Good/High**	**3% CH**

SF = Square feet LF = Linear feet F=Friable I=Category I, Non-Friable II=Category II, Non-Friable CH=Chrysotile Asbestos
Misc. = Miscellaneous TSI = Thermal System Insulation
*Samples collected by others during previous assessment activities.

The quantities of ACM provided in the report are for informational purposes only and should not be used for abatement contractor bidding purposes. Actual field measurements and quantity calculation should be performed by the prospective asbestos abatement contractor for bid purposes. If materials were assumed to contain asbestos and were not sampled, these materials must be treated as asbestos unless sampling indicates the materials are not ACM. Sample locations are depicted on **Figures 2-4 in Appendix III**. The summary of bulk asbestos results is provided in the Summary of Asbestos Sampling tables in **Appendix IV**. The laboratory report and chain-of-custody records are provided in **Appendix V**.

4.0 Other Regulated Materials and Universal Wastes

4.1 Regulated Waste

4.1.1 PCBs

Approximately 105 fluorescent light ballasts (FLBs) were observed to be present in the building. FLBs manufactured before July 1, 1979, may contain PCBs. FLBs manufactured between July 1, 1979, and July 1, 1998, that do not contain PCBs must be labeled "NO PCBs." If a FLB is *not* labeled "NO PCBs," it should be assumed to contains PCBs. FLBs manufactured after 1998 are not required to be labeled. If date of manufacture cannot be determined or verified on ballasts with no labeling indicating PCB content, they should be assumed to contain PCBs. S&ME did not observe "NO PCB" labels on the FLBs that were observed. For the purposes of this assessment, S&ME assumes all FLBs present on the building to contain PCBs.

PCB-containing fluid or oil has historically been used in various electrical components outside of FLBs, in switches, dampeners, and most commonly wet transformers either found on power poles or ground mounted on a concrete pad. We observed two pole-mounted transformers around the building. Labels indicating the presence of PCB fluids in the transformers were not observed; therefore, these transformers should be treated as potentially containing PCB fluid.

Along with PCB fluid/oil in electrical components, it has also been stated that PCBs have been found in older style door closers which are noted as being "kettle shaped." Five of these types of door closers were observed during this assessment.

4.2 Chlorofluorocarbons (CFCs)

Potential CFC-containing equipment may include drinking fountains, window or portable air conditioning units, refrigerators, freezers, and exterior condenser units. A summary of the items and approximate quantities is presented in **Table 4-2** below.

Table 4-2 – CFC Inventory Summary

Drinking Fountains	Refrigerators/Freezers	A/C Units	Exterior Condenser Units
0	1	13	0

4.3 Universal Wastes

The federal universal waste regulations are set forth in Part 273 Title 40 of the Code of Federal Regulations (40 C.F.R. 273). Materials regulated under this rule include batteries or battery-containing equipment (exit signs, smoke detectors, and emergency lights), cleaning/household chemicals, pesticides, mercury-containing equipment (thermostats and switches), and bulbs (lamps). Management and disposal of fluorescent light bulbs

are regulated under the Resource Conservation and Recovery Act (RCRA), the Universal Waste Rule (UWR), and Subtitle C Hazardous Waste regulations. A standard fluorescent bulb contains eight to 14 milligrams of mercury. Fluorescent light bulbs that are not marked with green aluminum end caps are generally considered to be regulated universal waste after their useful life. Fluorescent bulbs with green end caps contain less mercury than standard fluorescent bulbs and are also generally considered to be regulated universal waste after their useful life. A summary of the items and approximate quantities is presented in **Table 4-3** below.

Table 4-3 – Universal Waste Summary

Exit Signs/Emergency Lights	Smoke Detectors	Tritium-containing Exit Signs	Fluorescent Bulbs	Mercury-containing Equipment	Cleaning/ Household Chemicals	Pesticides
11	28	0	157	3	8	0

5.0 PCB-Containing Caulk

PCBs are a group of organic chemicals known as chlorinated hydrocarbons. These chemicals were manufactured between 1929 and 1979 and were used in a variety of building materials for their non-flammability, chemical stability, high boiling point, plasticizing, and electrical insulating properties. Specifically, PCBs in caulk may be present in buildings that were constructed or renovated during the 1950s through the 1970s. PCB caulk inspection and sampling methods are not regulated; however, the TSCA has established an action level of 50 mg/kg or 50 parts per million (ppm).

The PCB-containing caulk assessment included the interior and exterior of the building. A visual assessment and sampling strategy was developed and representative samples of each type of caulk identified during the visual assessment were collected. Each sample consisted of an approximately 10-gram (four-inch long) piece of caulk that was collected using a utility knife with a new blade for each sample. A total of three caulk samples were collected as part of this assessment. Each caulk sample was placed in a laboratory-provided two-ounce unpreserved glass jar with a Teflon-lined lid. The samples were shipped overnight to a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory under chain-of-custody.

The samples were analyzed for the presence of PCBs using United States Protection Agency (US EPA) Method 8082A. A copy of the laboratory analytical report is included in **Appendix VI** and a summary of results from the samples collected is provided in **Table 5-1** below. Please note that if multiple PCB compounds were identified in a sample, the total concentration of all identified PCB types in that sample is presented in the table below.

Table 5-1 – PCB Caulk Sampling Summary

Sample No.	Material Description and Location	Color	Result (mg/kg)	**Action** Level (mg/kg)
ANX-18	Window/Door Caulk (Room 102 Exterior)	White	ND	50
ANX-20	Expansion Joint Caulk (Room 105 Exterior)	Gray	ND	50
ANX-21	Building Addition Window Caulk (Room 107 Exterior)	Gray	ND	50

ND = Not Detected above laboratory detection limits

The PCB-caulk samples submitted for analysis did not reveal the presence of PCBs above the TSCA action level of 50 mg/kg.

6.0 Conclusions and Recommendations

6.1 Asbestos

ACM was identified in areas to be affected by the planned demolition. We recommend removal and disposal of the ACM by a KDEP-licensed and EPA-accredited asbestos abatement contractor, prior to activities that may disturb an ACM. State and federal regulations should be carefully considered in order to verify compliance before any actions are initiated that may disturb an ACM. If additional suspect ACMs not included in this report are discovered and will be disturbed by renovation activities, bulk samples must be collected by a KDEP-licensed and EPA-accredited asbestos inspector and analyzed for asbestos content, prior to disturbance of the suspect material(s).

Asbestos removal requires written notification to KDEP, specific removal procedures, proper transportation, and disposal per state and federal regulations. The identification and proper removal of ACM prior to demolition will aid in the prevention of occupational exposures and/or environmental releases of airborne asbestos. If ACMs are managed in place, OSHA requirements apply to employees that may contact or disturb ACMs, including maintenance and custodial workers.

Removal of Category I Non-friable ACM may not be required by state and federal regulations if the probability is low that it will be rendered friable during demolition. Likewise, removal of Category II Non-friable ACM may not be required if the probability is low that the material will become crumbled, pulverized, or reduced to powder during demolition. The demolition procedures must follow NESHAP and KDEP regulations and the debris contaminated with asbestos must be disposed of as regulated asbestos-containing waste.

While there are Category I and II Non-friable flooring and other materials found within the building, it is anticipated that contractors will not be able to remove these materials without rendering them friable, as they are multi-layered and/or attached to wooden or other porous substrates. Therefore, we recommend the removal of

all asbestos-containing Category I and II Non-friable materials as regulated materials, prior to demolition activities and that air monitoring and 3rd-party observation be conducted during removal activities. Additionally, due to the quantities of ACMs to be removed, a project design will need to be prepared and transmission electron microscopy (TEM) clearance will need to be conducted at the end of the abatement process.

Various areas of ACM flooring were covered with carpet. S&ME recommends that all carpeting and other surficial floor coverings be removed during the abatement phase to determine if additional asbestos-containing flooring or mastic exists in these areas prior to other trades performing work. If non-sampled suspect materials are discovered that are similar to the sampled materials in appearance, age, or use, they should be treated the same as the similarly sampled materials.

6.2 Other Regulated Materials and Universal Wastes

It is recommended that the other regulated materials and universal wastes identified in Section 5.0 of this report be removed by qualified waste disposal contractor and properly recycled or disposed prior to renovation activities that may impact them in accordance with the applicable EPA regulations regarding these materials.

6.3 PCB-Containing Caulk

The PCB-caulk samples submitted for analysis did not reveal the presence of PCBs above the TSCA action level of 50 mg/kg and do not require removal before demolition activities.

7.0 Limitations

This report is provided for the sole use Mr. Bob Kjelland and the University of Kentucky. Use of this report by any other parties will be at such party's sole risk, and S&ME disclaims liability for any such use or reliance by third parties. The results presented in this report are indicative of conditions only during the time of the sampling and of the specific areas referenced. Under no circumstances is this report to be used as a bidding document, or as a project design or specification.

S&ME performed the services in accordance with generally accepted practices of reputable environmental consultants undertaking similar studies at the same time and in the same geographical area. S&ME has endeavored to meet this standard of care. No other warranty, expressed or implied, is intended or made with respect to this report or S&ME's services. Users of this report should consider the scope and limitations related to these services when developing opinions as to risks associated with the site.

The findings of the limited hazardous materials survey are based largely on visual observations within the amount of time available. The findings do not warrant that all hazardous materials have been identified; hazardous materials could be present in areas not readily accessible to observation. In addition, the actual locations and quantities of materials determined to contain asbestos will vary from those herein. Apparent homogeneous sampling areas may vary in actual asbestos content due to previous renovations, maintenance, or related operations.

If additional suspect materials are found, our firm should be notified so that our findings can be reviewed for modification or verification.

7.1 Asbestos Survey Limitations

This report is not intended for use as an asbestos abatement specification. It is not within the scope of this project to describe all appropriate precautions, safeguards and regulations relating to asbestos. The possibility exists that suspect materials were undetected in inaccessible or concealed areas such as under carpeting or multiple flooring layers, and inside pipe chases or wall voids or were not observed during the assessment. If additional suspect materials are discovered during the planned renovation activities, bulk samples must be collected by a KDEP-licensed and EPA-accredited asbestos inspector and analyzed for asbestos content.

7.2 Other Regulated Materials and Universal Wastes

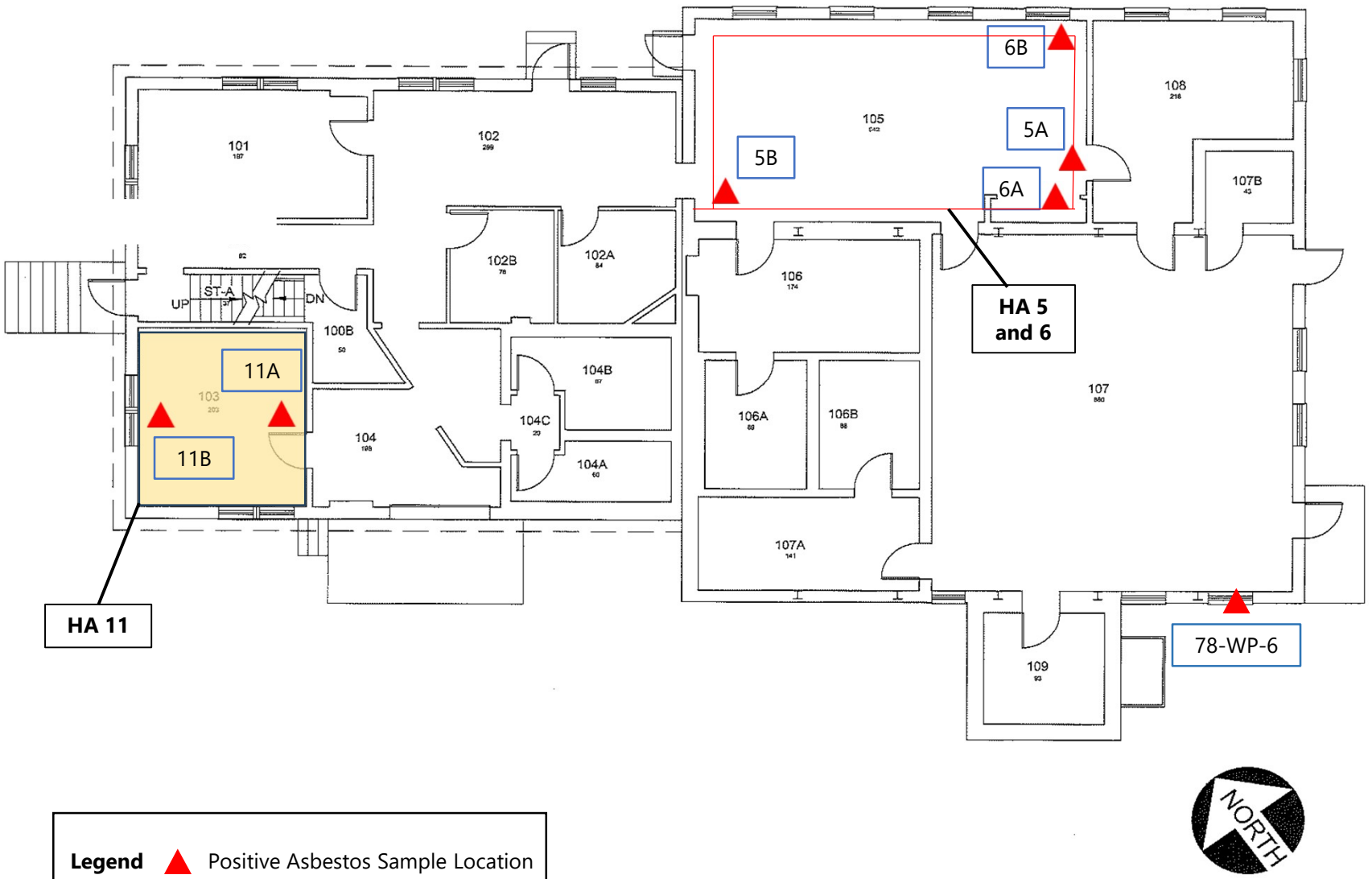
S&ME endeavored to identify hazardous materials or potentially hazardous wastes that should be removed prior to renovation or demolition and disposed of in accordance with state and federal regulations. Other hazardous materials or potentially hazardous waste may be present and identified during renovation or demolition. If additional hazardous materials or potentially hazardous wastes are identified, they should be disposed of in accordance with state and federal regulations pertaining to Universal Waste and hazardous waste.

Appendices

Appendix I – Figures

IMAGERY REFERENCE: ©2023 CNES/Airbus, Maxar Technologies, U.S. Geological Survey, ©Google
COORDINATE REFERENCE SYSTEM: EPSG:3089 - NAD83 / Kentucky Single Zone (ftUS)

	PROJECT LOCATION MAP	SCALE: Not to Scale ‘	FIGURE NO. 1
	Medical Annex #5 1096 Veterans Drive Lexington, Kentucky	DATE: 10-16-2023 PROJECT NUMBER: 23830110	



Legend ▲ Positive Asbestos Sample Location

10A Sample ID

University of Kentucky

BLDG #: 0078

MED CENTER ANNE #5

DRAWN BY: KS
DATE: 05-19-2008

REVISED BY: JCS
DATE: 06-05-2013

SHEET 2 OF 5

POSITIVE SAMPLE LOCATION MAP – FIRST FLOOR

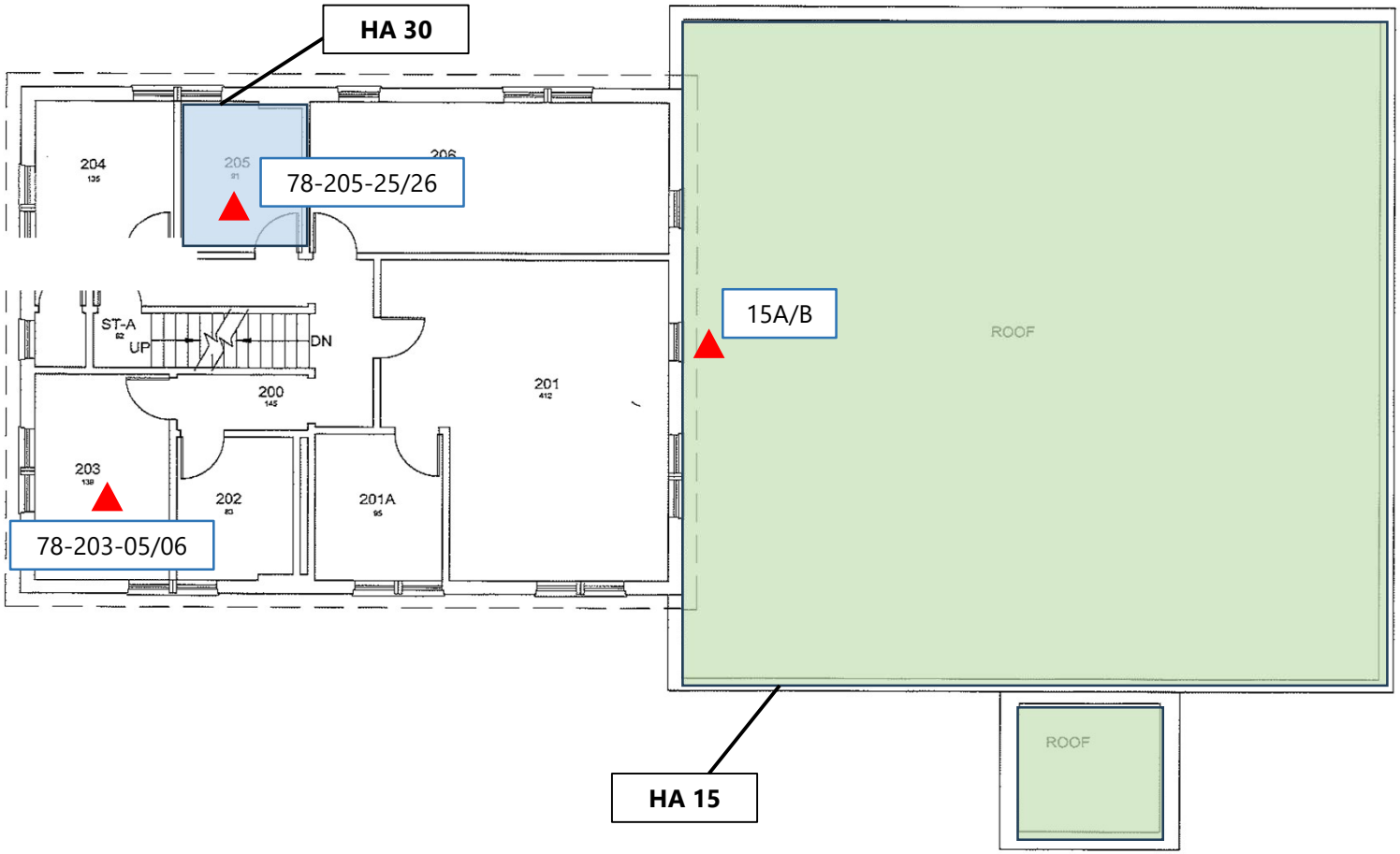
Medical Annex #5
1096 Veterans Drive
Lexington, Kentucky

SCALE: Not to Scale

DATE: 10-16-2023

PROJECT NUMBER: 23830110

FIGURE NO. 2



Legend

▲ Positive Asbestos Sample Location

10A Sample ID

University of Kentucky

BLDG #: 0078

MED CENTER ANNE #5

DRAWN BY: KS
DATE: 05-19-2008

REVISED BY: JCS
DATE: 06-05-2013

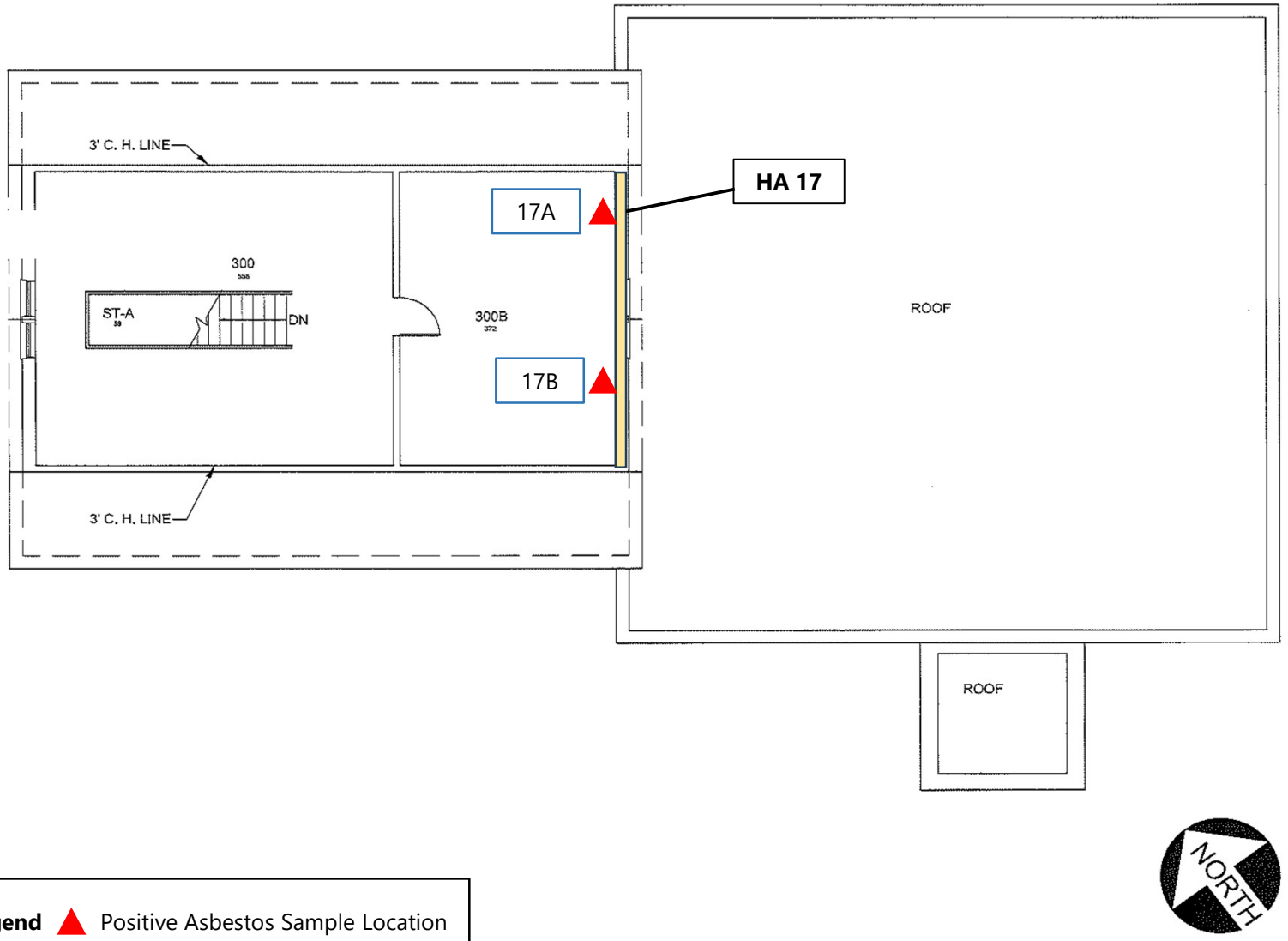
SHEET 3 OF 5

POSITIVE SAMPLE LOCATION MAP – SECOND FLOOR

Medical Annex #5
1096 Veterans Drive
Lexington, Kentucky

SCALE: Not to Scale
DATE: 10-16-2023
PROJECT NUMBER: 23830110

FIGURE NO. 3



Legend ▲ Positive Asbestos Sample Location

10A Sample ID

University of Kentucky

BLDG #: 0078

MED CENTER ANNE #5

DRAWN BY: KS
DATE: 05-19-2008

REVISED BY: JCS
DATE: 06-05-2013

SHEET 4 OF 5

POSITIVE SAMPLE LOCATION MAP – ATTIC

Medical Annex #5
1096 Veterans Drive
Lexington, Kentucky

SCALE: Not to Scale
DATE: 10-16-2023
PROJECT NUMBER: 23830110

FIGURE NO. 4

Appendix II – Asbestos Inspector Credentials

Andy Beshear
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
300 Sower Boulevard
Frankfort, Kentucky 40601
Phone: (502) 564-2150
Fax: 502-564-4245

Rebecca W. Goodman
SECRETARY

Anthony R. Hatton
COMMISSIONER

March 8, 2023

Vincent J Epps
862 E Crescentville Rd
Cincinnati, Ohio 45246

Asbestos Management Planner
AI Number: 155508
License Number: 63211
Expires: December 21, 2023

Dear Vincent J Epps:

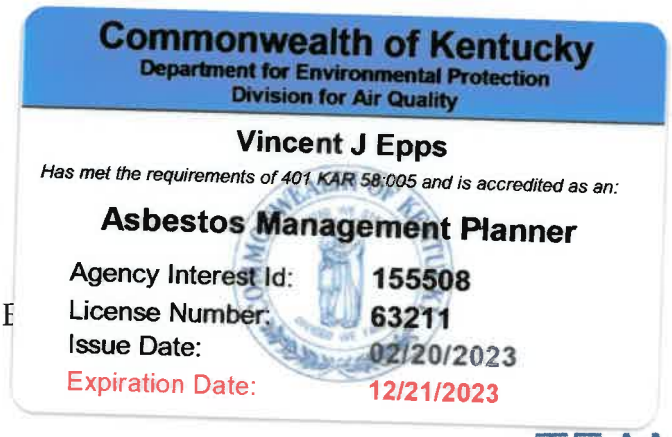
This is to acknowledge receipt of your application for accreditation as an asbestos abatement professional. Your application has been approved and the above-referenced card is enclosed.

Initial accreditation fee is $100.00 per person per discipline, except for abatement worker ($20.00). Renewal fees for accreditations within one year of the expiration date are one-half of the initial fees. Renewals for accreditations expired over one year require the initial fee. There is a $10.00 duplication charge to replace a lost card. Please also note that the expiration date on your license is determined by the expiration date on the training certificate submitted with your application.

When submitting application packets, please note the following:

- do not staple any of the application materials;
- make sure to fill out the application completely, including your signature; and
- include current proof of training for the discipline(s) for which you are applying

If you have any questions regarding this matter, please call our office at (502) 782-6717.

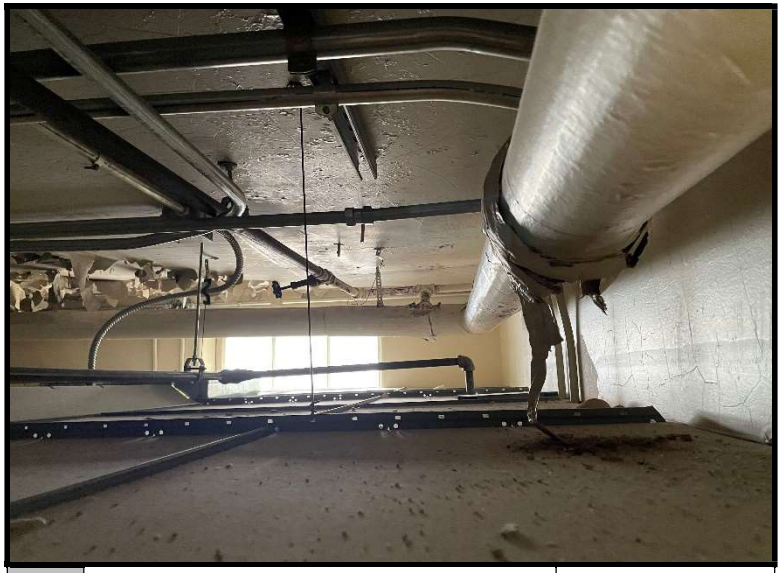


Sincerely,

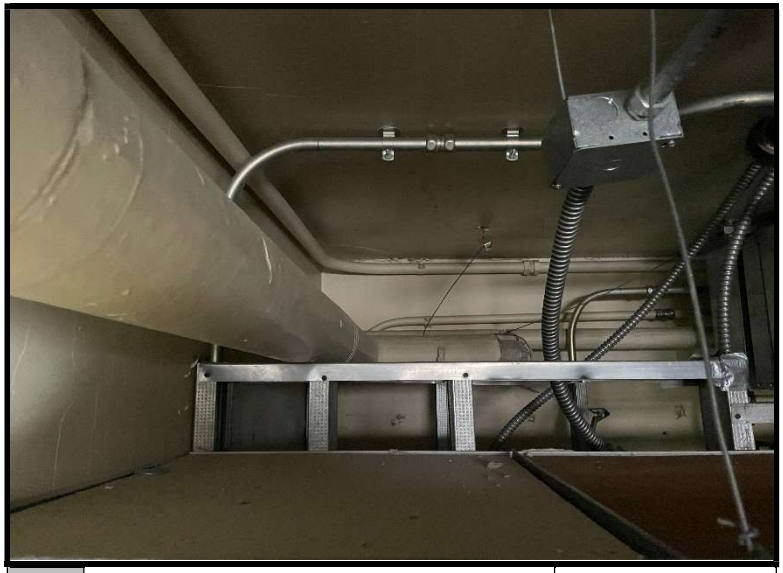
Emma Moreo

Emma Moreo
Field Support Section
Field Operations Branch

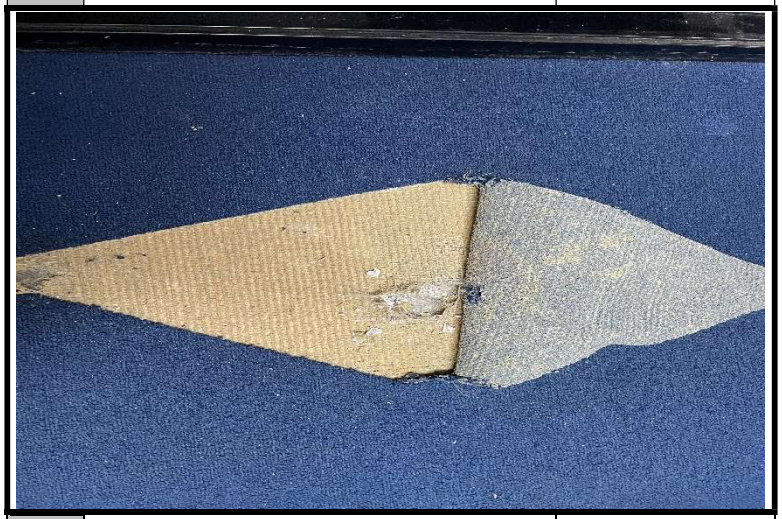
Appendix III – Photographic Log



1	View of Aircell Pipe Wrap and Mudded Elbows (HAs 5 and 6)	**Date:** 08/24/2023 **Photographer:** CR



2	View of Aircell Pipe Wrap and Mudded Elbows (HAs 5 and 6)	**Date:** 08/24/2023 **Photographer:** CR



3	HA 11 Under Carpet	**Date:** 08/24/2023 **Photographer:** CR

4	HA 15 ACM Roof Layer on Roof Deck	**Date:** 08/24/2023 **Photographer:** CR

5	HA 17 Transite Wall Panels	**Date:** 08/24/2023 **Photographer:** CR

6	HA 30 ACM Floor Tile Under Carpet	**Date:** 08/24/2023 **Photographer:** CR

7	General View of First Floor	**Date:** 08/24/2023 **Photographer:** CR

8	General View of Second Floor	**Date:** 08/24/2023 **Photographer:** CR

Appendix IV – ACM Summary Table

Summary of Asbestos Sampling

Project Name: UK Medical Annex	**Project Number: 23830110**
Location: Lexington, KY	**Sampling Date(s): 8/24/2023**

HOMOGENEOUS AREA **SAMPLE DATA**

HA Area	Material Description	Material Location	Quantity	[1]Cat (F/I/II)	[2]Type	Condition / Potential for Disturbance	Sample Number	Sample Location	Type and Percent Asbestos
1	Tan Cove Base with Yellow Mastic	Room 101	NQ	NA	Misc.	Good/Low	1A	Bottom of East Wall	ND
							1B	Bottom of West Wall	
2	Brown Floor Tile with Yellow Mastic	Room 101	NQ	NA	Misc.	Good/Low	2A	Near Door	ND
							2B	Near Window	
3	Blue Cove Base with Tan Adhesive	Room 102	NQ	NA	Misc.	Good/Low	3A	Bottom of West Wall	ND
							3B	Bottom of East Wall	
4	Window Glazing	Rooms 105, 108 & 107	NQ	NA	Misc.	Good/Low	4A	Room 105	ND
							4B	Room 108	
5	**Pipe Wrap**	**Room 105 Above Drop Ceiling**	**120 LF**	**F**	**TSI**	**Good/High**	**5A**	**Room 105**	**70% CH**
							5B	**Room 105**	
6	**Mudded Elbows**	**Room 105 Above Drop Ceiling**	**9 Units**	**F**	**TSI**	**Good/High**	**6A**	**Room 105**	**50% CH**
							6B	**Room 105**	
7	Wall Cement Coating	Room 107A	NQ	NA	Misc.	Good/Low	7A	Near Exterior Door	ND
							7B	Near Entrance Door	
8	12" x 12" Blue Floor Tile (Solid) with Yellow Mastic	Room 106	NQ	NA	Misc.	Good/Low	8A	Center	ND
							8B	Near Door	

NQ = Not Quantified ND = Asbestos Not Detected SF = Square feet LF = Linear feet CF = Cubic Feet CH = Chrysotile NA = Not Applicable

[1]Category: F=Friable I=Category I, Non-Friable II=Category II, Non-Friable

[2]Type; Misc. = Miscellaneous Sur = Surfacing TSI = Thermal System Insulation

Quantities are approximate and should not be used for cost estimates or biding purposes

*Samples collected by others during previous assessments

Summary of Asbestos Sampling

Project Name: UK Medical Annex	**Project Number: 23830110**
Location: Lexington, KY	**Sampling Date(s): 8/24/2023**

HOMOGENEOUS AREA **SAMPLE DATA**

HA Area	Material Description	Material Location	Quantity	[1]Cat (F/I/II)	[2]Type	Condition / Potential for Disturbance	Sample Number	Sample Location	Type and Percent Asbestos
9	Brown Cove Base with Brown Adhesive	Room 104A	NQ	NA	Misc.	Good/Low	9A	Near Door	ND
							9B	Under Window	
10	Floor Leveling Compound	Room 104	NQ	NA	Sur.	Good/Low	10A	Center	ND
							10B	Near Wall	
11	**Brown & Tan Floor Tile with Black Mastic**	**Room 103 Under Carpet**	**200 SF**	**I**	**Misc.**	**Good/High**	**11A**	**Near Door**	**3% CH Tile 2% CH Mastic**
							11B	**Under Window**	
12	Black Stair Treads with Clear Adhesive	Stairs to 2nd Floor	NQ	NA	Misc.	Good/Low	12A	Top Stair	ND
							12B	2nd From Top Stair	
13	Floor Leveling Compound	Room 201	NQ	NA	Sur.	Good/Low	13A	Near Column	ND
							13B	Near Door	
14	Red Terrazzo Floor	Room 202	NQ	NA	Misc.	Good/Low	14A	Near Door	ND
							14B	Near Door	
15	**Flat Roofing (Multiple Layers)**	**Flat Roof – First Layer Above Decking**	**2,500 SF**	**I**	**Misc.**	**Good/High**	**15A**	**Outside of Room 201**	**10% CH**
							15B	**Outside of Room 201**	
16	Brown Linoleum	Room 300B (Attic)	NQ	NA	Misc.	Good/Low	16A	Room 300B	ND
							16B	Room 300B	

NQ = Not Quantified ND = Asbestos Not Detected SF = Square feet LF = Linear feet CF = Cubic Feet CH = Chrysotile NA = Not Applicable

[1]Category: F=Friable I=Category I, Non-Friable II=Category II, Non-Friable

[2]Type; Misc. = Miscellaneous Sur = Surfacing TSI = Thermal System Insulation

Quantities are approximate and should not be used for cost estimates or biding purposes

*Samples collected by others during previous assessments

Summary of Asbestos Sampling

Project Name: UK Medical Annex	**Project Number: 23830110**
Location: Lexington, KY	**Sampling Date(s): 8/24/2023**

HOMOGENEOUS AREA **SAMPLE DATA**

HA Area	Material Description	Material Location	Quantity	[1]Cat (F/I/II)	[2]Type	Condition / Potential for Disturbance	Sample Number	Sample Location	Type and Percent Asbestos
17	**Transite**	**Room 300B (Attic) East Wall**	**140 SF**	**II**	**Misc.**	**Good/High**	**17A**	**Room 300B**	**10% Chrysotile**
							17B	**Room 300B**	
18	White Window and Door Caulk	Exterior Windows and Doors	NQ	NA	Misc.	Good/Low	18A	Bottom Right Pane	ND
							18B	Bottom Left Pane	
19	Window Putty	Exterior Windows Addition	NQ	NA	F	Good/Low	19A	Middle of Pane	ND
							19B	Middle of Pane	
20	Gray Expansion Joint Caulk	Exterior Brick Addition	NQ	NA	Misc.	Good/Low	20A	South Side	ND
							20B	South Side	
21	Gray Building Addition Window Caulk	Addition Exterior	NQ	NA	Misc.	Good/Low	21A	East Side	ND
							21B	East Side	
22	Black Foundation Coating	Addition Foundation	NQ	NA	Misc.	Good/Low	22A	East Foundation	ND
							22B	East Foundation	
23*	2' x 2' Drop-In Ceiling Tile	Throughout First Floor	NQ	NA	Misc.	Good/Low	78-102B-8	Room 102B	ND
							78-104-9	Room 104	

NQ = Not Quantified ND = Asbestos Not Detected SF = Square feet LF = Linear feet CF = Cubic Feet CH = Chrysotile NA = Not Applicable

[1]Category: F=Friable I=Category I, Non-Friable II=Category II, Non-Friable

[2]Type; Misc. = Miscellaneous Sur = Surfacing TSI = Thermal System Insulation

Quantities are approximate and should not be used for cost estimates or biding purposes

*Samples collected by others during previous assessments

Summary of Asbestos Sampling

Project Name: UK Medical Annex	**Project Number:** 23830110
Location: Lexington, KY	**Sampling Date(s):** 8/24/2023

HOMOGENEOUS AREA **SAMPLE DATA**

HA Area	Material Description	Material Location	Quantity	[1]Cat (F/I/II)	[2]Type	Condition / Potential for Disturbance	Sample Number	Sample Location	Type and Percent Asbestos
24*	12" x 12" Black Floor Tile with Yellow Mastic	Entrance	NQ	NA	Misc.	Good/Low	78-ET-10	Front Entrance	ND
							78-ET-11	Front Entrance	
25*	12" x 12" Blue Floor Tile with Yellow Mastic	Rooms 102B and 107	NQ	NA	Misc.	Good/Low	78-102B-12	Room 102B	ND
							78-107-13	Room 107	
26*	Drywall and Joint Compound	Throughout Building	NQ	NA	Misc.	Good/Low	78-104-14	Room 104	ND
							78-104A-15	Room 104A	
							78-206-24	Room 206	
27*	12" x 12" Gray Floor Tile with Yellow Mastic	Room 104A	NQ	NA	Misc.	Good/Low	78-104A-16	Room 104A	ND
							78-104A-17	Room 104A	
28*	Foundation Mortar	Basement	NQ	NA	Misc.	Good/Low	78-BST-18	Basement	ND
							78-BST-19	Basement	
							78-BST-20	Basement	
29*	Gray Carpet Glue	Rooms 201 and 206	NQ	NA	Misc.	Good/Low	78-201-21	Room 201	ND
							78-206-22	Room 206	
							78-206-23	Room 206	

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[2]Type; Misc. = Miscellaneous Sur = Surfacing TSI = Thermal System Insulation

Quantities are approximate and should not be used for cost estimates or biding purposes

*Samples collected by others during previous assessments

Summary of Asbestos Sampling

Project Name: UK Medical Annex	**Project Number: 23830110**
Location: Lexington, KY	**Sampling Date(s): 8/24/2023**

HOMOGENEOUS AREA **SAMPLE DATA**

HA Area	Material Description	Material Location	Quantity	[1]Cat (F/I/II)	[2]Type	Condition / Potential for Disturbance	Sample Number	Sample Location	Type and Percent Asbestos
30*	**Yellow Flooring with Tan Mastic**	**Room 205 Under Carpet**	**100 SF**	**I**	**Misc.**	**Good/High**	**78-205-25**	**Room 205**	**5% CH Tile Mastic ND**
							78-205-26	**Room 205**	
31*	Yellow Carpet Glue	Room 201	NQ	NA	Misc.	Good/Low	78-201-27	Room 201	ND
							78-201-28	Room 201	
32*	Black Felt Paper	Room 203	NQ	NA	Misc.	Good/Low	78-203-29	Room 203	ND
33*	Blue/Green Shingle	Pitched Roof	NQ	NA	Misc.	Good/Low	78-RF-30	Pitched Roof	ND
							78-RF-31	Pitched Roof	
							78-RF-32	Pitched Roof	
34*	Cork Insulation	Freezer Walls Rooms 106A, 106B, Basement	NQ	NA	TSI	Good/Low	78-106A-33	Room 106A	ND
							78-106B-34	Room 106B	
							78-BST-35	Basement	
35*	Cork Insulation	Freezer Ceiling Room 106B	NQ	NA	TSI	Good/Low	78-106B-36	Room 106B	ND
							78-106B-37	Room 106B	

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*Samples collected by others during previous assessments

Summary of Asbestos Sampling

Project Name: UK Medical Annex	**Project Number: 23830110**
Location: Lexington, KY	**Sampling Date(s): 8/24/2023**

HOMOGENEOUS AREA **SAMPLE DATA**

HA Area	Material Description	Material Location	Quantity	[1]Cat (F/I/II)	[2]Type	Condition / Potential for Disturbance	Sample Number	Sample Location	Type and Percent Asbestos
36*	Black Cork Insulation Coating	Rooms 106A, 106B, Basement	NQ	NA	TSI	Good/Low	78-106B-38	Room 106B	ND
							78-106A-39	Room 106A	
							78-BST-33	Basement	
							78-BST-34	Basement	
37*	**Plaster**	**Throughout Building Walls and Ceilings**	**9,361 SF**	**F**	**Surf.**	**Good/High**	**78-203-04**	**Room 203**	**1.84% CH by TEM**
							78-203-05	**Room 203**	**1.49% CH by TEM**
38*	12" x 12" Blue Tile with Yellow Mastic	Room 102	NQ	NA	Misc.	Good/Low	78-102-02	Room 102	ND
39*	2' x 2' Drop In Ceiling Tiles	Throughout	NQ	NA	Misc.	Good/Low	78-102-03	Room 102	ND
40*	**Window Putty**	**Exterior Windows Original Building**	**14 Units**	**F**	**Misc.**	**Good/High**	**78-WP-6**	**Exterior Window**	**3% CH**
41"	Window Putty	Exterior Windows Addition	NQ	NA	Misc.	Good/Low	78-WP-7	Exterior Window	ND

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Quantities are approximate and should not be used for cost estimates or biding purposes

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Appendix V – Asbestos Analytical Laboratory Reports

SanAir Technologies Laboratory

The Identification Specialists

Analysis Report prepared for S&ME, Inc.

Report Date: 9/5/2023

Project Name: UK-Annex #5

Project #: 23830110

SanAir ID#: 23047447

NVLAP TESTING

NVLAP LAB CODE 200870-0

10501 Trade Court | North Chesterfield, Virginia 23236
888.895.1177 | 804.897.1177 | fax: 804.897.0070 | IAQ@SanAir.com | SanAir.com

SanAir Technologies Laboratory

SanAir ID Number
23047447
FINAL REPORT
9/5/2023 5:27:52 PM

Name: S&ME, Inc.
Address: 6190 Enterprise Court
Dublin, OH 43016
Phone: 6147932226

Project Number: 23830110
P.O. Number: 23830110
Project Name: UK-Annex #5
Collected Date: 8/24/2023
Received Date: 8/28/2023 2:00:00 PM

Dear Jamie Bailey,

We at SanAir would like to thank you for the work you recently submitted. The 44 sample(s) were received on Monday, August 28, 2023 via Drop Box. The final report(s) is enclosed for the following sample(s): 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B, 5A, 5B, 6A, 6B, 7A, 7B, 8A, 8B, 9A, 9B, 10A, 10B, 11A, 11B, 12A, 12B, 13A, 13B, 14A, 14B, 15A, 15B, 16A, 16B, 17A, 17B, 18A, 18B, 19A, 19B, 20A, 20B, 21A, 21B, 22A, 22B.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

Sandra Sobrino

Sandra Sobrino
Asbestos & Materials Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

Sample conditions:
- 44 samples in Good condition.

SanAir Technologies Laboratory

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9/5/2023 5:27:52 PM

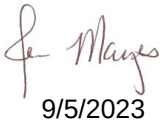
Name: S&ME, Inc.
Address: 6190 Enterprise Court
Dublin, OH 43016
Phone: 6147932226

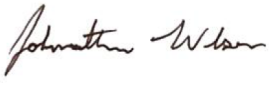
Project Number: 23830110
P.O. Number: 23830110
Project Name: UK-Annex #5
Collected Date: 8/24/2023
Received Date: 8/28/2023 2:00:00 PM

Analyst: Mayes, Jean

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
1A / 23047447-001 Cove Base w/ Adh., Cove Baes	Tan Non-Fibrous Homogeneous		100% Other	None Detected
1A / 23047447-001 Cove Base w/ Adh., Adhesive	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
1B / 23047447-002 Cove Base w/ Adh., Cove Baes	Tan Non-Fibrous Homogeneous		100% Other	None Detected
1B / 23047447-002 Cove Base w/ Adh., Adhesive	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
2A / 23047447-003 Floor Tile w/ Mastic, Floor Tile	Brown Non-Fibrous Homogeneous	10% Cellulose	90% Other	None Detected
2A / 23047447-003 Floor Tile w/ Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
2B / 23047447-004 Floor Tile w/ Mastic, Floor Tile	Brown Non-Fibrous Homogeneous	10% Cellulose	90% Other	None Detected
2B / 23047447-004 Floor Tile w/ Mastic, Mastic	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
3A / 23047447-005 Cove Base w/ Adh., Cove Base	Blue Non-Fibrous Homogeneous		100% Other	None Detected
3A / 23047447-005 Cove Base w/ Adh., Adhesive	Tan Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: 
Analysis Date: 9/5/2023

Approved Signatory: 
Date: 9/5/2023

SanAir Technologies Laboratory

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Project Number: 23830110
P.O. Number: 23830110
Project Name: UK-Annex #5
Collected Date: 8/24/2023
Received Date: 8/28/2023 2:00:00 PM

Analyst: Mayes, Jean

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
3B / 23047447-006 Cove Base w/ Adh., Cove Base	Blue Non-Fibrous Homogeneous		100% Other	None Detected
3B / 23047447-006 Cove Base w/ Adh., Adhesive	Tan Non-Fibrous Homogeneous		100% Other	None Detected
4A / 23047447-007 Window Glazing	Grey Non-Fibrous Homogeneous		100% Other	None Detected
4B / 23047447-008 Window Glazing	Grey Non-Fibrous Homogeneous		100% Other	None Detected
5A / 23047447-009 Pipe Wrap	Off-White Fibrous Heterogeneous		30% Other	70% Chrysotile
5B / 23047447-010 Pipe Wrap	Off-White Fibrous Heterogeneous		30% Other	70% Chrysotile
6A / 23047447-011 Elbow Mud	Off-White Fibrous Heterogeneous		50% Other	50% Chrysotile
6B / 23047447-012 Elbow Mud	Off-White Fibrous Heterogeneous		50% Other	50% Chrysotile
7A / 23047447-013 Wall Cement	Grey Non-Fibrous Homogeneous		100% Other	None Detected
7B / 23047447-014 Wall Cement	Grey Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: Jean Mayes
Analysis Date: 9/5/2023

Approved Signatory: Jonathan Wilson
Date: 9/5/2023

SanAir Technologies Laboratory

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Analyst: Mayes, Jean

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
8A / 23047447-015 Floor Tile + Adh., Floor Tile	Blue Non-Fibrous Homogeneous		100% Other	None Detected
8A / 23047447-015 Floor Tile + Adh., Adhesive	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
8B / 23047447-016 Floor Tile + Adh., Floor Tile	Blue Non-Fibrous Homogeneous		100% Other	None Detected
8B / 23047447-016 Floor Tile + Adh., Adhesive	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
9A / 23047447-017 Cove Base w/ Adh., Cove Base	Brown Non-Fibrous Homogeneous		100% Other	None Detected
9A / 23047447-017 Cove Base w/ Adh., Adhesive	Brown Non-Fibrous Homogeneous		100% Other	None Detected
9B / 23047447-018 Cove Base w/ Adh., Cove Base	Brown Non-Fibrous Homogeneous		100% Other	None Detected
9B / 23047447-018 Cove Base w/ Adh., Adhesive	Brown Non-Fibrous Homogeneous		100% Other	None Detected
10A / 23047447-019 Floor Level Compound	White Non-Fibrous Homogeneous		100% Other	None Detected
10B / 23047447-020 Floor Level Compound	White Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: Jean Mayes
Analysis Date: 9/5/2023

Approved Signatory: Jonathan Wilson
Date: 9/5/2023

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Analyst: Mayes, Jean

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
11A / 23047447-021 Floor Tile w/ Mastic, Floor Tile	Tan Non-Fibrous Homogeneous		97% Other	3% Chrysotile
11A / 23047447-021 Floor Tile w/ Mastic, Mastic	Black Non-Fibrous Homogeneous		98% Other	2% Chrysotile
11B / 23047447-022 Floor Tile w/ Mastic, Floor Tile	Tan Non-Fibrous Homogeneous		97% Other	3% Chrysotile
11B / 23047447-022 Floor Tile w/ Mastic, Mastic	Black Non-Fibrous Homogeneous		98% Other	2% Chrysotile
12A / 23047447-023 Floor Tile w/ Clear Adh., Floor Tile	Black Non-Fibrous Homogeneous		100% Other	None Detected
12A / 23047447-023 Floor Tile w/ Clear Adh., Adhesive	White Non-Fibrous Homogeneous		100% Other	None Detected
12B / 23047447-024 Floor Tile w/ Clear Adh., Floor Tile	Black Non-Fibrous Homogeneous		100% Other	None Detected
12B / 23047447-024 Floor Tile w/ Clear Adh., Mastic	Grey Non-Fibrous Homogeneous		100% Other	None Detected
13A / 23047447-025 Floor Level Cmpd	Grey Non-Fibrous Heterogeneous	2% Cellulose	98% Other	None Detected
13B / 23047447-026 Floor Level Cmpd	Grey Non-Fibrous Heterogeneous	2% Cellulose	98% Other	None Detected

Analyst: Jean Mayes
Analysis Date: 9/5/2023

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Analyst: Mayes, Jean

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
14A / 23047447-027 Terazzo	Various Non-Fibrous Heterogeneous		100% Other	None Detected
14B / 23047447-028 Terazzo	Various Non-Fibrous Heterogeneous		100% Other	None Detected
15A / 23047447-029 Flat Roof Layers, Membrane	Various Non-Fibrous Heterogeneous		100% Other	None Detected
15A / 23047447-029 Flat Roof Layers, Insulation	Yellow Non-Fibrous Homogeneous		100% Other	None Detected
15A / 23047447-029 Flat Roof Layers, Insulation	Brown Fibrous Heterogeneous	95% Cellulose	5% Other	None Detected
15A / 23047447-029 Flat Roof Layers, Carpet	Black Non-Fibrous Heterogeneous	70% Synthetic	30% Other	None Detected
15A / 23047447-029 Flat Roof Layers, Roofing	Black Non-Fibrous Heterogeneous	20% Cellulose	80% Other	None Detected
15A / 23047447-029 Flat Roof Layers, Roofing	Black Non-Fibrous Heterogeneous	20% Glass	70% Other	10% Chrysotile
15B / 23047447-030 Flat Roof Layers, Membrane	Various Non-Fibrous Heterogeneous		100% Other	None Detected
15B / 23047447-030 Flat Roof Layers, Insulation	Yellow Non-Fibrous Homogeneous		100% Other	None Detected

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Analyst: Mayes, Jean

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
15B / 23047447-030 Flat Roof Layers, Insulation	Brown Fibrous Heterogeneous	95% Cellulose	5% Other	None Detected
15B / 23047447-030 Flat Roof Layers, Carpet	Black Non-Fibrous Heterogeneous	70% Synthetic	30% Other	None Detected
15B / 23047447-030 Flat Roof Layers, Roofing	Black Non-Fibrous Heterogeneous	20% Cellulose	80% Other	None Detected
15B / 23047447-030 Flat Roof Layers, Roofing	Black Non-Fibrous Heterogeneous	20% Glass	70% Other	10% Chrysotile
16A / 23047447-031 Linoleum	Brown Non-Fibrous Heterogeneous	20% Cellulose	80% Other	None Detected
16B / 23047447-032 Linoleum	Brown Non-Fibrous Heterogeneous	20% Cellulose	80% Other	None Detected
17A / 23047447-033 Transite Panel	Grey Non-Fibrous Heterogeneous		90% Other	10% Chrysotile
17B / 23047447-034 Transite Panel	Grey Non-Fibrous Heterogeneous		90% Other	10% Chrysotile
18A / 23047447-035 Caulk	Grey Non-Fibrous Homogeneous		100% Other	None Detected
18B / 23047447-036 Caulk	Grey Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: Jean Mayes
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Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
19A / 23047447-037 Window Glazing	White Non-Fibrous Homogeneous		100% Other	None Detected
19B / 23047447-038 Window Glazing	White Non-Fibrous Homogeneous		100% Other	None Detected
20A / 23047447-039 Expansion Joint Caulk	White Non-Fibrous Homogeneous		100% Other	None Detected
20B / 23047447-040 Expansion Joint Caulk	White Non-Fibrous Homogeneous		100% Other	None Detected
21A / 23047447-041 Caulk, Caulk	Grey Non-Fibrous Homogeneous		100% Other	None Detected
21A / 23047447-041 Caulk, Caulk	White Non-Fibrous Homogeneous		100% Other	None Detected
21B / 23047447-042 Caulk, Caulk	Grey Non-Fibrous Homogeneous		100% Other	None Detected
21B / 23047447-042 Caulk, Caulk	White Non-Fibrous Homogeneous		100% Other	None Detected
22A / 23047447-043 Foundation Coating	Black Non-Fibrous Heterogeneous	1% Cellulose	99% Other	None Detected
22B / 23047447-044 Foundation Coating	Black Non-Fibrous Heterogeneous	1% Cellulose	99% Other	None Detected

Analyst: Jean Mayes
Analysis Date: 9/5/2023

Approved Signatory: Jonathan Wilson
Date: 9/5/2023

Disclaimer

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NYELAP Disclaimer:
Polarized- light microscopy is not consistently reliable in detecting asbestos in floor covering and similar non-friable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.

Asbestos Accreditations
National Voluntary Laboratory Accreditation Program (NVLAP) Lab Code 200870-0
City of Philadelphia Department of Public Health Air Management Services, Certification#ALL-460
Commonwealth of Pennsylvania Department of Environmental Protection Number 68-05397
California State Environmental Laboratory Accreditation Program Certificate Number 2915
Colorado Department of Public Health and Environment Registration Number AL-23143
Connecticut Department of Public Health Environmental Laboratory Registration Number PH-0105
Massachusetts Department of Labor Standards Asbestos Analytical Services License Number: AA000222
State of Maine Department of Environmental Protection License Number: LB-0075, LA-0084
New York State Department of Health Laboratory ID: 11983
State of Rhode Island Department of Health Certification No.: PCM00126, PLM00126, TEM00126
Texas Department of State Health Services License Number: 300440
Commonwealth of Virginia Department of Professional and Occupational Regulation Number: 3333000323
State of Washington Department of Ecology Laboratory ID: C989
State of West Virginia Bureau for Public Health Analytical Laboratory Number: LT000616
Vermont Department of Health License Number: Asb-Co-An-000006
Louisiana Department of Environmental Quality AI Number 212253, Certificate #05088

SanAir Technologies Laboratory

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sanair.com

Asbestos Chain of Custody

Form 140, Rev 2, 5/18/18

SanAir ID Number: 23047447

Company: S+ME	Project #: 23830110	Collect by: Vince Epps
Address: 862 E. Crescentville Rd.	Project Name: UK - Annex #5	Phone #: 513-591-8375
City, St., Zip: Cinci, OH 45246	Date Collected: 8/24/2023	Fax #: —
State of Collection: KY Account#:	P.O. Number: 23830110	Email: vepps@smeinc.com

Bulk

ABB	PLM EPA 600/R-93/116	X
	Positive Stop	
ABEPA	PLM EPA 400 Point Count	
ABB1K	PLM EPA 1000 Point Count	
ABBEN	PLM EPA NOB**	
ABBCH	TEM Chatfield**	
ABBTM	TEM EPA NOB**	
ABQ	PLM Qualitative	

** Available on 24-hr. to 5-day TAT

Water

ABHE	EPA 100.2	

Air

ABA	PCM NIOSH 7400	
ABA-2	OSHA w/ TWA*	
ABTEM	TEM AHERA	
ABATN	TEM NIOSH 7402	
ABT2	TEM Level II	
Other:		

New York ELAP

ABEPA2	NY ELAP 198.1	
ABENY	NY ELAP 198.6 PLM NOB	
ABBNY	NY ELAP 198.4 TEM NOB	

Soil

ABSE	PLM EPA 600/R-93/116 (Qual.)	

Vermiculite & Soil

ABSP	PLM CARB 435 (LOD <1%)	
ABSP1	PLM CARB 435 (LOD 0.25%)	
ABSP2	PLM CARB 435 (LOD 0.1%)	

Dust

ABWA	TEM Wipe ASTM D-6480	
ABDMV	TEM Microvac ASTM D-5755	

Matrix	Other	

Turn Around Times	3 HR (4 HR TEM)	6 HR (8HR TEM)	12 HR	24 HR
	2 Days	3 Days	4 Days	X 5 Days

Special Instructions

Sample #	Sample Identification/Location	Volume or Area	Sample Date	Flow Rate*	Start – Stop Time*
1 A-B	Tan cove base w/ yellow adh.	—	8/24/23		
2 A-B	Brown floor tile w/ yellow mastic	—	↓		
3 A-B	Blue cove base w/ tan adh.	—			
4 A-B	window glazing	—			
5 A-B	Pipe wrap	—			
6 A-B	Elbow mud	—			
7 A-B	wall cement	—			
8 A-B	Blue floor tile & yellow adh.	—			
9 A-B	Brown cove base w/ brown	—			
10 A-B	Floor level compd.	—			
11 A-B	Brown & tan floor tile w/ black	mastic			
12 A-B	Black floor tile w/ clear adh.				

Relinquished by	Date	Time	Received by	Date	Time
[signature]	8/28/23	1330	RMB	AUG 28 2023	@2:00pm
RMB	AUG 29 2023	1:10pm	EA	8/30/23	10:35am

If no technician is provided, then the primary contact for your account will be selected. Unless scheduled, the turnaround time for all samples received after 3 pm EST will be logged in the next business day. Weekend or holiday work must be scheduled ahead of time and is charged at 150% of the 3hr TAT or a minimum charge of $150. A courier charge will be applied for same day and one-day turnaround times for offsite work. SanAir covers Standard Overnight FedEx shipping. Shipments billed to SanAir with a faster shipping rate will result in additional charges.

2307447 Form 140, Revision 1, 1/20/2017

Sample #	Sample Identification/Location	Volume or Area	Sample Date	Flow Rate*	Start – Stop Time*	
13 A-B	Floor level cmpd.	—	8/24/23			
14 A-B	Terazzo	—				
15 A-B	Flat roof layers	—				
16 A-B	Brown linoleum	—				
17 A-B	Transite panel	—				
18 A-B	Caulk	—				
19 A-B	Window glazing	—				
20 A-B	Expansion joint caulk	—				
21 A-B	Caulk	—				
22 A-B	Black foundation coating	—				

Special Instructions

Relinquished by	Date	Time	Received by	Date	Time
	8/28/23	1330		AUG 28 2023	2:00pm
	AUG 29 2023	1110pm		8/30/23	10:35am

If no technician is provided, then the primary contact for your account will be selected. Unless scheduled, the turnaround time for all samples received after 3 pm EST will be logged in the next business day. Weekend or holiday work must be scheduled ahead of time and is charged at 150% of the 3hr TAT or a minimum charge of $150. A courier charge will be applied for same day and one-day turnaround times for offsite work. SanAir covers Standard Overnight FedEx shipping. Shipments billed to SanAir with a faster shipping rate will result in additional charges.

Page 2 of 2

Vincent J Epps

From: Taylor, Tommy W. <twtayl0@email.uky.edu>
Sent: Monday, June 5, 2023 10:08 AM
To: Smith, Andrea L.
Subject: Medical Center Annex #5 Survey Report & Database Info
Attachments: 20230605095419391.pdf

Andrea,
The flat roof on the back of the building has not been tested due to it having foam for a roof. I have been told that when foam was added it was installed over the flat roof on the building.
Historical Data shows window putty, black mastic and plaster to all contain asbestos.

Total quantities I came up with for plaster is 8565 sq. ft. on wood lath.
Total quantities I cam up with were plaster is on masonry is 796 sq. ft. in basement.

Linoleum I tested that was positive is 108 sq. ft.

Floor tile is 168 sq. ft.

I did not get quantities for the window putty.

Sector	BldgNo	BldgName	RoomNo	SampleNo		SampleDate	Description	Results	Condition	AbatedDate	Identity
MC	0078	Medical Center Annex #5		203	04	10/4/14	ceiling plaster	1.84% chry TEM			22013
MC	0078	Medical Center Annex #5		203	05	10/4/14	ceiling plaster	1.49% chry TEM			22014
CA	0078	Medical Center Annex #5		102	01		"12""x12"" fl. tile beige w/ bk. mastic tile				
NAD mastic 6% chry											12398
CA	0078	Medical Center Annex #5		102	02	1/24/08	12x12 blue fl. tile w/ yellow mastic				
both NAD											19811
CA	0078	Medical Center Annex #5		102	03	1/24/08	2x2 lay-in ceiling tile	NAD			
											19812
MC	0078	Medical Center Annex #5		WP	6	10/31/17	window putty	3% chry			
22835											
MC	0078	Medical Center Annex #5		WP	7	10/31/17	window putty	NAD			
22836											

Appendix VI – PCB Analytical Laboratory Report

Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

September 01, 2023

Vince Epps
S&ME, Inc.
862 East Crescentville Rd
Cincinnati, OH 45246

RE: Project: 23830110 MI King Library Anx
Pace Project No.: 50352686

Dear Vince Epps:

Enclosed are the analytical results for sample(s) received by the laboratory on August 29, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Indianapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Regina Bedel
regina.bedel@pacelabs.com
(317)228-3100
Project Manager

Enclosures

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

CERTIFICATIONS

Project: 23830110 MI King Library Anx
Pace Project No.: 50352686

Pace Analytical Services Indianapolis
7726 Moller Road, Indianapolis, IN 46268
Illinois Accreditation #: 200074
Indiana Drinking Water Laboratory #: C-49-06
Kansas/TNI Certification #: E-10177
Kentucky UST Agency Interest #: 80226
Kentucky WW Laboratory ID #: 98019
Michigan Drinking Water Laboratory #9050
Ohio VAP Certified Laboratory #: CL0065
Oklahoma Laboratory #: 9204
Texas Certification #: T104704355
Wisconsin Laboratory #: 999788130
USDA Foreign Soil Permit #: 525-23-13-23119
USDA Compliance Agreement #: IN-SL-22-001

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(317)228-3100

SAMPLE SUMMARY

Project: 23830110 MI King Library Anx
Pace Project No.: 50352686

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50352686001	**Anx-18**	Solid	08/24/23 15:55	08/29/23 09:30
50352686002	**Anx-20**	Solid	08/24/23 16:00	08/29/23 09:30
50352686003	**Anx-21**	Solid	08/24/23 16:05	08/29/23 09:30

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SAMPLE ANALYTE COUNT

Project: 23830110 MI King Library Anx
Pace Project No.: 50352686

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50352686001	**Anx-18**	EPA 8082	AM	8	PASI-I
50352686002	**Anx-20**	EPA 8082	AM	8	PASI-I
50352686003	**Anx-21**	EPA 8082	AM	8	PASI-I

PASI-I = Pace Analytical Services - Indianapolis

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ANALYTICAL RESULTS

Project: 23830110 MI King Library Anx
Pace Project No.: 50352686

Sample: Anx-18 **Lab ID: 50352686001** Collected: 08/24/23 15:55 Received: 08/29/23 09:30 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082 PCB Solids	Analytical Method: EPA 8082 Preparation Method: EPA 3546 Pace Analytical Services - Indianapolis							
PCB-1016 (Aroclor 1016)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:23	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:23	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:23	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:23	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:23	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:23	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:23	11096-82-5	
Surrogates								
Tetrachloro-m-xylene (S)	85	%.	10-133	1	08/30/23 16:34	09/01/23 02:23	877-09-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 23830110 MI King Library Anx
Pace Project No.: 50352686

Sample: Anx-20 **Lab ID: 50352686002** Collected: 08/24/23 16:00 Received: 08/29/23 09:30 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082 PCB Solids	Analytical Method: EPA 8082 Preparation Method: EPA 3546 Pace Analytical Services - Indianapolis							
PCB-1016 (Aroclor 1016)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:38	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:38	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:38	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:38	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:38	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:38	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	mg/kg	1.5	1	08/30/23 16:34	09/01/23 02:38	11096-82-5	
Surrogates								
Tetrachloro-m-xylene (S)	76	%.	10-133	1	08/30/23 16:34	09/01/23 02:38	877-09-8	

REPORT OF LABORATORY ANALYSIS

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Indianapolis, IN 46268
(317)228-3100

ANALYTICAL RESULTS

Project: 23830110 MI King Library Anx
Pace Project No.: 50352686

Sample: Anx-21 **Lab ID: 50352686003** Collected: 08/24/23 16:05 Received: 08/29/23 09:30 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8082 PCB Solids	Analytical Method: EPA 8082 Preparation Method: EPA 3546 Pace Analytical Services - Indianapolis							
PCB-1016 (Aroclor 1016)	ND	mg/kg	1.0	1	08/30/23 16:34	09/01/23 02:53	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	mg/kg	1.0	1	08/30/23 16:34	09/01/23 02:53	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	mg/kg	1.0	1	08/30/23 16:34	09/01/23 02:53	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	mg/kg	1.0	1	08/30/23 16:34	09/01/23 02:53	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	mg/kg	1.0	1	08/30/23 16:34	09/01/23 02:53	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	mg/kg	1.0	1	08/30/23 16:34	09/01/23 02:53	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	mg/kg	1.0	1	08/30/23 16:34	09/01/23 02:53	11096-82-5	
Surrogates								
Tetrachloro-m-xylene (S)	84	%.	10-133	1	08/30/23 16:34	09/01/23 02:53	877-09-8	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
7726 Moller Road
Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA

Project: 23830110 MI King Library Anx
Pace Project No.: 50352686

QC Batch: 750693
QC Batch Method: EPA 3546
Analysis Method: EPA 8082
Analysis Description: 8082 PCB Solids
Laboratory: Pace Analytical Services - Indianapolis
Associated Lab Samples: 50352686001, 50352686002, 50352686003

METHOD BLANK: 3440409 Matrix: Solid
Associated Lab Samples: 50352686001, 50352686002, 50352686003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	mg/kg	ND	0.10	08/31/23 11:43	
PCB-1221 (Aroclor 1221)	mg/kg	ND	0.10	08/31/23 11:43	
PCB-1232 (Aroclor 1232)	mg/kg	ND	0.10	08/31/23 11:43	
PCB-1242 (Aroclor 1242)	mg/kg	ND	0.10	08/31/23 11:43	
PCB-1248 (Aroclor 1248)	mg/kg	ND	0.10	08/31/23 11:43	
PCB-1254 (Aroclor 1254)	mg/kg	ND	0.10	08/31/23 11:43	
PCB-1260 (Aroclor 1260)	mg/kg	ND	0.10	08/31/23 11:43	
Tetrachloro-m-xylene (S)	%.	89	10-133	08/31/23 11:43	

LABORATORY CONTROL SAMPLE: 3440410

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	mg/kg	0.33	0.35	104	50-120	
PCB-1260 (Aroclor 1260)	mg/kg	0.33	0.33	99	40-122	
Tetrachloro-m-xylene (S)	%.			96	10-133	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3440411 3440412

Parameter	Units	50351723012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
PCB-1016 (Aroclor 1016)	mg/kg	ND	1.1	0.97	1.0	1.0	95	105	10-154	1	20	
PCB-1260 (Aroclor 1260)	mg/kg	ND	1.1	0.97	0.99	0.96	92	99	10-165	4	20	
Tetrachloro-m-xylene (S)	%.						92	95	10-133			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 23830110 MI King Library Anx
Pace Project No.: 50352686

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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Indianapolis, IN 46268
(317)228-3100

METHOD CROSS REFERENCE TABLE

Project: 23830110 MI King Library Anx
Pace Project No.: 50352686

Parameter	Matrix	Analytical Method	Preparation Method
8082 PCB Solids	Solid	SW-846 8082A	SW-846 3546

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Indianapolis, IN 46268
(317)228-3100

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 23830110 MI King Library Anx
Pace Project No.: 50352686

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50352686001	**Anx-18**	EPA 3546	750693	EPA 8082	750828
50352686002	**Anx-20**	EPA 3546	750693	EPA 8082	750828
50352686003	**Anx-21**	EPA 3546	750693	EPA 8082	750828

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Pace® Location Requested (City/State):
Pace Analytical Indianapolis
7726 Moller Road, Indianapolis, IN 46268

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

WO# : 50352686

50352686

Company Name:	S&ME, Inc.-OH	Contact/Report To:	Epps, Vince
Street Address:	862 East Crescentville Rd, Cincinnati, OH 45246	Phone #:	513-771-8471
		E-Mail:	vepps@smeinc.com
		Cc E-Mail:	
Customer Project #:	2383010	Invoice To:	
Project Name:	PCB Caulk-MI King Library, Kelly Medical Annex #5	Invoice E-Mail:	
Site Collection Info/Facility ID (as applicable):	UK - Annex #5	Purchase Order # (if applicable):	
		Quote #:	
Time Zone Collected: [ ] AK [ ] PT [ ] MT [ ] CT [ ] ET		County / State origin of sample(s):	Kentucky

Data Deliverables:
[ ] Level II [ ] Level III [ ] Level IV
[ ] EQUIS
[ ] Other_____

Regulatory Program (DW, RCRA, etc.) as applicable:

Rush (Pre-approval required):
[ ] 2 Day [ ] 3 day [ ] 5 day [ ] Other_____

Date Results Requested:

DW PWSID # or WW Permit # as applicable:

Field Filtered (if applicable): [ ] Yes [ ] No

Analysis:

Specify Container Size **

Identify Container Preservative Type***

Analysis Requested

**Container Size: (1) 1L, (2) 500mL, (3) 250mL, (4) 125mL, (5) 100mL, (6) 40mL vial, (7) EnCore, (8) TerraCore, (9) Other

*** Preservative Types: (1) None, (2) HNO3, (3) H2SO4, (4) HCl, (5) NaOH, (6) Zn Acetate, (7) NaHSO4, (8) Sod. Thiosulfate, (9) Ascorbic Acid, (10) MeOH, (11) Other

Lab Use Only

Proj. Mgr: **Regina Bedel**
AcctNum / Client ID:
Table #:
Profile / Template: **9257-22**
Prelog / Bottle Ord. ID: **1137855**

Preservation non-conformance identified for sample.

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Waste Water (WW), Product (P), Soil/Solid (SS), Oil (OL), Wipe (WP), Tissue (TS), Bioassay (B), Vapor (V), Other (OT), Surface Water (SW),Sediment (SED), Sludge (SL), Caulk

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res. Cl2	Number & Type of Containers Plastic	Number & Type of Containers Glass	PCB by 8082	Sample Comment
Anx - 18	C	G	8/24/23	1555	—	—			1	X	001
Anx - 20	C	G	8/24/23	1600	—	—			1	X	002
Anx - 21	C	G	8/24/23	1605	—	—			1	X	003

Customer Remarks / Special Conditions / Possible Hazards:

Collected By:
Printed Name: Vince Epps
Signature:

Additional Instructions from Pace®:

# Coolers:	Thermometer ID:	Correction Factor (°C):	Obs. Temp. (°C)	Corrected Temp. (°C)
1	H	0.0	20.2	20.2

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Tracking Number:
S&ME	8/28/23 1300	fedex	8/29/23 1300	
fedex	8/29/23 0930	CR	8/29/23 0930	Delivered by: [ ] In-Person [ ] Courier
				[✓] FedEX [ ] UPS [ ] Other
				Page: of

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace® Terms and Conditions found at https://www.pacelabs.com/resource-library/resource/pace-terms-and-conditions/

ENV-FRM-CORQ-0019_v01_082123©

SAMPLE CONDITION UPON RECEIPT FORM

Date/Time and Initials of person examining contents: 8/29/23 1046 CRR

1. **Courier:** ☒ FED EX ☐ UPS ☐ CLIENT ☐ PACE ☐ NOW/JETT ☐ OTHER _____
2. **Custody Seal on Cooler/Box Present:** ☒ Yes ☐ No
   (If yes)Seals Intact: ☒ Yes ☐ No **(leave blank if no seals were present)**
3. **Thermometer:** 1 2 3 4 5 6 7 8 A B C D E F G (H)
4. **Cooler Temperature(s):** 20.2/20.2 | | | |
   (Initial/Corrected) RECORD TEMPS OF ALL COOLERS RECEIVED (use Comments below to add more)
5. **Packing Material:** ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____
6. **Ice Type:** ☐ Wet ☐ Blue ☒ None
7. **If temp. is over 6°C or under 0°C, was the PM notified?** ☒ Yes ☐ No
   Cooler temp should be above freezing to 6°C

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
USDA Regulated Soils? (HI, ID, NY, WA, OR,CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		—	All containers needing acid/base preservation have been pH CHECKED?: **Exceptions: VOA, coliform, LLHg, O&G, RAD CHEM, and any container with a septum cap or preserved with HCl.** **Circle:** **HNO3 (<2) H2SO4 (<2) NaOH (>10) NaOH/ZnAc (>9)** Any non-conformance to pH recommendations will be noted on the container count form			
Short Hold Time Analysis (48 hours or less)? Analysis:		—				—
Time 5035A TC placed in Freezer or Short Holds To Lab	Time:			Present	Absent	N/A
			Residual Chlorine Check (SVOC 625 Pest/PCB 608)			—
Rush TAT Requested (4 days or less):		—	Residual Chlorine Check (Total/Amenable/Free Cyanide)			—
Custody Signatures Present?	—		Headspace Wisconsin Sulfide?			—
Containers Intact?:	—		Headspace in VOA Vials (>6mm): See Containter Count form for details	Present	Absent	No VOA Vials Sent —
Sample Label (IDs/Dates/Times) Match COC?: Except TCs, which only require sample ID		—	Trip Blank Present?		—	
Extra labels on Terracore Vials? (soils only)			Trip Blank Custody Seals?:			—

COMMENTS: Time (1605) on Sample ID Anx-20 is different from (1600) COC / Time (1600) on Sample ID Anx-21 is different from COC (1605) (8/29/23 CRR)

COC PAGE ____ of ____

Sample Container Count

** Place a RED dot on containers that are out of conformance **

									AMBER GLASS							PLASTIC									OTHER							
			MeOH (only)																												
			SBS																												
			DI																												
COC Line Item	WGFU	WGKU BG1U	R	DG9H VG9H	VOA VIAL HS >6mm	VG9U DG9U	VG9T	AG0U	AG1H	AG1U	AG3U	AG3S	AG3SF	AG3B	BP1U	BP1N	BP2U	BP3U	BP3N	BP3F	BP3S	BP3B	BP3Z	CG3H	CG3F	Syringe Kit		Matrix	Nitric Red HNO3 <2	Sulfuric Yellow H2SO4 <2	Sodium Hydroxide Green NaOH >10	Sodium Hydroxide/ ZnAc Black NaOH/Zn Ac >9
1	\																										SL				
2	\																										SL				
3	\																										SL				
4																															
5																															
6																															
7																															
8																															
9																															
10																															
11																															
12																															

Container Codes

Glass

DG9H	40mL HCl amber voa vial	BG1T	glass
DG9P	40mL TSP amber vial	BG1U	1L unpreserved glass
DG9S	40mL H2SO4 amber vial	CG3U	250mL Unpres Clear Glass
DG9T	40mL Na Thio amber vial	AG0U	100mL unpres amber glass
DG9U	40mL unpreserved amber vial	AG1H	1L HCl amber glass
VG9H	40mL HCl clear vial	AG1S	1L H2SO4 amber glass
VG9T	40mL Na Thio. clear vial	AG1T	1L Na Thiosulfate amber glass
VG9U	40mL unpreserved clear vial	AG1U	1liter unpres amber glass
I	40mL w/hexane wipe vial	AG2N	500mL HNO3 amber glass
WGKU	8oz unpreserved clear jar	AG2S	500mL H2SO4 amber glass
WGFU	4oz clear soil jar	AG2U	500mL unpres amber glass
JGFU	4oz unpreserved amber wide	AG3S	250mL H2SO4 amber glass
CG3H	250mL clear glass HCl	AG3SF	250mL H2SO4 amb glass -field filtered
CG3F	250mL clear glass HCl, Field Filter	AG3U	250mL unpres amber glass
BG1H	1L HCl clear glass	AG3B	250mL NaOH amber glass
BG1S	1L H2SO4 clear glass		

Plastic

BP1B	1L NaOH plastic	BP4U	125mL unpreserved plastic
BP1N	1L HNO3 plastic	BP4N	125mL HNO3 plastic
BP1S	1L H2SO4 plastic	BP4S	125mL H2SO4 plastic
BP1U	1L unpreserved plastic		
BP1Z	1L NaOH, Zn, Ac		
BP2N	500mL HNO3 plastic		
BP2C	500mL NaOH plastic		
BP2S	500mL H2SO4 plastic		
BP2U	500mL unpreserved plastic		
BP2Z	500mL NaOH, Zn Ac		
BP3B	250mL NaOH plastic		
BP3N	250mL HNO3 plastic		
BP3F	250mL HNO3 plastic-field filtered		
BP3U	250mL unpreserved plastic		
BP3S	250mL H2SO4 plastic		
BP3Z	250mL NaOH, ZnAc plastic		
BP3R	250mL Unpres FF SO4/OH buffer		

Miscellaneous

Syringe Kit	LL Cr+6 sampling kit
ZPLC	Ziploc Bag
R	Terracore Kit
SP5T	120mL Coliform Sodium Thiosulfate
GN	General Container
U	Summa Can (air sample)
WT	Water
SL	Solid
OL:	Oil
NAL	Non-aqueous liquid
WP	Wipe

DOCUMENT 01 3132 - GEOTECHNICAL DATA

1.1 GEOTECHNICAL DATA

A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information. This Document and its attachments are not part of the Contract Documents.

B. Because subsurface conditions indicated by the soil borings are a sampling in relation to the entire construction area, and for other reasons, the Owner, the Architect, the Architect's consultants, and the firm reporting the subsurface conditions do not warranty the conditions below the depths of the borings or that the strata logged from the borings are necessarily typical of the entire site. Any party using the information described in the soil borings and geotechnical report shall accept full responsibility for its use.

C. A geotechnical investigation report for Project, prepared by S&ME, Inc., dated August 26, 2022, is available for viewing as appended to this Document.

1. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from the data.
2. Any party using information described in the geotechnical report shall make additional test borings and conduct other exploratory operations that may be required to determine the character of subsurface materials that may be encountered.

D. Related Requirements:

1. Document 00 3119 "Existing Condition Information" for information about existing conditions that is made available to bidders.
2. Document 00 3126 "Existing Hazardous Material Information" for hazardous materials reports that are made available to bidders.

END OF DOCUMENT 01 3132

Report of Geotechnical Exploration
UK Health Education Building
Lexington, Kentucky
S&ME Project No. 22830088

PREPARED FOR:
JRA Architects
3225 Summit Square Place
Suite #200
Lexington, Kentucky 40509

PREPARED BY:
S&ME, Inc.
2020 Liberty Road, Suite 105
Lexington, Kentucky 40505

August 26, 2022

August 26, 2022

JRA Architects
3225 Summit Square Place
Suite #200
Lexington, Kentucky 40509

Attention: Mr. Rob Deal, AIA, LEED AP, KCID, NCARB

Reference: **Report of Geotechnical Exploration**
University of Kentucky – Health Education Building
Lexington, Kentucky
S&ME Project No. 22830088

Dear Mr. Deal:

S&ME, Inc. (S&ME) has completed our geotechnical exploration for the new Health Education Building project on the University of Kentucky campus in Lexington, Kentucky. We performed our work in accordance with S&ME Proposal No. 22830088 dated May 4, 2022 as authorized by you. The purpose of this exploration was to obtain subsurface data at the site and provide geotechnical recommendations for design and construction of the new Health Education Building.

This report explains our understanding of the project, documents our findings, and presents our conclusion and engineering recommendations.

Sincerely,

S&ME, Inc.

Andrew M. Fiehler, PE
Sr. Project Engineer
Licensed Kentucky 23977

John C. Lessley
Vice President/Technical Principal

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Appendices

Appendix I – Site Location Plan / Boring Location Plans

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Appendix III – Laboratory Testing Results

Appendix IV – ACI 302.1R-96 "GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION"

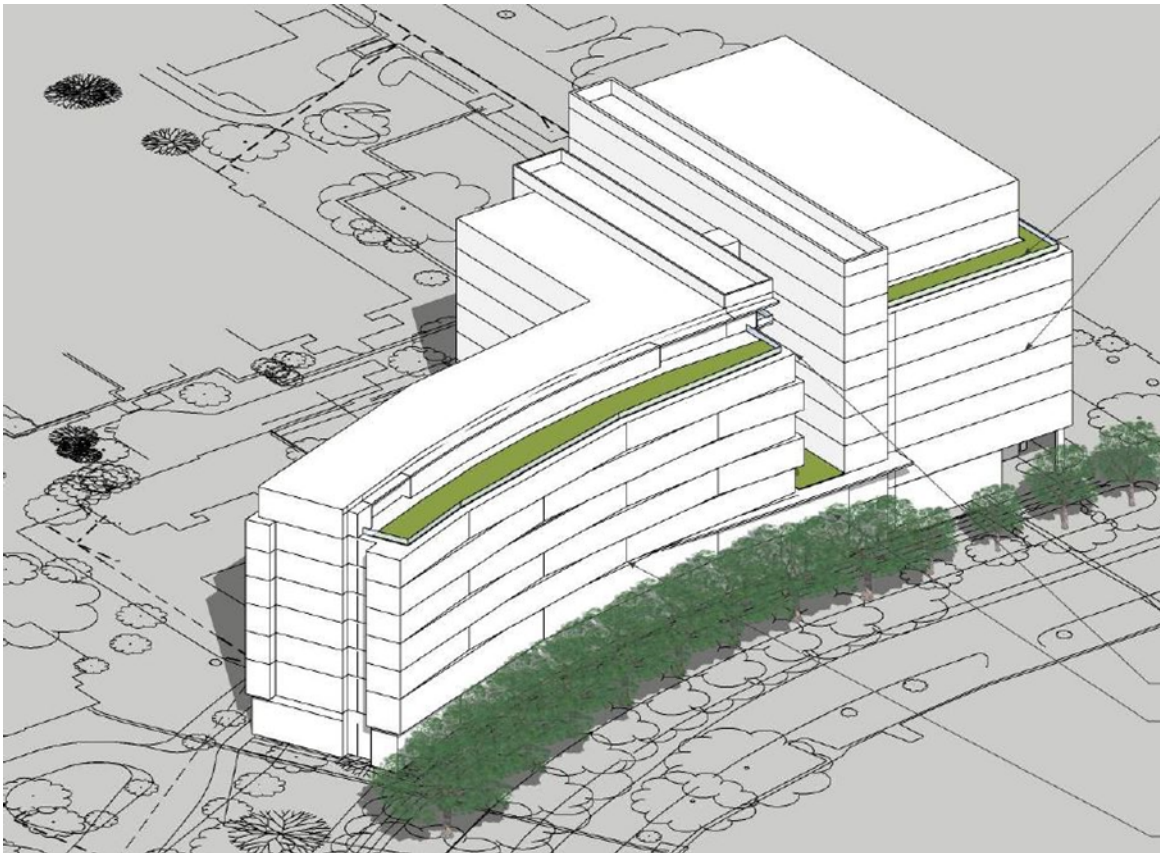
1.0 Introduction

S&ME, Inc. (S&ME) has completed our geotechnical exploration for the new Health Education Building (HEB) on the University of Kentucky campus in Lexington, Kentucky. We performed our work in accordance with S&ME Proposal No. 22830088 dated May 4, 2022 as authorized by you. The purpose of this exploration was to obtain subsurface data at the site and provide geotechnical recommendations for design and construction of the new education building.

This report explains our understanding of the project, documents our findings, and presents our conclusion and engineering recommendations.

2.0 Site and Project Description

The new HEB project design is still being refined; however, the structure will likely be a 5- to 7-story structure above grade with a basement level. The limits of the basement are also being refined. We understand that the basement will be under a portion of the building footprint rather than the entire building footprint. Below is a schematic image of the anticipated building layout.



The total building square footage will be around 450,000 square feet. Mr. Brian McMillan, PE with Brown and Kubican Structural Engineers indicated that typical column loads will range from about 1,100 to 1,400 kips with maximum column loads of near 2,000 kips.

Site development and grading plans are still being developed. We understand that the Finished Floor Elevation (FFE) will be 1002.0 feet for the main floor and 986.0 for the basement floor elevation. The provided topographic survey shows about 8 to 10 feet of relief across the site. We anticipate that site grading will consist of cuts/fills of less than 5 feet to match the adjacent grades around the new building which is currently developed. Proposed modifications to Veteran's Drive are planned as part of the HEB development.

The HEB site is currently occupied by several buildings, parking lots, and lawn areas and includes numerous existing utilities, as indicated on the provided Topographic Survey drawings prepared by Endris Engineering, In, dated March 29, 2022.

3.0 Geology

A review of the United States Geologic Survey (USGS) geologic map of the Lexington West Quadrangle (1967) indicates this project site is underlain by the Tanglewood Member of the Lexington Limestone Formation comprised of Ordovician aged deposits. The Tanglewood Member consists of irregularly bedded limestone and shale. Limestone comprises approximately 50 percent of the member and is described as light-gray to medium-gray, medium to coarse grained, in smooth to irregular-surfaced beds, medium to thick bedded, fossiliferous. Our recovered rock core classifications agreed with the geologic mapping of the region.

The Lexington Limestone series is prone to Karst features such as differential weathering, solution enlarged soil filled joints and sinkholes. The most common presentations of Karst development in the project area are an erratic top of rock profile due to differential weathering of the limestone and soil filled, solution enlarged joints in the bedrock. Subsurface water that may affect this project is water that infiltrates down through the soil from rainfall and collecting in solution widened joints and fractures and along the soil/rock interface. Alignments of solution enlarged fractures, sinkholes, caverns and depressions commonly indicate fracture zones followed by subsurface water courses.

The Kentucky Geological Survey (KGS) identifies this portion of Lexington as having a "moderate" potential for Karst activity. The Geologic Quadrangle mapping shows several closed depressions within one mile of the property; however, they are mapped in the underlying formations and at lower elevations than the project site. The local region has been heavily developed which may have hidden such surface indications of Karst.

From our experience on campus, we have encountered Karst features that are predominantly along a narrow valley extending from the recently constructed Woodland Glen dorms, beneath the WT Young Library, beneath the southern end of the Chemistry-Physics building, and on passed the Gatton College of Business. Several other projects where we have performed explorations on either side of this narrow valley have not exhibited signs of Karst development.

We did observe some variation in the bedrock surface (auger refusal) in our borings with these elevations ranging from 974.3 feet to 991.0 feet. Rock coring was performed of the refusal materials from four of the borings (B-8, B-11, B-15, and B-19). Recoveries of the coring ranged from 96 percent to 100 percent. Rock Quality Designations

(RQD) of the recovered cores ranged from 36 percent to 90 percent. Other than one 4 inch tall void in the upper foot of the rock core in boring B-15, we did not observe obvious signs of the development of Karst features. Thin voids in the weathered zone of the Tanglewood are not uncommon.

4.0 EXPLORATION METHODS

The procedures used by S&ME for field and laboratory sampling and testing are in general accordance with ASTM procedures and established engineering practice. Appendix II contains brief descriptions of the procedures used in this exploration.

4.1 Field Exploration

At total of 23 soil test borings were drilled for this project near locations requested by the structural engineer. The final locations were selected to avoid existing utilities or other obstructions. Prior to beginning drilling, S&ME staked the boring locations and measured the ground surface elevation at each boring location using survey grade GPS equipment. The measured locations are noted on the Boring Location Plan (Figure 2) included in Appendix I.

Mr. Deron Zierer, GIT from our office was on-site during drilling to observe pertinent surface and site features indicative of the site geology, record and log the recovered soil and rock core samples, and to direct the drilling operations.

The borings were drilled by a track-mounted Diedrich D-50 drill rig using a combination of 6-7/8 inch O.D. hollow stem augers and 4-1/4 inch O.D. solid flight augers. Soil samples were obtained using a split-barrel sampler driven by an automatic hammer system in general accordance with ASTM D1586. We also obtained relatively undisturbed (Shelby) tube samples of the soil using direct push methods. A bulk sample of auger cuttings from boring B-19 was obtained for laboratory testing to assess the moisture-density relationship.

The borings were advanced to auger refusal. As requested, 20 feet of rock coring was performed in four borings in general accordance with ASTM D2113. The recovered cores were placed in rock core sample boxes and delivered to our laboratory where the geologist and engineer logged the rock cores.

The stratification lines shown on the boring records represent the approximate boundaries between soil and rock types. The transitions may be more gradual than shown. A general description of our field procedures, a test boring record legend and Test Boring Records are provided in Appendix II of this report. Also included in Appendix II is a summary of the weathered bedrock and auger refusal depths and elevations for the borings.

4.2 Laboratory Testing

Following sample retrieval, the recovered soil samples were placed in sealed plastic storage bags. The recovered samples were returned to our laboratory where applicable laboratory tests were performed. These tests are used to assess the engineering properties of the soil. The soil samples were visually classified by an engineer according to the Unified Soil Classification System (ASTM D2487). S&ME conducted natural moisture content determinations and Atterberg limits tests on selected samples to aid in classification. We performed unconfined compressive strength testing of representative undisturbed soil and rock core samples.

We also performed moisture-density relationship testing (standard Proctor) and a California Bearing Ratio (CBR) test of the bulk samples of auger cuttings from boring B-19. A summary of laboratory test results is included in Appendix III.

5.0 SUBSURFACE CONDITIONS

As mentioned above, we drilled a total of 23 soil test borings at the project site. Ten of our borings were advanced through existing asphalt pavements and encountered 4 to 6 inches of asphalt overlying 6 to 9 inches of gravel base. The 13 borings advanced in lawn areas encountered between 1 and 5 inches of topsoil.

Ten of the borings encountered previously placed fill material beneath the surficial horizon. The fill typically classified as stiff to very stiff lean clay with varying amounts of limestone gravel and debris (most commonly brick fragments). The fill depths varied from 1 to 6 feet with an average depth of about 3 feet. Most of this material was likely placed as backfill around buried conduits without engineering control of compaction or moisture content.

Beneath the surficial materials or fill we encountered residuum consisting of low plasticity (lean) clay (CL) and low plasticity silt (ML) overlying high plasticity (fat) clay (CH) and high plasticity (elastic) silt (MH). These soils form part of the weathered profile of the Ordivician age Lexington Limestone Formation, well consolidated fine-grained sediments indicated on local geologic maps. These soils extended to refusal to the soil auger at depths of 10 to over 25 feet. Considering a basement finished floor elevation at 986 feet, most of these soils will be excavated and removed from the site, but these soils would form the majority of the side slopes of excavations made to construct basement areas. They may also form the immediate bearing surface for footings supporting light duty structures outside of basement areas. These soils will also form the immediate subgrade for pavements or floor slabs outside of basement areas.

Recovered samples were predominantly red-brown in color. Most samples manipulated by hand contained only slightly discernable free moisture. Moisture contents ranged from 14 to 38 percent oven-dried in the laboratory. Minus No. 40 sieve sizes exhibited liquid limit values of 44 to 61percent and plastic limit values ranging from 23 to 34 percent. Plasticity Index values thus ranged from 18 to 31 percent. Liquidity Index values determined by comparison of plasticity indices to in-place moisture content varied from 0.18 to -0.48.

Standard penetration resistance N-values ranged from 5 to over 20 blows per foot. Laboratory unconfined compressive strength testing of representative undisturbed samples of the cohesive soils ranged from 1400 psf to 6150 psf. Values obtained are consistent with generally firm to very stiff soil consistency. The table below summarizes the natural moisture content, Liquid Limit, and Plasticity Indices of selected representative soil samples.

Table 5.1 - Soil Classification Summary

Soil Type	Natural Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
Lean Clay (CL)	22 to 26	44 to 46	23 to 26	18 to 24
Silt (ML)	23 to 30	46 to 48	28 to 30	17 to 20
Fat Clay (CH)	22 to 39	51 to 58	24 to 29	27 to 29
Elastic Silt (MH)	29 to 32	51 to 66	29 to 34	22 to 31

Beneath the residual soils borings penetrated weathered bedrock, generally less than one foot thick, before encountering auger refusal. We note that refusal of our drilling tools in this layer may have resulted from the presence of gravel beds, lenses or seams of cemented or hard soils, boulders or ledges of weathered or partially weathered rock, or continuous, relatively hard competent rock. Diamond core procedures would be necessary to assess the character and apparent strength of materials below refusal.

Beneath the weathered bedrock we encountered limestone with interbedded shale which extended to termination of coring. Depth to refusal encountered in the soil test borings suggest substantial variations may occur in the top of rock over very short horizontal distances, typical of limestone strata where Karst solutioning is considered mature. Refusal elevations in the borings ranged from 3.8 feet in boring B-3 to 25.4 feet in boring B-6 with an average refusal depth of about 12 feet. Greater variations may occur between borings in areas not explored.

These materials resisted penetration by soil augers and were sampled by diamond rock core methods at four locations. The recovered rock from this zone was subdivided into multiple runs ranging from 4 to 5 feet in length as determined by the length of the core barrel. Since visually the recovered core appeared fairly uniform, we did not attempt to separate the recovered core into separate runs based on observed changes in formation or material type of the recovered rock.

Rock core samples obtained examined in the laboratory consisted of moderately hard thinly laminated limestone with calcareous shale. Rock continuity within the core runs was gauged to be fairly continuous to continuous based on an average recovery of 65 to 100 percent. Rock quality as assessed using the Rock Quality Designation (RQD) value ranged from good to excellent based on RQD values of 58 to 90 percent. Weathering of the rock mass was judged to be slight in most runs. Joints were stained and the rock fabric discolored up to one inch from joint surfaces. Weathering of the rock mass was judged to be moderate in the first run of Boring B-11. There was significant discoloration and staining of the rock fabric throughout the run as well as numerous clay partings for the first two feet of the run.

Selected recovered samples of intact rock core representative of each run were cut to length and the ends machined flat. Specimens were compressed in a loading frame and axial load continuously applied until peak load and failure were obtained. Samples were soaked prior to testing. Four representative rock core samples were subjected to unconfined compressive strength testing which indicated strengths ranging from 8,812 psi to 13,098 psi with an average strength of about 11,200 psi.

Our borings were dry upon completion of soil augering. Water level measurements after coring are most likely from water used in the coring process. Seasonal and periodic variations in precipitation can affect the observed water level conditions. Perched water is often encountered near the soil/bedrock transition and should not be considered the static groundwater table which is encountered at much greater depths in central Kentucky.

Detailed Boring Logs compiled by the geotechnical engineer based on laboratory classification and visual-manual manipulation of the recovered samples are included in Appendix II. The Test Boring Summary included in Appendix II includes the boring coordinates, ground surface elevation, and the measured depths and elevations of auger refusal.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 General Discussion

Our evaluation and the following discussions and recommendations are based upon a finished first floor elevation (FFE) of 1002 feet and a basement FFE elevation of 986 feet. We anticipate that bedrock supported foundations consisting of a combination of spread footings and drilled shafts will likely be used.

The following sections highlight areas of concern with development of the site and construction of the proposed facilities.

6.1.1 Existing Fill / Disturbed Ground

There are two existing buildings that will have to be demolished and numerous utilities relocated prior to beginning construction of the new facility. In our experience, redevelopment of a project site can be challenging. The new construction will encounter existing fill from previous development or ground disturbed by the demolition activities. Since the foundations will be mostly supported by bedrock, the risk of unacceptable structural settlements is expected to be low; however, since compression below rock bearing foundations will be negligible, settlements occurring below soil-supported footings and adjacent rock bearing foundations will be mostly differential.

Outside of proposed basement areas the first floor slab subgrade will bear near the existing surface. We recommend that existing fill or disturbed ground be excavated and replaced with acceptable structural fill to support the first floor slab subgrade. With proper site preparation, we expect that the risk to the floor slab from the existing fill or disturbed ground to be relatively low. Additional discussion on site preparation is included in the following sections of the report.

Depending on the final location of the basement, we anticipate that a significant portion of the existing fill will likely be excavated thus greatly reducing the potential impact of the existing fill.

6.1.2 High Plasticity Clay

The soils encountered during our exploration are typical of soils throughout Central Kentucky. The lower clay horizon at this site is a high plasticity clay based on laboratory Atterberg limits testing. Atterberg limits tests of representative Fat Clay and Elastic Silt samples obtained during this exploration indicate Liquid Limits up to 68 percent with Plasticity Indices up to 31 percent. Soils with plasticity indices greater than 30 percent have a tendency to shrink or swell with changes in moisture content. We anticipate the high plasticity soils will potentially impact the project if they are excavated from the basement area and used as structural fill. Once the grading plans are finalized, the potential impact of the high plasticity soils should be evaluated further.

Lightly-loaded structural elements such as slabs-on-grade, sidewalks, pavement areas, and non-load bearing walls are susceptible to damage from shrinking and swelling soils, particularly in areas that have been cut to grade where these soils, if present, would be at very shallow depth. Where these soils are incorporated into structural fills, swell potential can likely be reduced if the soil moisture content is kept near or above the plastic limit. In these cases soil swell is not as likely to occur. Moisture control during placement of these soils is crucial to the performance of the soil fill. Placing the higher plasticity soils deeper within the fill areas and then capping the fat

clay with lean clay or crushed stone may be more economical than wasting the high plasticity/swell-susceptible clay and importing structural soil fill. The swell potential of fat clays is of particular concern, since water may cause the fat clays to swell. Lime treatment of high plasticity clays has been shown to greatly reduce the swell potential. If construction takes place during wet periods of the year, wasting of wet soils may be required since high plasticity clays dry slowly.

6.1.3 Karst Features

As discussed in the Geology section above, the site is located in an area of moderate Karst potential. In Karst prone areas, the most common presentation of Karst development is often manifested as an erratic top of rock profile similar to the profile of auger refusal depths in the borings at this site. Other manifestations include soil filled solution enlarged joints in the bedrock, and variable weathering of the bedrock (i.e. – clay seams). From our experience on campus, such features are more common in the upper weathered zone of the bedrock. Extending foundation excavations beyond observed imperfections in the bedrock is usually the more cost effective remediation approach.

Full time observation of the foundation excavation and construction is recommended to help identify such features so they can be addressed in a timely fashion. Additional evaluation of the bedrock conditions beneath the foundations is also recommended. Discussion of methods for further evaluation of the bedrock are included Section 6.4.3. There are numerous mitigation methods that can be employed to remediate identified features. As features are encountered during construction, an engineer should evaluate the conditions and provide recommendations for the appropriate methods. Additional discussion of these methods is included in the Foundation section below.

6.2 Initial Site Preparation

A detailed site development and grading plan has not yet been finalized. Initial site preparation will require demolition of Kelley Hall and the Medical Center Annex No. 5 as well as existing asphalt driveways and parking lots. Numerous underground and overhead utilities will also have to be relocated. We understand that the majority of the trees lining University Avenue will remain; however, we anticipate that some trees within the construction footprint will have to be removed.

Based on a FFE of 1002 feet and the measured surface elevations at our borings, we expect less than 5 feet of fill will be required across the majority of the building footprint outside of basement areas. Up to 12 to 15 feet will be required at the southern end of the building footprint to achieve the required subgrade elevation. The limits of the basement have not yet been defined. Depending on the existing ground surface elevation, the limits of the basement, and the final exterior grades, cut l depths in basement areas could range from 5 to 15 feet below present exterior grade.

Prior to beginning cut and fill operations, the vegetation, topsoil, tree stumps, and other debris should be removed from the proposed construction areas. We recommend that entire rootball from any trees be removed. During demolition of the existing buildings and relocation of the utilities, the entire structure should be removed. This includes floor slabs, foundations, utilities, etc. Outside of the new basement footprint, the resulting holes from rootballs and removed foundations and other underground structures should be backfilled with compacted structural fill to reach subgrade elevation.

It is important an S&ME representative observes site stripping to assess that adequate (but not excessive) material has been stripped. Previously unexplored or unknown conditions could become evident during these operations. S&ME must judge whether the recommendations in this report should be modified in view of the conditions encountered. Once the initial site stripping is complete, S&ME should be retained to visit the site and assess the exposed grade before fill is placed. Observed soft areas should be remediated at the S&ME engineer's discretion before moving on to subsequent tasks.

Once the initial site demolition and stripping has occurred, we recommend a proofroll of the at-grade areas and areas to receive structural fill. Proofrolling consists of observing a loaded dump truck or scraper traffic over the planned fill area. Areas observed to exhibit excessive rutting and/or deflection should be remediated at the engineer's direction. Areas where planned construction bears at or near the existing site grades may require stabilizing prior to beginning construction. Either undercutting and backfilling with structural fill or aerating/drying and re-compaction of the soil will likely be required.

To control distress associated with swelling clay the upper three feet of the floor slab subgrade should have a Plasticity Index (PI) of 30 percent or less. The upper horizon of soil across the site classified as Lean Clay with a PI of less than 30 percent. Where fat clay is present within three (3) feet of the building pad subgrade elevation, we recommend undercutting and replacing with lean clay. Fat clay can be used as structural fill in deeper fill areas within the building footprint and below the top one foot of asphalt pavement subgrade. It can also be used within one foot of the subgrade elevation beneath sidewalks that lead to entrances where they are more than 20 feet from the building. If suspect soils are observed during site grading, additional Atterberg Limits testing should be performed.

Bedrock Removal

Based on the encountered refusal elevations and the proposed finished basement floor elevation of 986 feet, bedrock excavation of up to 9 feet may be necessary. It would be reasonable to anticipate that rock excavation will require hard rock removal methods such as trenching or hoe ramming. Blasting of bedrock is not typically permitted on campus. To assist the contractor in determining the appropriate rock removal method, selection of bits or teeth, and the ease or difficulty of rock excavation, S&ME performed unconfined compressive strength tests on selected samples of the recovered limestone cores. Please reference the laboratory test reports in Appendix III of this report for a summary of the determined unconfined compressive strengths. S&ME offers the following considerations for trenching and blasting:

Trenching:

A combination of heavy-duty rock trenching equipment and hoe-ramming may be used to perform the required mass rock excavation or utility installation for this project. If the contractor chooses to perform mass rock removal by trenching, the following items should be considered:

- Trenching will not require a comprehensive pre-blast survey to be conducted on all structures that have the potential to be impacted by blasting operations.
- Trenching will reduce the ground vibrations compared to blasting
- Trenching will offer more control over rock excavation but typically takes longer to perform.
- Trenching will not require the stoppage of traffic along Polo Club Boulevard or the Interstate while being performed.
- Dust control measures will need to be implemented during trenching operations.

Bedrock Evaluation

Once the mass excavation has been performed in the basement footprint, we recommend that exposed bedrock be evaluated by an S&ME engineer to assess the presence of solution features, and provide remediation recommendations, if required. Once the exposed bedrock is observed by an S&ME engineer, construction can continue in accordance with the recommendations presented later in this report.

6.3 Structural Fill Placement

6.3.1 Soil Fill

Structural fill is defined as inorganic natural soil with a maximum particle size of 3 inches and maximum dry density of at least 100 pounds per cubic foot (pcf) when tested by the standard Proctor method (ASTM D698) and a plasticity index (PI) of less than 30 percent. While the lean clay (CL) satisfies the criteria for structural soil fill, the majority of the fat clay (CH) at the site does not meet the plasticity requirements; however, it can be used in deeper fills.

We performed a standard Proctor test on a composite sample of auger cuttings from borings B-19 and 22. The table below summarizes the standard Proctor test results.

Sample ID/Location	Maximum Dry Density (pcf)	Optimum Moisture Content	Liquid Limit / Plasticity Index
B-18/22	104.3	20.5	44 / 22

It is imperative that, during construction, additional standard Proctor testing and Atterberg limits testing of fill soils should be performed by S&ME for compliance with the project specifications before they are used as fill material. If soils are imported to the site, we recommend the soils be tested for conformance with the project specifications before being transported to the site. Please realize laboratory conformance testing usually takes three to four business days to complete; therefore, the Contractor should plan accordingly.

Structural fill placement should occur in relatively thin (6 to 8-inch) layers and be compacted to at least 98 percent of the standard Proctor maximum dry density beneath the foundation and 95 percent of the standard Proctor maximum dry density in pavement areas. For fills greater than 10 feet in height, we recommend at least 100 percent of the standard Proctor maximum dry density. The moisture content of the fill should be maintained within 2 percent of the soil's optimum moisture content even though compaction may be achieved at moisture contents outside the specified range.

The upper three feet of structural fill beneath building pads, the last 20 feet of sidewalks connecting to building entrances, and concrete pavements should consist of lean clay soils with a plasticity index less than 30 percent, KYDOT Dense Graded Aggregate (DGA) or quarry screenings. Do not use fat clay with a PI of greater than 30 percent as fill within three feet of subgrade beneath the building, sidewalks connecting to entrances, and concrete pavements, as the expansive properties of the fat clay may result in unwanted swell and distress to lightly loaded structural elements such as sidewalks, pavements, etc. Excavated fat clay should be used in greenspace or non-structural areas that are not planned for future development or in deep fill areas.

In-place density testing must be performed on structural fill as a check that the recommended compaction criteria have been achieved. This allows our project engineer to evaluate the quality of the fill construction and assess that the design criteria is being achieved in the field. We further recommend these tests be performed on a full-time basis by S&ME. The testing frequency for density tests performed on a full-time basis can be determined by our personnel based on the area to be tested, the grading equipment used, and construction schedule. Tests should be performed at vertical intervals of 8-inches or less (the recommended lift thickness) as the fill is being placed.

6.4 Foundation Recommendations

S&ME recommends the foundations for the health education building extend through the soil and weathered bedrock to bear on intact bedrock. Depending on bearing elevation and location within the structure, foundations may consist either of shallow rock bearing footings or drilled shafts extending into rock. We recommend use of an allowable bearing pressure to **70 ksf** (kips per square foot) to size foundations bearing on intact, relatively unweathered limestone bedrock similar to recovered materials in the four rock core borings. For drilled shafts or shallow foundations bearing on intact bedrock, we anticipate both total and differential settlements of approximately 1/4 of an inch or less, not including elastic compression of the foundations.

For foundations resisting uplift forces and relying on resistance of the concrete to bedrock bond to do so, they should be socketed into bedrock using an allowable net uplift design value of 4,000 psf for the concrete to bedrock bond zone. The weathered bedrock zone should be ignored when measuring the rock socket for uplift resistance.

Project conceptual plans suggest a partial basement only, with foundations in the remaining portions of the building bearing close to existing grade. In addition, boring data suggest numerous slots or fissures in soils extend below the proposed basement floor elevation. We expect a combination of end bearing drilled shafts and spread footings bearing on bedrock will be used. The following sections include more detailed recommendations for each of the anticipated foundation types.

6.4.1 Drilled Shaft Design and Construction Considerations

For drilled shafts we recommend a minimum rock socket of 12-inches into intact bedrock. Additionally, a 25 percent increase in the allowable axial unit end bearing pressure may be used for short term (transient) load increases. At that magnitude of transient increase, deflections will be within the elastic response zone of the rock and will not result in permanent deflection. S&ME recommends that increases in design values for short term loadings due to wind and seismic loads be in accordance with the Kentucky Building Code or other applicable Code. For uplift resistance, an allowable unit side resistance for the unweathered limestone of 125 psi can be used (assuming 4,000 psi concrete for the drilled shafts).

The following construction considerations are recommended for end bearing drilled shaft construction:

End Bearing

- Clean the foundation bearing area so it is nearly level or suitably benched and is free of ponded water or loose material.
- Provide a minimum drilled shaft diameter of 30 inches to reasonably enter the drilled shaft excavation for cleaning, bottom preparation, and inspection.

- Make provisions for groundwater removal from the drilled shaft excavation after rainfall events. Subsurface water often occurs along the soil/rock interface for several days after rain. If water is flowing into the drilled shaft at less than 20 gallons per minute, pumps may be used to maintain less than 2 inches of water in the drilled shaft during cleaning and inspection. After approval of the bearing surface, the pumps should be pulled and concreting commenced immediately. If more than 20 gallons per minute are flowing into the drilled shaft, the water level should be allowed to stabilize before attempting to place the concrete. For this condition, concrete placement should be accomplished using a tremie pipe or concrete pumping equipment.
- Specify a concrete slump of 7 to 9 inches for the drilled shaft construction. This slump is recommended to fill irregularities along the sides and bottom of the drilled shaft, displace water as it is placed, and permit placement of reinforcing cages into the fluid concrete.
- Retain S&ME personnel to observe foundation excavations after the bottom of the hole is leveled, cleaned of any mud or extraneous material, and de-watered.
- Install temporary (if no voids greater than 6 inches are encountered) or permanent (if voids greater than 6 inches are encountered) protective steel casing or Sonotube to prevent side wall collapse, prevent excessive mud and water intrusion, and to allow workers to clean and inspect the drilled shaft.
- Where temporary casing is required, the protective steel casing may be extracted as the concrete is placed provided a sufficient head of concrete is maintained inside the steel casing to prevent soil or water intrusion into the newly placed concrete.
- Direct the concrete placement into the drilled shaft through a centering chute or tremie to reduce side flow or segregation.

Side Resistance

- For side resistance design, we will require cleaning of the socket "face" prior to concrete placement. Cleaning will require hand cleaning or washing if a mud smear forms on the face of the rock. The geotechnical engineer should approve the rock socket surface prior to concrete placement.
- Provide a minimum drilled shaft diameter of 30 inches to reasonably enter the drilled shaft excavation for cleaning, rock socket face preparation, and inspection.
- Make provisions for groundwater removal from the drilled shaft excavation after rainfall events. Subsurface water often occurs along the soil/rock interface for several days after rain. If water is flowing into the drilled shaft at less than 20 gallons per minute, pumps may be used to maintain less than 2 inches of water in the drilled shaft during cleaning and inspection. After approval of the bearing surface, the pumps should be pulled and concreting commenced immediately. If more than 20 gallons per minute are flowing into the drilled shaft, the water level should be allowed to stabilize before attempting to place the concrete. For this condition, concrete placement should be accomplished using a tremie pipe or concrete pumping equipment.
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- Retain S&ME personnel to observe foundation excavations after the bottom of the hole is leveled, cleaned of mud or extraneous material, and de-watered.
- Install temporary (if no voids greater than 6 inches are encountered) or permanent (if voids greater than 6 inches are encountered) protective steel casing or Sonotube to prevent side wall collapse, prevent excessive mud and water intrusion, and to allow workers to clean and inspect the drilled shaft.

- Where temporary casing is required, the protective steel casing may be extracted as the concrete is placed provided a sufficient head of concrete is maintained inside the steel casing to prevent soil or water intrusion into the newly placed concrete.
- Direct the concrete placement into the drilled shaft through a centering chute or tremie to reduce side flow or segregation.

6.4.2 Drilled Shaft Rock Excavations

Our experience indicates general drilled shaft construction and delineation of "rock" in the excavation is greatly facilitated if adequate drilling equipment is used. We recommend the use of a drill capable of producing at least 500,000 inch·pounds of torque and 35,000 pounds of downward force. Additionally, we recommend that rock be defined as material which cannot be penetrated by a heavy-duty earth auger with hardened teeth at a rate in excess of 3 inches per minute.

Note that the unconfined compressive strengths for the tested rock cores are relatively high for limestone in Central Kentucky. The drilled shaft contractor should review the attached laboratory results when preparing/bidding the project.

6.4.3 Drilled Shaft Quality Control Requirements

We recommend that the drilled shaft construction be observed by an S&ME geotechnical engineer or an S&ME, ICC Certified Special Inspector experienced in drilled shaft construction. The observation should address the following items:

- Top location within tolerances
- Correct plan dimensions
- Plumbness within tolerances
- Materials excavated agree with borings
- Statement of bottom cleanliness
- Construction procedure

Drilled shafts with diameters of 30-inches or greater are large enough to allow a down-hole inspection of the bearing conditions. S&ME will assess the rock condition during construction using 2-inch diameter probe holes to evaluate the actual condition at each shaft location. Specifications are typically written to require the contractor to perform at least one probe hole per shaft at his expense and provide access to the base of the shaft for the engineer to examine the bearing materials.

We recommend drilling the probe holes at least 5-feet into the rock-bearing material for all drilled shafts. These probe holes are usually drilled with a pneumatic percussion drill by the Contractor. S&ME will check the probe hole using a hooked-end steel feeler rod to assess the rock continuity and to check for the presence of mud seams or voids. If this check indicates a discontinuity or void in the rock, our Engineer will compute the expected settlement for that shaft using elastic theory. If the calculated settlement exceeds the allowable, our Engineer will require that the drilled shaft be excavated deeper. Additional probe holes may be required by the S&ME Geotechnical Engineer to check foundations supported on marginal material.

6.4.4 Bedrock Evaluation Alternatives

There are several alternatives to physically sending a person into the drilled shaft excavation to drill a test hole and another to inspect the test hole. These include either coring of the bedrock or using geophysical methods to evaluate the bedrock at individual drilled shaft locations.

There are numerous benefits to either coring the bedrock at each drilled shaft location or using geophysical testing methods including:

- Setting the final bearing elevation/depth and shaft lengths prior to finalization of bids resulting in fewer unknowns during bidding or change orders during construction.
- Fewer delays and/or change orders during construction resulting from having to extend drilled shaft excavations that encounter unsuitable conditions that were not observed during the geotechnical exploration.
- The reinforcing cages can be constructed off-site since the shaft length is known. We anticipate that the project site will likely be congested. Eliminating an area for constructing rebar cages will help reduce such congestion.
- Eliminating the need to send workers into the excavation to drill a test hole or inspect the test hole. This is an improvement in jobsite safety as well as efficiency during drilled shaft excavation.

One option for bedrock evaluation is to use conventional rock coring methods to sample the bedrock at each drilled shaft location. This approach has been performed on numerous projects and provides a physical sample of the bedrock that can be measured and analyzed. The engineer can the provide a recommended bearing elevation for the drilled shafts.

Another option for bedrock evaluation is to use optical and acoustic televiewers to observe probe holes drilled into the bedrock. The probe holes need to be at least 3-inches in diameter but can be drilled with air-track equipment (similar to drills used for blasting) which are typically faster and less expensive than a conventional rock core drill. After installing PVC casing in the soil overburden, the televiewers are lowered into the borehole. Optical televiewers utilize recordings from a high resolution CMOS digital image sensor combined with a fisheye lens to provide a continuous digital image. Acoustic televiewers use ultrasound pulses from a rotating sensor to record the amplitude and travel time of the signals reflected at the interface between fluids and the borehole wall. The combination of these televiewers provide direct measurements of the bedrock in-situ including height and depth of voids or seams as well as strike, dip, and aperture of planer features.

Both coring and drilling of the probe holes and use of the geophysical testing can be performed before the drilled shaft contractor mobilizes. Scheduling of the either the coring or geophysical televiewers must be included in the project scheduling. The existing buildings will have to be demolished prior to mobilizing the core or probe hole drill. Typically, the building construction starts immediately after demolition. Some amount of time must be allowed after demolition for the drill crew(s) to complete the coring and for analysis of the rock cores to set the bearing elevations. The greater number of drilled shafts that are planned, the greater the amount of time will be required.

Note that either the core holes or probe holes should be drilled nearer the perimeter of the drilled shaft footprint than the center. If the core or probe hole is not dead center of the drilled shaft location, the lead teeth of the drilled shaft rig augers can follow the core/probe hole and drag the shaft off-center or out of plumb.

Even if either of these methods are used, a qualified technician should observe the shaft construction and the six bullet points noted above.

6.4.5 Spread Footing Design and Construction Considerations

We anticipate that foundations in the basement portion of the building will consist of spread footings bearing on bedrock. Where bedrock is near the foundation bearing elevation, over-excavating through the soil and weathered bedrock and backfilling to re-establish the foundation bearing elevation with lean concrete is an acceptable alternative provided the bedrock surface has been observed before backfilling. Foundations should excavated through overlying materials to bear entirely on acceptable bedrock. We recommend a minimum 28-day compressive strength of 4,000 psi concrete be used for backfilling beneath foundations.

For resistance to lateral or sliding forces of foundations bearing on the limestone bedrock, we recommend a friction factor of 0.7 be used for design. Socketing or keying spread footings into bedrock can also be used to resist lateral forces.

To evaluate the bedrock beneath the spread footings, we recommend that 2-inch diameter probe holes be drilled to assess the continuity of the underlying bedrock. We recommend at least one probe hole be drilled every 25 feet along continuous footings. Additionally, at least one probe hole may be requested for each column footing. Two or more probe holes may be required, at the discretion of the engineer, when the footing sizes exceed 25 square feet. We recommend that the project budget contain a unit price contingency for additional probe hole drilling if additional probe holes are required based on encountered subsurface conditions.

The probe holes should be drilled to a depth of 5 feet into the bedrock-bearing material for all spread footing foundations. These probe holes are usually drilled with a pneumatic percussion drill. The engineering technician should check the probe hole using a hooked-end steel feeler rod to assess the bedrock continuity. If this check indicates a discontinuous or compressible seam in the bedrock, the foundation should be excavated deeper. Additional probe holes may be required by the Geotechnical Engineer to check foundations supported on marginal material.

Since the foundations will bear on bedrock, the frost depth requirement will not apply. We recommend all foundations have a minimum footing width of 24 inches to allow for hand cleaning of footing subgrades disturbed by the excavation process and the placement of reinforcing steel. The reinforcing steel should be clean and dry prior to concrete placement.

6.4.6 Seismic Site Classification

The current seismic design procedures outlined in the NEHRP (National Earthquake Hazard Reduction Program) guidelines mandate structural design loads to be based on the seismic coefficients of the site. Based on the results of our exploration and the geology of the area, we recommend **a site seismic classification of "C"** for this project site. This classification is further defined in the Kentucky Building Code.

6.5 Below Grade Walls

Basement walls will be required to resist the lateral earth pressures of the soil and backfill within the Rankine zone. Please note that the following information is only for the design of basement walls and should not be used for the design of any other retaining structures.

The lateral earth pressure coefficients listed below assume the excavation between the wall and the face of the limestone will be backfilled with compacted KYDOT No. 57 crushed stone of sufficient width that a Rankine failure surface could develop within the crushed stone backfill. The Rankine failure surface is defined by a 1H:1V slope projected from the rear base of the wall where it meets the foundation to the proposed finished grade. In areas where the face of the limestone falls within the Rankine failure surface, the lateral earth pressure coefficients will be conservative. The No. 57 crushed stone will also be conducive to draining water from around the basement walls. A geo-synthetic filter fabric should be placed between the crushed stone and the retained soil to help prevent migration of soil into the stone.

Where pavements are near the building, the wall design should also factor in the lateral load imparted by the traffic loads. This is often modeled as a traffic surcharge strip load of 250 psf over the driving lane.

We recommend that the below grade wall design include drainage such as a prefabricated drain board or two feet wide zone of KYDOT No. 57 crushed stone immediately behind the wall. Some areas of basement walls could employ single-form construction where the wall is backed by bedrock. Where single-form construction is used, a prefabricated drainage board should be installed and connected to the foundation drain system.

The remainder of the material behind the wall will consist of undisturbed residual soil and structural soil fill. As such, the lateral earth pressures exerted on the wall will predominantly be influenced by soil. We recommend that the KYDOT No. 57 crushed stone include a sock covered, perforated drainage pipe that will allow water to be channeled away from the wall and discharged into a storm sewer or drained to daylight away from the building. The following chart indicates the recommended values associated with stone and clay backfill for the various lateral earth pressure coefficients for horizontal backfill surface. We recommend that the At-Rest coefficient be used for below grade walls that are not free to rotate.

S&ME recommends the At-Rest coefficient be used for the basement wall design. As requested, the following table provides the Active, At-Rest, and Passive pressure coefficients

Backfill Material	Φ′	Unit Weight	Active (Ka)	At-Rest (Ko)	Passive (Kp)
KYDOT No. 57 Stone	40°	105 pcf	0.22	0.35	4.6
Soil Backfill	24°	120 pcf	0.42	0.59	2.3

Depending on the limits of the basement and other site constraints, shoring of the basement excavations may be required. Once the building design and site development plans have been completed, additional evaluation of the excavation plan and requirements for shoring should be evaluated. We understand that there is a major underground utility route containing steam lines and several other utilities that would be costly to relocate. We also understand that the trees lining University Avenue are to remain. Care must be taken when designing tie-backs (if used) to prevent damaging both utilities and the root systems of the trees.

6.6 Floor Slab Recommendations

The planned building will have a first floor FFE of 1002 feet and a basement FFE of 986 feet. Based on the observed surface elevations and planned site development, the first floor slab will be supported by a combination of residual clay and newly placed and compacted fill. We anticipate that a portion of the first floor slab will also

bear on the backfill behind the basement walls. In our experience, floor slabs supported on basement wall backfill have a tendency to settle and crack near the cut/fill transition. Constructing the portion of the slab adjacent to the basement wall to be structurally supported by the basement wall is one method to help reduce the potential for floor cracking. Constructing the first floor slab to be entirely structurally supported is also an option; however, doing so is expensive. Compacting the basement wall backfill to 100% of the standard Proctor maximum dry density can help reduce the potential for settlement. This approach is often difficult to achieve in the field during construction.

We recommend the upper three feet of the building pad subgrade consist of low plasticity fill with a plasticity index (PI) of less than 30 percent, Dense Graded Aggregate (DGA), or quarry screenings.

Where bedrock excavation is required to achieve the planned basement floor elevations, we recommend over-excavating the bedrock to allow for a minimum of 2-feet of crushed stone beneath the floor slab. We also recommend consideration be given to removing the soil from beneath the basement floor slab where bedrock excavation is not required. The intent of the over-excavation is to soften the transition where the slab will bear on bedrock to bearing on soil. The crushed stone will also aid in draining water from beneath the floor slab.

We recommend that control joints be placed in the slab around columns and along footing supported walls to reduce cracking due to minor differential settlements. We recommend that ACI 302.1R-96 "GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION" be followed for design and placement of concrete floor slabs, see attached form in Appendix V to this report.

Between completion of grading and slab construction, floor slab subgrades are often disturbed by weather, footing and utility line installation, and other construction activities. For this reason, the subgrade should be evaluated by an S&ME engineer immediately prior to constructing the slab.

6.7 Pavement Recommendations

New pavement areas are anticipated around the health education building; however, the site development plans have not yet been finalized thus we do not know the extent or planned usage of the pavement areas.

In order for the pavement to perform satisfactorily, the subgrade soils must have sufficient strength and be stable enough to avoid deterioration from construction traffic and support the paving equipment. In addition, the completed pavement section must resist freeze/thaw cycles and wheel loads from traffic. Generally, construction traffic loading is more severe than the traffic after construction.

Typical asphalt pavement is designed for a lifespan of 20 years. While the northwest parking lot will likely have a life of about 5 years, the south parking lot pavement will have a life of approximately 10 years if the current development phasing is followed. Placing a slightly thinner pavement section in these areas could provide for savings in the initial construction as well as during demolition of the parking lot for the future construction. However, the owner must be willing to assume some risk of premature failure in the form of cracking and/or bird baths in the pavement surface.

Minimizing infiltration of water into the subgrade and rapid removal of subsurface water are essential for the successful long-term performance of the pavement. Both the subgrade and the pavement surface should have a minimum slope of one-quarter inch per foot to promote surface drainage. Edges of the pavement should provide

a means of water outlet by extending the aggregate base course through to side ditches. Side ditches should be at least 2 feet below the pavement surface.

The pavement materials should conform and be placed and compacted in accordance with the applicable sections of the Kentucky Transportation Cabinet (KTC) Standard Specifications for Road and Bridge Construction, latest edition. We used the American Association of State Highway and Transportation Officials (AASHTO) Guide for Design of Pavement Structures (1993) as a basis for our flexible pavement thickness analysis. The total pavement thickness requirement is a function of the CBR. We performed CBR testing on three samples from the site which are summarized below.

Sample ID/Location	Maximum Dry Density (psf)	Optimum Moisture Content	CBR at 95% MDD
B-19/22	104.3	20.5	8.8

While the laboratory testing indicated a CBR value 8.8 percent, we recommend a CBR of 4 percent for pavement design calculations, based on our experience with similar soils in the vicinity of the project site.

The following parking lot pavement design recommendations are based on the assumptions of a 20-year service life, a CBR value of 3 percent, 15,000 ESAL's for light duty pavement (light duty parking lot) and 30,000 ESAL's for heavy duty pavement (drive lanes and drop off lanes). If actual or anticipated traffic volumes exceed the estimated ESAL value used for this design, S&ME must re-evaluate the pavement thickness recommendations. The total pavement thickness requirement is obtained from the AASHTO nomograph in terms of a structural number (SN), a weighted sum of the pavement layer thicknesses accounting for their structural and drainage properties.

S&ME recommends that the pavement section (base stone and asphalt) be placed after the majority of the new building construction has been completed. S&ME recommends that both binder and surface mix asphalt be placed sequentially before traffic is allowed on the new pavement. S&ME recommends that the light duty pavement section be used for automobile parking only.

The following pavement thickness design thickness recommendations will likely NOT provide a sufficient pavement for haul roads or construction traffic. Expect that at least isolated repairs will be required to roadways following major phases of construction. If construction sequencing requires that new pavement areas be constructed prior to substantial completion of the building, do not allow construction traffic on the finished pavement.

S&ME recommends the following flexible asphalt pavement sections for this project:

Table 6-1 – Flexible Pavement Bearing on Soil

Material	Light Duty	Heavy Duty	KY Transportation Cabinet Specification
Asphalt Surface Course	1-½ Inches	1-½ Inches	Section 400
Asphalt Binder Course	3 Inches	4 Inches	Section 400
Crushed Stone Base	5 Inches	6 Inches	Section 303

Our pavement recommendations are based on the assumption that S&ME is retained to monitor installation of the asphalt and base, check the installed thickness of the aggregate materials, and perform in-place density tests. Asphalt placement should be monitored full-time to observe placement and compaction procedures. Asphalt samples should be collected periodically and tested for asphalt cement content, aggregate gradation, and density.

Impervious Concrete Pavement Alternative – We recommend that in areas where heavy, concentrated loads (i.e., dumpster area, entrances, loading docks, etc.) are expected, a rigid (concrete) pavement section be used. For dumpster areas, we recommend that rigid pavement be extended beyond the dumpster pad for the entire length of the garbage truck loading area. The pavement subgrade should be stabilized in accordance with the recommendations for the asphalt paved areas, and the related recommendations in this report. We recommend that the concrete pavement be supported by at least a 6-inch layer of compacted DGA. The DGA should be compacted to a minimum of 95 percent of the standard Proctor maximum dry density. We recommend a minimum concrete section of 6 inches for this site. The concrete should be air-entrained and have a 28-day compressive strength of 4,500 psi. Joint spacing should be at a maximum spacing of 15 feet each way.

7.0 FOLLOW-UP SERVICES

Our services should not end with the submission of this geotechnical report. S&ME should be kept involved throughout the design and construction process to maintain continuity and to assess whether our recommendations are properly interpreted and implemented. To achieve this, we should be retained to review project plans and specifications with the designers to see that our recommendations are fully incorporated. We also should be retained to observe and test the site preparation, foundation excavation, and building construction. If we are not allowed the opportunity to continue our involvement on this project, we cannot be held responsible for the recommendations in this report.

Our familiarity with the site and with the foundation recommendations will make us a valuable part of your construction quality assurance team. In addition, a qualified engineering technician should observe and test all structural concrete and steel. Only experienced, qualified persons trained in geotechnical engineering and familiar with foundation construction should be allowed to evaluate and test foundation excavations. Normally, full-time observations and testing of the site work and foundation installation is appropriate.

8.0 LIMITATIONS OF REPORT

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other representation or warranty either express or implied, is made.

We relied on project information given to us to develop our conclusions and recommendations. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes so that we can modify our recommendations based on this additional information if necessary.

Our conclusions and recommendations are based on limited data from a field exploration program. Subsurface conditions can vary widely between explored areas. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified. This report should not be construed to represent subsurface conditions for the entire site.

Unless specifically noted otherwise, our field exploration program did not include an assessment of regulatory compliance, environmental conditions or pollutants or presence of any biological materials (mold, fungi, bacteria). If there is a concern about these items, other studies should be performed. S&ME can provide a proposal and perform these services if requested.

S&ME should be retained to review the final plans and specifications to confirm that earthwork, foundation, and other recommendations are properly interpreted and implemented. The recommendations in this report are contingent on S&ME's review of final plans and specifications followed by our observation and monitoring of earthwork and foundation construction activities.

For more information on the use and limitations of this report, please read the Geoprofessional Business Association (GBA) document that follows this page.

Important Information About Your
Geotechnical Engineering Report

Variations in subsurface conditions can be a principal cause of construction delays, cost overruns and claims. The following information is provided to assist you in understanding and managing the risk of these variations.

Geotechnical Findings Are Professional Opinions

Geotechnical engineers cannot specify material properties as other design engineers do. Geotechnical material properties have a far broader range on a given site than any manufactured construction material, and some geotechnical material properties may change over time because of exposure to air and water, or human activity.

Site exploration identifies subsurface conditions at the time of exploration and only at the points where subsurface tests are performed or samples obtained. Geotechnical engineers review field and laboratory data and then apply their judgment to render professional opinions about site subsurface conditions. Their recommendations rely upon these professional opinions. Variations in the vertical and lateral extent of subsurface materials may be encountered during construction that significantly impact construction schedules, methods and material volumes. While higher levels of subsurface exploration can mitigate the risk of encountering unanticipated subsurface conditions, no level of subsurface exploration can eliminate this risk.

Geotechnical Findings Are Professional Opinions

Professional geotechnical engineering judgment is required to develop a geotechnical exploration scope to obtain information necessary to support design and construction. A number of unique project factors are considered in developing the scope of geotechnical services, such as the exploration objective; the location, type, size and weight of the proposed structure; proposed site grades and improvements; the construction schedule and sequence; and the site geology.

Geotechnical engineers apply their experience with construction methods, subsurface conditions and exploration methods to develop the exploration scope. The scope of each exploration is unique based on available project and site information. Incomplete project information or constraints on the scope of exploration increases the risk of variations in subsurface conditions not being identified and addressed in the geotechnical report.

Services Are Performed for Specific Projects

Because the scope of each geotechnical exploration is unique, each geotechnical report is unique. Subsurface conditions are explored and recommendations are made for a specific project.

Subsurface information and recommendations may not be adequate for other uses. Changes in a proposed structure location, foundation loads, grades, schedule, etc. may require additional geotechnical exploration, analyses, and consultation. The geotechnical engineer should be consulted to determine if additional services are required in response to changes in proposed construction, location, loads, grades, schedule, etc.

Geo-Environmental Issues

The equipment, techniques, and personnel used to perform a geo-environmental study differ significantly from those used for a geotechnical exploration. Indications of environmental contamination may be encountered incidental to performance of a geotechnical exploration but go unrecognized. Determination of the presence, type or extent of environmental contamination is beyond the scope of a geotechnical exploration.

Geotechnical Recommendations Are Not Final

Recommendations are developed based on the geotechnical engineer's understanding of the proposed construction and professional opinion of site subsurface conditions. Observations and tests must be performed during construction to confirm subsurface conditions exposed by construction excavations are consistent with those assumed in development of recommendations. It is advisable to retain the geotechnical engineer that performed the exploration and developed the geotechnical recommendations to conduct tests and observations during construction. This may reduce the risk that variations in subsurface conditions will not be addressed as recommended in the geotechnical report.

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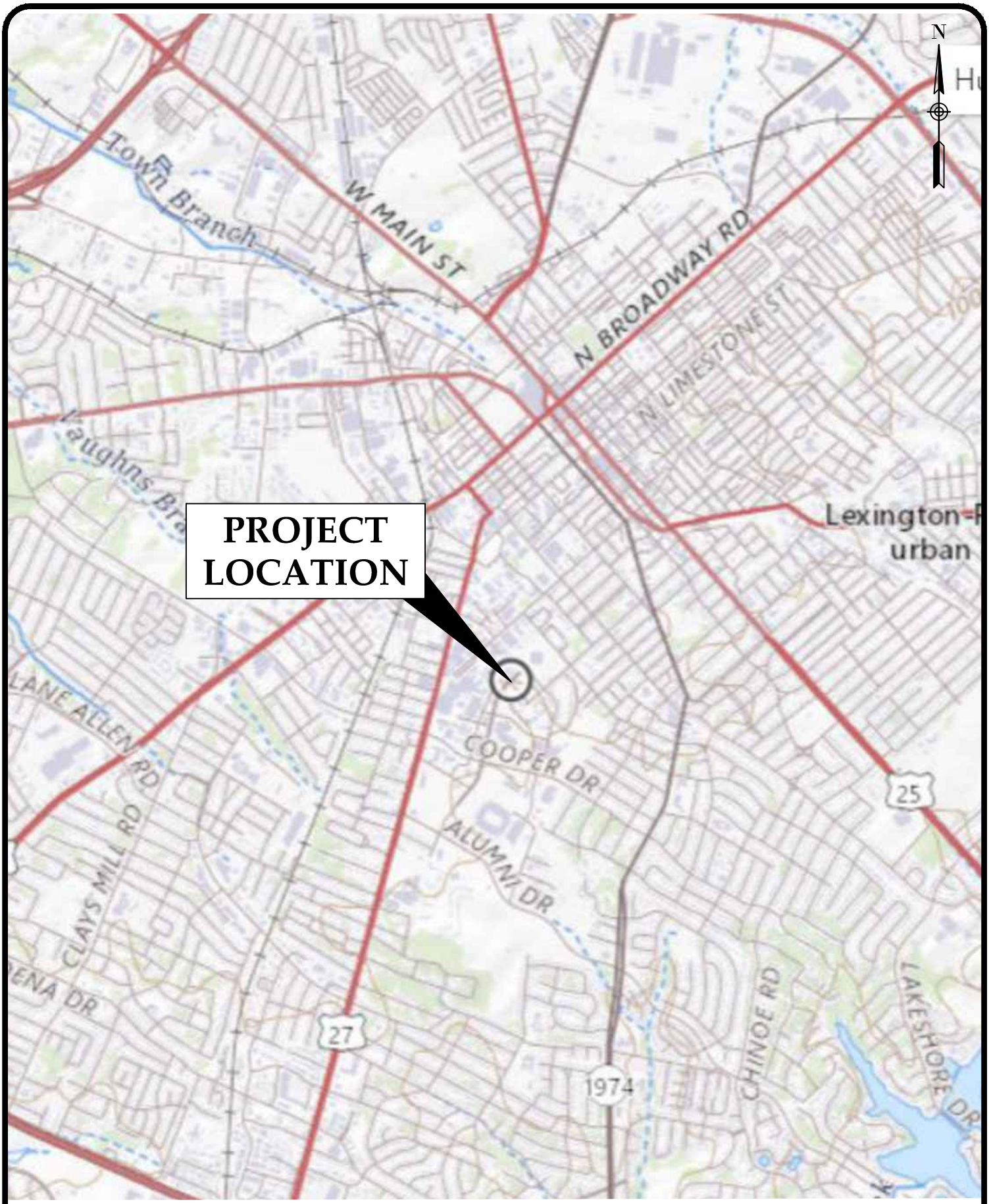
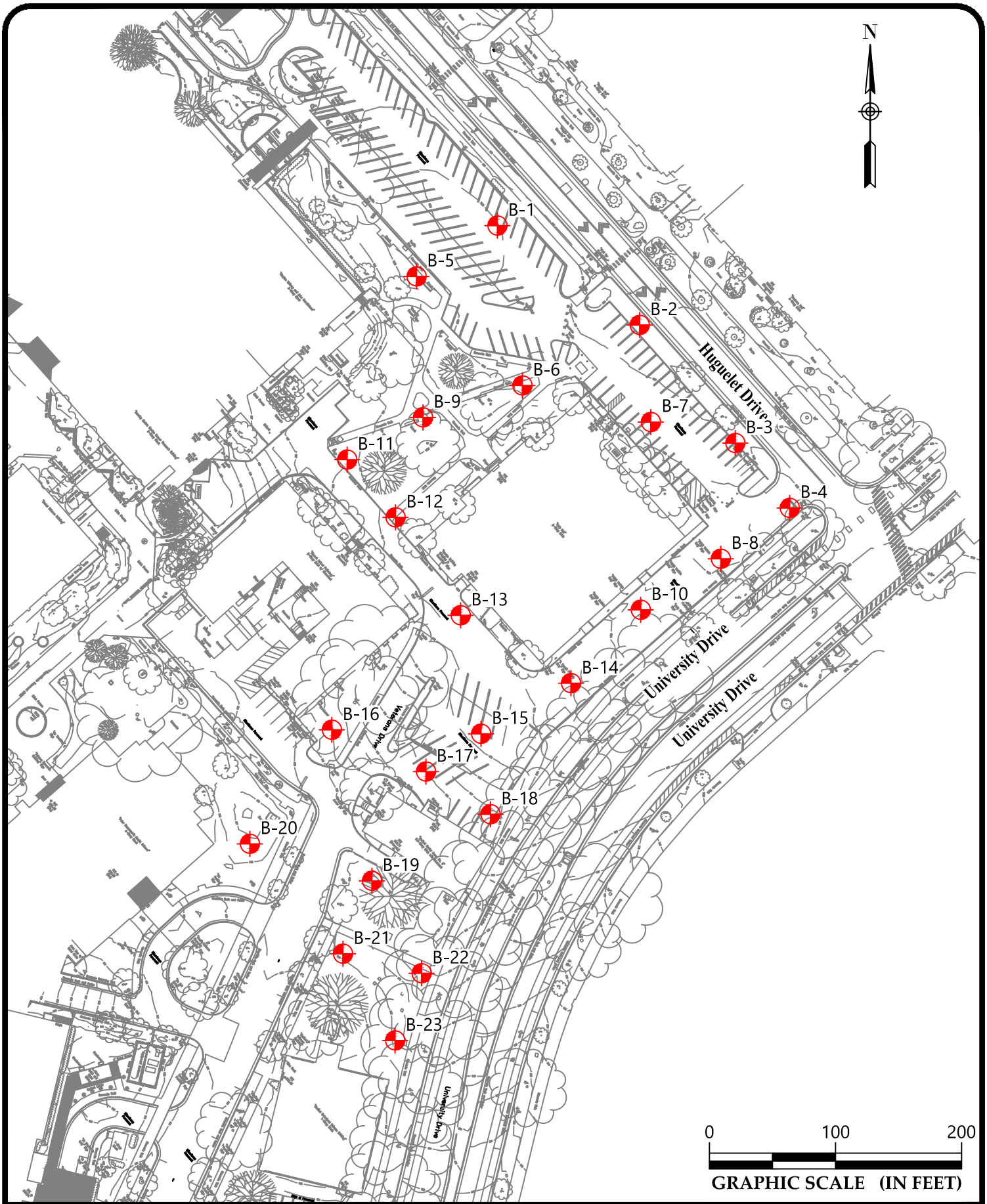
Appendix I – Site Location Plan / Boring Location Plans



Drawing Path: T:\GEO\Projects\2022\22830088_JRA_UK Health Education Building_Lexington, KY\4 GEO\CAD\22830088 _FIG 1&2.dwg

	VICINITY MAP	SCALE: NTS	FIGURE NO. 1
	UK Health Education Bulding Huguelet Drive Lexington, Kentucky	DATE: 08/15/2022 PROJECT NUMBER 22830088	



Drawing Path: T:\GEO\Projects\2022\22830088_JRA_UK Health Education Building_Lexington, KY\4 GEO\CAD\22830088 _FIG 1&2.dwg

BORING LOCATION PLAN

UK Health Education Bulding
Huguelet Drive
Lexington, Kentucky

SCALE:	FIGURE NO.
1" = 100'	2
DATE:	
08/15/2022	
PROJECT NUMBER	
22830088	

Appendix II – Boring Summary / Test Boring Logs

TEST BORING LOG LEGEND

FINE AND COARSE GRAINED SOIL INFORMATION

COARSE GRAINED SOILS
(SANDS AND GRAVELS)

N	Relative Density
0-4	Very Loose
5-10	Loose
11-30	Medium Dense
31-50	Dense
Over 50	Very Dense

FINE GRAINED SOILS
(CLAYS AND SILTS)

N	Consistency
0-2	Very Soft
3-4	Soft
5-8	Firm
9-15	Stiff
16-30	Very Stiff
Over 30	Hard

PARTICLE SIZE

Boulders	Greater than 300 mm (12")
Cobbles	75 mm—300 mm (3-12")
Gravel	4.75 mm—75 mm (3/16-3")
Coarse Sand	2 mm—4.74 mm
Medium Sand	.425 mm—2 mm
Fine Sand	0.075 mm—0.425 mm
Silts and Clays	Less than 0.075 mm

The STANDARD PENETRATION TEST as defined by ASTM D 1586 is a method to obtain a disturbed soil sample for examination and testing and to obtain relative density and consistency information. A standard 1.4-inch I.D. / 2.0-inch O.D. split barrel sampler is driven three 6-inch increments with a 140 lb. hammer falling 30 inches. The hammer can either be of a trip, free-fall design, or actuated by a rope and cathead. The blow counts required to drive the sampler the final two 6-inch increments are added together and designated the N-value defined in the above tables.

ROCK PROPERTIES

RQD

Percent RQD	Quality
0-25	Very Poor
25-50	Poor
50-75	Fair
75-90	Good
90-100	Excellent

ROCK HARDNESS

Very Hard	Rock can be broken by heavy hammer blows.
Hard	Rock cannot be broken by thumb pressure, but can be broken by moderate hammer blows.
Moderately Hard	Small pieces can be broken off along sharp edges by considerable thumb pressure; can be broken with light hammer blows.
Soft	Rock is coherent but breaks very easily with thumb pressure at sharp edges and crumbles with firm hand pressure.
Very Soft	Rock disintegrates or easily compresses when touched; can be hard to very hard soil.

KEY

Undisturbed Sample

Standard Penetration Test Sample

Rock Core Sample

Core Diameter (I.D.)	Inches
BQ	1-7/16
NQ	1-7/8
HQ	2-1/2

$$\text{RQD} = \frac{\text{Sum of 4" and Longer Rock Pieces Recovered}}{\text{Length of Core Run}} \times 100$$
(Rock Quality Designation)

$$\text{REC} = \frac{\text{Length of Rock Core Recovered}}{\text{Length of Core Run}} \times 100$$
(Recovery)

SOIL PROPERTY SYMBOLS

N	Standard Penetration, BPF
NMC	Natural Moisture Content, %
LL	Liquid Limit, %
PL	Plastic Limit, %
PI	Plasticity Index, %
PPV	Pocket Penetrometer Value, TSF
Qu	Unconfined Compressive Strength, TSF
Yd	Dry Unit Weight, PCF
F	Fines Content

UK Health Education Building
Boring Summary
S&ME Project No. 22830088

	Northing	Easting	Surface Elevation	Refusal Depth	Refusal Elevation
B-1	193861.6743	1567011.871	1000.1	14.4	985.7
B-2	193783.4788	1567124.618	998.8	16.4	982.4
B-3	193695.9776	1567201.733	999.5	11.3	988.2
B-4	193637.9824	1567243.507	1000.3	10.8	989.5
B-5	193820.7441	1566947.643	1000.2	19.5	980.7
B-6	193735.065	1567031.548	999.7	25.4	974.3
B-7	193704.3662	1567133.486	999.6	16.3	983.3
B-8	193596.9889	1567188.93	1001.3	11.3	990.0
B-9	193706.9747	1566952.751	999.7	14.4	985.3
B-10	193556.4525	1567125.356	1001.1	14.8	986.3
B-11	193674.2976	1566892.642	998.5	8.0	990.5
B-12	193626.5699	1566934.066	999.4	9.1	990.3
B-13	193552.6088	1566982.577	999.5	10.3	989.2
B-14	193497.7672	1567070.163	1000.5	12.3	988.2
B-15	193459.0565	1566998.861	999.2	8.2	991.0
B-16	193461.7486	1566880.551	993.9	8.5	985.4
B-17	193424.4767	1566955.111	995.8	7.5	988.3
B-18	193393.3092	1567006.345	996.9	10.3	986.6
B-19	193344.1547	1566912.242	993.6	13.4	980.2
B-20	193370.5143	1566815.494	991.4	14.2	977.2
B-21	193285.6899	1566889.289	993.1	3.8	989.3
B-22	193266.0441	1566951.717	998.3	17.2	981.1
B-23	193215.3807	1566930.654	993.5	8.2	985.3

Northing/Easting coordinates are in KY North Zone

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B- 1 *Sheet 1 of 1*
DATE DRILLED: 06/20/2022	**ELEVATION:** 1000.1 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 14.4 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193861.4 **EASTING:** 1567011.9
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0					ASPHALT, 6 in			
0.5					GRAVEL BASE, 7 in			
1.1				SPT-1 (10 in)	LEAN CLAY (CL), firm to stiff, red brown, slightly moist	6-3-5 N = 8	●	
5				SPT-2 (10 in)		4-3-6 N = 9	●	996
5.9		Residuum		SPT-3 (10 in)	FAT CLAY (CH), some degraded Chert, stiff to very stiff, moist	3-4-6 N = 10	●	
10				SPT-4 (11 in)		5-8-10 N = 18	●	991
14.1	Auger refusal at 14.4 feet			SPT-5	Weathered Limestone	50/4" N = 50/4"	●	986
14.4					Borehole terminated at 14.4 feet			
15								
20								981
25								976
30								971
35								966

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/20/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B- 2 *Sheet 1 of 1*
DATE DRILLED: 06/20/2022	**ELEVATION:** 998.8 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 16.9 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193782.6 **EASTING:** 1567124.6
SAMPLING METHOD: UD, SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

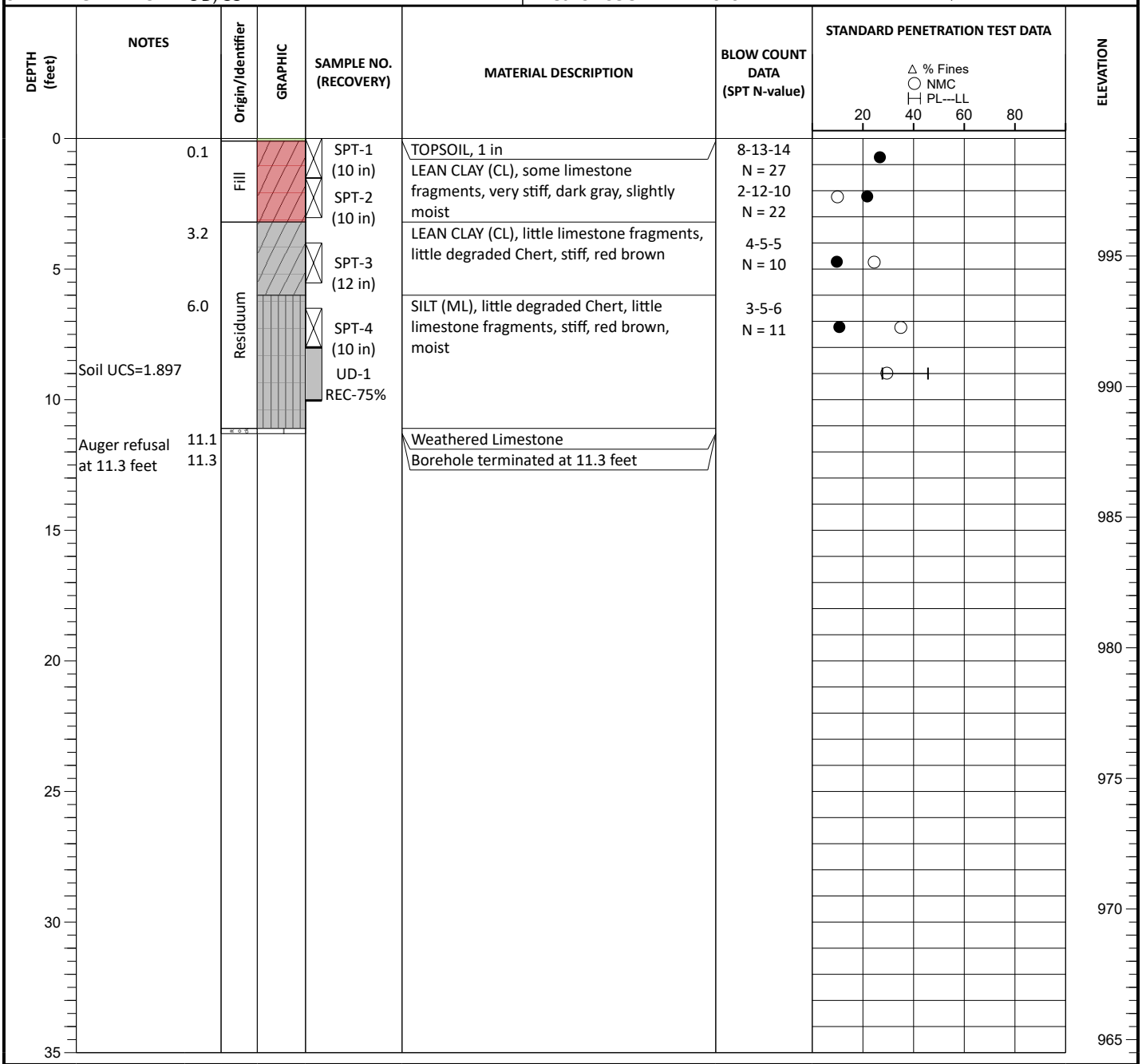
DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0								
				SPT-1 (10 in)	TOPSOIL, 4 in	5-8-8		
0.3		Fill			LEAN CLAY (CL), little limestone fragments, very stiff, dark gray	N = 16		
				SPT-2 (8 in)		4-14-10		
3.1					LEAN CLAY (CL), trace limestone fragments, stiff, slightly moist	N = 24		
5	Soil UCS= 5.288 KSF			UD-1 REC-100%				994
				SPT-3 (12 in)		5-4-5 N = 9		
9.1		Residuum			FAT CLAY (CH), trace clayey silt, soft to stiff, red brown, moist	4-6-6 N = 12		
10				SPT-4 (12 in)				989
				SPT-5 (12 in)		2-1-2 N = 3		
15								984
16.6	Auger refusal at 16.9 feet				Weathered Limestone			
16.9					Borehole terminated at 16.9 feet			
20								979
25								974
30								969
35								

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/20/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B- 3 *Sheet 1 of 1*
DATE DRILLED: 06/20/2022	**ELEVATION:** 999.5 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 11.3 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193695.4 **EASTING:** 1567201.7
SAMPLING METHOD: UD, SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	



GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/20/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B- 4 *Sheet 1 of 1*
DATE DRILLED: 06/21/2022	**ELEVATION:** 1000.3 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 10.8 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193637.4 **EASTING:** 1567243.5
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0					ASPHALT, 6 in			
0.5					GRAVEL BASE, 6 in			
1.0		Residuum		SPT-1 (12 in)	LEAN CLAY (CL), firm to stiff, red brown, slightly moist	3-4-5 N = 9	●	
5				SPT-2 (12 in)		2-3-4 N = 7	●	996
				SPT-3 (12 in)		5-6-8 N = 14	●	
8.0					FAT CLAY (CH), stiff, red brown, moist			
10				SPT-4 (12 in)		3-7-6 N = 13	●	991
10.6	Auger refusal at 10.8 feet				Weathered Limestone			
10.8					Borehole terminated at 10.8 feet			
15								986
20								981
25								976
30								971
35								966

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/20/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B- 5 *Sheet 1 of 1*
DATE DRILLED: 06/20/2022	**ELEVATION:** 1000.2 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 19.5 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193821.0 **EASTING:** 1566947.6
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0								
				SPT-1 (11 in)	TOPSOIL, 4 in	7-5-4		
	0.3				FAT CLAY (CH), firm to stiff, red brown, slightly moist	N = 9		
				SPT-2 (10 in)		6-4-5		
						N = 9		
				SPT-3 (10 in)		3-3-5		
5						N = 8		996
				SPT-4		4-5-5		
						N = 10		
	8.2	Residuum			ELASTIC SILT WITH SAND (MH), degraded Chert, limestone fragments, stiff to very stiff, red brown, slightly moist	5-6-7		
10				SPT-5 (11 in)		N = 13		991
						16-15-5		
15				SPT-6 (11 in)		N = 20		986
						50/3"		
	19.1	Rock		SPT-7	Weathered Limestone	N = 50/3"		981
20	Auger refusal at 19.5 feet				Borehole terminated at 19.5 feet			
	19.5							
25								976
30								971
35								966

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/20/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B- 6 *Sheet 1 of 1*
DATE DRILLED: 06/20/2022	**ELEVATION:** 999.7 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 25.4 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193734.6 **EASTING:** 1567031.6
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0								
	0.2			SPT-1 (11 in)	TOPSOIL, 2 in	6-6-7 N = 13		
				SPT-2 (11 in)	SILT (ML), little, stiff, red brown, slightly moist	6-5-7 N = 12		
5				SPT-3 (12 in)		5-5-5 N = 10		995
				SPT-4 (12 in)		3-4-5 N = 9		
10				SPT-5 (12 in)		6-7-8 N = 15		990
	11.1	Residuum			ELASTIC SILT (MH), little degraded Chert, stiff, red brown, slightly moist			
15				SPT-6 (12 in)		6-7-9 N = 16		985
20				SPT-7 (12 in)		5-5-7 N = 12		980
25				SPT-8 (10 in)		3-3-50/5" N = 50/5"		975
	Auger refusal at 25.4 feet 25.3 25.4				Weathered Limestone Borehole terminated at 25.4 feet			
30								970
35								

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/20/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B- 7 *Sheet 1 of 1*
DATE DRILLED: 06/20/2022	**ELEVATION:** 999.6 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 16.3 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193705.6 **EASTING:** 1567133.5
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0					ASPHALT, 4 in (0.3)			
					GRAVEL BASE 9 in (1.1)			
				SPT-1 (10 in)	LEAN CLAY (CL), firm, brown and red, mottled, slightly moist	2-3-3 N = 6	●	
5				SPT-2 (12 in)		3-3-4 N = 7	●	995
				SPT-3 (12 in)		2-3-4 N = 7	●	
		Residuum			FAT CLAY (CH), stiff, red brown, moist (8.2)			
10				SPT-4 (12 in)		5-6-7 N = 13	●	990
15				SPT-5 (12 in)		2-2-7 N = 9	●	985
	Auger refusal at 16.3 feet				Weathered Limestone (16.1) Borehole terminated at 16.3 feet (16.3)			
20								980
25								975
30								970
35								965

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/20/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B- 8 *Sheet 1 of 1*
DATE DRILLED: 06/20/2022	**ELEVATION:** 1001.3 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 31.3 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA, NQ	**LOGGED BY:** Deron Zierer	**NORTHING:** 193597.1 **EASTING:** 1567188.9
SAMPLING METHOD: SS, CORE, UD	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0					ASPHALT, 6 in			
0.5					GRAVEL BASE, 6 in			
1.0				SPT-1 (12 in)	LEAN CLAY (CL), some ferrous nodules, firm, dark red brown, slightly moist	2-4-4 N = 8	●	
5				SPT-2 (12 in)		2-3-4 N = 7	● ○	997
5.5		Residuum		UD-1 REC-100%	ELASTIC SILT WITH SAND (MH), some ferrous nodules, few degraded Chert, firm, dark red brown, slightly moist		○ ⊢	
	Soil UCS= 5.301 KSF							
10				SPT-3 (10 in)		3-2-3 N = 5	● ○	992
11.0					Weathered Limestone			
11.3	Auger refusal at 11.3 feet Rock UCS= 11,251 psi			R-1 REC-98% RQD-70%	LIMESTONE AND SHALE, dark gray to pale gray, very thinly laminated, freshly weathered			987
15								
15.9					LIMESTONE, pale gray, very thinly laminated, Some shale partings			
18.9				R-2 REC-100% RQD-60%	LIMESTONE, light gray, very thinly laminated, Heavily Jointed, 50- 85			982
20								
20.9		Rock			LIMESTONE, pale gray, very thinly laminated *Lost Water*			
25				R-3 REC-100% RQD-86%				977
				R-4 REC-100% RQD-62%				972
30								
31.3					Borehole terminated at 31.3 feet			
35								967

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/20/2022	28.2	
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B- 9 *Sheet 1 of 1*
DATE DRILLED: 06/22/2022	**ELEVATION:** 999.7 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 14.4 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193709.2 **EASTING:** 1566952.8
SAMPLING METHOD: SS, UD	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0								
0.2				SPT-1 (10 in)	TOPSOIL, 2 in	7-8-7		
					LEAN CLAY (CL), firm to stiff, brown, slightly moist	N = 15		
				SPT-2 (10 in)		4-6-7		
						N = 13		
				SPT-3 (10 in)		4-4-4		
5						N = 8		995
6.0		Residuum			FAT CLAY (CH), stiff, red brown, moist			
				SPT-4 (10 in)		4-5-7		
						N = 12		
	Soil UCS= 1.444			UD-1 REC-100%				
10				SPT-5 (10 in)		3-6-5		990
						N = 11		
14.1				SPT-6 (2 in)	Weathered Limestone	50/5"		
14.4	Auger refusal at 14.4 feet				Borehole terminated at 14.4 feet	N = 50/5"		985
15								
20								980
25								975
30								970
35								

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/21/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-10 *Sheet 1 of 1*
DATE DRILLED: 06/21/2022	**ELEVATION:** 1001.1 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 14.8 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193556.6 **EASTING:** 1567125.4
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0					ASPHALT, 6 in			
0.5					GRAVEL BASE, 6 in			
1.0				SPT-1 (10 in)	LEAN CLAY (CL), soft, red brown, slightly moist	1-2-2 N = 4	●	
3.1				SPT-2 (12 in)	LEAN CLAY (CL), stiff, red brown, slightly moist	4-5-6 N = 11	●	997
5				SPT-3 (12 in)		4-5-8 N = 13	●	
8.0		Residuum		SPT-4 (12 in)	FAT CLAY (CH), stiff, red brown, moist	4-6-6 N = 12	●	992
10								
14.2		Rock		SPT-5 (6 in)	Weathered Limestone	7-50/4" N = 50/4"	●	987
14.8	Auger refusal at 14.8 feet				Borehole terminated at 14.8 feet			
15								
20								982
25								977
30								972
35								967

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/21/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-11 *Sheet 1 of 1*
DATE DRILLED: 06/22/2022	**ELEVATION:** 998.5 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 28.0 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA, NQ	**LOGGED BY:** Deron Zierer	**NORTHING:** 193675.8 **EASTING:** 1566892.6
SAMPLING METHOD: CORE, SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines ○ NMC ⊢ PL---LL; 20 40 60 80)	ELEVATION
0								
0.2		Fill		SPT-1 (10 in)	TOPSOIL, 2 in LEAN CLAY WITH GRAVEL (CL), limestone fragments, stiff to very stiff, dark brown	5-10-8 N = 18	●	
2.0		Residuum		SPT-2 (10 in)	LEAN CLAY (CL), stiff, red brown, slightly moist	4-5-7 N = 12	●	
5				SPT-3 (12 in)		5-5-5 N = 10	●	994
				SPT-4 (12 in)		6-5-8 N = 13	●	
7.9	Auger refusal at 8.0 feet				Weathered Limestone			
8.0					LIMESTONE, light gray and dark gray, moderately weathered, Clay partings throughout			
9.6				R-1 REC-100% RQD-36%				989
10					LIMESTONE AND CALCAREOUS SHALE, light gray and dark gray, very thinly laminated, slightly weathered			
12.1					LIMESTONE, light gray to dark gray, very thinly laminated			
15	Rock UCS= 11,561 psi	Rock		R-2 REC-100% RQD-62%				984
20				R-3 REC-100% RQD-54%				979
24.5				R-4 REC-96% RQD-74%	LIMESTONE, light gray to gray, Heavily Jointed 90-70			974
25								
28.0					Borehole terminated at 28.0 feet			
30								969
35								964

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/22/2022	24.0	
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-12 *Sheet 1 of 1*
DATE DRILLED: 06/21/2022	**ELEVATION:** 999.4 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 9.1 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193626.1 **EASTING:** 1566934.1
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

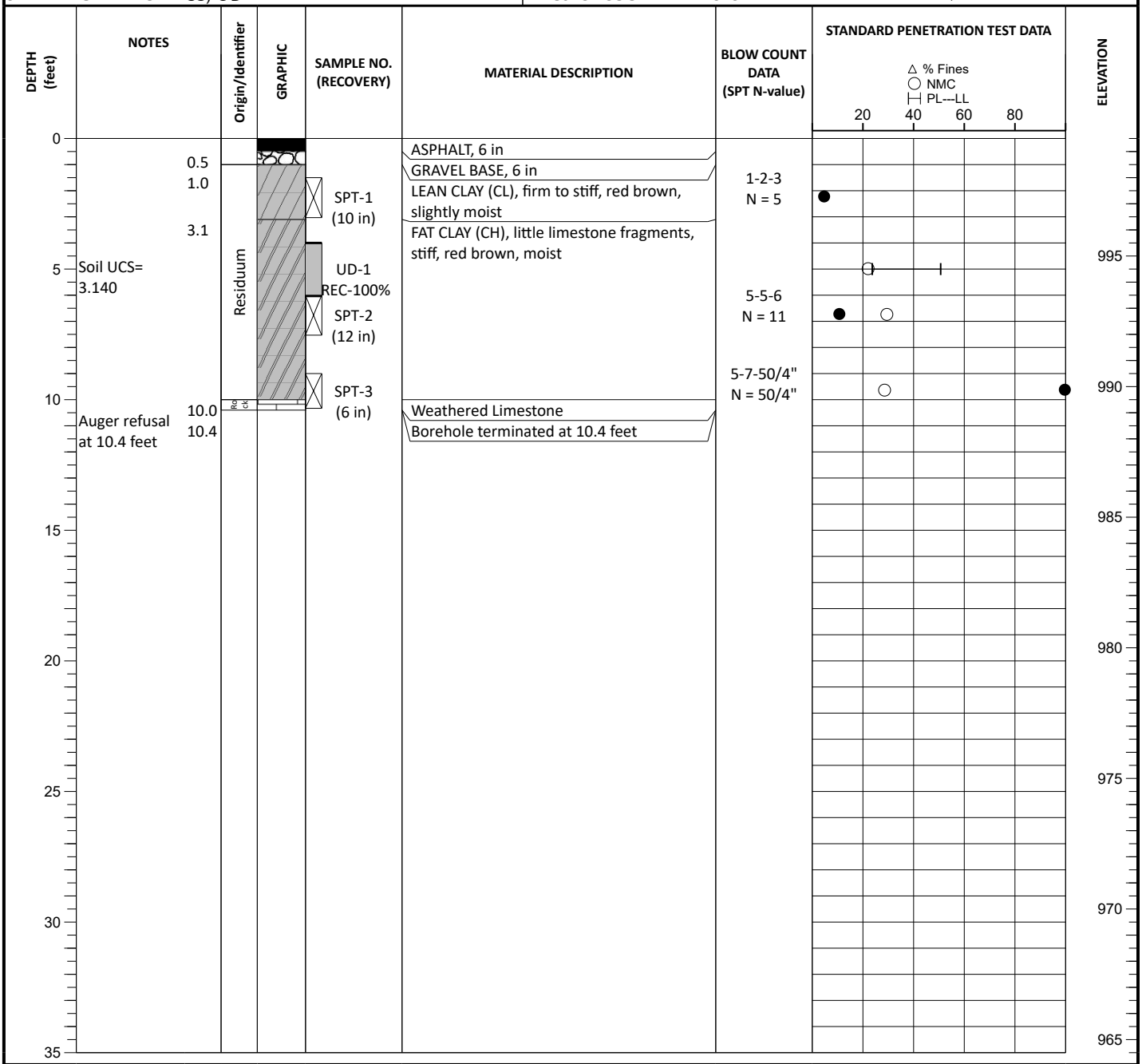
DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0								
				SPT-1 (10 in)	TOPSOIL, 1 in	6-13-6		
	0.1	Fill			LEAN CLAY (CL), firm to very stiff, dark gray, slightly moist	N = 19		
				SPT-2 (6 in)		3-3-4		
	3.0					N = 7		
		Residuum			LEAN CLAY WITH SAND (CL), degraded Chert, firm, red brown, slightly moist	2-3-4		
5				SPT-3 (10 in)		N = 7		995
						3-2-3		
				SPT-4 (10 in)		N = 5		
	8.9			SPT-5 (1 in)	Weathered Limestone	50/1"		
10	Auger refusal at 9.1 feet 9.1				Borehole terminated at 9.1 feet	N = 50/1"		990
15								985
20								980
25								975
30								970
35								965

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/21/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-13 *Sheet 1 of 1*
DATE DRILLED: 06/21/2022	**ELEVATION:** 999.5 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 10.4 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193552.2 **EASTING:** 1566982.6
SAMPLING METHOD: SS, UD	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	



GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/21/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-14 *Sheet 1 of 1*
DATE DRILLED: 06/21/2022	**ELEVATION:** 1000.5 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 12.3 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193498.4 **EASTING:** 1567070.2
SAMPLING METHOD: SS, UD	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0					ASPHALT, 6 in			
0.5					GRAVEL BASE, 6 in			
1.0				SPT-1 (12 in)	LEAN CLAY (CL), little ferrous nodules, firm to stiff	3-3-4 N = 7	●	
5		Residuum		SPT-2 (10 in)		3-7-6 N = 13	●	996
6.0				UD-1 REC-100%	FAT CLAY (CH), stiff, red brown, moist, iron oxide staining			
10				SPT-3 (12 in)		4-6-8 N = 14	●	991
12.0	Auger refusal at 12.3 feet				Weathered Limestone			
12.3					Borehole terminated at 12.3 feet			
15								986
20								981
25								976
30								971
35								966

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/21/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-15 *Sheet 1 of 1*
DATE DRILLED: 06/21/2022	**ELEVATION:** 999.2 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 28.2 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA, NQ	**LOGGED BY:** Deron Zierer	**NORTHING:** 193458.3 **EASTING:** 1566998.9
SAMPLING METHOD: CORE, SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0					ASPHALT, 6 in			
0.5					GRAVEL BASE, 7 in			
1.1		Residuum		SPT-1 (12 in)	LEAN CLAY (CL), firm to stiff, red brown, moist	1-2-3 N = 5	●	
5				SPT-2 (12 in)		4-6-5 N = 11	● ○	995
				SPT-3 (12 in)		3-4-5 N = 9	● ○	
8.0					Weathered Limestone			
8.2	Auger refusal at 8.2 feet Rock UCS= 13,098 psi			R-1 REC-96% RQD-40%	LIMESTONE, pale gray to dark gray, very thinly laminated, slightly weathered *4 in void*			990
10								
13.7				R-2 REC-100% RQD-68%	LIMESTONE, pale gray to light gray, very thinly laminated, Some calcareous shale partings			985
15								
18.0		Rock			LIMESTONE, pale gray and dark gray, very thinly laminated			980
20				R-3 REC-100% RQD-65%				
25				R-4 REC-100% RQD-66%				975
28.2					Borehole terminated at 28.2 feet			970
30								
35								965

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/21/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-16 *Sheet 1 of 1*
DATE DRILLED: 06/22/2022	**ELEVATION:** 993.9 ft	**NOTES:** Offset 5 ft S, shaded no grass
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 8.5 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193461.4 **EASTING:** 1566880.6
SAMPLING METHOD: SS, UD	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0								
	0.1			SPT-1 (12 in)	TOPSOIL, 1 in	7-10-9		
					LEAN CLAY (CL), stiff to very stiff, brown, slightly moist	N = 19		
				SPT-2 (10 in)		5-6-5		
						N = 11		
5		Residuum		UD-1 REC-100%				989
						6-5-7		
				SPT-3 (12 in)		N = 12		
	Auger refusal at 8.5 feet 8.4				Weathered Limestone			
10	8.5				Borehole terminated at 8.5 feet			984
15								979
20								974
25								969
30								964
35								

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/22/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-17 *Sheet 1 of 1*
DATE DRILLED: 06/21/2022	**ELEVATION:** 995.8 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 7.5 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193425.7 **EASTING:** 1566955.1
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0					ASPHALT, 6 in			
0.5					GRAVEL BASE, 6 in			
1.0		Fill		SPT-1 (12 in)	LEAN CLAY (CL), brick fragments, firm, dark brown to dark gray	2-2-3 N = 5	●	
2.0		Residuum		SPT-2 (10 in)	LEAN CLAY (CL), firm, red brown, slightly moist	3-4-5 N = 9	●	991
5				SPT-3		2-50/5" N = 50/5"	●	
7.3					Weathered Limestone			
7.5	Auger refusal at 7.5 feet				Borehole terminated at 7.5 feet			986
10								
15								981
20								976
25								971
30								966
35								

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/21/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-18 *Sheet 1 of 1*
DATE DRILLED: 06/21/2022	**ELEVATION:** 996.9 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 10.3 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193394.4 **EASTING:** 1567006.4
SAMPLING METHOD: UD, SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0					ASPHALT, 6 in			
0.5					GRAVEL BASE, 6 in			
1.0		Residuum		SPT-1 (12 in)	ELASTIC SILT (MH), firm to stiff, red brown, slightly moist	3-3-4 N = 7	●	
5				SPT-2 (10 in)		5-5-8 N = 13	● ○	992
	Soil UCS= 6.160 KSF			UD-1 REC-100%			○ ⊢	
				SPT-3 (12 in)		4-6-7 N = 13	● ○	
10								987
10.0					Weathered Limestone			
10.3	Auger refusal at 10.3 feet				Borehole terminated at 10.3 feet			
15								982
20								977
25								972
30								967
35								

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/21/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-19 *Sheet 1 of 1*
DATE DRILLED: 06/22/2022	**ELEVATION:** 993.6 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 33.4 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA, NQ	**LOGGED BY:** Deron Zierer	**NORTHING:** 193341.6 **EASTING:** 1566912.2
SAMPLING METHOD: CORE, SS, AU	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0								
0.4		Fill		SPT-1 (10 in)	TOPSOIL, 5 in	5-11-9 N = 20		
				SPT-2 (10 in)	LEAN CLAY WITH GRAVEL (CL), few construction debris, very stiff	5-7-9 N = 16		
3.5		Residuum		SPT-3 (11 in)	LEAN CLAY (CL), firm to stiff, brown, slightly moist	4-3-3 N = 6		989
5				SPT-4 (11 in)		4-5-6 N = 11		
8.5				SPT-5 (12 in)	FAT CLAY (CH), stiff, red brown, slightly moist	12-5-7 N = 12		984
10								
13.0					Weathered Limestone			
13.4	Auger refusal at 13.4 feet Rock UCS= 8,812 psi				LIMESTONE, gray to light gray, very thinly laminated, slightly weathered, Clay partings throughout			
14.6				R-1 REC-100% RQD-72%				979
15								
16.4					LIMESTONE AND CALCAREOUS SHALE, light gray to dark gray, very thinly laminated			
					LIMESTONE, light gray to pale gray, very thinly laminated			974
20				R-2 REC-100% RQD-58%				
22.5 ▽		Rock			LIMESTONE, pale gray to light gray, very thinly laminated, slightly weathered, Fractured, clay partings throughout			
24.1					LIMESTONE, light gray to pale gray, very thinly laminated			969
25				R-3 REC-100% RQD-82%				
30				R-4 REC-100% RQD-90%				964
33.4					Borehole terminated at 33.4 feet			959
35								

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/22/2022	23.0	
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-20 *Sheet 1 of 1*
DATE DRILLED: 06/20/2022	**ELEVATION:** 991.4 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 14.7 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193371.0 **EASTING:** 1566815.5
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0								
0.1				SPT-1 (7 in)	TOPSOIL, 1 in	6-13-9		
		Fill		SPT-2 (8 in)	LEAN CLAY WITH GRAVEL (CL), little construction debris, firm to very stiff, dark brown and dark gray	N = 22 4-7-6 N = 13		
5				SPT-3 (8 in)		3-3-3 N = 6		987
6.0				SPT-4 (12 in)	LEAN CLAY (CL), stiff, red brown, slightly moist	4-4-6 N = 10		
8.8		Residuum		SPT-5 (12 in)	FAT CLAY (CH), little limestone fragments, stiff, red brown, moist	5-6-7 N = 13		982
10								
14.1		Rock		SPT-6	Weathered Limestone	50/1" N = 50/1"		977
14.7	Auger refusal at 14.7 feet				Borehole terminated at 14.7 feet			
15								
20								972
25								967
30								962
35								957

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/22/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-21 *Sheet 1 of 1*
DATE DRILLED: 06/22/2022	**ELEVATION:** 993.1 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 3.8 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193283.8 **EASTING:** 1566889.3
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0								
	0.1	Fill		SPT-1 (10 in)	TOPSOIL, 1 in	10-11-12 N = 23		
	1.0	Residuum		SPT-2 (10 in)	SANDY LEAN CLAY WITH GRAVEL (CL), light brown	11-11-13 N = 24		
					LEAN CLAY (CL), very stiff, light brown, slightly moist			
	3.6				Weathered Limestone			
5	Auger refusal at 3.8 feet 3.8				Borehole terminated at 3.8 feet			989
10								984
15								979
20								974
25								969
30								964
35								959

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/22/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-22 *Sheet 1 of 1*
DATE DRILLED: 06/22/2022	**ELEVATION:** 998.3 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 17.3 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193268.3 **EASTING:** 1566951.7
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0								
				SPT-1 (9 in)	TOPSOIL, 3 in	10-11-11 N = 22		
0.2		Fill			LEAN CLAY (CL), few construction debris, very stiff, dark brown, slightly moist			
				SPT-2 (8 in)		10-11-9 N = 20		
						9-11-9 N = 20		994
5				SPT-3 (7 in)				
6.0					LEAN CLAY (CL), stiff, red brown, slightly moist	6-5-6 N = 11		
				SPT-4 (12 in)				
8.9		Residuum			FAT CLAY (CH), little ferrous nodules, stiff, red brown, slightly moist	3-6-7 N = 13		989
10				SPT-5 (12 in)				
						6-7-8 N = 15		984
15				SPT-6 (12 in)				
17.0	Auger refusal at 17.3 feet				Weathered Limestone			
17.3					Borehole terminated at 17.3 feet			
20								979
25								974
30								969
35								964

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/22/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

PROJECT:	UK Health Education Building Lexington, KY S&ME Project No. 22830088	BORING LOG: B-23 *Sheet 1 of 1*
DATE DRILLED: 06/22/2022	**ELEVATION:** 993.5 ft	**NOTES:**
DRILL RIG: D-50	**DATUM:** NAVD88	
DRILLER: Damain Caudill	**BORING DEPTH:** 8.2 ft	
HAMMER TYPE: Automatic hammer	**CLOSURE:** Auger Cuttings	
DRILLING METHOD: 3-1/4" HSA	**LOGGED BY:** Deron Zierer	**NORTHING:** 193214.9 **EASTING:** 1566930.6
SAMPLING METHOD: SS	**PROJECT COORDINATE SYSTEM -** NAD 1983 StatePlane Kentucky North FIPS 1601 Feet	

DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA (△ % Fines, ○ NMC, ⊢ PL---LL; 20 40 60 80)	ELEVATION
0								
0.3		Fill		SPT-1 (10 in)	TOPSOIL, 4 in	7-10-11		
					SANDY LEAN CLAY WITH GRAVEL (CL), little limestone fragments, stiff to very stiff	N = 21		
				SPT-2 (11 in)		5-8-7		
3.2						N = 15		
		Residuum			LEAN CLAY (CL), few ferrous nodules, very stiff, red brown, slightly moist	6-9-11		
5				SPT-3 (11 in)		N = 20		989
						11-11-8		
				SPT-4 (10 in)		N = 19		
8.0	Auger refusal at 8.2 feet				Weathered Limestone			
8.2					Borehole terminated at 8.2 feet			
10								984
15								979
20								974
25								969
30								964
35								959

GROUNDWATER		DATE	DEPTH (FT)	REMARKS
ATD	▽			
END OF DRILLING	▼	06/22/2022		not encountered
AFTER DRILLING	▼			
AFTER DRILLING	▼			

Vertical Accuracy: Land Survey, Horizontal Accuracy: Land Survey

GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL = Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), AR = Auger Refusal

FIELD TESTING PROCEDURES

Field Operations: The general field procedures employed by S&ME, Inc. are summarized in ASTM D 420 which is entitled "Investigating and Sampling Soils and Rocks for Engineering Purposes." This recommended practice lists recognized methods for determining soil and rock distribution and ground water conditions. These methods include geophysical and in situ methods as well as borings.

Borings are drilled to obtain subsurface samples using one of several alternate techniques depending upon the subsurface conditions. These techniques are:

a. Continuous 2-1/2 or 3-1/4 inch I.D. hollow stem augers;
b. Wash borings using roller cone or drag bits (mud or water);
c. Continuous flight augers (ASTM D 1425).

These drilling methods are not capable of penetrating through material designated as "refusal materials." Refusal, thus indicated, may result from hard cemented soil, soft weathered rock, coarse gravel or boulders, thin rock seams, or the upper surface of sound continuous rock. Core drilling procedures are required to determine the character and continuity of refusal materials.

The subsurface conditions encountered during drilling are reported on a field test boring record by a field engineer who is on site to direct the drilling operations and log the recovered samples. The record contains information concerning the boring method, samples attempted and recovered, indications of the presence of various materials such as coarse gravel, cobbles, etc., and observations between samples. Therefore, these boring records contain both factual and interpretive information. The field boring records are on file in our office.

The soil and rock samples plus the field boring records are reviewed by a geotechnical engineer. The engineer classifies the soils in general accordance with the procedures outlined in ASTM D 2488 and prepares the final boring records that are the basis for all evaluations and recommendations.

The final boring records represent our interpretation of the contents of the field records based on the results of the engineering examinations and tests of the field samples. These records depict subsurface conditions at the specific locations and at the particular time when drilled. Soil conditions at other locations may differ from conditions occurring at these boring locations. Also, the passage of time may result in a change in the subsurface soil and ground water conditions at these boring locations. The lines designating the interface between soil or refusal materials on the records and on profiles represent approximate boundaries. The transition between materials may be gradual. The final boring records are included with this report. The detailed data collection methods using during this study are discussed on the following pages.

Soil Test Borings: Soil test borings were made at the site at locations shown on the attached Boring Plan. Soil sampling and penetration testing were performed in accordance with ASTM D 1586.

The borings were made by mechanically twisting a 5-5/8” outer diameter auger into the soil. At regular intervals, the drilling tools were removed and samples obtained with a standard 1.4 inch I.D., 2 inch O.D., split tube sampler. The sampler was first seated 6 inches to penetrate any loose cuttings, then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot was recorded and is designated the "penetration resistance”.

Representative portions of the samples, thus obtained, were placed in glass jars and transported to the laboratory. In the laboratory, the samples were examined to verify the driller's field classifications. Test Boring Records are attached which graphically show the soil descriptions and penetration resistances.

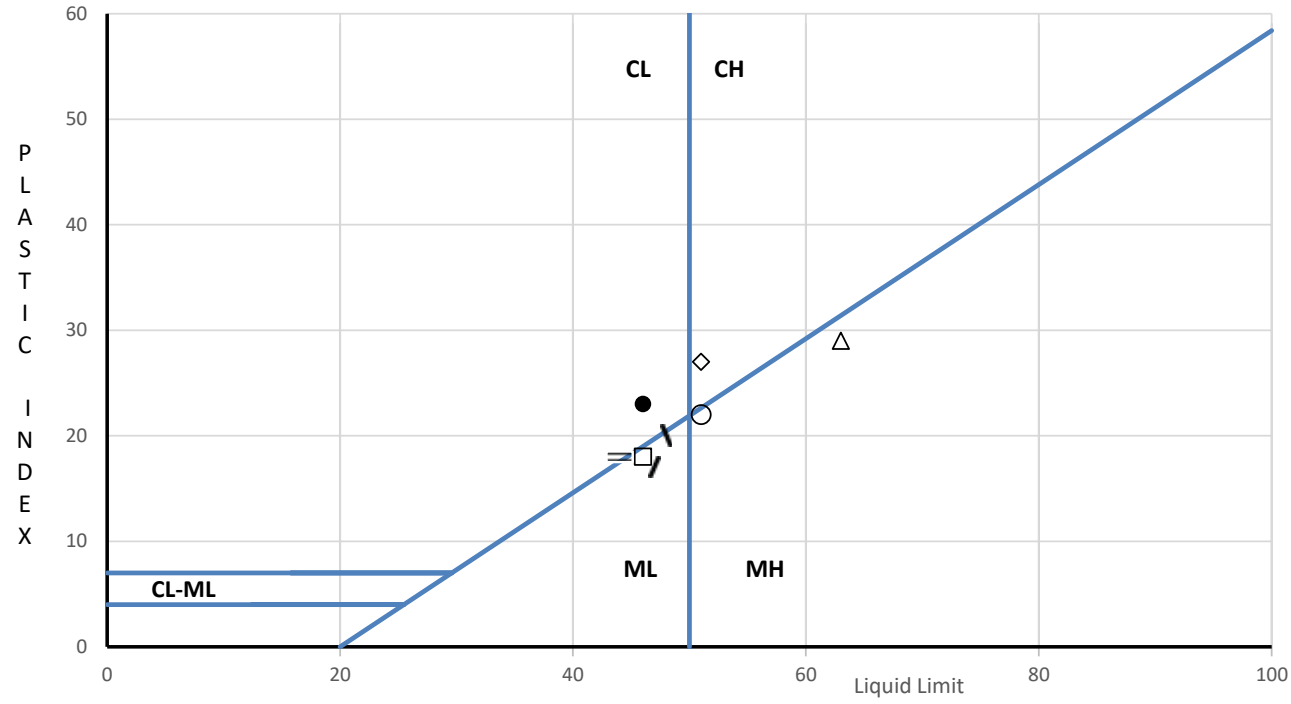
Soil Auger Soundings: Soil auger soundings were made at the site at the locations shown on the attached Boring Location Plan. The soundings were performed by mechanically twisting a steel auger into the soil. However, unlike the soil test borings, a smaller diameter solid stem auger was used and no split-spoon samples were obtained. The driller provided a general description of the soil encountered by observing the soils brought to the surface by the twisting auger. The auger was advanced until refusal materials were encountered and the refusal depth was noted by the driller. The auger is then withdrawn and the depths to water or caved materials are then measured and recorded by the driller.

Soil auger soundings provide a rapid, economical method of obtaining the approximate bedrock depth, groundwater depth, and general soil conditions at locations where detailed soil testing and sampling is not required.

Water Level Readings: Water table readings are normally taken in conjunction with borings and are recorded on the "Test Boring Records". These readings indicate the approximate location of the hydrostatic water table at the time of our field investigation. Where impervious soils are encountered (clayey soils) the amount of water seepage into the boring is small, and it is generally not possible to establish the location of the hydrostatic water table through water level readings. The ground water table may also be dependent upon the amount of precipitation at the site during a particular period of time. Fluctuations in the water table should be expected with variations in precipitation, surface run-off, evaporation and other factors.

The time of boring water level reported on the boring records is determined by field crews as the drilling tools are advanced. The time of boring water level is detected by changes in the drilling rate, soil samples obtained, etc. Additional water table readings are generally obtained at least 24 hours after the borings are completed. The time lag of at least 24 hours is used to permit stabilization of the ground water table which has been disrupted by the drilling operations. The readings are taken by dropping a weighted line down the boring or using an electrical probe to detect the water level surface. Occasionally the borings will cave-in, preventing water level readings from being obtained or trapping drilling water above the caved-in zone. The cave-in depth is also measured and recorded on the boring records.

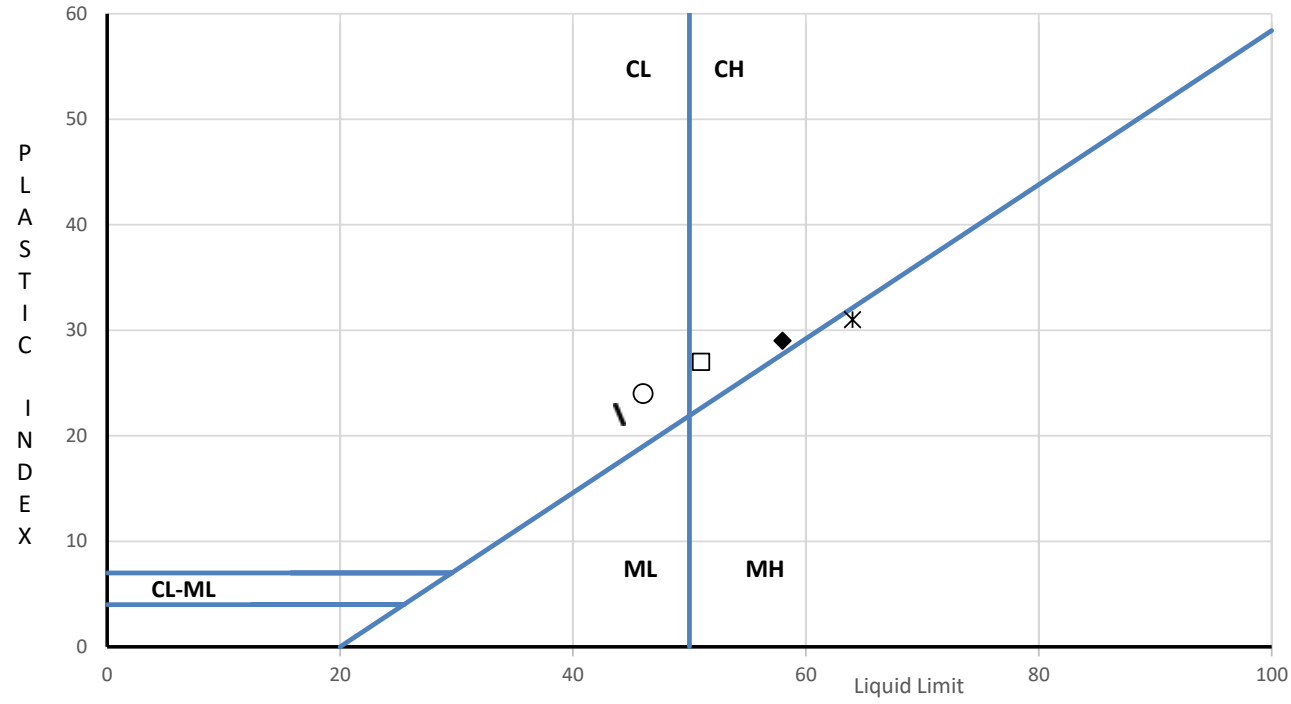
Appendix III – Laboratory Testing Results



Specimen Identification				MC	LL	PL	PI	Fines	Classification (symbol is based on minus 40 material only when no grain size information is present.)	
	ID	No.	Top Depth						Symbol	Name
	B- 2	SPT-3	6	36.8						
	B- 2	SPT-4	9	33.3						
	B- 2	SPT-5	14	32.6						
●	B- 2	UD-1	4	21.7	46	23	23		CL	
	B- 3	SPT-2	1.5	10.1						
	B- 3	SPT-3	4	24.6						
□	B- 3	UD-1	8	29.6	46	28	18		ML	
◇	B- 5	SPT-3	4	25.8	51	24	27		CH	
△	B- 5	SPT-5	9	39.1	63	34	29		MH	
	B- 5	SPT-6	14	34.4						
	B- 5	SPT-7	19	26.5						
\	B- 6	SPT-3	4	23.3	48	28	20		ML	
/	B- 6	SPT-5	9	25.7	47	30	17		ML	
○	B- 6	SPT-6	14	27.2	51	29	22		MH	
	B- 6	SPT-7	19	31.9						
	B- 8	SPT-2	4	27.2						
	B- 8	SPT-3	9	30.6						
‖	B- 8	UD-1	6	31.6	66	35	31		MH	
=	B- 9	SPT-3	4	24.0	44	26	18		CL	
	B- 9	SPT-5	10	38.7						

INDEX TEST RESULTS

Project Name	UK Health Education Building
Project Number	22830088
Approved by	Date
Jacob Olson	7/19/2022 16:40



Specimen Identification				MC	LL	PL	PI	Fines	Classification (symbol is based on minus 40 material only when no grain size information is present.)	
	ID	No.	Top Depth						Symbol	Name
	B- 9	SPT-6	14	19.5						
◆	B- 9	UD-1	8	35.1	58	29	29		CH	
	B-12	SPT-3	4	26.5						
	B-12	SPT-5	9	29.1						
	B-13	SPT-2	6	29.6						
	B-13	SPT-3	9	28.7						
□	B-13	UD-1	4	22.2	51	24	27		CH	
	B-15	SPT-2	4	30.5						
	B-18	SPT-2	4	28.7						
	B-18	SPT-3	8	24.6						
✳	B-18	UD-1	6	29.6	64	33	31		MH	
\	B-19	ite Bulk B-	5	16.2	44	22	22		CL	
	B-20	SPT-3	4	24.4						
○	B-20	SPT-4	6.5	24.5	46	22	24		CL	
	B-20	SPT-5	9	25.6						
	B-20	SPT-6	14	13.6						
	B-22	SPT-5	9	23.6						
	B-22	SPT-6	14	29.5						

INDEX TEST RESULTS

Project Name	UK Health Education Building
Project Number	22830088
Approved by	Date
Jacob Olson	7/19/2022 16:40

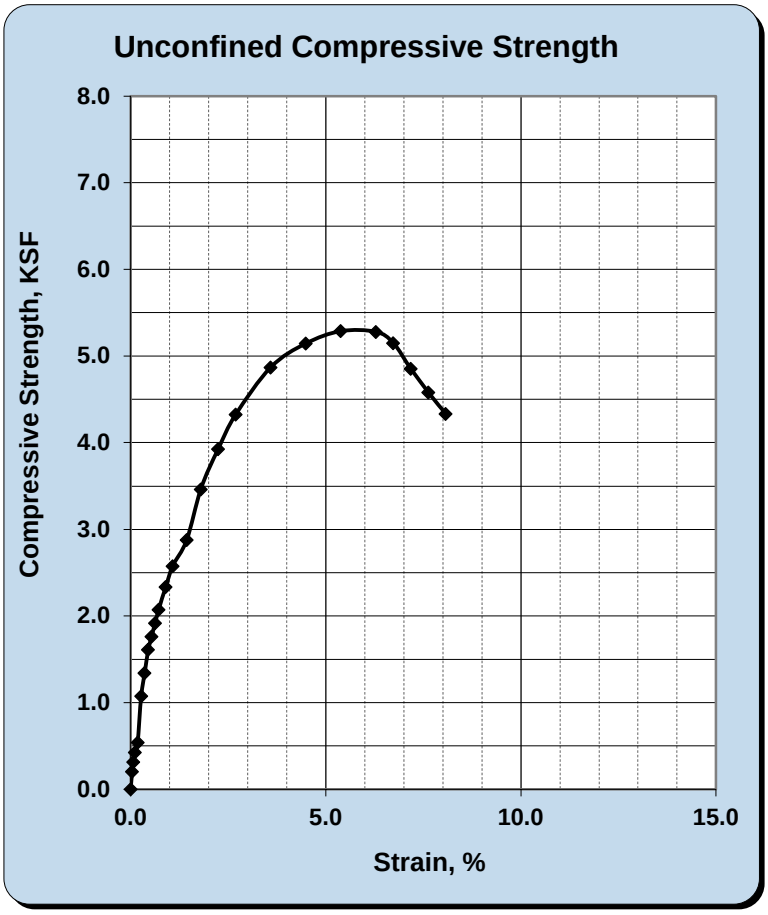
Form No. TR-D2166-01-C
Revision No. : 1LEXb
Revision Date: 09/02/20

UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS

ASTM D2166

S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

Project No.:	22830088	Report Date:	7/19/2022
Project Name:	UK Health Education Building	Test Date(s):	7/12/2022
Client Name:	JRA Architects		
Client Address:	3225 Summit Square Place, Suite 200, Lexington, KY		
Type:	UD	Sample Date:	6/28/2022
Location:	B-2	Depth (ft.):	4.5 - 5.0
Sample Description:	LEAN CLAY (CL), brown		



Failed Specimen

Type of Sample: Intact
Source of Moisture Sample: 3/4 Specimen

Initial Dry Unit Weight: 100.7 pcf
Initial Water Content: 21.7%
Unconfined Compressive Strength, q_u: **5.288** KSF
Undrained Shear Strength, s_u: **2.644** KSF

Liquid Limit: 46
Plasticity Index: 23
Height to Diameter Ratio: 1.9
Rate of Strain (%/min.): 1.1
Strain at Failure: 5.4%

References / Comments / Deviations:

Jacob Folsom	Jacob Folsom	Lab Services Manager	7/19/2022
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D2166-01-C
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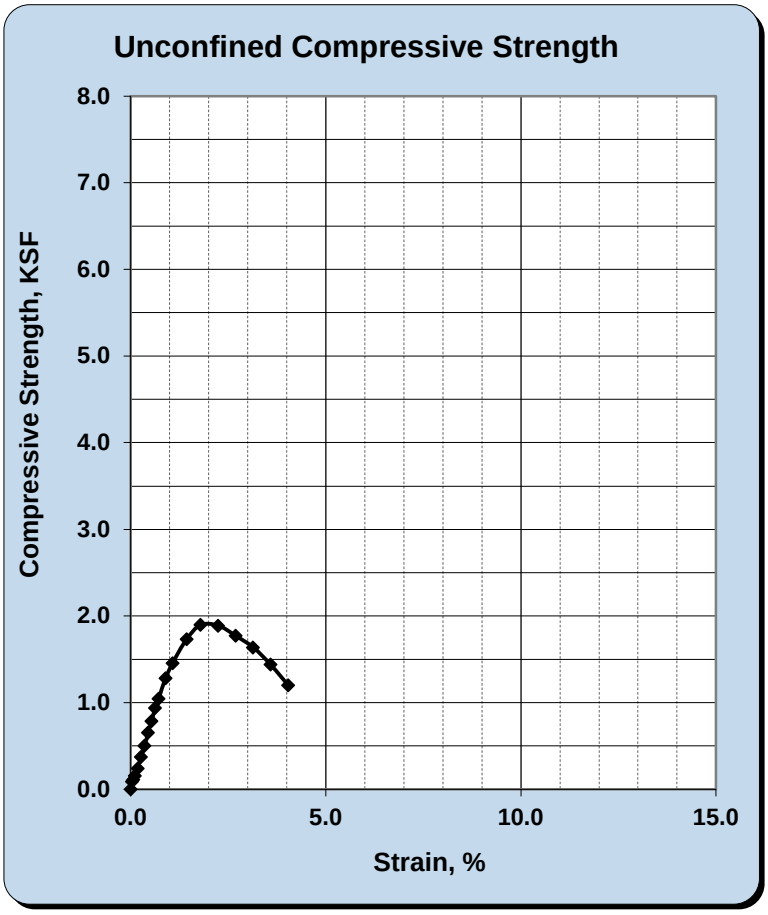
UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS

ASTM D2166

S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

Project No.:	22830088	Report Date:	7/19/2022
Project Name:	UK Health Education Building	Test Date(s):	7/12/2022
Client Name:	JRA Architects		
Client Address:	3225 Summit Square Place, Suite 200, Lexington, KY		
Type:	UD	Sample Date:	6/28/2022
Location:	B-3	Depth (ft.):	8.3 - 8.8
Sample Description:	SILT (ML), brown		



Failed Specimen

Type of Sample: Intact
Source of Moisture Sample: 3/4 Specimen

Initial Dry Unit Weight: 87.6 pcf
Initial Water Content: 29.6%
Unconfined Compressive Strength, q_u: **1.897** KSF
Undrained Shear Strength, s_u: **0.949** KSF

Liquid Limit: 46
Plasticity Index: 18
Height to Diameter Ratio: 1.9
Rate of Strain (%/min.): 1.1
Strain at Failure: 1.8%

References / Comments / Deviations:

Jacob Folsom	Jacob Folsom	Lab Services Manager	7/19/2022
Technical Responsibility	*Signature*	*Position*	*Date*

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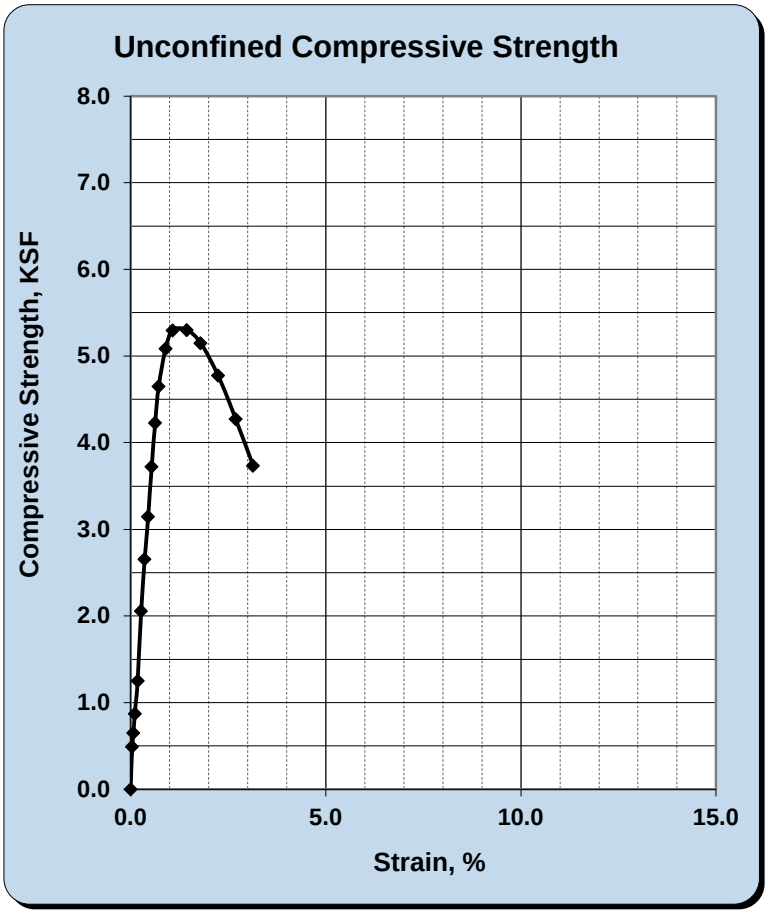
Revision Date: 09/02/20

UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS

ASTM D2166

S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

Project No.:	22830088	Report Date:	7/19/2022
Project Name:	UK Health Education Building	Test Date(s):	7/12/2022
Client Name:	JRA Architects		
Client Address:	3225 Summit Square Place, Suite 200, Lexington, KY		
Type:	UD	Sample Date:	6/28/2022
Location:	B-8	Depth (ft.):	6.5 - 7.0
Sample Description:	ELASTIC SILT (MH), yellow brown		



Failed Specimen

Type of Sample: Intact
Source of Moisture Sample: 3/4 Specimen

Initial Dry Unit Weight: 90.4 pcf
Initial Water Content: 31.6%
Unconfined Compressive Strength, q_u: **5.301** KSF
Undrained Shear Strength, s_u: **2.651** KSF

Liquid Limit: 66
Plasticity Index: 31
Height to Diameter Ratio: 2.0
Rate of Strain (%/min.): 1.1
Strain at Failure: 1.4%

References / Comments / Deviations:

Jacob Folsom	Jacob Folsom	Lab Services Manager	7/19/2022
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D2166-01-C
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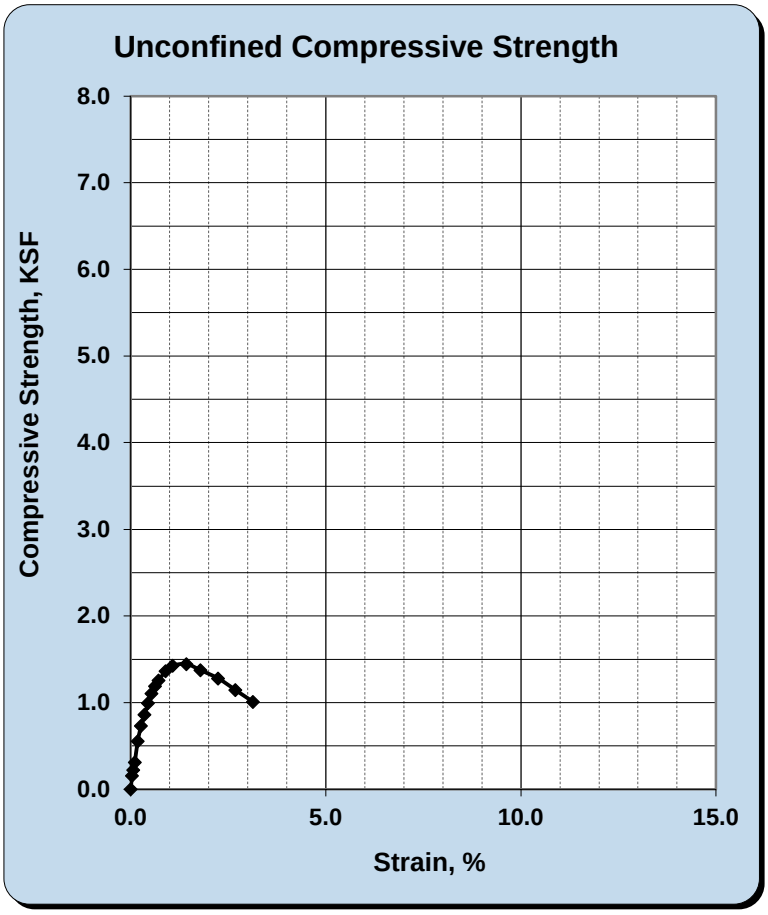
Revision Date: 09/02/20

UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS

ASTM D2166

S&ME, Inc. - Lexington:	2020 Liberty Road, Suite 105, Lexington, KY 40505		
Project No.:	22830088	Report Date:	7/19/2022
Project Name:	UK Health Education Building	Test Date(s):	7/12/2022
Client Name:	JRA Architects		
Client Address:	3225 Summit Square Place, Suite 200, Lexington, KY		
Type:	UD	Sample Date:	6/28/2022
Location:	B-9	Depth (ft.):	8.3 - 8.8
Sample Description:	FAT CLAY (CH), yellow brown		



Failed Specimen

Type of Sample: Intact
Source of Moisture Sample: 3/4 Specimen

Initial Dry Unit Weight: 84.3 pcf
Initial Water Content: 35.1%
Unconfined Compressive Strength, q_u: **1.444** KSF
Undrained Shear Strength, s_u: **0.722** KSF

Liquid Limit: 58
Plasticity Index: 29
Height to Diameter Ratio: 1.9
Rate of Strain (%/min.): 1.1
Strain at Failure: 1.4%

References / Comments / Deviations:

Jacob Folsom	Jacob Folsom	Lab Services Manager	7/19/2022
Technical Responsibility	*Signature*	*Position*	*Date*

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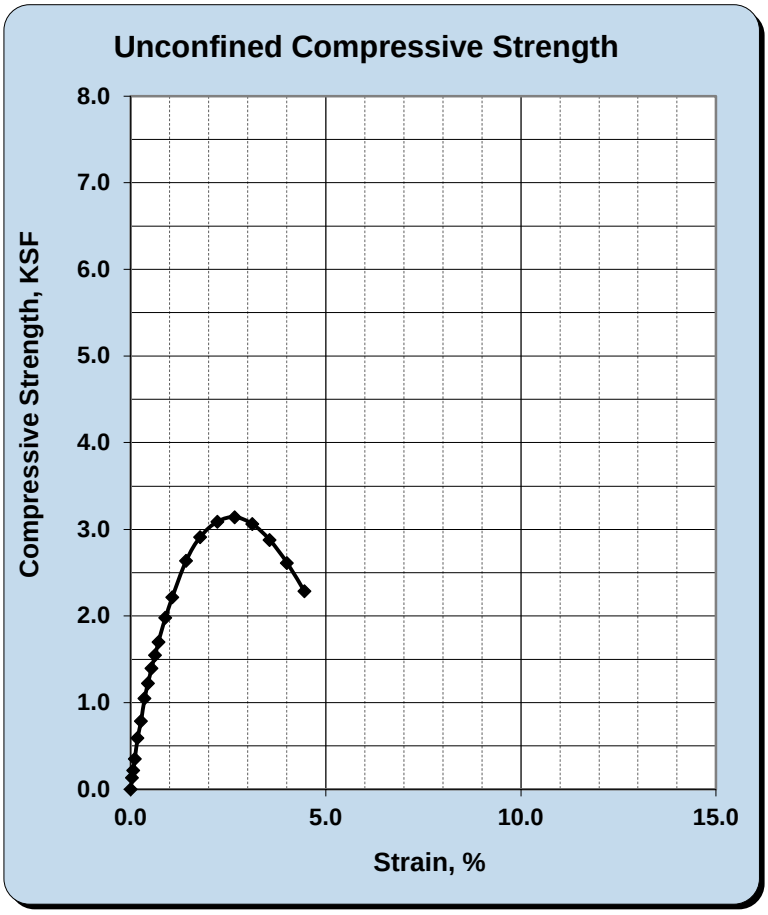
UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS

ASTM D2166

S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

Project No.:	22830088	Report Date:	7/19/2022
Project Name:	UK Health Education Building	Test Date(s):	7/12/2022
Client Name:	JRA Architects		
Client Address:	3225 Summit Square Place, Suite 200, Lexington, KY		
Type:	UD	Sample Date:	6/28/2022
Location:	B-13	Depth (ft.):	4.3 - 4.8
Sample Description:	FAT CLAY (CH), brown		



Failed Specimen

Type of Sample: Intact
Source of Moisture Sample: 3/4 Specimen

Initial Dry Unit Weight: 99.0 pcf
Initial Water Content: 22.2%
Unconfined Compressive Strength, q_u: **3.140** KSF
Undrained Shear Strength, s_u: **1.570** KSF

Liquid Limit: 51
Plasticity Index: 27
Height to Diameter Ratio: 1.9
Rate of Strain (%/min.): 1.1
Strain at Failure: 2.7%

References / Comments / Deviations:

Jacob Folsom		Lab Services Manager	7/19/2022
Technical Responsibility	*Signature*	*Position*	*Date*

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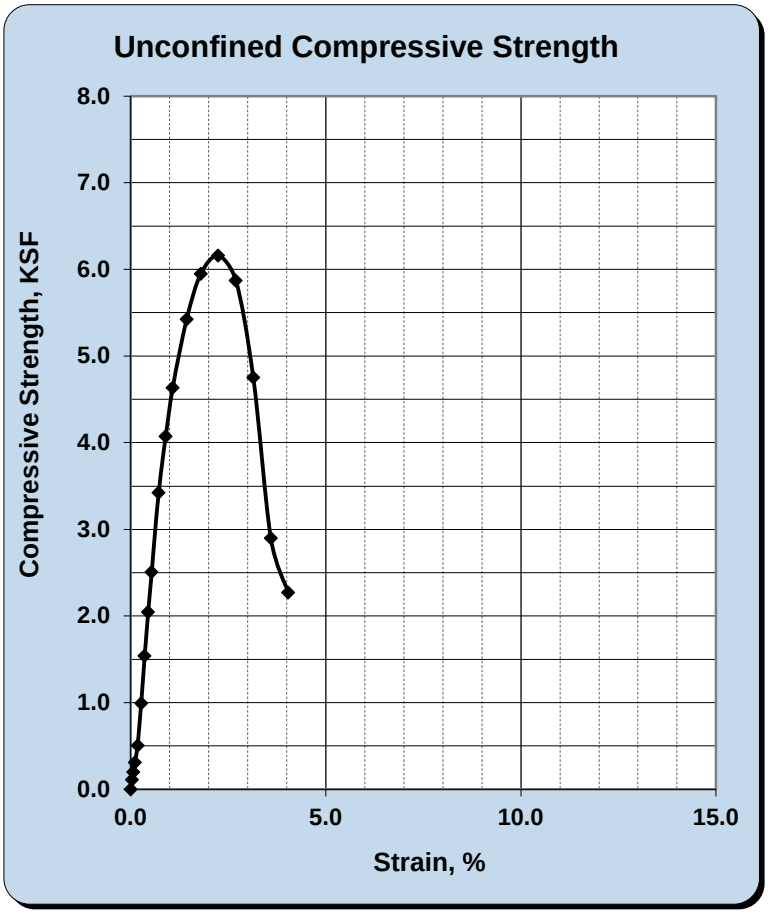
Form No. TR-D2166-01-C
Revision No. : 1LEXb
Revision Date: 09/02/20

UNCONFINED COMPRESSIVE STRENGTH OF COHESIVE SOILS

ASTM D2166

S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

Project No.:	22830088	Report Date:	7/19/2022
Project Name:	UK Health Education Building	Test Date(s):	7/12/2022
Client Name:	JRA Architects		
Client Address:	3225 Summit Square Place, Suite 200, Lexington, KY		
Type:	UD	Sample Date:	6/28/2022
Location:	B-18	Depth (ft.):	6.3 - 6.8
Sample Description:	ELASTIC SILT (MH), brown		



Failed Specimen

Type of Sample: Intact
Source of Moisture Sample: 3/4 Specimen

Initial Dry Unit Weight: 88.2 pcf
Initial Water Content: 29.6%
Unconfined Compressive Strength, q_u: **6.160** KSF
Undrained Shear Strength, s_u: **3.080** KSF

Liquid Limit: 64
Plasticity Index: 31
Height to Diameter Ratio: 1.9
Rate of Strain (%/min.): 1.1
Strain at Failure: 2.2%

References / Comments / Deviations:

Jacob Folsom	Jacob Folsom	Lab Services Manager	7/19/2022
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D698-2
Revision No. 1LEXe
Revision Date: 02/12/21

MOISTURE - DENSITY REPORT

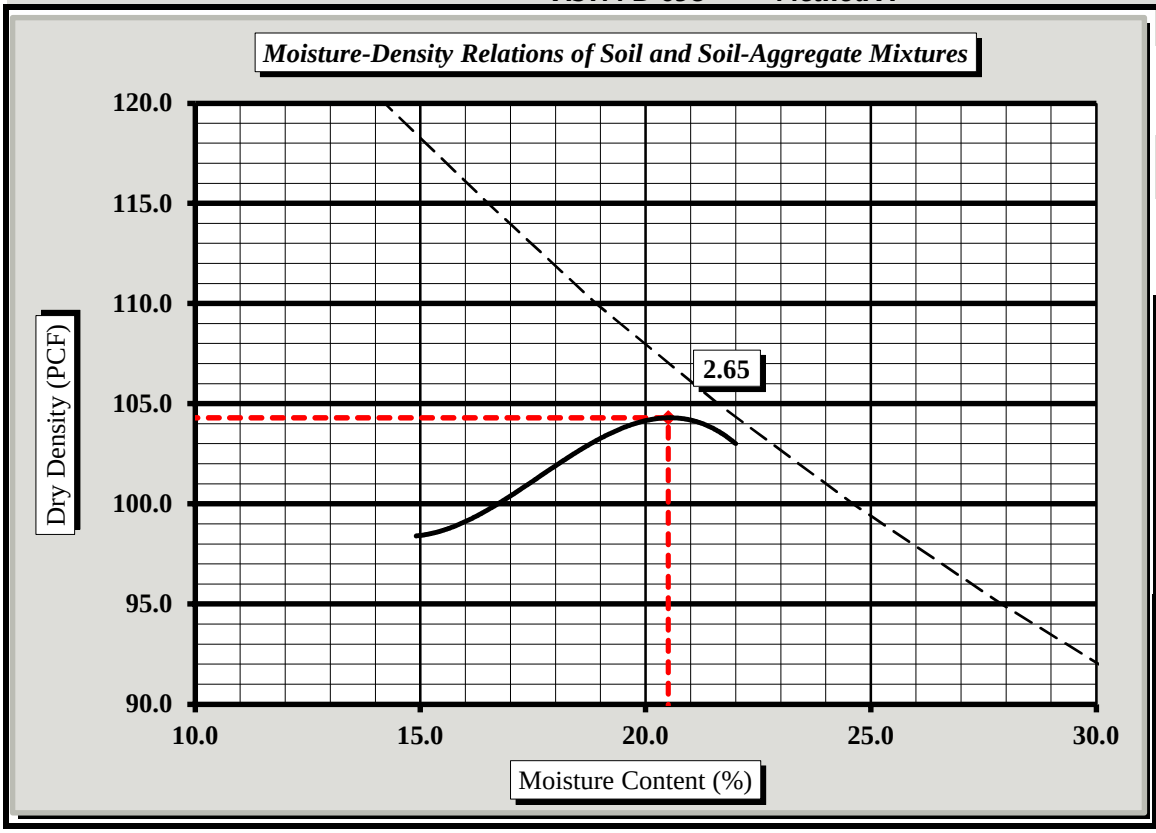
Quality Assurance ASTM D 698 Method A

S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

Project #:	22830088	Report Date:	07/19/22
Project Name:	UK Health Education Building	Test Date(s):	07/13/22
Client Name:	JRA Architects		
Client Address:	3225 Summit Square Place, Suite 200, Lexington, KY		
	Sample No.: P-1	Sample Date:	06/28/22
Location:	B-19/22	Depth (ft.):	N/A
Sample Description:	LEAN CLAY (CL), brown		

Maximum Dry Density 104.3 PCF. Optimum Moisture Content 20.5%

ASTM D 698 - - Method A



Soil Properties

As Received Moisture Content	16.3%
Specific Gravity Soil:*	2.650
Liquid Limit	44
Plastic Limit	22
Plastic Index	22

% Passing	
3/4"	ND
3/8"	ND
#4	100%
#10	ND
#40	ND
#60	ND
#200	ND

Oversize Fraction	
Bulk Gravity	ND
% Moisture	ND
% Oversize	0%
MDD	NA
Opt. MC	NA

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☒ Manual Rammer ☐ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations: NA = Not Applicable; ND = Not Determined. *Specific gravity of soil assumed.
Percent retained on separating sieve estimated from Proctor sample separation operations.

Jacob Folsom	Jacob Folsom	Lab Services Manager	7/19/2022
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D1883-T193-1
Revision No. 2 LEXc
Revision Date: 09/02/20

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

ASTM D 1883

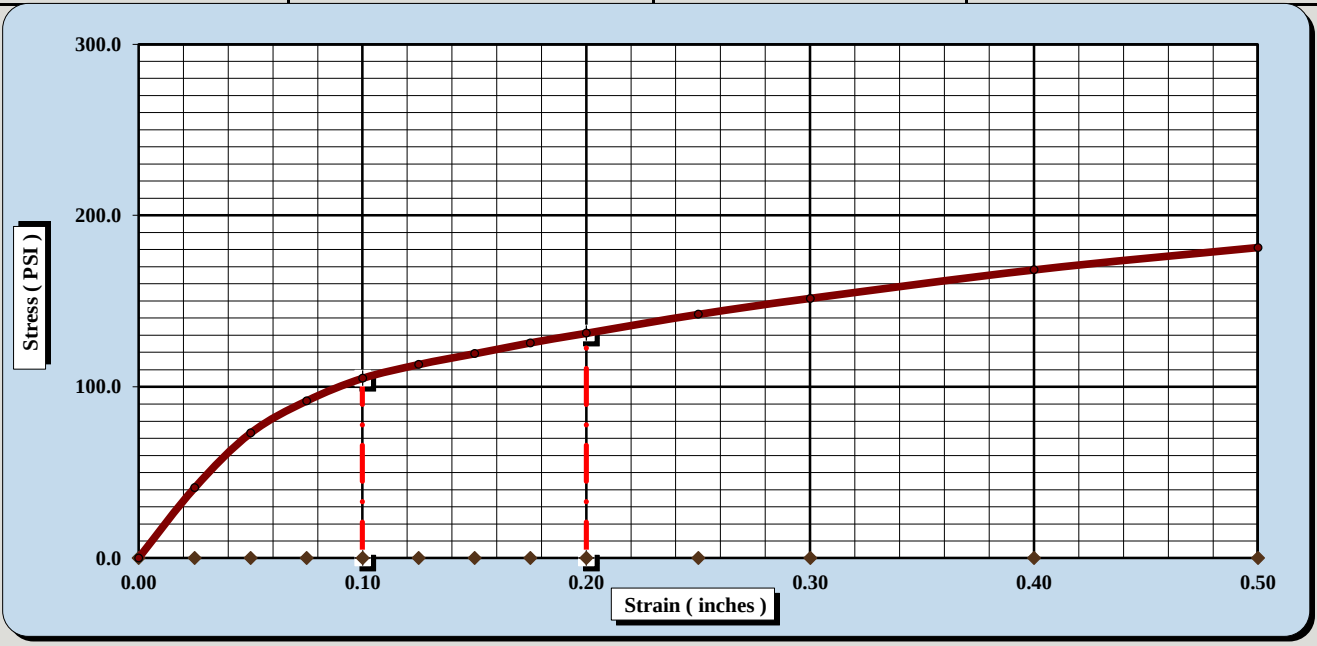
S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

Project #:	22830088	Report Date:	07/19/22
Project Name:	UK Health Education Building	Test Date(s)	07/14/22
Client Name:	JRA Architects		
Client Address:	3225 Summit Square Place, Suite 200, Lexington, KY		
Type:	Bulk	Sample #: P-1	Sample Date: 06/28/22
Location:	B-19/22	Depth (ft.):	N/A
Sample Description:	LEAN CLAY (CL), brown		

ASTM D 698 *Method A* Maximum Dry Density: 104.3 PCF Optimum Moisture Content: 20.5%

Compaction Test performed on grading complying with CBR spec. % Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values				Corrected CBR Values			
CBR at 0.1 in.	10.5	CBR at 0.2 in.	8.8	CBR at 0.1 in.	10.5	CBR at 0.2 in.	8.8



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with ASTM D1883, Section 6.1.1

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	101.7	Final Dry Density (PCF)	102.0
Moisture Content of the Compacted Specimen	21.9%	Moisture Content (top 1" after soaking)	23.1%
Percent Compaction	97.5%	Percent Swell	0.2%

Soak Time: 96 Surcharge Weight: 10.0 Surcharge Wt. per sq. Ft.: 50.8

Liquid Limit: 44 Plastic Index: 22

Notes/Deviations/References:

Jacob Folsom	Jacob Folsom	Lab Services Manager	7/19/2022
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D7012C-01
Revision No. 0
Devision Date: 06/25/15

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

ASTM D 7012 Method C

Quality Assurance

S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

Project No.:	22830088	Report Date:	07/19/22
Project Name:	UK Health Education Building	Test Date(s):	07/18/22
Client Name:	JRA Architects		
Client Address:	3225 Summit Square Place, Suite 200, Lexington, KY	Received Date:	06/28/22
Location:	B-8	Depth/Elev., ft:	12.8 - 13.2
Sample Description:	Gray Limestone		

Angle of load relative to lithology: Approximately perpendicular

Test Results

Moisture Content ***0.1*** **%** ***Dry Unit Weight*** ***166.9*** **pcf**

Compressive Strength ***11,251*** **psi**

Strain rate: 0.015 in/min.

Notes / Deviations / References:

J. Folsom	Jacob Folsom	Lab Services Manager	7/19/2022
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D7012C-01
Revision No. 0
Devision Date: 06/25/15

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

ASTM D 7012 Method C

S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

Project Name: UK Health Education Building Location: B-8 Depth, feet: 12.8 - 13.2

Summary of Specimen Tolerances

Length/diameter target:	**MET**	Perpendicularity target:	**MET**
Side straightness target:	**MET**	Planeness target:	**MET**
Parallelism target:	**MET**		

*ASTM D4543-08 Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance, Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content, chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, the rock specimen will be prepared to the closest tolerance practicable and be considered the best effort and report it as such. If allowable or necessary for the intended test, capping the ends of the specimen as discussed in ASTM D7012 is permitted."

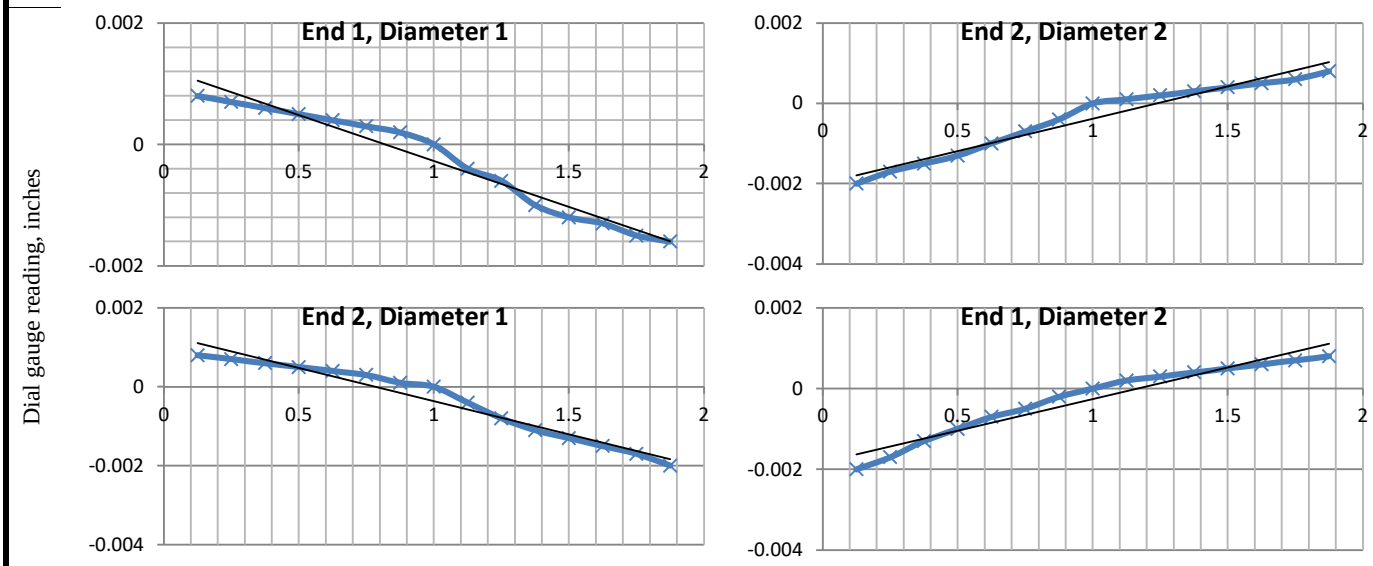
Length to Diameter Ratio

Length, inches: 4.40 Diameter, inches: 1.860
Ratio: 2.36 length to 1 diameter
Target tolerance: L:D ratio between 2 to 1 and 2.5 to 1

Side Straightness

Maximum gap between side of core and reference plate, inches: < .02
Target tolerance: Maximum gap less than .02 inches

Planeness



Distance along diameter, inches

Maximum point-line deviation, inches: < .001
Target Tolerance: No individually measured point should deviate from the best fit line by more than .001 inches.

Parallelism

Slope difference, Diameter 1, degrees: 0.01
Slope difference, Diameter 2, degrees: 0.00
Target Tolerance: Difference between slopes on each end less than 0.25º

Perpendicularity

Slope of End 1, Diameter 1, degrees: -0.09
Slope of End 2, Diameter 1, degrees: -0.10
Slope of End 1, Diameter 2, degrees: 0.09
Slope of End 2, Diameter 2, degrees: 0.09
Target Tolerance: Each diameter perpendicular to the long axis to within 0.25º

Test Information

Strain rate, in/min: 0.015
OR
Stress rate, lbs/sec:
Time to failure, min: 3.7
Temperature: room temperature

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Form No. TR-D7012C-01
Revision No. 0
Devision Date: 06/25/15

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

ASTM D 7012 Method C

Quality Assurance

S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

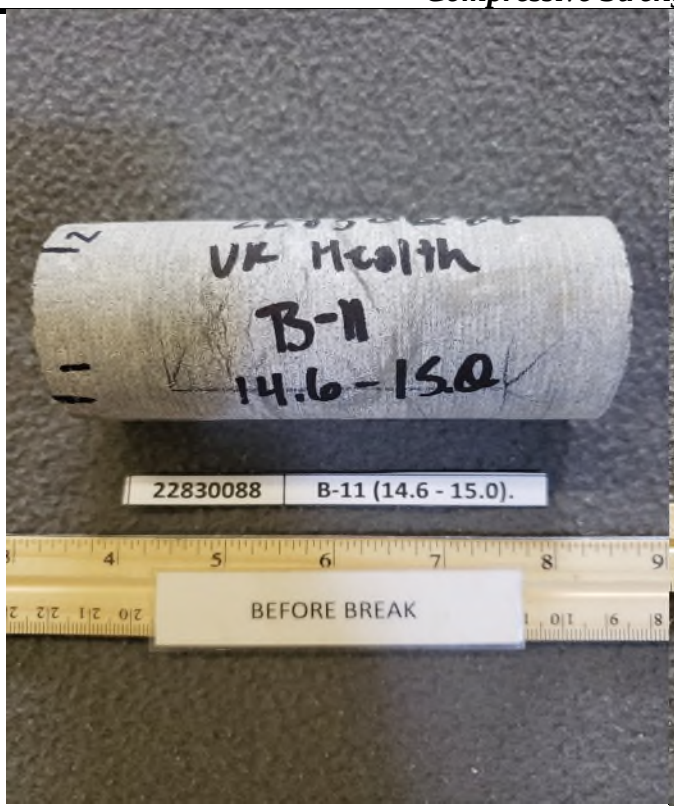
Project No.:	22830088	Report Date:	07/19/22
Project Name:	UK Health Education Building	Test Date(s):	07/18/22
Client Name:	JRA Architects		
Client Address:	3225 Summit Square Place, Suite 200, Lexington, KY	Received Date:	06/28/22
Location:	B-11	Depth/Elev., ft:	14.6 - 15.0
Sample Description:	Gray Limestone		

Angle of load relative to lithology: Approximately perpendicular

Test Results

Moisture Content ***0.2*** **%** ***Dry Unit Weight*** ***164.7*** **pcf**

Compressive Strength ***11,561*** **psi**



Strain rate: 0.015 in/min.

Notes / Deviations / References:

J. Folsom	Jacob Folsom	Lab Services Manager	7/19/2022
Technical Responsibility	*Signature*	*Position*	*Date*

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Revision No. 0
Devision Date: 06/25/15

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

ASTM D 7012 Method C

Quality Assurance

S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

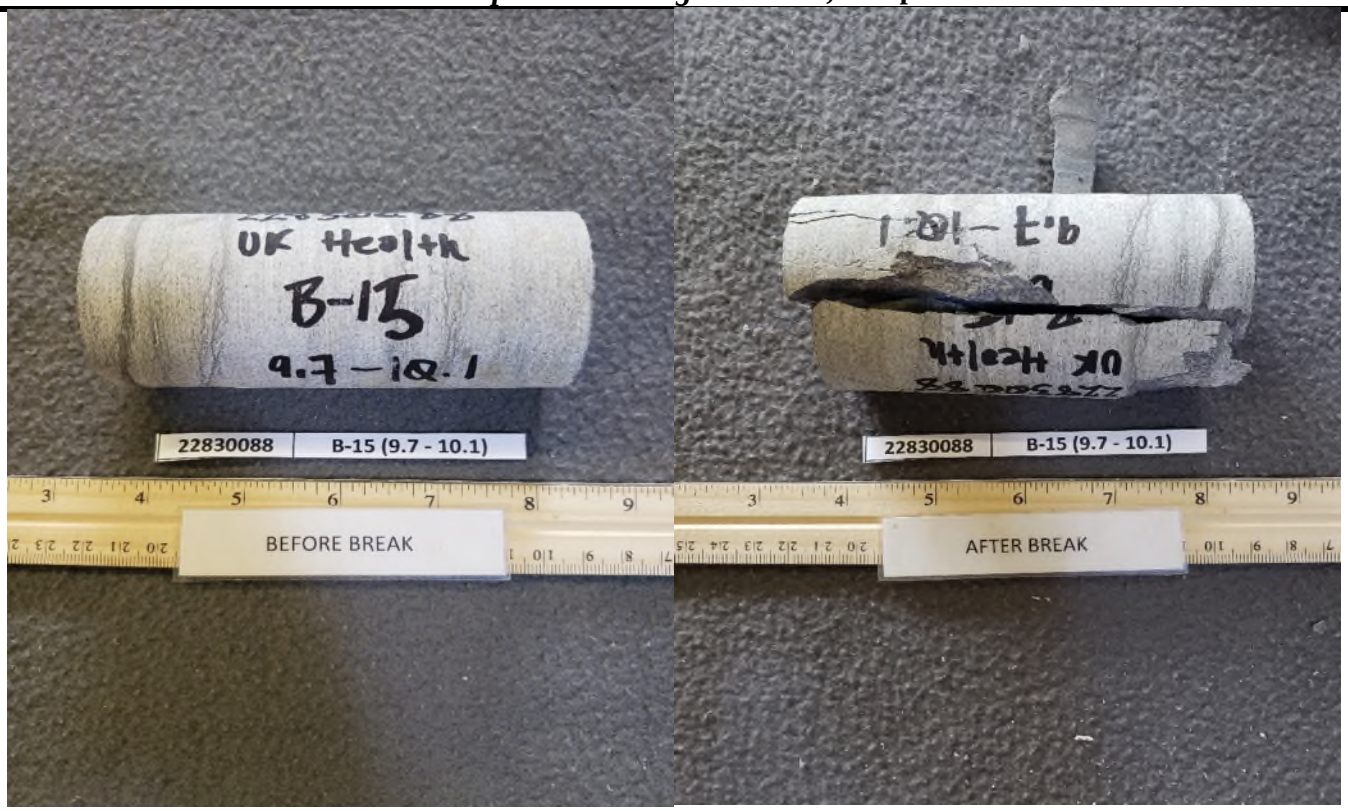
Project No.:	22830088	Report Date:	07/19/22
Project Name:	UK Health Education Building	Test Date(s):	07/18/22
Client Name:	JRA Architects		
Client Address:	3225 Summit Square Place, Suite 200, Lexington, KY	Received Date:	06/28/22
Location:	B-15	Depth/Elev., ft:	9.7 - 10.1
Sample Description:	Gray Limestone		

Angle of load relative to lithology: Approximately perpendicular

Test Results

Moisture Content ***0.1*** **%** ***Dry Unit Weight*** ***165.8*** **pcf**

Compressive Strength ***13,098*** **psi**



Strain rate: 0.015 in/min.

Notes / Deviations / References:

J Folsom	Jacob Folsom	Lab Services Manager	7/19/2022
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D7012C-01
Revision No. 0
Devision Date: 06/25/15

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

ASTM D 7012 Method C

S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

Project Name: UK Health Education Building Location: B-15 Depth, feet: 9.7 - 10.1

Summary of Specimen Tolerances

Length/diameter target:	**MET**	Perpendicularity target:	**MET**
Side straightness target:	**MET**	Planeness target:	**MET**
Parallelism target:	**MET**		

*ASTM D4543-08 Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance, Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content, chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, the rock specimen will be prepared to the closest tolerance practicable and be considered the best effort and report it as such. If allowable or necessary for the intended test, capping the ends of the specimen as discussed in ASTM D7012 is permitted."

Length to Diameter Ratio

Length, inches: 4.42 Diameter, inches: 1.860

Ratio: 2.38 length to 1 diameter

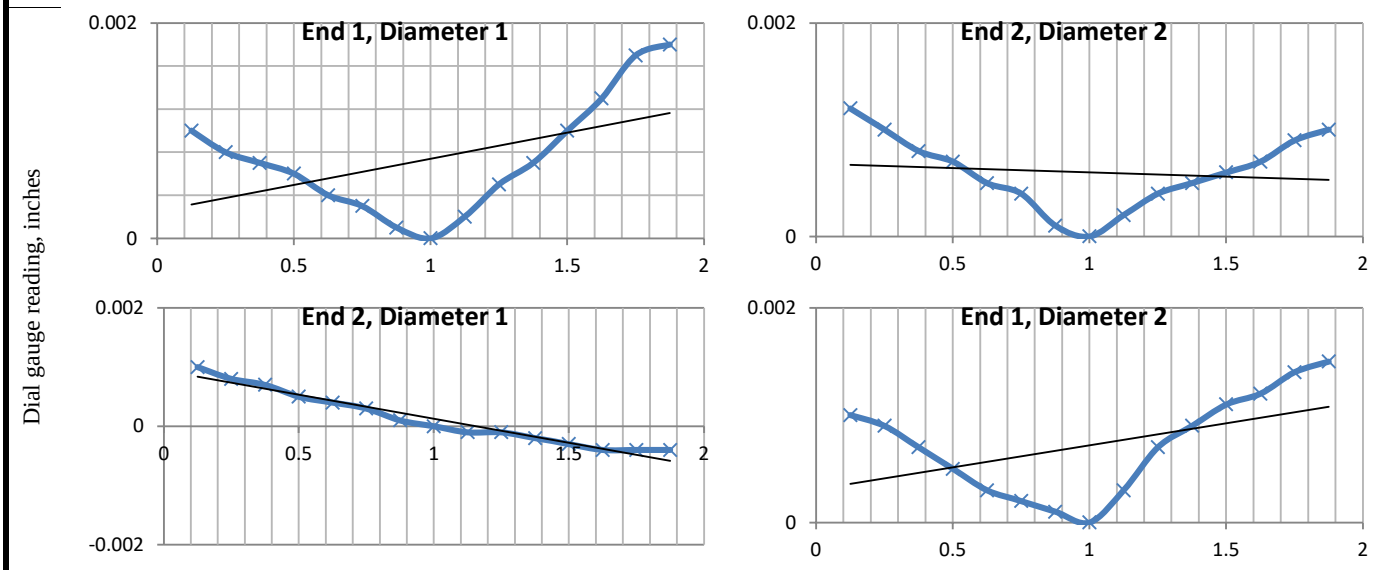
Target tolerance: L:D ratio between 2 to 1 and 2.5 to 1

Side Straightness

Maximum gap between side of core and reference plate, inches: < .02

Target tolerance: Maximum gap less than .02 inches

Planeness



Distance along diameter, inches

Maximum point-line deviation, inches: < .001

Target Tolerance: No individually measured point should deviate from the best fit line by more than .001 inches.

Parallelism

Slope difference, Diameter 1, degrees: 0.07

Slope difference, Diameter 2, degrees: 0.03

Target Tolerance: Difference between slopes on each end less than 0.25º

Perpendicularity

Slope of End 1, Diameter 1, degrees: 0.03

Slope of End 2, Diameter 1, degrees: -0.05

Slope of End 1, Diameter 2, degrees: 0.02

Slope of End 2, Diameter 2, degrees: 0.00

Target Tolerance: Each diameter perpendicular to the long axis to within 0.25º

Test Information

Strain rate, in/min: 0.015

OR

Stress rate, lbs/sec:

Time to failure, min: 3

Temperature: room temperature

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Form No. TR-D7012C-01
Revision No. 0
Devision Date: 06/25/15

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

ASTM D 7012 Method C

Quality Assurance

S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

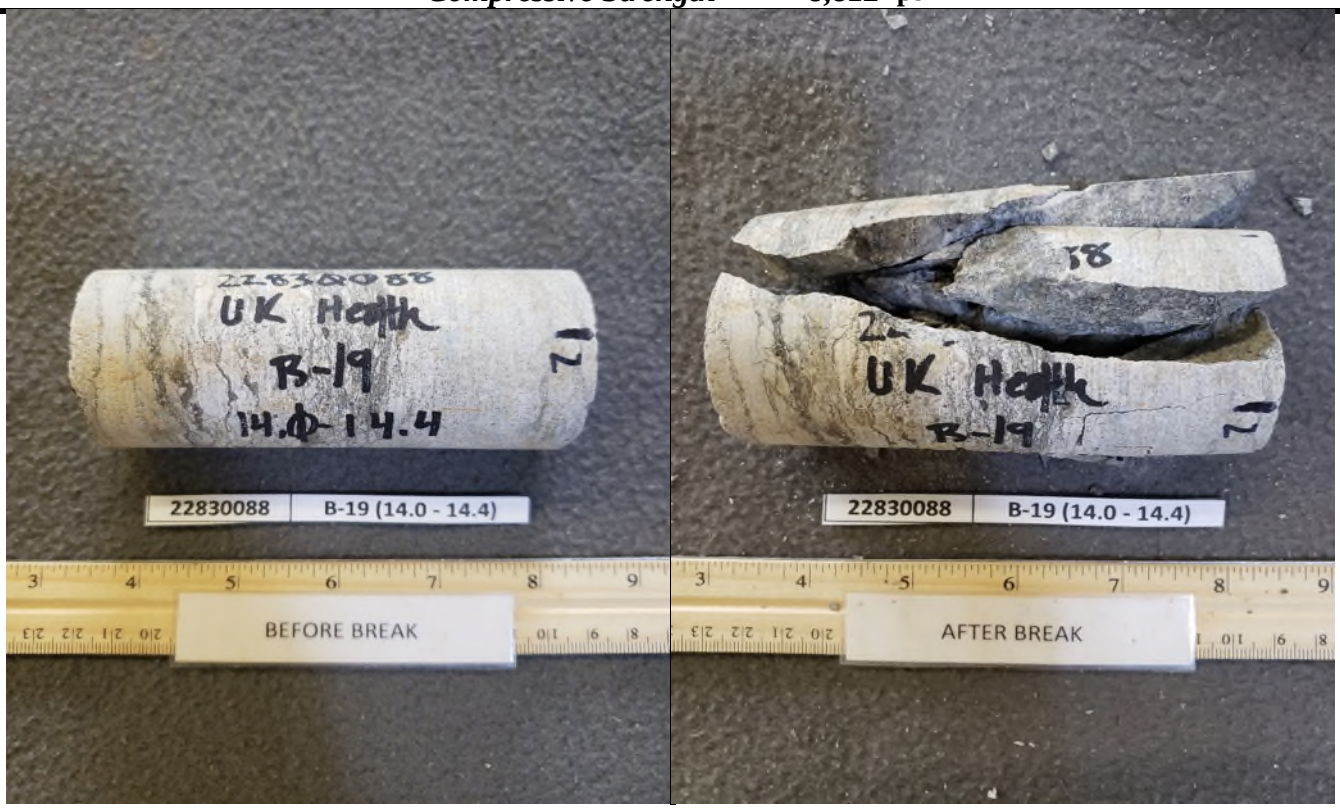
Project No.:	22830088	Report Date:	07/19/22
Project Name:	UK Health Education Building	Test Date(s):	07/18/22
Client Name:	JRA Architects		
Client Address:	3225 Summit Square Place, Suite 200, Lexington, KY	Received Date:	06/28/22
Location:	B-19	Depth/Elev., ft:	14.0 - 14.4
Sample Description:	Gray Limestone		

Angle of load relative to lithology: Approximately perpendicular

Test Results

Moisture Content ***0.2*** **%** ***Dry Unit Weight*** ***162.5*** **pcf**

Compressive Strength ***8,812*** **psi**



Strain rate: 0.015 in/min.

Notes / Deviations / References:

J. Folsom	Jacob Folsom	Lab Services Manager	7/19/2022
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D7012C-01
Revision No. 0
Devision Date: 06/25/15

UNIAXIAL COMPRESSIVE STRENGTH OF ROCK

ASTM D 7012 Method C

S&ME, Inc. - Lexington: 2020 Liberty Road, Suite 105, Lexington, KY 40505

Project Name: UK Health Education Building Location: B-19 Depth, feet: 14.0 - 14.4

Summary of Specimen Tolerances

Length/diameter target:	**MET**	Perpendicularity target:	**MET**
Side straightness target:	**MET**	Planeness target:	**MET**
Parallelism target:	**MET**		

*ASTM D4543-08 Standard Practice for Preparing Rock Core as Cylindrical Test Specimens and Verifying Conformance to Dimensional and Shape Tolerance, Section 1.2 - "Rock is a complex engineering material that can vary greatly as a function of lithology, stress history, weathering, moisture content, chemistry, and other natural geologic processes. As such, it is not always possible to obtain or prepare rock core specimens that satisfy the desirable tolerances given in this practice. Most commonly, this situation presents itself with weaker, more porous, and poorly cemented rock types and rock types containing significant or weak (or both) structural features. For these and other rock types which are difficult to prepare, all reasonable efforts shall be made to prepare a specimen in accordance with this practice and for the intended test procedure. However, when it has been determined by trial that this is not possible, the rock specimen will be prepared to the closest tolerance practicable and be considered the best effort and report it as such. If allowable or necessary for the intended test, capping the ends of the specimen as discussed in ASTM D7012 is permitted."

Length to Diameter Ratio

Length, inches: 4.36 Diameter, inches: 1.865

Ratio: 2.34 length to 1 diameter

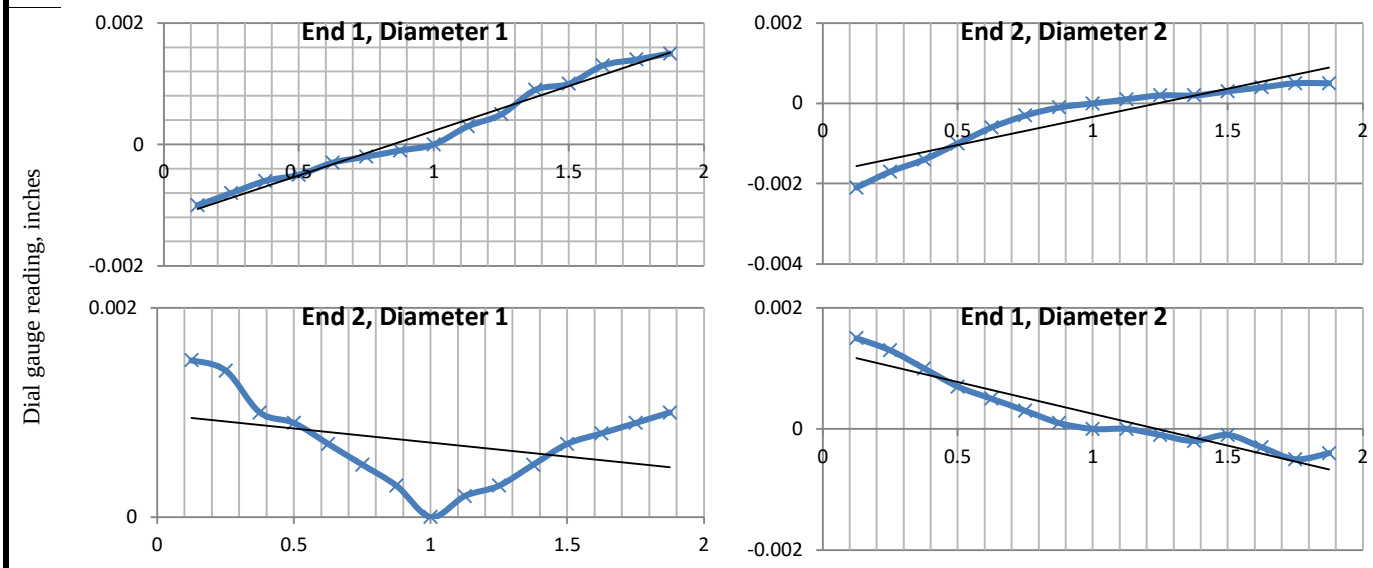
Target tolerance: L:D ratio between 2 to 1 and 2.5 to 1

Side Straightness

Maximum gap between side of core and reference plate, inches: < .02

Target tolerance: Maximum gap less than .02 inches

Planeness



Distance along diameter, inches

Maximum point-line deviation, inches: < .001

Target Tolerance: No individually measured point should deviate from the best fit line by more than .001 inches.

Perpendicularity

Slope of End 1, Diameter 1, degrees:	0.08
Slope of End 2, Diameter 1, degrees:	-0.02
Slope of End 1, Diameter 2, degrees:	-0.06
Slope of End 2, Diameter 2, degrees:	0.08

Target Tolerance: Each diameter perpendicular to the long axis to within 0.25º

Parallelism

Slope difference, Diameter 1, degrees:	0.10
Slope difference, Diameter 2, degrees:	0.14

Target Tolerance: Difference between slopes on each end less than 0.25º

Test Information

Strain rate, in/min:	0.015
OR	
Stress rate, lbs/sec:	
Time to failure, min:	2.62
Temperature:	room temperature

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LABORATORY TESTING PROCEDURES

Soil Classification: Soil classifications provide a general guide to the engineering properties of various soil types and enable the engineer to apply past experience to current problems. In our investigations, samples obtained during drilling operations are examined in our laboratory and visually classified by an engineer. The soils are classified according to consistency (based on number of blows from standard penetration tests), color and texture. These classification descriptions are included on our "Test Boring Records."

The classification system discussed above is primarily qualitative and for detailed soil classification two laboratory tests are necessary: grain size tests and plasticity tests. Using these test results the soil can be classified according to the AASHTO or Unified Classification Systems (ASTM D 2487). Each of these classification systems and the in-place physical soil properties provides an index for estimating the soil's behavior. The soil classification and physical properties obtained are presented in this report.

Compaction Tests: Compaction tests are run on representative soil samples to determine the dry density obtained by a uniform compactive effort at varying moisture contents. The results of the test are used to determine the moisture content and unit weight desired in the field for similar soils. Proper field compaction is necessary to decrease future settlements, increase the shear strength of the soil and decrease the permeability of the soil.

The two most commonly used compaction tests are the Standard Proctor test and the Modified Proctor test. They are performed in accordance with ASTM D 698 and D 1557, respectively. Generally, the Standard Proctor compaction test is run on samples from building or parking areas where small compaction equipment is anticipated. The Modified compaction test is generally performed for heavy structures, highways, and other areas where large compaction equipment is expected. In both tests a representative soil sample is placed in a mold and compacted with a compaction hammer. Both tests have three alternate methods.

Test	Method	Hammer Wt./Fall	Mold Diam.	Run on Material Finer Than	No. of Layers	No. of Blows/Layer
Standard D 698	A	5.5 lb./12"	4"	No. 4 sieve	3	25
	B	5.5 lb./12"	4"	3/8" sieve	3	25
	C	5.5 lb./12"	6"	3/4" sieve	3	56

Test	Method	Hammer Wt./Fall	Mold Diam.	Run on Material Finer Than	No. of Layers	No. of Blows/Layer
Standard D 1557	A	10 lb./18"	4"	No. 4 sieve	5	25
	B	10 lb./18"	4"	3/8" sieve	5	25
	C	10 lb./18"	6"	3/4" sieve	5	56

The moisture content and unit weight of each compacted sample is determined. Usually 4 to 5 such tests are run at different moisture contents. Test results are presented in the form of a dry unit weight versus moisture content curve. The compaction method used and any deviations from the recommended procedures are noted in this report.

Atterberg Limits: Portions of the samples are taken for Atterberg Limits testing to determine the plasticity characteristics of the soil. The plasticity index (PI) is the range of moisture content over which the soil deforms as a plastic material. It is bracketed by the liquid limit (LL) and the plastic limit (PL). The liquid limit is the moisture content at which the soil becomes sufficiently "wet" to flow as a heavy viscous fluid. The plastic limit is the lowest moisture content at which the soil is sufficiently plastic to be manually rolled into tiny threads. The liquid limit and plastic limit are determined in accordance with ASTM D 4318.

Moisture Content: The Moisture Content is determined according to ASTM D 2216.

Appendix IV – ACI 302.1R-96 "GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION"

ADDENDUM
GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION (302.1R-96)
Vapor Retarder Location

The report of ACI Committee 302, "Guide for Concrete Floor and Slab Construction (ACI 302.1R-96)" states in section 4.1.5 that "if a vapor barrier or retarder is required due to local conditions, these products should be placed under a minimum of 4 in. (100 mm) of trimable, compactible, granular fill (not sand)." ACI Committee 302 on Construction of Concrete Floors, and Committee 360 on Design of Slabs on Ground have found examples where this approach may have contributed to floor covering problems.

Based on the review of the details of problem installations, it became clear that the fill course above the vapor retarder can take on water from rain, wet-curing, wet-grinding or cutting, and cleaning. Unable to drain, the wet or saturated fill provides an additional source of water that contributes to moisture-vapor emission rates from the slab well in excess of the 3 to 5 lb/1000 ft^2/24 h (1.46 to 2.44 kg/100 m^2/24 h) recommendation of the floor covering manufacturers.

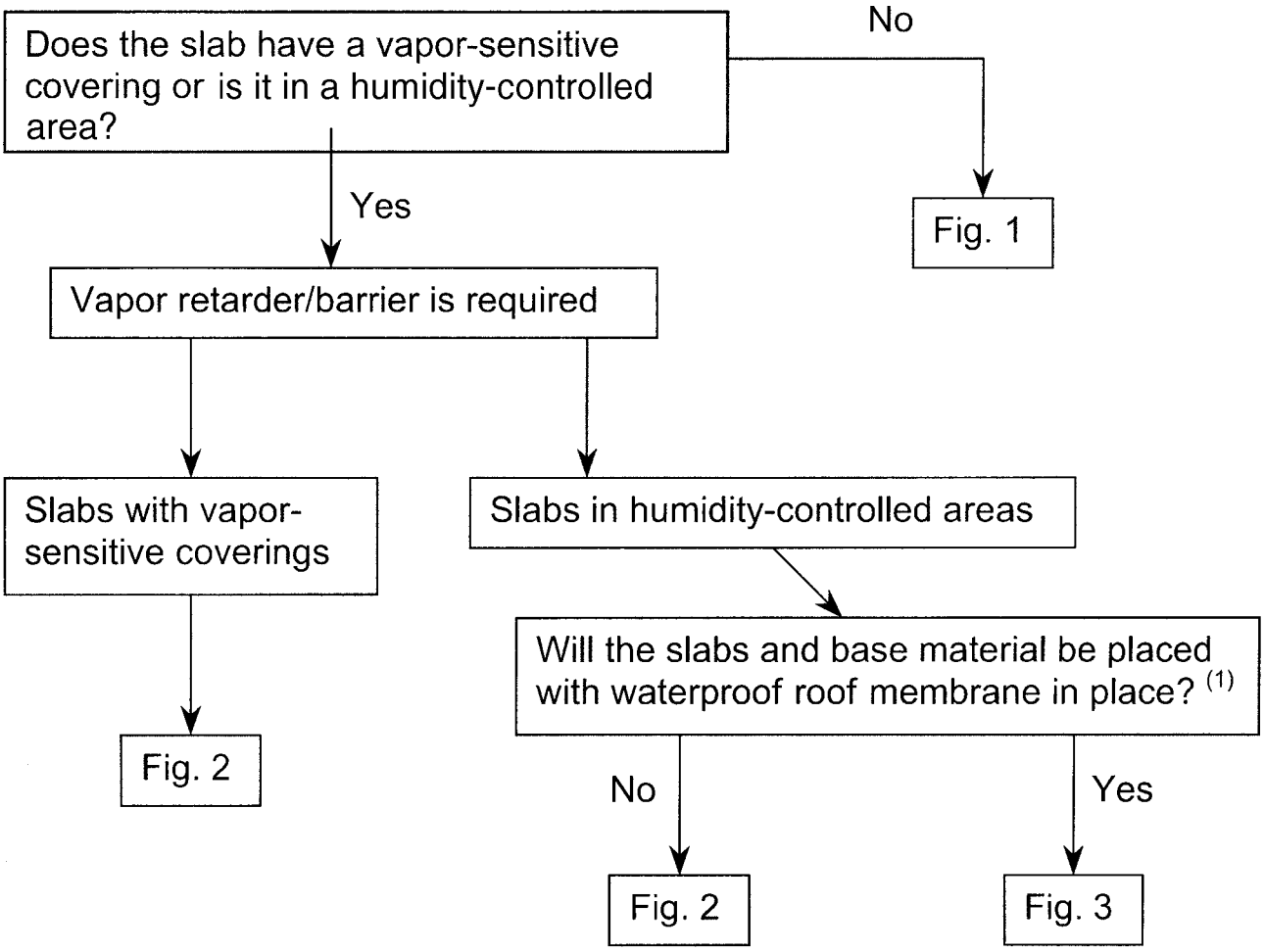
As a result of these experiences, and the difficulty in adequately protecting the fill course from water during the construction process, caution is advised on the use of the granular fill layer when moisture-sensitive finishes are to be applied to the slab surface.

The committees believe that when the use of a vapor retarder or barrier is required, the decision whether to locate the retarder or barrier in direct contact with the slab or beneath a layer of granular fill should be made on a case-by-case basis.

Each proposed installation should be independently evaluated by considering the moisture sensitivity of subsequent floor finishes, anticipated project conditions and the potential effects of slab curling and cracking.

The following chart can be used to assist in deciding where to place the vapor retarder. The anticipated benefits and risks associated with the specified location of the vapor retarder should be reviewed with all appropriate parties before construction.

ADDENDUM
GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION (302.1R-96)
Flow Chart for Location of Vapor Retarder/Barrier



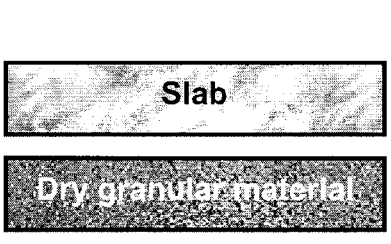


Figure 1

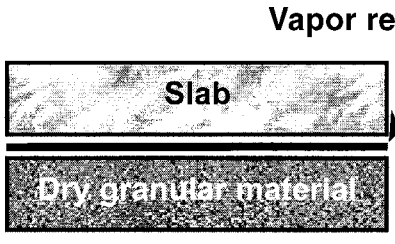


Figure 2 (2)

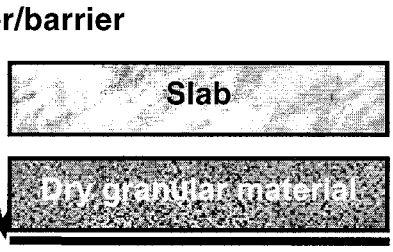


Figure 3

(1) If granular material is subject to future moisture infiltration, use Fig. 2

(2) If Fig. 2 is used, reduced joint spacing, a concrete with low shrinkage potential, or other measures to minimize slab curling will likely be required.

JRA Architects
3225 Summit Square Place
Suite #200
Lexington, Kentucky 40509

October 13, 2023

Attention: Mr. Rob Deal, AIA, LEED AP, KCID, NCARB

Reference: **Addendum to Report of Geotechnical Exploration**
University of Kentucky – Health Education Building
Lexington, Kentucky
S&ME Project No. 22830088

Dear Mr. Deal:

S&ME, Inc. (S&ME) completed our geotechnical exploration for the new UK Health Education Building project with our findings and recommendations outlined in a report dated August 18, 2022. At that time, the project was still in the scoping/development phase. On October 8, 2023, Mr. Brian McMillan, PE with Brown and Kubican Structural Engineers emailed updated structural and architectural floor plan drawings.

The current plans include a full depth basement beneath the entire footprint of the building. Bedrock supported spread footing foundations are currently planned which will require areas of bedrock removal to achieve the planned elevations as well as areas of soil over-excavation to expose intact bedrock. In our August 2022 report we recommended an allowable bearing pressure of 70 ksf for foundations bearing on intact bedrock. Where over-excavation is required to expose intact bedrock, we recommend backfilling to the plan bearing elevation with lean concrete with a 28-day compressive strength of at least 4,000 psi. Since the structure foundations will be supported by shallow foundations bearing directly on bedrock, a site seismic classification of "B" can be used for the structural design.

Note that if blasting of the bedrock is performed for the basement excavation, over-shot material should be excavated from beneath both the building footprint and backfilled with lean concrete to the plan grades. Given the relatively shallow bedrock excavation depths, over-shooting of the bedrock should be expected.

Based on our understanding of the project, the recommendations outlined in our August 2022 report are applicable. If additional design elements are altered or if we can be of further assistance, please call.

Sincerely,

S&ME, Inc.

Andrew M. Fiehler, PE
Sr. Project Engineer
Licensed Kentucky 23,977

John C. Lessley, PE
Technical Principal Engineer

SECTION 01 3233 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.

B. Related Requirements:
1. Section 02 4116 "Structure Demolition" for photographic documentation before building demolition operations commence.
2. Section 31 1000 "Site Clearing" for photographic documentation before site clearing operations commence.

1.2 INFORMATIONAL SUBMITTALS

A. Digital Photographs: Submit image files within three days of taking photographs.

1. Submit photos on CD-ROM or thumb-drive and by uploading to web-based Project management software site. Include copy of key plan indicating each photograph's location and direction.
2. Identification: Provide the following information with each image description in file metadata tag:

a. Name of Project.
b. Name and contact information for photographer.
c. Date photograph was taken.

1.3 QUALITY ASSURANCE

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

B. Construction Webcam Service Provider: A firm specializing in providing photographic equipment, web-based software, and related services for construction projects, with a record of providing satisfactory services similar to those required for Project.

1.4 FORMATS AND MEDIA

A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by 2400 pixels, and with vibration-reduction technology. Use flash in low light levels or backlit conditions.

B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

C. Metadata: Record accurate date and time from camera.

D. File Names: Name media files with date and sequential numbering suffix.

1.5 CONSTRUCTION PHOTOGRAPHS

A. Photographer: Engage a qualified photographer to take construction photographs.

B. General: Take photographs with maximum depth of field and in focus.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

C. Preconstruction Photographs: Before commencement of the Work, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect or Construction Manager.

1. Flag construction limits before taking construction photographs.
2. Take 20 photographs to show existing conditions adjacent to property before starting the Work.
3. Take 20 photographs of existing buildings either on or adjoining property, to accurately record physical conditions at start of construction.
4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 3233

DOCUMENT 01 4110 – STRUCTURAL SPECIAL INSPECTION & CONTRACTOR RESPONSIBILITY

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. General Conditions of the Construction Contract Inspection of Work / Defective or Incomplete Work / Special Inspections shall apply in its entirety to this project. Where any conflict exists between this Specification Section and the General Conditions, the General Conditions provisions shall supersede in all aspects.

1.2 SUMMARY

A. Special Inspections as defined in Section 1704 of The Kentucky Building Code are required.

B. The Risk Category, Seismic Design Category, and Basic Wind Speed for the structure are shown in the General Notes section of the structural drawings.

C. Special inspections per Kentucky Building Code Sections 1704 and 1705 are required for the following materials and work:

1. Inspection of Fabricators per Section 1704.2.5 of the Kentucky Building Code.
2. Steel Construction per Section 1705.2 of the Kentucky Building Code.
3. Concrete Construction per Section 1705.3 of the Kentucky Building Code.
    a. Including Erection of Structural Precast Components and Architectural Precast Cladding Panels.
4. Additional materials and work as/if indicated on the Construction Drawings.

D. The structural special inspections required on this project are further defined in the Special Inspections section of the structural drawings. Other, non-structural special inspections may be required and are specified elsewhere if applicable.

1.3 SCOPE

A. The scope of the construction work to be inspected / tested / observed is that structural and foundation work shown on the structural construction drawings (S- sheets).

B. All inspections and tests performed shall be documented by report including, but not limited to, inspections for grout and concrete placement, reinforcing inspection, curing, fabricators, etc.

1.4 DEFINITIONS

A. In accordance with the intent of the Building Code, inspection work specified to be “continuous” shall be inspected the full, uninterrupted time that the Contractor is performing said construction work. Work specified to be “periodic” may be inspected as convenient to the Inspector, except that all work must be inspected prior to being covered by other work, during the working hours of the Contractor, and in a fashion that does not delay the Contractor. Regardless as to whether inspections are performed in “continuous” or “periodic” fashion, 100% of the construction work shall be inspected, unless noted otherwise.

1.5 SELECTION AND PAYMENT

A. The Inspection Agency shall be retained by the Owner. Costs for reinspection and retesting, should discrepancies be found, will be paid for by the Owner, except where rework is due to negligence or omission deemed excessive by the Owner.

1. In case of excessive rework, such retesting and reinspection shall be paid for by the Owner as an additional service of the Inspection Agency, but will be backcharged by deductive change order to the Contractor's contract.
2. In case of excessive waste/lost time of the Special Inspector due to inadequate scheduling by the General Contractor, such time shall be paid for by the Owner as an additional service of the Inspection Agency but will be backcharged by deductive change order to the Contractor's contract.

B. Special Inspections are additional to testing and inspection requirements shown elsewhere in the specifications and on the drawings, which is to be paid for by the Contractor. The Contractor shall also pay for additional structural testing and inspection required for their convenience. Inspection work not part of the Structural Special Inspections may be performed by an Inspection Agency of the Contractor's choosing, unless noted otherwise.

1.6 INFORMATIONAL SUBMITTALS

A. General: Furnish submittals in quantity, format, and other Conditions of the Contract and as specified in Division 1 of the Project Manual.

B. Fabricator certificate of current good standing with Qualified Certification Program.

C. Fabricators exempt from special inspection shall submit a *Certificate of Compliance* to the structural engineer of record at the completion of fabrication stating that all work was completed in accordance with the approved construction documents.

D. Each contractor responsible for the construction of a main wind- or seismic-force resisting system or component as specified above shall submit a written *Statement of Responsibility* prior to commencement of work on the system or component. The contractor's statement shall include:

1. Acknowledgement of awareness of the special requirements of this specification and the statement of special inspections.
2. Acknowledgement that control will be exercised to obtain conformance with the construction documents.
3. Procedures for exercising control within the contractor's organization, the method and frequency of reporting, and the distribution of reports.
4. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.

1.7 QUALITY ASSURANCE

A. Qualified Certification Authorities: Subject to compliance with Kentucky Building Code Requirements, Qualified Certification Authorities providing certification which may be applicable to Project include:

1. American Concrete Institute (ACI).
2. American Institute of Steel Construction (AISC).
3. American Society of Nondestructive Testing (ASNT).
4. American Welding Society (AWS).
5. International Code Council (ICC).
6. National Institute of Certified Engineering Technology (NICET).
7. Prestressed Concrete Institute (PCI).

PART 2 – EXECUTION

2.1 PROGRESS MEETINGS

A. The Special Inspector’s designated Project Manager is to attend any pre-construction meetings which may be conducted at the construction site by the Structural Engineer to discuss quality issues.

B. The Special Inspector’s designated Project Manager is to attend construction progress meetings which will be held at the construction site by the Architect, Engineer, and General Contractor.

2.2 CONTRACTOR’S RESPONSIBILITIES

A. Provide a complete copy of all structural shop drawings to the Structural Testing/Inspection Agency.

B. Coordinate with the Project Manager, Design Professional, and Using Agency to initiate a Pre-Installation Meeting, typically held at the construction site. Arrange and require relevant project managers and site foremen from the Subcontractors to attend the meeting to discuss quality issues.

C. Notify the Structural Testing/Inspection Agency sufficiently in advance of operations to allow assignment of personnel and scheduling of tests.

D. Cooperate with Structural Testing/Inspection Agency and provide access, including equipment with operator, to work. Access equipment includes, but is not limited to, man lifts, excavation equipment, etc.

E. Provide samples of materials to be tested in required quantities.

F. Provide storage space for Structural Testing/Inspection Agency's exclusive use, such as for storing and curing concrete testing samples. If required by Special Inspector, General Contractor shall provide cure box with electricity, water, and blankets for curing concrete specimens.

G. Provide labor to assist the Structural Testing/Inspection Agency in performing tests/inspections.

H. Construction and work for which Special Inspection is required shall remain accessible and exposed for special inspection purposes until the completion of the inspections and tests.

I. All parties who are to receive inspection and testing reports shall maintain an active email account to receive reports by.

J. General Contractor shall create and maintain a discrepancy log on site. Log shall list each discrepancy documented by the Special Inspector; state the date of discovery and Special Inspector's report number; and provide room for the Special Inspector to sign and date when said discrepancy is corrected. No work containing discrepancy shall be covered prior to having reinspection and approval by the Special Inspector.

K. Neither the observation of the Architect/Structural Engineer in the administration of the contract, nor tests/inspections by the Testing/Inspection Agency, nor approvals by any other person(s) shall relieve the Contractor from their obligation to perform the work in accordance with the Contract Documents.

2.3 SPECIAL INSPECTOR'S RESPONSIBILITIES

A. Cooperate with the Contractor and provide timely service.

B. Notify Contractor of minimum advance notice for each type of inspection/test.

C. Upon arriving at the construction site, sign in and notify the Contractor of presence.

D. Select the representative samples that are to be tested/inspected.

E. Perform tests/inspections as outlined in the Contract Documents, the applicable codes, and as directed by the Structural Engineer.

F. Keep records of all inspections.

G. Furnish inspection reports to the Architect, Structural Engineer, and General Contractor weekly as construction progresses.

1. Each report shall include photographs of the project status and the typical work inspected and documented in that subject report. These general photographs are in addition to the required photograph at discrepancies.
2. Format of report deliverables shall be Special Inspection Report (PDF), Project Photographs (JPG), and Related Supporting Documentation (PDF).

H. Inform General Contractor and / or Fabricator of all discrepancies immediately for correction.

1. Document in writing correction of discrepancies.
2. Highlight discrepancies within the report.

a. The report shall include a text description of each discrepancy. Description shall convey the discrepancy location on the project and the issue.
b. The report shall include a photograph of each discrepancy observed in the field and/or in the shop. Photograph shall be labeled to convey location on project and the issue shown. (Photographs of material strength tests for concrete and/or masonry are not required, unless otherwise instructed.)
c. The report shall document the date that each discrepancy was initially discovered.
d. Inspection related discrepancies shall be reinspected by the Special Inspector along the course of the project and prior to concealment by other work. Subsequent reports shall document date that prior discrepancy was confirmed to be corrected.

3. If discrepancies are not corrected, the discrepancies shall be brought to the attention of the Code Official and the Structural Engineer prior to the completion of that phase of the work.

I. Leave copies of field notes with the Contractor prior to leaving the construction site. Field notes shall include the message given to the Contractor, date, time of message, name of Contractor's representative informed, type and location of work or materials tested/inspected, whether the work or materials complies with Contract Documents and name of the Structural Testing/Inspection Agency's representative.

J. Immediately notify General Contractor, Architect, and Structural Engineer by separate letter if work yet to be inspected is found on site that is either being covered by other work or was to receive continuous inspection.

K. Structural Testing/Inspection Agency shall not alter requirements of Contract Documents, approve or reject any portion of the work, or perform duties of the Contractor.

L. Submit a final report of inspections documenting completion of **all** required Special Inspections and correction of any discrepancies noted in inspections to the Structural Engineer. Final report shall be prepared by, sealed, and signed by the Special Inspector and shall include a complete list of materials and work inspected during the course of the project. One copy of said report is to be provided to the Contractor for their records.

END OF DOCUMENT 01 4110

SECTION 014339 - MOCKUPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Mockups are required for, but not limited to, the following:

1. Integrated exterior wall mockups.

B. Related Sections include the following:

1. Division 02 - 49 Sections for items requiring mock-ups in addition to mock-ups specified under this section.

1.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design temporary supports for composite mockups, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

1.4 MOCKUPS, GENERAL

A. Mockups specified in this Section, other Sections of the Specifications, or shown on the drawings will be reviewed and approved by the Architect.

1. Replace or reconstruct unacceptable mockups in part or in total with the extent of the replacement or reconstruction at the discretion of the Architect.
2. Replace or reconstruct each mock-up until acceptance by Architect is obtained.
3. Include mockup costs in the Contract Sum, including as many replacements or reconstructions as necessary to gain Architect’s acceptance.

B. Coordinate Work of trades and schedule elements to expedite the fabricating, furnishing and installation of multiple component mockups specified in this Section, in other Sections of the Specifications, and as shown on the Drawings.

C. Unless directed otherwise by Architect, locate exterior visual mockups to simulate actual conditions of solar direction, solar angle, and shading.

D. Where indicated, install actual finished lighting for Architect's review of interior mockups. In not indicated, provide actual finished lighting or simulate finished lighting conditions.

E. Do not proceed with fabrication and installation of work items represented on mockups until receiving mockup approval from Architect. Construct mockups to allow sufficient time for review and approval so as not to delay the Work.

F. Approval, acceptance, observation, or review of mockups does not constitute approval of deviation from the Contract Documents contained in mockups, unless such deviation is specifically identified in writing by Contractor, and thereafter approved by Architect in writing.

G. Complete mockup design and construction in a timely manner to ensure that there will be no delays in performance and completion of the Work. Contractor shall schedule and construct mockup(s) to allow for review(s), possible rejection(s), and corrective work, without interfering with the progress of the Work or delaying the project schedule.

H. Mockup materials and assemblies, as tested and approved, shall govern materials and assemblies furnished for field erection, and Contractor shall revise job production Shop Drawings accordingly to conform to accepted mockups.

I. Mockup components shall be fabricated and assembled at the locations where and by the same persons as will do this work for the project. Mockup installation shall be performed by the same personnel for the mockup as will do this work on the site.

J. Do not use special measures or techniques for mockups that are not representative of those to be used in the building.

K. Clean and protect approved mockups.

1.5 ACTION SUBMITTALS

A. Mockup Shop Drawings: For integrated exterior mockups and casework composite mockups, provide plans, sections, elevations, and details indicating materials and size of mockup construction.

1. Indicate manufacturer and model number of individual components.
2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.
3. Include items indicated to be included with Shop Drawings specified in individual specification sections for items being incorporated in mockups.
4. Clearly indicate materials, methods, and coordination with other portions of the Work.
5. Include dimensions and attachments to other work.
6. Include details indicating interface with each system of the Work.
7. Include indication of design and coordination of temporary or permanent supports.
8. For installed products indicated to comply with design loads, include Shop Drawings signed and sealed by the qualified professional engineer responsible for their preparation.
9. Resubmit “as-built” Shop Drawings for record, with changes based on accepted mockups.

1.6 INFORMATIONAL SUBMITTALS

A. Mockup Schedule: Comply with requirements in Section 013200 “Construction Progress Documentation”. Submit copies of schedule indicating coordination with overall construction schedule. Indicate the following:

1. Milestones for fabrication of mockup materials, mockup installation start, mockup installation completion, and mockup acceptance.
2. Include time periods for Architect and Owner reviews.
3. Include time periods for testing.
4. Include time periods required by testing laboratory for scheduling, setup, and testing.
5. Submit schedule a minimum of 30 days prior to start of mockup fabrication.

B. Mockup Preconstruction Testing Program: Developed specifically for Project and to comply with indicated testing requirements.

C. Mockup Field Quality Control Reports: Submit reports indicating completion of correction items noted on Architect's mockup review(s). Include field quality control reports for testing associated with mockups.

1. Upon completion of testing, provide "as built" mockup shop drawings showing modifications or additions required to meet the performance requirements and submit within 15 days of mockup testing completion.

D. Delegated-Design Submittal: For composite mockup support systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation. Prepare calculations proving performance and compliance with specified loads. For members subject to thermal movement, prepare thermal calculations to indicate the amount of anticipated movement when subjected to the maximum temperature design range. Include copies of shop drawings or sketches indicating the location and configuration for each assembly, support, member, connection, anchor, etc.; labeling the magnitude and direction for each load that is imposed onto the primary building structure.

1. Certificate of Compliance: Submit a signed letter certifying that the system is designed to comply with the specified design requirements.

   a. Provide certification that analysis methodology, as referenced in SEI/ASCE 7, has been satisfactorily performed and can demonstrate system compliance with specified design performance requirements.
   b. Submit certification letter with Shop Drawings and calculations.

2. Design Calculations: Calculate requirements for system. Coordinate transferred loads with work of other Sections. Submit complete design, structural analysis, calculations, testing and other data demonstrating that the work of this Section will conform to accepted engineering practice, and conform to the design requirements indicated.

   a. The submittal shall be certified, stamped and signed by a registered Professional Engineer responsible for the information contained in the submittal.

E. Record Drawings: Submit record drawings of preconstruction mockups prepared by preconstruction testing agency.

1.7 QUALITY ASSURANCE

A. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.

    a. Allow 15 days for initial review and each re-review of each mockup. Allow sufficient time for corrective work or reconstructions.

6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
7. Demolish and remove mockups when directed, unless otherwise indicated.

B. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.

1. Exterior Wall Mock-ups for Testing: Comply with requirements of preconstruction testing and those specified in individual Specification Sections in Divisions 02 through 33.

1.8 COMPOSITE EXTERIOR WALL MOCKUPS

A. Construct composite mockup for performance testing, to establish quality of installation and to verify material selections for color and textural characteristics. Comply with the following:

1. Construct mockups on site where indicated or, if not indicated, in locations directed by the Architect.
2. Exterior wall and window mock-up: Size indicated on Drawings by full exterior wall thickness, including the following.

    a. Backup-wall construction with full assembly of framing, sheathing, air and vapor barrier, insulation and related materials.
    b. Brick masonry using standard brick and special shapes, with brick anchors and ties.
    c. Fenestration including curtain wall framing, glass and glazing materials and perimeter sealant.
    d. Control joint with joint sealant

3. Exterior wall parapet mock-up: Size indicated on Drawings by full exterior wall thickness.

    a. Backup-wall construction with full assembly of framing, sheathing, air and vapor barrier, insulation and related materials.
    b. Brick masonry using standard brick and special shapes, with brick anchors and ties.
    c. Fenestration including curtain wall framing, glass and glazing materials and perimeter sealant.
    d. Control joint with joint sealant

4. Exterior wall with textured brick: Size indicated on Drawings by full exterior wall thickness.

a. Backup-wall construction with full assembly of framing, sheathing, air and vapor barrier, insulation and related materials.
b. Brick masonry using standard brick and special shapes, with brick anchors and ties.
c. Fenestration including curtain wall framing, glass and glazing materials and perimeter sealant.
d. Control joint with joint sealant

B. Construct composite mockup unit(s) of sufficient size and configuration to adequately demonstrate the performance capabilities of each type of work, including support systems of the work. Construct mockup with dimensions and configuration specified or indicated on Drawings, and in accordance with approved shop drawings.

1. Mockup(s) shall include exterior wall assemblies and other Work as indicated on the Drawings. The Contractor may at their option include other portions of the Work as part of mockup(s).
2. Surrounding work of trades other than those indicated on Drawings shall, if so directed by the Contractor, be provided by those trades who perform the work for the project, and coordinated accordingly.
3. Mockup(s) shall be complete with corners, splice joints, sealants, glass and glazing, anchors, flashings, complete finishes, and with details complete and identical to those proposed for use in the building. Do not use excessive amounts of sealant or other special measures or techniques that are not representative of those to be used in the building.
4. Mockup(s) shall include engineering, design, and construction of required temporary supports including but not limited to concrete footings, concrete slabs, structural steel framing, reinforced masonry, cold-formed metal framing, miscellaneous metal supports, anchors, and other temporary support construction.
5. Mockup(s) shall be fabricated, assembled and glazed (if shop glazed for the project) at the locations where and by the same persons as will do this work for the project. Mockup installation and field glazing and demonstration field glazing procedures shall be performed by the same personnel for the mockup as will do this work on the site.
6. Set up and make complete installation of mockup(s) at the designated location on the project site campus. Mockup(s) shall be used to demonstrate quality of materials, finish and workmanship.
7. Unless directed otherwise by Architect, locate exterior mockups to simulate actual conditions of solar direction, solar angle, and shading.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014339

SECTION 017419 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition waste.
2. Recycling nonhazardous demolition waste.
3. Disposing of nonhazardous demolition waste.

B. Related Requirements:

1. Section 024116 “Structure Demolition”
2. Section 311000 "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.
3. Definitions included in the “LEED Version 4 Building Design and Construction Reference Guide (LEED v4 BD+C) Construction and Demolition Waste Management and Diversion, Option 1 Path 2 and online amendments apply to this Section.

1.03 DEFINITIONS

1. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.
2. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner’s property.
3. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
4. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
5. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.04 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.05 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within 7 (seven) days of date established for the Notice to Proceed.

1.06 INFORMATIONAL SUBMITTALS

A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:

1. Material category.
2. Generation point of waste.
3. Total quantity of waste in tons.
4. Quantity of waste salvaged, both estimated and actual in tons.
5. Quantity of waste recycled, both estimated and actual in tons.
6. Total quantity of waste recovered (salvaged plus recycled) in tons.
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

G. Qualification Data: For waste management coordinator.

H. Refrigerant Recovery: Comply with requirements in Section 024116 "Structure Demolition" for refrigerant recovery submittals.

1.07 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by General Contractor, with a record of successful waste management coordination of projects with similar requirements. Superintendent may serve as Waste Management Coordinator.

B. Refrigerant Recovery Technician Qualifications: Comply with requirements in Section 024116 "Structure Demolition."

C. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.

D. Waste Management Conference(s): Conduct conference(s) at Project site. Review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan including responsibilities of each contractor and waste management coordinator.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

1.08 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition and site-clearing waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work in compliance with Section 024116 "Structure Demolition."
2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

PART 2 - PRODUCTS

2.01 RECYCLING RECEIVERS AND PROCESSORS

A. Subject to compliance with requirements, available recycling receivers and processors include, but are not limited to, the following:

1. Rumpke
2. Central Kentucky Landfill
3. Republic

2.02 PERFORMANCE REQUIREMENTS

A. General: Achieve end-of-Project rates for salvage/recycling of ninety-five percent (95%) by weight of total nonhazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:

1. Demolition Waste:
    a. Asphalt paving.
    b. Concrete.
    c. Concrete reinforcing steel.
    d. Brick.
    e. Concrete masonry units.
    f. Wood studs.
    g. Wood joists.
    h. Plywood and oriented strand board.
    i. Wood paneling.
    j. Wood trim.
    k. Structural and miscellaneous steel.
    l. Rough hardware.
    m. Roofing.
    n. Insulation.
    o. Doors and frames.
    p. Door hardware.
    q. Windows.
    r. Glazing.
    s. Metal studs.
    t. Gypsum board.
    u. Acoustical tile and panels.
    v. Carpet.
    w. Carpet pad.
    x. Demountable partitions.
    y. Equipment.
    z. Cabinets.
    aa. Plumbing fixtures.
    bb. Piping.
    cc. Supports and hangers.
    dd. Valves.
    ee. Sprinklers.
    ff. Mechanical equipment.
    gg. Refrigerants.
    hh. Electrical conduit.
    ii. Copper wiring.
    jj. Lighting fixtures.

kk. Lamps.
ll. Ballasts.
mm. Electrical devices.
nn. Switchgear and panelboards.
oo. Transformers.

2. Construction Office Waste: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following construction office waste materials:
   a. Paper.
   b. Aluminum cans.
   c. Glass containers.
   d. Cardboard

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

1. Distribute waste management plan to everyone concerned within three (3) days of submittal return.
2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
2. Comply local requirements for controlling dust and dirt, environmental protection, and noise control.

3.02 SALVAGING DEMOLITION WASTE

A. Comply with requirements in Section 024116 "Structure Demolition" for salvaging demolition waste.

3.03 RECYCLING DEMOLITION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

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D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
   a. Inspect containers and bins for contamination and remove contaminated materials if found.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

3.04 RECYCLING DEMOLITION WASTE

A. General: The following articles define acceptable recycling procedures. The contractor has the option to utilize all or none of the following procedures; however, the Contractor is required to meet the requirement for diverted content defined in Article 2.02, A – PERFORMANCE REQUIREMENTS

B. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.

C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.

D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.

E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.

F. Metals: Separate metals by type.

1. Structural Steel: Stack members according to size, type of member, and length.
2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.

H. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.

I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.

J. Metal Suspension System: Separate metal members, including trim and other metals from acoustical panels and tile, and sort with other metals.

K. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.

1. Store clean, dry carpet and pad in a closed container or trailer provided by carpet reclamation agency or carpet recycler.

L. Carpet Tile: Remove debris, trash, and adhesive.

1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by carpet reclamation agency or carpet recycler.

M. Piping: Reduce piping to straight lengths and store by material and size. Separate supports, hangers, valves, sprinklers, and other components by material and size.

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N. Conduit: Reduce conduit to straight lengths and store by material and size.

O. Lamps: Separate lamps by type and store according to requirements in 40 CFR 273.

3.05 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 017419

SECTION 02 4116 - STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section Includes:

1. Demolition and removal of buildings or structures.
2. Demolition and removal of site improvements.
3. Abandoning in-place below-grade construction.
4. Removing below-grade construction.
5. Disconnecting, capping or sealing, and abandoning in-place site utilities.
6. Disconnecting, capping or sealing, and removing site utilities.
7. Salvaging items for reuse by Owner.

B. Related Requirements:

1. Section 31 1000 "Site Clearing" for site clearing and removal of above- and below-grade site improvements that are not part of building demolition.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner as indicated. Include fasteners or brackets needed for reattachment elsewhere.

1.3 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.4 COORDINATION

A. Arrange demolition schedule so as not to interfere with Owner's on-site operations oroperations of adjacent occupied buildings.

1.5 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be demolished.
2. Review structural load limitations of existing structures.
3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review and finalize protection requirements.
5. Review procedures for noise control and dust control.
6. Review procedures for protection of adjacent buildings.
7. Review storage, protection, and accounting for items to be salvaged and returned to Owner.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Statements: For refrigerant recovery technician and specialty demolition contractor.

B. Engineering Survey: Submit engineering survey of condition of building.

C. Survey of Existing Conditions: Submit survey.

D. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain including means of egress from those buildings.

E. Schedule of Building Demolition Activities: Indicate the following:

1. Detailed sequence of demolition work, with starting and ending dates for each activity.
2. Temporary interruption of utility services. Indicate how long services will be interrupted.
3. Coordination for shutoff and capping or re-routing of utility services.

F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed in accordance with EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.7 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Universal certified by an EPA-approved certification program.

B. Specialty Demolition Contractor Qualifications: A competent person who has training, knowledge, or experience in the use of each type of blasting method used and in the field of transporting, storing, handling, and using explosives; and has a working knowledge of state and local laws and regulations pertaining to explosives.

1.9 FIELD CONDITIONS

A. Buildings to be demolished will be vacated and their use discontinued before start of the Work.

B. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.

1. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.

a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.

C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before building demolition, Owner will remove the following items:

a. Items to be removed by Owner as indicated on the Drawings.

D. Hazardous Materials:

1. Hazardous materials are present in buildings and structures to be demolished. A report on the presence of hazardous materials is included in Section 00 3126 "Existing Hazardous Material Information" for review and use. Examine report to become aware of locations where hazardous materials are present.

a. Hazardous material remediation is specified in Section <**Insert Section number**> "<**Insert Section title**>."
b. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified in Section <**Insert Section number**> "<**Insert Section title**>."
c. Owner will provide material safety data sheets for hazardous materials that are known to be present in buildings and structures to be demolished because of building operations or processes performed there.

E. On-site sale of removed items or materials is not permitted.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

2.2 SOIL MATERIALS

A. Satisfactory Soils: Comply with requirements in Section 31 2000 "Earth Moving."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

D. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

E. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

F. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video. Comply with Section 01 3233 "Photographic Documentation."

1. Inventory and record the condition of items to be removed and salvaged. Photograph or video conditions that might be misconstrued as damage caused by removal.
2. Photograph or video existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by demolition operations or removal of items for salvage.

3.2 PREPARATION

A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.

B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of demolition.

C. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 01 5000 "Temporary Facilities and Controls."

1. Protect adjacent buildings and facilities from damage due to demolition activities.
2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.

7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.

D. Existing Utilities to Remain: Maintain utility services to remain and protect against damage during demolition operations.

1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.

a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

E. Existing Utilities to Be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.

1. Owner will arrange to shut off utilities when requested by Contractor.
2. Arrange to shut off utilities with utility companies.
3. If disconnection of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
4. Cut off pipe or conduit a minimum of 24 inches below grade at or outside the building or structure to be demolished and cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing in accordance with requirements of authorities having jurisdiction.
5. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing by authorities having jurisdiction.

F. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment in accordance with 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 SALVAGE

A. Items to be removed and salvaged are indicated on Drawings.

B. Comply with the following for salvaged items:

1. Clean salvaged items of dirt and demolition debris.
2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
3. Store items in a secure area until delivery to Owner.
4. Transport items to storage area designated by Owner.
5. Protect items from damage during transport and storage.

3.4 DEMOLITION, GENERAL

A. General: Demolish indicated buildings and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
2. Maintain fire watch during and for at least twenty-four hours after flame-cutting operations.

3. Maintain adequate ventilation when using cutting torches.
4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

C. Explosives: Use of explosives is not permitted.

3.5 DEMOLITION BY MECHANICAL MEANS

A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.

B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.

C. Below-Grade Construction:

1. Demolish foundation systems and other below-grade construction.

a. Remove below-grade construction, including basements, foundation systems, and footings, completely.

D. Existing Utilities:

1. Demolish and remove existing utilities and below-grade utility structures.

E. Hydraulic Elevator Systems: Demolish and remove elevator system, including cylinder, plunger, well assembly, steel well casing and liner, oil supply lines, and tanks.

3.6 SITE RESTORATION

A. Below-Grade Areas:

1. Rough grade below-grade areas ready for further excavation or new construction.

B. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.7 REPAIRS

A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.8 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction. and recycle or dispose of them in accordance with Section 01 7419 "Demolition Waste Management and Disposal."

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Do not burn demolished materials.

3.9 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

1. Clean roadways of debris caused by debris transport.

END OF SECTION 02 4116

SECTION 03 4100 – PRECAST STRUCTURAL CONCRETE – PLANT CAST

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes structural precast concrete units, plant cast, including the following:

1. Precast Structural Concrete Wall Panels (vertical and lateral load bearing).
2. Steel connection plates and brackets.
3. Grouting and anchor bolting and welding.

B. Related Sections: The following sections contain requirements that relate to this section.

1. Division 1 Section “Structural Special Inspection.”

1.3 PREINSTALLATION MEETING

A. Preinstallation Conference: Conduct conference at Project Site.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Engineer, fabricate, and install structural precast concrete units to withstand design loadings indicated within limits and under conditions required.

1. Design loads are shown on the drawings, including the wall Elevation views and the General Notes.

B. Engineering Responsibility: Engage a fabricator who uses a qualified professional engineer, licensed in the state where the Project is located and who is experienced in providing engineering services of the type requested, to prepare design calculations, fire-resistance calculations, shop drawings, and other structural data.

1.5 ACTION SUBMITTALS

A. General: Furnish submittals in quantity, format, and other Conditions of the Contract and as specified in Division 1 of the Project Manual.

B. Product data and instructions for manufactured materials and products.

1. Certification by paint and curing compound manufacturers that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

C. Shop drawings detailing fabrication and installation of precast concrete units. Indicate member dimensions and cross-sections; locations, sizes, and types of reinforcement, including special reinforcement; estimated camber; and lifting devices necessary for handling and erection.

1. Include an erection plan indicating layout and dimensions, and identifying each precast concrete unit corresponding to sequence and procedure of installation.

Indicate welded connections by AWS standard symbols. Detail loose, cast-in, and field hardware, inserts, connections, and joints, including accessories and construction at openings in precast units. Show all openings required for mechanical, plumbing, and other penetrations 10" and larger which are to be cast into precast members.

2. Indicate locations and details of anchorage devices that are to be embedded in other construction. Indicate joints, reveals, drips, chamfers, and extent and location of each surface finish Furnish templates, if required, for accurate placement.
3. Include and locate openings larger than 10 inches. Where additional structural support is required, include header design.
4. Show precast structural concrete unit types, connections, types of reinforcement, including special reinforcement, and concrete cover on reinforcement.
5. Indicate shim sizes and grouting sequence.
6. If design modifications are proposed to meet performance requirements and field conditions, submit design calculations and Shop Drawings. Do not adversely affect the appearance, durability, or strength of units when modifying details or materials and maintain the general design concept.
7. Shop drawings shall be signed and sealed by the qualified professional engineer, registered in the State of the Project location, responsible for their preparation.
8. To the extent structural precast unit design considerations are indicated as fabricator's responsibility, include structural analysis data signed and sealed by the qualified professional engineer, registered in the State of the Project location, responsible for their preparation. The calculations will be reviewed for design intent only. Engineering and detailing shall be solely the responsibility of the manufacturer and the professional engineer responsible for their preparation.
9. Computer generated electronic structural construction document files will be made available to the General Contractor. The Contractor will be required to sign the Digital Licensing Agreement AIA C106 as outlined in specification section 013300 Submittal Procedures. Rules for use of said files shall be as defined in the CRSI "Code of Standard Practice" Sections 4.19 and 6.4.1.
10. Shop drawing resubmittals are reviewed for conformance with review marks only. Any changes or questions originating on a resubmittal shall be clearly clouded.

D. Design mixes for each concrete mix. Submit revised mix proportions when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

E. Material test reports from a qualified independent testing agency evidencing compliance with requirements of the following based on comprehensive testing of current materials:

1. Concrete materials.
2. Reinforcing materials.
3. Prestressing strands.
4. Admixtures.
5. Bearing pads.

F. Material certificates in lieu of agency test reports, when permitted by Architect, signed by fabricator certifying that each material item complies with requirements.

G. Product Data: For each joint-sealant product.

H. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.

I. Joint Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

J. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

K. Field-Adhesion-Test Reports: For each sealant application tested.

L. Delegated-Design Submittal: For precast structural concrete indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Show precast structural concrete unit types, connections, types of reinforcement, including special reinforcement, and concrete cover on reinforcement. Indicate location, type, magnitude, and direction of loads imposed on the building structural frame from precast structural concrete.

M. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
2. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.
3. Design Mixtures for Credit ID 1.1: For each concrete mixture containing fly ash as a replacement for portland cement or other portland cement replacements and for equivalent concrete mixtures that do not contain portland cement replacements.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data for Fabricator and Installer.

B. Welding certificates.

C. Material Certificates for the following:

1. Cementitious materials.
2. Reinforcing materials including prestressing tendons.
3. Admixtures.
4. Bearing pads.
5. Structural Steel shapes, including plates and hollow structural sections.
6. Anchors and accessories.

D. Material Test Reports: For aggregates, by a qualified testing agency

E. Preconstruction test reports.

F. Source quality-control reports

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed structural precast concrete work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

1. Installer shall retain a "PCI-Certified Field Auditor" to conduct a field audit of the project installed by erector in Category S2 - Complex Structural Systems and who can produce an Erectors' Post Audit Declaration, according to PCI MNL 127, "PCI Erector's Manual - Standards and Guidelines for the Erection of Precast Concrete Products.

B. Fabricator Qualifications: Firm experienced in producing structural precast concrete units similar to those indicated for this Project and with a record of successful in-service performance as well as sufficient production capacity to produce required units without delaying the Work.

1. Fabricator must participate in the Precast/Prestressed Concrete Institute’s (PCI) Plant Certification Program and be designated a PCI Certified Plant. Certifications shall be for type of structural members to be used for this project (Category C3 minimum). Certification Category C1 or C2 shall not be considered as acceptable.
2. Fabricator shall be located within 500 miles of project site.

C. Professional Engineer Qualifications: A professional engineer who is legally authorized to practice in the State where the Project is located and who is experienced in providing engineering services of the kind indicated that have resulted in the installation and successful in-service performance of precast concrete units similar to this Project in material, design, and extent.

D. Testing Agency: Owner may engage an independent testing agency to perform shop inspections and tests and to provide test reports. Manufacturer shall provide testing agency with access to places where structural precast concrete units are being fabricated so inspection and testing can be accomplished. Correction of deficiencies and additional testing to determine compliance of corrected work will be performed at Contractor’s expense.

E. PCI Design Standard: Comply with recommendations of PCI MNL-120 “PCI Design Handbook – Precast and Prestressed Concrete” applicable to types of structural precast concrete units indicated.

F. PCI Quality-Control Standard: Comply with requirements of PCI MNL-116 “Manual for Quality Control Plants and Production of Precast and Prestressed Concrete Products,” including manufacturing and testing procedures, quality-control recommendations, and camber and dimensional tolerances for types of units required.

G. ACI Publications: Comply with the following ACI publications applicable to types of structural precast concrete units indicated:

1. ACI 301 “Specifications for Structural Concrete for Buildings.”
2. ACI 318 (ACI 318M) “Building Code Requirements for Reinforced Concrete.”
3. ACI 315 “Manual of Standard Practice for Detailing Reinforced Concrete Structures.”
4. ACI 525 “Minimum Requirements for Thin-Section Precast Concrete Construction.”

H. Welding Standards: Comply with applicable provisions of the following American Welding Society publications:

1. AWS D1.1 “Structural Welding Code – Steel.”
2. AWS D1.4 “Structural Welding Code – Reinforcing Steel.”
3. AWS D12.1 “Recommended Practices for Welding Reinforcing Steel, Metal Inserts, and Connections in Reinforced Concrete Construction.”

I. Joint-sealant testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

J. Preconstruction Laboratory Testing for Joint-sealants: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Adhesion Testing: Use ASTM C 794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
3. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.

K. Preconstruction Field-Adhesion Testing for Joint-sealants: Before installing sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints as directed by Architect.
2. Conduct field tests for each kind of sealant and joint substrate.
3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint-sealant manufacturer’s technical representative present.

a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

L. Calculated Fire-Test-Response Characteristics: When fire-resistance-rated assemblies are indicated, provide structural precast concrete units whose calculated fire resistance has been determined according to ASTM E 119 and PCI MNL-124 “Design for Fire Resistance of Precast Prestressed Concrete” and is acceptable to authorities having jurisdiction.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver precast concrete units to Project site in such quantities and at such times to ensure continuity of installation. Store units at Project site to prevent cracking, distorting, warping, staining, or other physical damage, and so that markings are visible.

B. Support units during shipment on nonstaining shock-absorbing material in same position as during storage.

C. Store units with adequate bracing and protect units to prevent contact with soil, to prevent staining, and to prevent cracking, distortion, warping or other physical damage.

1. Store units with dunnage across full width of each bearing point unless otherwise indicated.
2. Place adequate dunnage of even thickness between each unit.
3. Place stored units so identification marks are clearly visible, and units can be inspected.

D. Lift and support units only at designated lifting or supporting points as shown on final Shop Drawings.

E. Deliver anchorage items that are to be embedded in other construction before starting such work. Provide setting diagrams, templates, instructions, and directions, as required, for installation.

F. Provide temporary lateral support during erection to prevent bowing, warping, and overall lateral instability. Blocking and supports shall be clean, non-staining, and shall not prevent uniform curing of exposed surfaces.

1.8 FIELD CONDITIONS – JOINT SEALANTS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.9 WARRANTY – JOINT SEALANTS

A. Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty period: 2 years from substantial completion of project.

B. Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty period: 5 years from substantial completion of project.

C. Warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

1.10 COORDINATION

A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction before starting that Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in "Quality Requirements," to design precast structural concrete units.

B. Design Standards: Comply with ACI 318 (ACI 318M) and with design recommendations in PCI MNL 120, "PCI Design Handbook - Precast and Prestressed Concrete," applicable to types of precast structural concrete units indicated.

C. Structural Performance: Precast structural concrete units and connections shall withstand design loads indicated within limits and under conditions indicated.

1. Design precast structural concrete framing system and connections to maintain clearances at openings, to allow for fabrication and construction tolerances, to accommodate live-load deflection, shrinkage and creep of primary building structure, and other building movements. Maintain precast structural concrete deflections within limits of ACI 318.

2. Design to allow for thermal movements during the Construction period.

2.2 MOLD MATERIALS

A. Molds: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that provides continuous precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.

1. Mold-Release Agent: Commercially produced form-release agent that does not bond with, stain, or adversely affect precast concrete surfaces and does not impair subsequent surface or joint treatments of precast concrete.

2.3 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.

C. Supports for Reinforcement: Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use supports complying with CRSI recommendations.

1. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs that are protected with plastic (CRSI, Class 1) or stainless steel (CRSI, Class 2).

D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars in place. Manufacture bar supports from steel wire or plastic and as follows:

1. For concrete surfaces, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.4 PRESTRESSING TENDONS

A. Prestressing Strand: ASTM A 416, Grade 250 or 270, uncoated, 7-wire, stress-relieved.

B. Unbonded Post-Tensioning Strand: ASTM A 416/A 416M, Grade 270, uncoated, seven-wire, low-relaxation strand.

1. Coat unbonded post-tensioning strand with post-tensioning coating complying with ACI 423.7 and sheath with polypropylene tendon sheathing complying with ACI 423.7. Include anchorage devices and coupler assemblies.

C. Post- Tensioning Bars: ASTM A 722/A 722M, uncoated high-strength steel bar.

2.5 CONCRETE MATERIALS

A. Regional Materials: Precast structural concrete shall be manufactured from aggregates and cement that have been extracted or recovered, as well as manufactured, within 500 miles of Project site.

B. Portland Cement: ASTM C 150, Type I or Type III.

1. Use only one brand and type of cement throughout Project, unless otherwise acceptable to Architect.

C. Fly Ash: Not permitted.

D. Normal-Weight Aggregates: ASTM C 33, Class 5S. Provide aggregates from a single source.

1. For exposed surfaces, do not use fine or coarse aggregates that contain substances that cause spalling or surface discoloration due to oxidation.

E. Water: Potable.

F. Admixtures, General: Provide admixtures for concrete that contain not more than 0.05 percent chloride ions.

G. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.

1. Water-reducing admixtures, Types A, D, and E, or a high-range water reducer, Type F, predominate.
2. Water-Reducing Admixtures: ASTM C 494/C 494M, Type A.
3. Retarding Admixture: ASTM C 494/C 494M, Type B.
4. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
5. Water-Reducing and Accelerating Admixture: ASTM C 494/C 494M, Type E.
6. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
7. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
8. Plasticizing Admixture: ASTM C 1017/C 1017M, Type I.
9. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
10. Corrosion-Inhibiting Admixture: ASTM C 1582/C 1582M.

2.6 CONNECTION MATERIALS AND FINISHES

A. Steel Shapes and Plates: ASTM A 572 Grade 50. Hot-dipped Galvanized, except column base plates may be cold-galvanized on exposed surfaces (edges) of plate.

B. Plate Stainless Steel: ASTM A 666, Type 304, of grade suitable for application. Use for all double tee flange to flange connectors.

C. Bolts and Studs: ASTM A 307, Grade A; carbon-steel, hex-head bolts and studs; carbon-steel nuts; and flat, unhardened steel washers.

D. Threaded Steel Rods: ASTM A36, A307 or F1554 Grade 36. Electroplated finish per ASTM B117.

E. High-Strength Bolts and Nuts: ASTM A 325, Type 1, heavy hex steel structural bolts, ASTM A563 heavy hex carbon-steel nuts, and ASTM F436 hardened carbon-steel washers. Hot dipped galvanized.

F. Welded Headed Studs: AWS D1.1, Type B headed studs, cold-finished carbon-steel bars.

G. Deformed-Steel Wire Bar Anchors: ASTM A 496.

H. Welding Electrodes: Comply with AWS standards.

I. Accessories: Provide clips, hangers, shims, and other accessories required to install precast concrete units.

J. Hot-Dip Galvanized Finish: For exterior steel items and items indicated for galvanizing, apply zinc coating by the hot-dip process, complying with the following requirements:

1. ASTM A 123 for galvanizing rolled, pressed, and forged shapes, plates, bars, and strips.
2. ASTM A 153 for galvanizing iron and steel hardware.

K. Galvanizing Repair Paint: High-zinc-dust-content paint with dry film containing not less than 93 percent zinc dust by weight, and complying with DOD-P-21035A or SSPC-Paint 20.

2.7 BEARING PADS

A. Provide bearing pads for precast concrete units as follows:

1. Elastomeric Pads: AASHTO M 251, plain, vulcanized, 100 percent polychloroprene (neoprene) elastomer, molded to size or cut from a molded sheet, 50 to 70 shore A durometer, minimum tensile strength 2250 psi (15.5 MPa) per ASTM D 412.
2. Random-Oriented-Fiber-Reinforced Elastomeric Pads: Preformed, randomly oriented synthetic fibers set in elastomer. 70 to 90 Shore, Type A durometer hardness, ASTM D 2240; capable of supporting a compressive stress of 3000 psi (20.7 MPa) with no cracking, splitting, or delaminating in the internal portions of pad. Test one specimen for every 200 pads used in Project.

2.8 ACCESSORIES

A. Precast Accessories: Provide clips, hangers, high-density plastic or steel shims, and other accessories required to install structural precast concrete units.

2.9 GROUT MATERIALS

A. Cement Grout: Portland cement, ASTM C 150, Type I, and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2 ½ parts sand, by volume, with minimum water required for placement and hydration. Compressive strength of 3500 psi: 28 day strength or greater.

B. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, with fluid consistency and a 30-minute working time. Minimum 28-day compressive strength 10,000 psi.

2.10 CURING MATERIALS

A. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type I, Class B.

1. Provide material that has a maximum volatile organic compound (VOC) rating not to exceed those allowable by jurisdictional regulations.

2.11 CONCRETE MIXES

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use an independent testing agency acceptable to Architect or qualified precast manufacturing plant personnel for preparing and reporting proposed mix designs. Trial batch and field experience tests shall have been performed within 12 months of submittal date.

1. Fly ash is not permitted.

B. Normal-Weight Concrete: Provide normal-weight concrete with the following properties:

1. Compressive Strength (28-Day): 5000 psi (34.5 MPa).
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.

C. Limit water-soluble chloride ions to maximum percentage by weight of cement permitted by ACI 318 or PCI MNL 116 when tested according to ASTM C 1218.

D. Water Absorption: For structural precast concrete with an architectural finish, limit water absorption to 6 percent by weight or 14 percent by volume, tested according to ASTM C 642, except for boiling requirement.

E. Other Admixtures: Use water-reducing, high-range water-reducing, water-reducing and accelerating, or water-reducing and retarding admixtures, as required, according to manufacturer’s directions.

F. Concrete-Mix Adjustments: Concrete-mix design adjustments may be requested by precaster when characteristics of materials, project conditions, weather, test results, or other circumstances warrant as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in the work.

2.12 FABRICATION

A. Formwork: Accurately construct forms, mortar tight, of sufficient strength to withstand pressures due to concrete placing operations, temperature changes, and for pretensioning and detensioning operations. Maintain formwork to provide completed precast concrete units of shapes, lines, and dimensions indicated, within fabrication tolerances specified in PCI MNL-116.

1. Coat surfaces of forms with bond-breaking compound before reinforcement is placed. Provide commercial-formula, form-coating compounds that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces requiring bond or adhesion. Apply in compliance with manufacturer’s instructions.
2. Unless forms for precast, prestressed concrete units are stripped prior to detensioning, design forms so that stresses are not induced in precast units due to deformation of concrete under prestress or movement during detensioning.
3. Use forms to product a flat, gray, as-cast finish on the surfaces of the precast wall panels.

B. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.

1. Weld-headed studs and deformed bar anchors used for anchorage according to AWS D1.1/D1.1M and AWS C5.4, "Recommended Practices for Stud Welding."

C. Cast-in reglets, slots, holes, and other accessories in precast structural concrete units as indicated on the Contract Drawings.

D. Cast-in openings larger than 10 inches in any dimension. Do not drill or cut openings or prestressing strand without Architect's approval.

E. Reinforcement: Comply with recommendations in PCI MNL 116 for fabricating, placing, and supporting reinforcement for fabricating, placing, and supporting reinforcement.

1. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy the bond with concrete. When damage to epoxy-coated reinforcement exceeds limits specified in ASTM A 775/A 775M, repair with patching material compatible with coating material and epoxy coat bar ends after cutting.
2. Accurately position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcement by metal chairs, runners, bolsters, spacers and hangers, as required.
3. Place reinforcing steel and prestressing strand to maintain at least 1-1/2 inches minimum concrete cover. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Direct wire tie ends away from finished, exposed concrete surfaces.
4. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh spacing and wire tie laps, where required by design. Offset laps of adjoining widths to prevent continuous laps in either direction.

F. Reinforce precast structural concrete units to resist handling, transportation, and erection stresses and specified in-place loads

G. Prestress tendons for precast structural concrete units by either pretensioning or post-tensioning methods. Comply with PCI MNL 116.

1. Delay detensioning or post-tensioning of precast, prestressed structural concrete units until concrete has reached its indicated minimum design release compressive strength as established by test cylinders cured under same conditions as concrete unit.
2. Detension pretensioned tendons either by gradually releasing tensioning jacks or by heat cutting tendons, using a sequence and pattern to prevent shock or unbalanced loading.
3. If concrete has been heat cured, detension while concrete is still warm and moist to avoid dimensional changes that may cause cracking or undesirable stresses.
4. Protect strand ends and anchorages with bituminous, zinc-rich, or epoxy paint to avoid corrosion and possible rust spots.
5. Protect strand ends and anchorages with a minimum of 1-inch thick, nonmetallic, nonshrink, grout mortar and sack rub surface. Coat or spray the inside surfaces of pocket with bonding agent before installing grout.

H. Comply with requirements in PCI MNL 116 and in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.

I. Concrete Placement: Place concrete in a continuous operation to prevent seams or planes of weakness from forming in precast units. Comply with requirements of PCI MNL 116 for measuring, mixing, transporting, and placing concrete.

J. Thoroughly consolidate placed concrete by vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air voids on surfaces. Use equipment and procedures complying with PCI MNL 116.

K. Place concrete in a continuous operation to prevent cold joints or planes of weakness from forming in precast concrete units.

L. Comply with PCI MNL 116 procedures for hot- and cold-weather concrete placement.

M. Identify pickup points of precast structural concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each precast structural concrete unit on a surface that does not show in finished structure.

N. Cure concrete, according to requirements in PCI MNL 116, by moisture retention without heat or by accelerated heat curing using live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.

O. Finish formed surfaces of precast concrete as indicated for each type of unit as follows:

1. Standard Grade Finish: Fill air pockets and holes greater than ¼ inch (6 mm) in diameter with sand-cement paste matching color of adjacent surfaces. Grind smooth form offsets or fins greater than 1/8 inch (3 mm). Use Standard Grade finish for concealed structural wall panels.

P. Finish unformed surfaces by trowel, unless otherwise indicated. Consolidate concrete, bring to proper level with straightedge, float, and trowel to a smooth, uniform finish.

Q. Discard and replace precast structural concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet requirements in PCI MNL 116 and meet Architect's approval.

2.13 FABRICATION TOLERANCES

A. Fabricate precast structural concrete units to shapes, lines, and dimensions indicated so each finished unit complies with PCI MNL 116 product dimension tolerances as well as position tolerances for cast-in items.

1. Tolerance for panel alignment, panel thickness, panel length, panel height, and embed position shall each be 1/4-inch unless noted otherwise.

2.14 JOINT SEALANTS

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and

application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Colors of Joint Sealants: As selected by Architect from manufacturer's full range.

C. Urethane, M, NS, 25, T, NT: Multicomponent, nonsag, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type M, Grade NS, Class 25, Uses T and NT.

1. Products: Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:

a. Tremco Incorporated: Dymeric 240.
b. Sika Corporation: Sikaflex -2c NS EZ Mix.

D. JOINT-SEALANT BACKING

1. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1) BASF Construction Chemicals, LLC
2) Construction Foam Products, a division of Nomaco, Inc.

2. Cylindrical Sealant Backings: ASTM C 1330, Type C closed-cell material with a surface skin or Type B (bicellular material with a surface skin, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

3. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

E. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

F. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

G. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

2.15 SOURCE QUALITY CONTROL

A. The Owner may employ an independent testing agency to evaluate precast fabricator's quality control and testing methods.

1. Allow Owner's testing agency access to material storage areas, concrete production equipment, concrete placement, and curing facilities. Cooperate with Owner's testing agency and provide samples of materials and concrete mixes as may be requested for additional testing and evaluation.

B. Quality-Control Testing: Test and inspect precast concrete according to PCI MNL-116 requirements. Maintain records of test reports at the fabricator's plant. Make test records available to Owner, Architect and Engineer upon request.

1. Test and inspect self-consolidating concrete according to PCI TR-6.

C. Strength of precast concrete units will be considered potentially deficient when precast concrete units fail to comply with requirements, including the following:

1. Fail to meet compressive-strength test requirements.
2. Reinforcement, and pretensioning and detensioning tendons of prestressed concrete do not conform to fabrication requirements.
3. Concrete curing and protection of precast units against extremes in temperature fail to meet requirements.
4. Precast units are damaged during handling and erecting.

D. Testing: When there is evidence that the strength of precast concrete units may be deficient or may not meet requirements, the Owner will employ an independent testing agency to obtain, prepare, and test cores drilled from hardened concrete to determine compressive strength according to ASTM C 42.

1. A minimum of 3 representative cores will be taken from precast concrete units of suspect strength, from locations directed by Architect.
2. Cores will be tested in an air-dry condition per ACI 301 when precast concrete units will be dry under service conditions.
3. Strength of concrete for each series of 3 cores will be considered satisfactory if the average compressive strength is at least 85 percent of the 28-day design compressive strength and no core compressive strength is less than 75 percent of the 28-day design compressive strength.
4. Test results will be made in writing on the same day that tests are made, with copies to Architect, Contractor, and Precast Fabricator. Test reports will include the Project identification name and number, date, name of precast concrete fabricator, name of concrete testing agency; identification letter, name, and type of precast concrete unit or units represented by core tests; design compressive strength, compressive strength at break and type of break, corrected for length-diameter ratio, and direction of applied load to core with respect to horizontal plane of concrete as placed.

E. Patching: Where core test results are satisfactory and precast concrete units meet requirements, solidly fill core holes with patching mortar and finish to match adjacent concrete surfaces.

F. Dimensional Tolerances: Units having dimensions smaller or greater than required and not meeting tolerance limits may be subject to additional testing.

1. Precast units having dimensions greater than required will be rejected if the appearance or function of the structure is adversely affected or if larger dimensions interfere with other construction. Repair or remove and replace rejected units, as required, to meet construction conditions.

G. Defective Units: Discard and replace precast structural concrete units that do not comply with requirements, including strength, manufacturing tolerances, and color and texture range. Chipped, spalled, or cracked units may be repaired, subject to Architect's approval. Architect reserves the right to reject precast units that do not match approved samples, sample panels, and mockups. Replace unacceptable units with precast concrete units that comply with requirements.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements, including installation tolerances, true and level bearing surfaces, and other conditions affecting performance of precast concrete units.

1. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Do not install precast concrete units until supporting, cast-in-place concrete has attained minimum allowable design compressive strength and until supporting steel or other structure is structurally ready to receive loads from precast concrete units.

3.2 INSTALLATION

A. Grouting or Dry-Packing Connections and Joints: Grout connections and joints and open spaces at keyways, connections, and joints where required or indicated on Shop Drawings. Grout solid all vertical and horizontal joints between structural precast wall panels. Retain flowable grout in place until hard enough to support itself. Alternatively, pack spaces with stiff dry-pack grout material, tamping until voids are completely filled.

1. Place grout and finish smooth, level, and plumb with adjacent concrete surfaces.
2. Fill joints completely without seepage to other surfaces.
3. Trowel edges of grout joints smooth and uniform.
4. Place grout end cap or dam in voids as required.
5. Promptly remove grout material from exposed surfaces before it affects finishes or hardens.
6. Keep grouted joints damp for not less than 24 hours after initial set.

B. Set vertical units dry, without grout, attaining joint dimension with steel or plastic spacers.

1. Grout pack entirety of base of unit after leveling, plumbing, and squaring. Grout shall be for the full member thickness. Contractor shall ensure stability of panel until system is complete, with all attachments to structure.
2. Do not cast concrete on metal deck above precast panels until panel gaps are grouted and fully cured.
3. Do not stack more than three-stories nor 45 feet in height above grouted panel gaps.

C. Erect precast structural concrete level, plumb, and square within specified allowable tolerances. Provide temporary structural framing, shoring, and bracing as required to maintain position, stability, and alignment of units until permanent connections are complete.

1. Install temporary steel or plastic spacing shims or bearing pads as precast structural concrete units are being erected. Tack weld steel shims to each other to prevent shims from separating.
2. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
3. Remove projecting lifting devices and use plastic patch caps or sand-cement grout to fill voids within recessed lifting devices flush with surface of adjacent precast surfaces when recess is exposed.

D. Connect precast structural concrete units in position by bolting, welding, grouting, or as otherwise indicated on Shop Drawings. Remove temporary shims, wedges, and spacers as soon as practical after connecting and grouting are completed.

1. Do not permit connections to disrupt continuity of roof flashing.

E. Field cutting of precast units is not permitted without approval of Architect.

F. Fasteners: Do not use drilled or powder-actuated fasteners for attaching accessory items to precast, prestressed concrete units.

G. Bearing Pads: Install bearing pads as precast concrete units are being erected. Set pads on true, level, and uniform bearing surfaces and maintain in correct position until precast units are placed.

H. Welding: Perform welding in compliance with AWS D1.1 and AWS D1.4, with qualified welders.

1. Protect precast concrete units and bearing pads from damage by field welding or cutting operations and provide noncombustible shields as required.
2. Clean weld-affected steel surfaces with chipping hammer followed by brushing, and apply a minimum 4.0-mil thick coat of galvanized repair paint to galvanized surfaces according to ASTM A 780.
3. Visually inspect welds and remove, reweld, or repair incomplete and defective welds.

I. At bolted connections, use lock washers, tack welding, or other approved means to prevent loosening of nuts after final adjustment.

1. Where slotted connections are used, verify bolt position and tightness. For sliding connections, properly secure bolt but allow bolt to move within connection slot.
2. For slip-critical connections, use one of the following methods to assure proper bolt pretension:
    a. Turn-of-Nut: According to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
    b. Calibrated Wrench: According to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

J. Shore and brace precast concrete units to maintain location, stability, and alignment until permanent connections are installed. Contractor is responsible for all Construction shoring for panel stability during construction.

K. Remove lifting hooks if necessary. Patch any voids left at lifting points.

L. Contractor shall coordinate all penetrations through and attachment to precast concrete elements with the precast manufacturer. Penetrations shall be located to not disturb or cut prestressing tendons. Attachment to the prestressed/post-tensioned precast shall be located around tendon layout and shall incorporate fasteners designed for use in prestressed/post-tensioned concrete and that do not penetrate the concrete more than 3/4-inch.

3.3 ERECTION TOLERANCES

A. Erect precast structural concrete units level, plumb, square, and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 135.

3.4 REPAIRS

A. Repair precast structural concrete units if permitted by Architect.

1. Repairs may be permitted if structural adequacy, serviceability, durability, and appearance of units have not been impaired.

B. Mix patching materials and repair units so cured patches blend with color, texture, and uniformity of adjacent exposed surfaces and show no apparent line of demarcation between original and repaired work, when viewed in typical daylight illumination from a distance of 20 feet.

C. Prepare and repair damaged galvanized coatings with galvanizing repair paint according to ASTM A 780.

D. Remove and replace damaged precast structural concrete units that cannot be repaired or when repairs do not comply with requirements as determined by Architect.

3.5 CLEANING

A. Clean exposed surfaces of precast concrete units after erection to remove weld marks, other markings, dirt, and stains.

1. Wash and rinse according to precast concrete fabricator’s recommendations. Protect other work from staining or damage due to cleaning operations.
2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes.

B. Clean mortar, weld slag, and other deleterious material from concrete surfaces and adjacent materials immediately.

3.6 CLEANING – JOINT SEALANTS

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.7 JOINT SEALANTS

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
3. Remove laitance and form-release agents from concrete.

D. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

E. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

F. Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

G. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

H. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

I. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

J. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

K. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
4. Provide flush joint profile at locations indicated on Drawings Insert locations according to Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C 1193.

a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

L. Protection: Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.8 JOINT SEALANT SCHEDULE

A. Horizontal, Sloped and Vertical surface joints:

1. Urethane, M, NS, 25, T, NT.
2. Color as selected by Architect from manufacturer’s full range of colors.

3.9 FIELD QUALITY CONTROL

A. General: The Owner will employ a testing agency which meets the requirements of ASTM E329 to perform tests and to submit test reports. The agency will monitor concrete quality by means of site and laboratory tests. They will be authorized to reject work not conforming to specifications. Failure to detect any defective materials or installation shall not prevent later rejection when such defect is discovered, or obligate the Architect or Owner for final acceptance.

1. See Section 014110 – Structural Special Inspections for testing and inspection to be performed. Tests and inspections include concrete as well as steel connections and welding.
2. Test results will be reported in writing to the Architect, Engineer and Cosntruction Manager within two weeks after tests.
3. Additional Tests: The testing agency will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect.

B. Repair or remove and replace work where tests and inspections indicate that it does not comply with specified requirements.

3.10 FIELD QUALITY CONTROL – JOINT SEALANTS

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:

   a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
   b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

   a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

3. Inspect tested joints and report on the following:

   a. Whether sealants filled joint cavities and are free of voids.
   b. Whether sealant dimensions and configurations comply with specified requirements.
   c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.

5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.11 CLEANING

A. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, and stains.

1. Perform cleaning procedures, if necessary, according to precast concrete fabricator's written recommendations. Protect other work from staining or damage due to cleaning operations.
2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION 03 4100

SECTION 03 4500 - PRECAST ARCHITECTURAL CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Precast architectural concrete cladding units.
2. Mold materials.
3. Insulation Materials.
4. Reinforcing materials.
5. Prestressing tendons.
6. Concrete materials.
7. Steel connection materials.
8. Grout materials.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
2. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.

C. Design Mixtures: For each precast concrete mixture. Include compressive strength and water-absorption tests.

D. Shop Drawings:

1. Detail fabrication and installation of architectural precast concrete units.
2. Indicate locations, plans, elevations, dimensions, shapes, and cross sections of each unit.

3. Indicate joints, reveals, drips, chamfers, and extent and location of each surface finish.
4. Indicate details at building corners.
5. Indicate separate face and backup mixture locations and thicknesses.
6. Indicate type, size, and length of welded connections by AWS standard symbols. Detail loose and cast-in hardware and connections.
7. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
8. Indicate locations, extent, and treatment of dry joints if two-stage casting is proposed.
9. Include plans and elevations showing unit location and sequence of erection for special conditions.
10. Indicate location of each architectural precast concrete unit by same identification mark placed on panel.
11. Indicate relationship of architectural precast concrete units to adjacent materials.
12. Indicate locations, dimensions, and details of thin-brick units, including corner units and special shapes, and joint treatment.
13. Indicate locations, dimensions, and details of stone facings, anchors, and joint widths.
14. If design modifications are proposed to meet performance requirements and field conditions, submit design calculations and Shop Drawings. Do not adversely affect the appearance, durability, or strength of units when modifying details or materials and maintain the general design concept.
15. Indicate panel to panel connections and panel to support structure connections.
    a. Distinguish between lateral only, vertical only, or combined lateral and vertical connection.
    b. Include details of each connection type.
16. Shop drawings shall be signed and sealed by the qualified professional engineer, registered in the State of Kentucky, responsible for their preparation.
17. Shop drawing resubmittals are reviewed for conformance with review marks only. Any changes or questions originating on a resubmittal shall be clearly clouded.

E. Samples: Design reference samples for initial verification of design intent, for each type of finish indicated on exposed surfaces of architectural precast concrete units, in sets of three, representative of finish, color, and texture variations expected; approximately 12 by 12 by 2 inches.

1. Samples for each thin-brick unit required, showing full range of color and texture expected. Include Sample showing color and texture of joint treatment.

    a. Grout Samples for Initial Selection: Color charts consisting of actual sections of grout showing manufacturer's full range of colors.
    b. Grout Samples for Verification: Showing color and texture of joint treatment.

F. Sample Panels: After sample approval and before fabricating architectural precast concrete units, produce a minimum of two sample panels approximately 16 sq. ft. in area for review by Architect. Incorporate full-scale details of architectural features, finishes, textures, and transitions in sample panels.

1. Locate panels where indicated or, if not indicated, as directed by Architect.
2. Damage part of an exposed-face surface for each finish, color, and texture, and demonstrate adequacy of repair techniques proposed for repair of surface blemishes.
3. After acceptance of repair technique, maintain one sample panel at manufacturer's plant and one at Project site in an undisturbed condition as a standard for judging the completed Work.
4. Demolish and remove sample panels when directed.

G. Joint Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

H. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

I. Field-Adhesion-Test Reports: For each sealant application tested.

J. Delegated Design Submittals: For architectural precast concrete indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified Professional Engineer responsible for their preparation.

1. Show governing panel types, connections, types of reinforcement, including special reinforcement, and concrete cover on reinforcement. Indicate location, type, magnitude, and direction of loads imposed on the building structural frame from architectural precast concrete.

K. Sustainable Design Submittals:

1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Provide locations, setting diagrams, templates, instructions, and directions, as required, for furnishing and installation of loose connection hardware and anchorage items to be embedded in or attached to other construction.

B. Welding certificates.

C. Material test reports for each material used in system, including aggregates.

D. Source Quality-Control Reports: For aggregate, cementitious materials.

E. Qualification Statements: For fabricator, Installer, and testing agency.

F. Fabrication quality control reports: Including compressive strength test reports.

1.6 CLOSEOUT SUBMITTALS

A. General Contractor/Construction Manager Project Survey: Complete the survey form, providing feedback of the certified precast producer's performance in accordance with PCI's Architectural Certification Program. Submit to PCI as directed on form; provide a copy to Architect.

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm that assumes responsibility for engineering architectural precast concrete units to comply with performance requirements. This responsibility includes

preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

1. Designated at time of bidding as a PCI-certified plant for Category A1.
2. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 117 and PCI MNL 135.

B. Certified Installer Qualifications: A precast concrete erector qualified and designated by PCI's Certificate of Compliance to erect Category A (Architectural Systems) for non-load-bearing members.

C. Installer Qualifications: A precast concrete erector who has retained a "PCI-Certified Field Auditor" to conduct a field audit of a project in same category as this Project and who can produce an Erectors' Post-Audit Declaration.

D. Delegated Design Engineer Qualifications: A professional engineer who is legally qualified to practice in state where Project is located and who is experienced in providing engineering services of the type indicated.

E. Welding Qualifications: Qualify procedures and personnel in accordance with the following welding codes:

1. AWS D1.1/D1.1M.
2. AWS D1.4/D1.4M.
3. AWS D1.6/D1.6M.

1.8 MOCKUPS

A. Build mockups to verify selections made under Sample submittals and to set quality standards for materials and execution.

1. After sample panel and range sample approval, build mockup as indicated on Drawings, complete with anchors, connections, flashings, and joint fillers.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations by Change Order.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 COORDINATION

A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction without delaying the Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver architectural precast concrete units in such quantities and at such times to limit unloading units temporarily on the ground or other rehandling.

B. Store units with adequate dunnage and bracing, and protect units to prevent contact with soil, prevent staining, and prevent cracking, distortion, warping, or other physical damage.

C. Place stored units so identification marks are clearly visible, and units can be inspected.

D. Handle and transport units in a manner that avoids excessive stresses that cause cracking or damage.

E. Lift and support units only at designated points indicated on Shop Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in "Quality Assurance," to design architectural precast concrete units, including architectural facing system/s.

B. Design Standards: Comply with ACI 318-14 and design recommendations of PCI MNL 120 applicable to types of architectural precast concrete units indicated.

C. Structural Performance: Provide architectural precast concrete units and connections capable of withstanding the indicated design loads within limits and under conditions indicated on the Construction Documents.

1. See Structural General Notes sheet for Components and Cladding Wind Loading and Seismic Design Criteria. Precast Design Engineer shall determine and account for Dead Loads and Live Loads as applicable.
2. Design precast concrete units and connections to maintain clearances at openings, to allow for fabrication and construction tolerances, to accommodate live-load deflection, shrinkage and creep of primary building structure, and other building movements as follows:
3. Upward and downward movement of 3/4 inch.
4. Thermal Movements: Provide for in-plane thermal movements resulting from annual ambient temperature changes of 100 deg F.

2.2 PRECAST ARCHITECTURAL CONCRETE UNITS

A. Provide unit types as indicated on Drawings, including insulated wall panels.

B. Source Limitations: Obtain precast architectural concrete units for the entire project from single fabricator.

2.3 MOLD MATERIALS

A. Molds: Rigid, dimensionally stable, nonabsorptive material, warp and buckle free, that provides continuous and true precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.

1. Mold-Release Agent: Commercially produced form-release agent that does not bond with, stain or adversely affect precast concrete surfaces and does not impair subsequent surface or joint treatments of precast concrete.

B. Form Liners: Units of face design, texture, arrangement, and configuration to match those used for precast concrete design reference sample. Provide solid backing and supports to keep form liners in place during concrete placement.

1. Face Pattern: Smooth, Brick.

C. Form-Release Agent: Commercially produced form-release agent that does not bond with, stain, or adversely affect precast concrete surfaces and does not impair subsequent surface or joint treatments of precast concrete.

D. Surface Retarder: Chemical-set retarder, capable of temporarily delaying final hardening of newly placed concrete mixture to depth of reveal specified.

2.4 REINFORCING MATERIALS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 50 percent.

B. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.

C. Low-Alloy-Steel Reinforcing Bars: ASTM A706/A706M, deformed.

D. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, fabricated fromsteel wire into flat sheets.

E. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

F. Supports: Suspend reinforcement from back of mold. Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement in place may only be used if they are not visible in the finished face.

2.5 PRESTRESSING TENDONS

A. Prestressing Strand: ASTM A416/A416M, Grade 270, uncoated, seven-wire, low-relaxation strand.

1. Coat unbonded post-tensioning strand with post-tensioning coating and sheath with polypropylene tendon sheathing in compliance with ACI 423.7. Include anchorage devices and coupler assemblies.

B. Post-Tensioning Bars: ASTM A722/A722M, uncoated high-strength steel bars.

2.6 CONCRETE MATERIALS

A. Regional Materials: Verify concrete is manufactured within 100 miles of Project site from aggregates and cementitious materials that have been extracted, harvested, or recovered, as well as manufactured, within 100 miles Project site.

B. Portland Cement: ASTM C150/C150M, Type I or Type III.

1. For surfaces exposed to view in finished structure, use white cement, of same type, brand, and mill source.

a. Standard gray cement is acceptable for use where not exposed to view.

C. Supplementary Cementitious Materials:

1. Fly Ash: ASTM C618, Class C or F, with maximum loss on ignition of 3 percent.
2. Metakaolin: ASTM C618, Class N.
3. Silica Fume: ASTM C1240, with optional chemical and physical requirement, white.
4. Ground Granulated Blast-Furnace Slag: ASTM C989/C989M, Grade 100 or 120.

D. Normal-Weight Aggregates: Except as modified by PCI MNL 117, ASTM C33/C33M, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project.

1. Face-Mixture-Coarse Aggregates: Selected, hard, and durable; free of material that reacts with cement or causes staining; to match approved finish sample.

a. Gradation: Uniformly graded.

2. Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand compatible with coarse aggregate; to match approved finish sample.

E. Coloring Admixture: ASTM C979/C979M, synthetic or natural mineral-oxide pigments or colored water-reducing admixtures, temperature stable, and nonfading[.].

F. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 117 and ASTM C1602/C1602M.

G. Air-Entraining Admixture: ASTM C260/C260M, certified by manufacturer to be compatible with other required admixtures.

H. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.

1. Water-Reducing Admixtures: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. Water-Reducing and Accelerating Admixture: ASTM C 494/C 494M, Type E.
5. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
6. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
7. Plasticizing Admixture: ASTM C 1017/C 1017M, Type I.
8. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
9. Corrosion Inhibiting Admixture: ASTM C 1582/C 1582M.

2.7 STEEL CONNECTION MATERIALS

A. Carbon Steel Shapes and Plates: ASTM A572 Grade 50.

B. Carbon Steel-Headed Studs: ASTM A108, Grades 1010 through 1020, cold finished, AWS D1.1/D1.1M, Type A or Type B, with arc shields and with minimum mechanical properties of PCI MNL 117, Table 3.2.3.

C. Carbon Steel Plate: ASTM A283/A283M, Grade C.

D. Malleable Iron Castings: ASTM A47/A47M, Grade 32510 or Grade 35028.

E. Carbon Steel Castings: ASTM A27/A27M, Grade 60-30.

F. High-Strength, Low-Alloy Structural Steel: ASTM A572/A572M.

G. Carbon Steel Structural Tubing: ASTM A500/A500M, Grade C.

H. Wrought Carbon Steel Bars: ASTM A675/A675M, Grade 65.

I. Deformed-Steel Wire or Bar Anchors: ASTM A1064/A1064M or ASTM A706/A706M.

J. Carbon Steel Bolts and Studs: ASTM A307, Grade A, or ASTM F1554, Grade 36; carbon steel, hex-head bolts and studs; carbon steel nuts, ASTM A563; and flat, unhardened steel washers, ASTM F844.

K. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon steel nuts; and ASTM F436/F436M, Type 1, hardened carbon steel washers.

L. Zinc-Coated Finish: For exterior steel items, steel in exterior walls, and items indicated for galvanizing, apply zinc coating by hot-dip process in accordance with ASTM A123/A123M or ASTM A153/A153M.

1. For steel shapes, plates, and tubing to be galvanized, limit silicon content of steel to less than 0.03 percent or to between 0.15 and 0.25 percent, or limit sum of silicon and 2.5 times phosphorous content to 0.09 percent.
2. Galvanizing Repair Paint: High-zinc-dust-content paint with dry film containing not less than 94 percent zinc dust by weight, and complying with MIL-P-21035B or SSPC-Paint 20.

M. Shop-Primed Finish: Prepare surfaces of nongalvanized-steel items, except those surfaces to be embedded in concrete, in accordance with requirements in SSPC-SP 3, and shop-apply lead- and chromate-free, rust-inhibitive primer, complying with performance requirements in MPI 79 in accordance with SSPC-PA 1.

N. Welding Electrodes: Comply with AWS standards.

2.8 BEARING PADS

A. Provide one of the following bearing pads for architectural precast concrete units as recommended by precast fabricator, and accepted by the Engineer-of-Record, for application:

1. Elastomeric Pads: AASHTO M 251, plain, vulcanized, 100 percent polychloroprene (neoprene) elastomer, molded to size or cut from a molded sheet, Type A durometer hardness of 50 to 70, ASTM D 2240, minimum tensile strength 2250 psiASTM D 412.
2. Random-Oriented-Fiber-Reinforced Elastomeric Pads: Preformed, randomly oriented synthetic fibers set in elastomer. Type A durometer hardness of 70 to 90, ASTM D 2240; capable of supporting a compressive stress of 3000 psi with no cracking, splitting, or delaminating in the internal portions of pad. Test one specimen for every 200 pads used in Project.
3. Cotton-Duck-Fabric-Reinforced Elastomeric Pads: Preformed, horizontally layered cotton-duck fabric bonded to an elastomer; Type A durometer hardness of 80 to 100,

ASTM D 2240; complying with AASHTO's "AASHTO LRFD Bridge Design Specifications," Division II, Section 18.10.2; or with MIL-C-882E.

4. Frictionless Pads: PTFE, glass-fiber reinforced, bonded to stainless or mild-steel plate, or random-oriented-fiber-reinforced elastomeric pads; of type required for in-service stress.
5. High-Density Plastic: Multimonomer, nonleaching, plastic strip.

2.9 GROUT MATERIALS

A. Sand-Cement Grout: Portland cement, ASTM C150/C150M, Type I, and clean, natural sand, ASTM C144 or ASTM C404. Mix at ratio of 1 part cement to 2-1/2 to 3 parts sand, by volume, with minimum water required for placement and hydration. Water-soluble chloride ion content is to be less than 0.06 percent by weight of cement when tested in accordance with ASTM C1218/C1218M.

B. Nonmetallic, Nonshrink Grout: Packaged, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C1107/C1107M, Grade A for dry pack and Grades B and C for flowable grout, and of consistency suitable for application within a 30-minute working time. Water-soluble chloride ion content is to be less than 0.06 percent by weight of cement when tested in accordance with ASTM C1218/C1218M.

C. Epoxy-Resin Grout: Two-component, mineral-filled epoxy resin; ASTM C881/C881M, of type, grade, and class to suit requirements.

2.10 THIN BRICK AND ACCESSORIES

A. Products: Subject to compliance with requirements, provide the following:

1. Brick matching Belden Brick at Gatton Business College.

B. Thin Brick: Not less than 1/2 inch or more than 1 inch (25 mm) thick, and as follows:

1. Dimensional Tolerances: Plus 0 inch (0 mm) or minus 1/16 inch (1.6 mm) for any dimension 8 inches (203 mm) or less and plus 0 inch (0 mm) or minus 3/32 inch (2.4 mm) for any dimension more than 8 inches (203 mm).
2. Out-of-Square Tolerance: Plus or minus 1/16 inch (1.6 mm).
3. Warpage Tolerance: Plus 0 inch (0 mm) or minus 1/16 inch (1.6 mm).
4. Variation of Shape from Specified Angle: Plus or minus one degree.
5. Modulus of Rupture: Not less than 250 psi (1.7 MPa) when tested according to ASTM C 67.
6. Tensile Bond Strength: Not less than 150 psi (1.0 MPa) when tested before and after freeze-thaw test according to ASTM E 488 as modified: Adhere a steel plate with a welded rod on a single thin-brick face with epoxy for each test.
7. 24-Hour Cold-Water Absorption: Not more than 6 percent when tested according to ASTM C 67.
8. Freeze-Thaw Resistance: No detectable disintegration or separation after 300 freezing-and-thawing cycles when tested according to ASTM C 666/C 666M, Method B.
9. Chemical Resistance: Tested according to ASTM C 650 and rated "not affected."
10. Efflorescence: Tested according to ASTM C 67 and rated "not effloresced."
11. Surface Coating: Thin brick with colors or textures applied as coatings shall withstand 50 cycles of freezing and thawing; ASTM C 67 with no observable difference in applied finish when viewed from 10 feet (3 m).

12. Back Surface Texture: Scored, combed, wire roughened, ribbed, keybacked, or dovetailed.

C. Regional Materials: Thin brick shall be manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.

D. Special Shapes: Include corners, edge corners, and end edge corners.

E. Face Size: 2-1/4 inches (57 mm) high by 11-5/8 inches (295 mm) long.

F. Face Color and Texture: Match Architect's samples.

G. Sand-Cement Mortar: Portland cement, ASTM C 150/C 150M, Type I, and clean, natural sand, ASTM C 144. Mix at ratio of 1 part cement to 4 parts sand, by volume, with minimum water required for placement.

H. Pointing Grout: Packaged, polymer-modified, sanded grout complying with ANSI A118.7.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Bostik, Inc.
b. C-Cure.
c. Custom Building Products.
d. DAP Products Inc.
e. Jamo Inc.
f. Laticrete International, Inc.
g. MAPEI Corporation.
h. Merkrete by Parex USA, Inc.
i. ProSpec.
j. SGM Inc.
k. Summitville Tiles, Inc.
l. TEC Specialty Products Inc.

2. Polymer Type: Acrylic resin in dry, redispersible form, packaged with other dry ingredients.
3. Colors: As selected by Architect from manufacturer's full range.

2.11 INSULATED PANEL ACCESSORIES

A. Polyisocyanurate Board Insulation: ASTM C 591, Type I, 1.8 lb/cu. ft. (29 kg/cu. m) unfaced, with thickness of.

B. Wythe Connectors: Corrosion resistant connectors per manufacturer’s design manufactured to connect wythes of precast concrete panels.

2.12 CONCRETE MIXTURES

A. Prepare design mixtures for each type of precast concrete required.

1. Use a single design mixture for units with more than one major face or edge exposed.

2. Where only one face of unit is exposed, use either a single design mixture or separate mixtures for face and backup.

B. Limit use of fly ash and ground granulated blast-furnace slag to 20 percent of portland cement by weight; limit metakaolin and silica fume to 10 percent of portland cement by weight.

C. Design mixtures may be prepared by a qualified independent testing agency or by qualified precast plant personnel at architectural precast concrete fabricator's option.

D. Limit water-soluble chloride ions to maximum percentage by weight of cement permitted by ACI 318 or PCI MNL 117 when tested in accordance with ASTM C1218/C1218M.

E. Normal-Weight Concrete Mixtures: Proportion face and backup mixtures by either laboratory trial batch or field test data methods in accordance with ACI 211.1, with materials to be used on Project, to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 5000 psi minimum.
2. Maximum Water-Cementitious Materials Ratio: 0.45.

F. Water Absorption: Six percent by weight or 14 percent by volume, tested in accordance with ASTM C642, except for boiling requirement.

G. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content complying with PCI MNL 117.

H. When included in design mixtures, add other admixtures to concrete mixtures in accordance with manufacturer's written instructions.

2.13 FABRICATION OF MOLDS

A. Molds: Accurately construct molds, mortar tight, of sufficient strength to withstand pressures due to concrete-placement operations and temperature changes and for prestressing and detensioning operations. Coat contact surfaces of molds with release agent before reinforcement is placed. Avoid contamination of reinforcement and prestressing tendons by release agent.

1. Place form liners accurately to provide finished surface texture indicated. Provide solid backing and supports to maintain stability of liners during concrete placement. Coat form liner with form-release agent.

B. Maintain molds to provide completed architectural precast concrete units of shapes, lines, and dimensions indicated, within fabrication tolerances specified.

1. Form joints are not permitted on faces exposed to view in the finished Project.
2. Edge and Corner Treatment: Uniformly chamfered.

2.14 THIN-BRICK FACINGS

A. Place form liner templates accurately to provide grid for thin-brick facings. Provide solid backing and supports to maintain stability of liners while placing thin bricks and during concrete placement.

B. Securely place thin-brick units face down into form liner pockets and place concrete backing mixture.

C. Completely fill joint cavities between thin-brick units with sand-cement mortar, and place precast concrete backing mixture while sand-cement mortar is still fluid enough to ensure bond.

D. Mix and install pointing grout according to ANSI A108.10. Completely fill joint cavities between thin-brick units with pointing grout, and compress into place without spreading grout onto faces of thin-brick units. Remove excess grout immediately to prevent staining of thin brick.

1. Tool joints to a slightly concaveshape when pointing grout is thumbprint hard.

E. Clean faces and joints of thin-brick facing.

2.15 FABRICATION OF PRECAST ARCHITECTURAL CONCRETE

A. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.

1. Weld-headed studs and deformed bar anchors used for anchorage in accordance with AWS D1.1/D1.1M and AWS C5.4.

B. Furnish loose hardware items, including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other hardware shapes for securing architectural precast concrete units to supporting and adjacent construction.

C. Cast-in reglets, slots, holes, and other accessories in architectural precast concrete units, as indicated on the Drawings.

D. Cast-in openings larger than 10 inchesin any dimension. Do not drill or cut openings or prestressing strand without Architect's approval.

E. Reinforcement: Comply with recommendations in PCI MNL 117 for fabricating, placing, and supporting reinforcement.

1. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy the bond with concrete. When damage to epoxy-coated reinforcing exceeds limits specified in ASTM A 775/A 775M, repair with patching material compatible with coating material and epoxy coat bar ends after cutting.
2. Accurately position, support, and secure reinforcement against displacement during concrete-placement and consolidation operations. Completely conceal support devices to prevent exposure on finished surfaces.
3. Place reinforcing steel and prestressing strands to maintain at least 3/4-inchminimum concrete cover. Increase cover requirements for reinforcing steel to 1-1/2 inches when units are exposed to corrosive environment or severe exposure conditions. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Direct wire tie ends away from finished, exposed concrete surfaces.
4. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh spacing and wire tie laps, where required by design. Offset laps of adjoining widths to prevent continuous laps in either direction.

F. Reinforce precast architectural concrete units to resist handling, transportation, and erection stresses and specified in-place loads.

G. Prestress tendons for architectural precast concrete units by either pretensioning or post-tensioning methods. Comply with PCI MNL 117.

1. Delay detensioning or post-tensioning of precast, prestressed architectural concrete units until concrete has reached its indicated minimum design release compressive strength as established by test cylinders cured under same conditions as concrete unit.
2. Detension pretensioned tendons either by gradually releasing tensioning jacks or by heat-cutting tendons, using a sequence and pattern to prevent shock or unbalanced loading.
3. If concrete has been heat cured, detension while concrete is still warm and moist to avoid dimensional changes that may cause cracking or undesirable stresses.
4. Protect strand ends and anchorages with bituminous, zinc-rich, or epoxy paint to avoid corrosion and possible rust spots.

H. Comply with requirements in PCI MNL 117 and requirements in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.

I. Place face mixture to a minimum thickness after consolidation of the greater of 1 inch or 1.5 times the maximum aggregate size, but not less than the minimum reinforcing cover specified.

J. Place concrete in a continuous operation to prevent cold joints or planes of weakness from forming in precast concrete units.

1. Place backup concrete mixture to ensure bond with face-mixture concrete.

K. Thoroughly consolidate placed concrete by internal and external vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air voids on surfaces. Use equipment and procedures complying with PCI MNL 117.

1. Place self-consolidating concrete without vibration in accordance with PCI TR-6. Ensure adequate bond between face and backup concrete, if used.

L. Comply with PCI MNL 117 for hot- and cold-weather concrete placement.

M. Identify pickup points of architectural precast concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each architectural precast concrete unit on a surface that does not show in finished structure.

N. Cure concrete, in accordance with PCI MNL 117, by moisture retention without heat or by accelerated heat curing using low-pressure live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.

O. Discard and replace architectural precast concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs comply with requirements in PCI MNL 117 and Architect's approval.

2.16 INSULATED PANEL CASTING

A. Cast, screed, and consolidate bottom concrete wythe supported by mold.

B. Place insulation boards abutting edges and ends of adjacent boards. Insert wythe connectors through insulation holes, and consolidate concrete around connectors according to connector manufacturer's written instructions.

C. Ensure bottom wythe and insulation layer are not disturbed after bottom wythe reaches initial set.

D. Cast, screed, and consolidate top wythe to meet required finish.

E. Maintain temperature below 150 deg Fin bottom concrete wythe.

2.17 FABRICATION TOLERANCES

A. Fabricate architectural precast concrete units to shapes, lines, and dimensions indicated so each finished unit complies with PCI MNL 117 and PCI Category A1 product tolerances as well as position tolerances for cast-in items. The following minimum tolerances shall apply where tighter tolerances are not required by PCI Category A1 requirements:

1. Overall Height and Width of Units, Measured at the Face Exposed to View: As follows:

    a. 10 feet or under, plus or minus 1/8 inch.
    b. 10 to 20 feet, plus 1/8 inch, minus 3/16 inch.
    c. 20 to 40 feet, plus or minus 1/4 inch.
    d. Each additional 10 feet, plus or minus 1/16 inch.

2. Overall Height and Width of Units, Measured at the Face Not Exposed to View: As follows:

    a. 10 feet or under, plus or minus 1/4 inch.
    b. 10 to 20 feet, plus 1/4 inch, minus 3/8 inch.
    c. 20 to 40 feet, plus or minus 3/8 inch.
    d. Each additional 10 feet, plus or minus 1/8 inch.

3. Total Thickness or Flange Thickness: Plus 1/4 inch, minus 1/8 inch.
4. Rib Thickness: Plus or minus 1/8 inch.
5. Rib to Edge of Flange: Plus or minus 1/8 inch.
6. Distance between Ribs: Plus or minus 1/8 inch.
7. Variation from Square or Designated Skew (Difference in Length of the Two Diagonal Measurements): Plus or minus 1/8 inch/72 inches or 1/2 inch total, whichever is greater.
8. Length and Width of Block-outs and Openings within One Unit: Plus or minus 1/4 inch.
9. Location and Dimension of Block-outs Hidden from View and Used for HVAC and Utility Penetrations: Plus or minus 3/4 inch.
10. Dimensions of Haunches: Plus or minus 1/4 inch.
11. Haunch Bearing Surface Deviation from Specified Plane: Plus or minus 1/8 inch.
12. Difference in Relative Position of Adjacent Haunch Bearing Surfaces from Specified Relative Position: Plus or minus 1/4 inch.
13. Bowing: Plus or minus L/360, maximum 1 inch.
14. Local Smoothness: 1/4 inch/10 feet .
15. Warping: 1/16 inch/12 inches of distance from nearest adjacent corner.
16. Tipping and Flushness of Plates: Plus or minus 1/4 inch.

17. Dimensions of Architectural Features and Rustications: Plus or minus 1/8 inch.

B. Position Tolerances: For cast-in items measured from datum line location, as indicated on Shop Drawings.

1. Weld Plates: Plus or minus 1 inch.
2. Inserts: Plus or minus 1/2 inch.
3. Handling Devices: Plus or minus 3 inches.
4. Reinforcing Steel and Welded Wire Reinforcement: Plus or minus 1/4 inch where position has structural implications or affects concrete cover; otherwise, plus or minus 1/2 inch.
5. Reinforcing Steel Extending out of Member: Plus or minus 1/2 inch of plan dimensions.
6. Tendons: Plus or minus 1/4 inch, vertical; plus or minus 1 inch, horizontal.
7. Location of Rustication Joints: Plus or minus 1/8 inch.
8. Location of Opening within Panel: Plus or minus 1/4 inch.
9. Location of Flashing Reglets: Plus or minus 1/4 inch.
10. Location of Flashing Reglets at Edge of Panel: Plus or minus 1/8 inch.
11. Reglets for Glazing Gaskets: Plus or minus 1/8 inch.
12. Electrical Outlets, Hose Bibs: Plus or minus 1/2 inch.
13. Location of Bearing Surface from End of Member: Plus or minus 1/4 inch.
14. Allowable Rotation of Plate, Channel Inserts, and Electrical Boxes: 2-degree rotation or 1/4 inch maximum over the full dimension of unit.
15. Position of Sleeve: Plus or minus 1/2 inch.
16. Location of Window Washer Track or Buttons: Plus or minus 1/8 inch.

C. Thin-Brick-Faced Architectural Precast Concrete Units: Restrict the following misalignments to 2 percent of number of thin bricks in a unit.

1. Alignment of Mortar Joints:

    a. Jog in Alignment: 1/8 inch.
    b. Alignment with Panel Centerline: Plus or minus 1/8 inch.

2. Variation in Width of Exposed Mortar Joints: Plus or minus 1/8 inch.
3. Tipping of Individual Thin Bricks from the Panel Plane of Exposed Thin-Brick Surface: Plus 0 inch; minus 1/4 inch less than or equal to depth of form liner joint.
4. Exposed Thin-Brick Surface Parallel to Primary Control Surface of Panel: Plus 1/4 inch; minus 1/8 inch.
5. Individual Thin-Brick Step in Face from Panel Plane of Exposed Thin-Brick Surface: Plus 0 inch; minus 1/4 inch less than or equal to depth of form liner joint.

2.18 FINISHES

A. Exposed faces to be free of joint marks, grain, and other obvious defects. Corners, including false joints to be uniform, straight, and sharp. Finish exposed-face surfaces of architectural precast concrete units to match approved sample panels and as follows:
1. PCI's "Architectural Precast Concrete - Color and Texture Selection Guide," of plate numbers indicated.
2. Thin-Brick Facing: See "Thin-Brick Facings" Article.
3. Acid-Etched Finish: Use acid and hot-water solution, equipment, application techniques, and cleaning procedures to expose aggregate and surrounding matrix surfaces. Protect hardware, connections, and insulation from acid.

B. Finish exposed top, bottom, side, and back surfaces of architectural precast concrete units to match face-surface finish unless noted otherwise.

C. Finish unexposed surfaces of architectural precast concrete units with as-cast finish.

2.19 SOURCE QUALITY CONTROL

A. Quality-Control Testing: Test and inspect precast concrete in accordance with PCI MNL 117 requirements. If using self-consolidating concrete, also test and inspect in accordance with PCI TR-6, ASTM C1610/C1610M, ASTM C1611/C1611M, ASTM C1621/C1621M, and ASTM C1712.

B. Owner will employ an independent testing agency to evaluate architectural precast concrete fabricator's quality-control and testing methods.

1. Allow Owner's testing agency access to material storage areas, concrete production equipment, concrete placement, and curing facilities. Cooperate with Owner's testing agency and provide samples of materials and concrete mixtures as may be requested for additional testing and evaluation.

C. See Special Inspections Specification and Special Inspections Chart in the Structural Drawings for the concrete testing and evaluation criteria.

D. Defective Units: Discard and replace recast architectural concrete units that do not comply with acceptability requirements in PCI MNL 117, including concrete strength, manufacturing tolerances, and color and texture range. Chipped, spalled, or cracked units may be repaired, subject to Architect's approval. Architect reserves the right to reject precast units that do not match approved samples, sample panels, and mockups. Replace unacceptable units with precast concrete units that comply with requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting structural frame or foundation and conditions for compliance with requirements for installation tolerances, bearing surface tolerances, and other conditions affecting performance of the Work.

B. Do not install precast concrete units until supporting cast-in-place concrete has attained minimum allowable design compressive strength and supporting steel or other structure is structurally ready to receive loads from precast concrete units.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF PRECAST ARCHITECTURAL CONCRETE UNITS

A. Install clips, hangers, bearing pads, and other accessories required for connecting architectural precast concrete units to supporting members and backup materials.

B. Erect architectural precast concrete level, plumb, and square within specified allowable tolerances. Provide temporary supports and bracing as required to maintain position, stability, and alignment of units until permanent connections are completed.

1. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
2. Unless otherwise indicated, maintain uniform joint widths of 3/4 inch.

C. Connect architectural precast concrete units in position by bolting, welding, grouting, or as otherwise indicated on Shop Drawings. Remove temporary shims, wedges, and spacers as soon as practical after connecting and grouting are completed.

1. Do not permit connections to disrupt continuity of roof flashing.

D. Welding: Comply with applicable requirements in AWS D1.1/D1.1M and AWS D1.4/D1.4M for welding, welding electrodes, appearance, quality of welds, and methods used in correcting welding work.

1. Protect architectural precast concrete units and bearing pads from damage by field welding or cutting operations, and provide noncombustible shields as required.
2. Welds not specified shall be continuous fillet welds, using no less than the minimum fillet as specified by AWS.
3. Clean weld-affected metal surfaces with chipping hammer followed by brushing, and apply a minimum 4.0-mil-thick coat of galvanized repair paint to galvanized surfaces according to ASTM A 780/A 780M, prime paint non-galvanized surfaces.
4. Visually inspect welds and remove, reweld, or repair incomplete and defective welds.

E. At bolted connections, use lock washers, tack welding, or other approved means to prevent loosening of nuts after final adjustment.

1. Where slotted connections are used, verify bolt position and tightness. For sliding connections, properly secure bolt but allow bolt to move within connection slot.
2. For slip-critical connections, use method and inspection procedure approved by Architect and coordinated with inspection agency.

F. Grouting or Dry Packing Connections and Joints: Grout connections where required or indicated. Retain flowable grout in place until hard enough to support itself. Alternatively, pack spaces with stiff dry pack grout material, tamping until voids are completely filled. Place grout and finish smooth, level, and plumb with adjacent concrete surfaces. Promptly remove grout material from exposed surfaces before it affects finishes or hardens. Keep grouted joints damp for not less than 24 hours after initial set.

3.3 ERECTION TOLERANCES

A. Erect architectural precast concrete units level, plumb, square, and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 135 and in accordance with PCI Category A1. The following minimum tolerances shall apply where tighter tolerances are not required by PCI Category A1 requirements:

1. Plan Location from Building Grid Datum: Plus or minus 1/2 inch.
2. Plan Location from Centerline of Steel: Plus or minus 1/2 inch.
3. Top Elevation from Nominal Top Elevation: As follows:

a. Exposed Individual Panel: Plus or minus 1/4 inch.

b. Non-Exposed Individual Panel: Plus or minus 1/2 inch.
c. Exposed Panel Relative to Adjacent Panel: 1/4 inch.
d. Non-Exposed Panel Relative to Adjacent Panel: 1/2 inch.

4. Support Elevation from Nominal Support Elevation: As follows:

a. Maximum Low: 1/2 inch.
b. Maximum High: 1/4 inch.

5. Maximum Plumb Variation over the Lesser of Height of Structure or 100 Feet: 1 inch.
6. Plumb in Any 10 Feet of Element Height: 1/4 inch.
7. Maximum Jog in Alignment of Matching Edges: 1/4 inch.
8. Joint Width (Governs over Joint Taper): Plus or minus 1/4 inch.
9. Maximum Joint Taper: 3/8 inch.
10. Joint Taper in 10 Feet: 1/4 inch.
11. Maximum Jog in Alignment of Matching Faces: 1/4 inch.
12. Differential Bowing or Camber, as Erected, between Adjacent Members of Same Design: 1/4 inch.
13. Opening Height between Spandrels: Plus or minus 1/4 inch.

3.4 REPAIR

A. Repair architectural precast concrete units if permitted by Architect. Architect reserves the right to reject repaired units that do not comply with requirements.

B. Mix patching materials and repair units so cured patches blend with color, texture, and uniformity of adjacent exposed surfaces and show no apparent line of demarcation between original and repaired work, when viewed in typical daylight illumination from a distance of 20 feet.

C. Prepare and repair damaged galvanized coatings with galvanizing repair paint in accordance with ASTM A780/A780M.

D. Wire brush, clean, and paint damaged prime-painted components with same type of shop primer.

E. Remove and replace damaged architectural precast concrete units when repairs do not comply with requirements.

3.5 FIELD QUALITY CONTROL

A. The Owner will employ an independent testing and inspection agency that meets the requirements of ASTM E329 to perform inspections and tests and to prepare test reports. The agency will monitor concrete quality by means of site and laboratory tests. They will be authorized to reject plastic concrete not conforming to specifications. Failure to detect any defective materials shall not prevent later rejection when such defect is discovered, or obligate the Architect or Owner for final acceptance.

1. See Section 014110 – Structural Special Inspections and Contract Drawings for testing and inspection to be performed.
2. Provide access for testing agency to places where structural steel work is being installed so that required inspection and testing can be accomplished.
3. The testing agency shall be provided with a complete set of approved shop drawings.

4. Reports will be delivered to the Architect, Engineer, and the Construction Manager within two weeks of inspection.
5. Deviations from requirements of the contract documents will be reported in writing to the General Contractor within 24 hours.

B. Correct deficiencies in or remove and replace construction that inspections and test reports indicate do not comply with specified requirements.

3.6 CLEANING

A. Clean surfaces of precast concrete units exposed to view.

B. Clean mortar, plaster, fireproofing, weld slag, and other deleterious material from concrete surfaces and adjacent materials immediately.

1. Do not remove fireproofing from steel connections/connectors in concealed spaced.

C. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, and stains.

1. Perform cleaning procedures, if necessary, in accordance with precast concrete fabricator's recommendations. Protect other work from staining or damage due to cleaning operations.
2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION 03 4500

SECTION 05 7313 - GLAZED DECORATIVE METAL RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior structural glass railings.
2. Exterior post-supported railings with glass-infill panels.
3. Interior structural glass railings.
4. Interior post-supported railings with glass-infill panels.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Metal railings assembled from standard components.
2. Glass products.
3. Glazing cement and accessories for structural glass railings.
4. Sealant and accessories for structural glass railings.
5. Fasteners.
6. Bituminous paint.
7. Nonshrink, nonmetallic grout.
8. Anchoring cement.

B. Shop Drawings: Include plans, elevations, sections, and attachment details.

C. Samples: For each type of exposed finish required.

1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
2. Base channel.
3. Each type of glass and glass edge required.
4. Fittings and brackets.

D. Delegated Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For tests performed by a qualified testing agency, in accordance with ASTM E894, ASTM E935, ASTM E2353, and ASTM E2358.

B. Research reports.

C. Preconstruction test reports.

1.5 WARRANTY

A. Manufacturer's Special Warranty for Laminated Glass: Glazed decorative metal railing manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ATR Technologies, Inc.
2. C.R. Laurence Co., Inc.; CRH Americas, Inc.
3. CraneVeyor Corp.
4. Glass Vice USA.
5. Greco; CSW Industrials Inc.
6. Hollaender Architectural Railing Systems; Hollaender Mfg. Co.
7. Hollaender Mfg. Co.
8. Julius Blum & Co., Inc.
9. Livers Bronze Co.
10. Morse Industries.
11. Southwest Metalsmiths, Inc.
12. TACO Metals Inc.
13. Trex Commercial Products, Inc.
14. Tri Tech, Inc.
15. Tuttle, a Dant Clayton Division.
16. VIVA Railings, LLC.
17. Wagner Companies (The); R&B Wagner, Inc.

B. Product Options: Information on Drawings and in the Specifications establishes requirements for railing system's aesthetic effects and performance characteristics.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 4000 "Quality Requirements," to design glazed decorative metal railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, are to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ft. applied in any direction.
b. Concentrated load of 200 lbf applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Structural Glass Railings:

a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
b. Infill load and other loads need not be assumed to act concurrently.

3. For structural glass railings, support each section of top rail and handrail by a minimum of three glass panels or by other means so railings will remain in place if any one glass panel fails.

a. Support top rail ends such that railings remains in place if end glass panel fails.

C. Wind Loads: For exterior glazed decorative metal railings, capable of withstanding the following wind loads in accordance with the IBC and ASTM E1300:

1. Wind Load: As indicated on Drawings.

2.3 METALS, GENERAL

A. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.

2.4 ALUMINUM

A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with strength and durability properties for each aluminum form required not less than that of alloy and temper designated below.

B. Extruded Bars and Shapes: ASTM B221, Alloy 6063-T5/T52.

C. Plate and Sheet: ASTM B209, Alloy 5005-H32.

D. Castings: ASTM B26/B26M, Alloy A356.0-T6.

2.5 STAINLESS STEEL

A. Sheet, Strip, Plate, and Flat Bar: ASTM A666 or ASTM A240/A240M, Type 304.

B. Bars and Shapes: ASTM A276, Type 304.

2.6 GLASS AND GLAZING PRODUCTS, GENERAL

A. Safety Glazing: Glazing is to comply with 16 CFR 1201, Category II.

B. Safety Glazing Labeling: Permanently mark glass with certification label of the SGCC or manufacturer. Label is to indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Low-Iron Float Glass: ASTM C1036, Type I, Class I (clear), Quality-Q3; and with visible light transmission of not less than 91 percent.

D. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear), Class 1 and low-iron clear, or Class 2 (tinted) as indicated, Quality-Q3.

E. Sealant and Accessories for Structural Glass Railings: Sealant, gaskets, setting blocks, shims, and related accessories as recommended or supplied by railing manufacturer for installing structural glazing in metal base channels.

F. Glazing Gaskets for Glass-Infill Panels: Glazing gaskets and related accessories as recommended or supplied by railing manufacturer for installing glass-infill panels in post-supported railings.

2.7 GLASS HANDRAILS AND GUARDS

A. Laminated Glass Handrails and Guards: ASTM C1172, Type II with two plies of glass bonded together by an interlayer.

1. Construction: Laminate glass with polyvinyl butyral interlayer or ionoplast polymer interlayer to comply with interlayer manufacturer's written instructions.
2. Interlayer Thickness: 0.060 inch.
3. Kind: LT (laminated tempered).
4. Glass Color: Inner-ply low-iron clear; outer-ply low-iron clear.
5. Interlayer Color: Clear.
6. Glass Plies for Structural Glass Balusters: Thickness required by structural loads, but not less than 6.0 mm thick each.

2.8 FASTENERS

A. Fastener Materials: Unless otherwise indicated, provide the following:

1. Aluminum Components: Type 304 stainless steel fasteners.
2. Stainless Steel Components: Type 304 stainless steel fasteners.
3. Dissimilar Metals: Type 304 stainless steel fasteners.

B. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to design load, in accordance with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/ASTM F1941M, Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless steel bolts, ASTM F593, and nuts; ASTM F594.

2.9 MISCELLANEOUS MATERIALS

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.10 FABRICATION OF METAL RAILINGS

A. Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

C. Form changes in direction by inserting prefabricated elbow fittings.

D. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

E. Close exposed ends of hollow railing members with prefabricated end fittings.

F. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, handrail brackets, miscellaneous fittings, and anchors to interconnect railing members to other work where indicated.

2.11 FABRICATION OF GLASS PANELS AND BALUSTERS

A. Fabricate glass to sizes and shapes required; provide for proper edge clearance and bite on glazing panels.

B. Structural Glass Balusters: Provide laminated, tempered structural glass balusters.

1. Edge Finish: Grind smooth and flat polish exposed edges of glass, including those at open joints, to produce smooth, square edges with glass edge finishes.

2.12 ALUMINUM FINISHES

A. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70percent PVDF resin by weight in color coat.

Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color and Gloss: Match Architect's sample.

2.13 STAINLESS STEEL FINISHES

A. Stainless Steel Sheet, Strip, Plate, and Bar Finishes:

1. Directional Satin Finish: ASTM A480/A480M, No. 4.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with Drawings and manufacturer's written instructions for installing glazed decorative metal railings, accessories, and other components.

B. Perform cutting, drilling, and fitting required for installing metal railings.

1. Fit exposed connections together to form tight, hairline joints.
2. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
3. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
4. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with shop primer.

D. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted in sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grou**t**, mixed and placed to comply with anchoring material manufacturer's written instructions.

E. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout.

F. Anchor posts to metal surfaces with flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members

3.2 INSTALLATION OF GLASS BALUSTERS

A. Structural Glass Railings: Install assembly to comply with railing manufacturer's written instructions.

END OF SECTION 05 7313

SECTION 07 4113.19 – INVERTED-BATTEN-SEAM METAL ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Inverted-seamed-batten metal roof panels.
2. Snow guards.
3. Substrate board.
4. Roof insulation.
5. Infill board.
6. Underlayment.

B. Related Requirements:

1. Section 07 4293 "Soffit Panels" for metal panels used in horizontal soffit applications.
2. Section 07 7253 "Snow Guards" for prefabricated devices designed to hold snow on the roof surface, allowing it to melt and drain off slowly.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of roof accessories and roof-mounted equipment.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written installation instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review structural loading limitations of supporting structure during and after roofing.
6. Review flashings, special details, drainage, penetrations, equipment curbs, and condition of other construction that affect metal panels.
7. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
8. Review temporary protection requirements for metal panel systems during and after installation.
9. Review procedures for repair of metal panels damaged after installation.
10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.3 ACTION SUBMITTALS

A. Product Data:

1. For batten-seam metal roof panels. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: Manufacturer's standard color charts, showing full range of available colors for each type of exposed finish.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: Actual sample of finished products for each type of exposed finish for metal panels, retainers, fasteners, closures, and other metal panel accessories.

1. Size: Manufacturers' standard size.

E. Sustainable Design Submittals:

1. Product Test Reports: For roof materials, documentation indicating that roof materials comply with Solar Reflectance Index requirements.
2. Recycled Content: Provide manufacturer documentation for recycled content, indicating postconsumer and preconsumer recycled content.

1.4 INFORMATIONAL SUBMITTALS

A. Certificates for portable roll-forming equipment.

B. Product Test Reports: For batten-seam metal roof panels, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Qualification Statements: For roof installers.

E. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels.

1.6 QUALITY ASSURANCE

A. Manufacturer’s On-site Representation: Provide a manufacturer’s representative to provide part-time inspection of roofing system installation. Submit construction/installation progress reports and a final inspection report to the Owner’s Authorized Representative and the Architect.

B. Roof Installer Qualifications: Entity that employs a supervisor who is an NRCA ProCertified Roofing Foreman and not less than 20 percent of installers who are NRCA ProCertified Metal Panel Roof Systems Installers.

C. Portable Roll-Forming Equipment Certification: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of Work.

1.7 MOCKUPS

A. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Build mockup of typical roof area and eave, including fascia, and soffit as shown on Drawings; approximately 48 inches square by full thickness, including attachments, underlayment, and accessories.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations by Change Order.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed in accordance with manufacturers' written installation instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

B. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

C. Special Weathertightness Warranty: Manufacturer agrees to repair or replace batten-seam metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing in accordance with ASTM E1592:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.
3. Deflection Limits: For wind loads, no greater than 1/180 of the span.

B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested in accordance with ASTM E1680 or ASTM E283/E283M at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

C. Water Penetration under Static Pressure: No water penetration when tested in accordance with ASTM E1646 or ASTM E331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

D. Watertightness: No water penetration when tested in accordance with ASTM E2140 for hydrostatic-head resistance.

E. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.

1. Uplift Rating: UL 90.

F. FM Approvals Listing: Provide metal roof panels and component materials that comply with requirements in FM Approvals 4471 as part of a panel roofing system and that are listed in FM Approvals' "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals markings.

1. Fire/Windstorm Classification: Class 1A- 90.
2. Hail Resistance: SH.

G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 BATTEN-SEAM METAL ROOF PANELS, GENERAL

A. Provide factory-formed metal roof panel assembly designed to be installed by mechanically attaching panels to supports using concealed retainers and covering vertical side edges of adjacent panels with batten caps. Include caps and accessories required for weathertight installation.

1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E1514.
2. Aluminum Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E1637.

B. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than <Insert value> percent.

C. Solar Reflectance Index (SRI): Three-year-aged SRI not less than 32 or initial SRI not less than 39 when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.

2.3 INVERTED-BATTEN-SEAM METAL ROOF PANELS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Overly Evolution Metal Sales Manufacturing Corporation or comparable product by one of the following:

1. Zahner.

B. Panels: Formed with flat ribs at panel edges; designed for independent installation by mechanically attaching panels to supports using concealed retainers located between panels, and installing wide profile caps over panel joints.

1. Structural Support: Over solid deck.
2. Material: Aluminum.

3. Panel Profile: Flat pan.
4. Panel Coverage: 36 inches.
5. Panel Height: 0.5 inches.
6. Cap: Manufacturer's standard. Same material, finish, and color as roof panels.
    a. Height: 0.5 inches including drain channel and compression cap receiver.
    b. Width: 2.75 inches.
7. Extruded internal drainage channel and compression cap:
    a. 0.056 inches thick minimum and 0.125 inches nominal thickness, each in a 6063-alloy aluminum T-5 temper. Install in maximum lengths available.
    b. Provide continuous EPDM gaskets with compression cap.
8. Fasteners: System fasteners shall be concealed and no less than a #12 stainless steel screw shall be used to anchor the internal drain channel; length as required for substrate construction.
9. Replacement of panels: Provide for the non-destructive selection removal and replacement of individual roof sheets.
10. Installation Tape and Silicone: 3M High Temp VHB Tape for metal applications and Dow 995 Silicone to install aluminum edge trim as shown on drawings and per roofing manufacturer’s standard details.

2.4 SNOW GUARDS

A. Custom snow guard system including attachment brackets and rails. Snow Guards shall be engineered to contain anticipated snow loads commensurate with the expected snow loads for the climate zone and project location. Finish of all components to match roof panels. Seal all Snow Guard bracket fasteners with seal washers and sealant as shown in drawings.

B. Movement: Provide for independent movement of all snow guard components consistent with a thermal range of 120 degrees F and consistent with anticipated movement of building structure.

2.5 SUBSTRATE BOARD

A. Glass-Mat Gypsum Roof Substrate Board: ASTM C1177/C1177M, water-resistant gypsum board.
1. Thickness: Type X, 5/8 inch.
2. Surface Finish: Unprimed.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions for fastening substrate panel to roof deck.

2.6 ROOF INSULATION

A. Insulation over Solid Deck:

1. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 3, felt or glass-fiber mat facer on both major surfaces.
    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
        1) Carlisle Syntec Systems.
        2) CertainTeed; SAINT-GOBAIN.

3) GAF.
4) Johns Manville; a Berkshire Hathaway company.
5) Rmax, A Business Unit of Sika Corporation.

2.7 INFILL BOARD

A. Polyisocyanurate Insulation Cover Board: ASTM C1289 Type II, Class 4, Grade 1, 1/2 inch thick, with a minimum compressive strength of 80 psi.

2.8 UNDERLAYMENT

A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils thick, specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer when recommended by underlayment manufacturer.

1. Thermal Stability: Stable after testing at 240 deg F; ASTM D1970/D1970M.
2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F; ASTM D1970/D1970M.

3. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

a. Carlisle WIP Products; a brand of Carlisle Construction Materials.
b. GCP Applied Technologies Inc.
c. Henry Company; a Carlisle company.
d. Owens Corning.

B. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

2.9 PANEL MATERIALS

A. Aluminum Sheet: Coil-coated sheet, ASTM B209/B209M, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

1. Thickness: 0.063 inch.
2. Surface: Smooth, flat finish.

2.10 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645; cold-formed, metallic-coated steel sheet, minimum ASTM A653/A653M, G90 hot-dip galvanized coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, retainers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.11 FABRICATION

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate in accordance with equipment manufacturer's written instructions and to comply with details shown.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with manufacturer's recommendations.
4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by metal roof panel manufacturer for application, but not less than thickness of metal being secured.

2.12 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.

    a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages in accordance with ASTM C754 and metal panel manufacturer's written recommendations.

3.3 INSTALLATION OF SUBSTRATE BOARD

A. Install substrate board with long joints in continuous straight lines, with end joints staggered not less than 24 inches in adjacent rows.

1. At steel roof decks, install substrate board at right angle to flutes of deck.

    a. Locate end joints over crests of steel roof deck.

2. Tightly butt substrate boards together.
3. Cut substrate board to fit tight around penetrations and projections, and to fit tight to intersecting sloping roof decks.
4. Fasten substrate board in accordance with roofing system manufacturers' written installation instructions.

3.4 INSTALLATION OF ROOF INSULATION

A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, in accordance with manufacturer's written installation instructions.

1. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
2. Tape joints and ruptures in vapor retarder and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.

B. Blanket Roof Insulation: Comply with the following installation method:

1. Over-Framing Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal roof panels fastened to secondary framing.
2. Between-Purlin Installation: Extend insulation and vapor retarder between purlins. Carry vapor-retarder-facing tabs up and over purlin, overlapping adjoining facing of next insulation course and maintaining continuity of retarder. Hold in place with bands and crossbands below insulation.

3.5 INSTALLATION OF INFILL BOARD

A. Install cover board over insulation in accordance with manufacturer's written installation instructions. Install with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.

3.6 INSTALLATION OF UNDERLAYMENT

A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated below, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.

1. Apply over the entire roof surface.

B. Slip Sheet: Apply slip sheet over underlayment before installing metal roof panels.

C. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 07 6200 "Sheet Metal Flashing and Trim."

3.7 INSTALLATION OF BATTEN-SEAM METAL ROOF PANELS

A. Install metal panels in accordance with manufacturer's written instructions and approved Shop Drawings in orientation, sizes, and locations indicated on Drawings. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
3. Copper Panels: Use copper, stainless steel, or hardware-bronze fasteners.
4. Stainless Steel Panels: Use stainless steel fasteners.

C. Anchor Channels: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners in accordance with manufacturers' written instructions.

D. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

E. Batten-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed retainers at each batten-seam joint at location, spacing, and with fasteners recommended by manufacturer.

1. Install retainers to supports with self-drilling fasteners.
2. Apply caps to metal roof panel seams, fully engaged to provide weathertight joints.
3. Watertight Installation:

    a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommend by manufacturer as needed to make panels watertight.
    b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
    c. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.

F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal roof panel manufacturer.

G. Flashing and Trim: Comply with performance requirements and manufacturer's written installation instructions. Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 ft. with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

H. Pipe and Conduit Penetrations: Fasten and seal to metal roof panels as recommended by manufacturer.

3.8 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal panel units within installed tolerance of 1/4 inch in 20 ft. on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.9 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal roof panel installation, including accessories. Report results in writing.

B. Remove and replace metal roof panels where tests and inspections indicate that they do not comply with specified requirements.

C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

D. Prepare test and inspection reports.

3.10 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 4113.19

SECTION 07 4213.13 - FORMED METAL WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exposed-fastener, lap-seam metal wall panels.
2. Concealed-fastener, lap-seam metal wall panels.

B. Related Requirements:
1. Section 07 4293 "Soffit Panels" for metal panels used in horizontal soffit applications.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
7. Review temporary protection requirements for metal panel assembly during and after installation.
8. Review of procedures for repair of metal panels damaged after installation.
9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.3 ACTION SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

1. Exposed-fastener, lap-seam metal wall panels.
2. Concealed-fastener, lap-seam metal wall panels.
3. Metal liner panels.

B. Sustainable Design Submittals:

1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
2. Environmental Product Declaration: For each product.
3. Health Product Declaration: For each product.
4. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

D. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.

1. Include Samples of trim and accessories involving color selection.

E. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below:

1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For exposed-fastener, lap-seam metal wall panels concealed-fastener, lap-seam metal wall panels, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.

1.7 MOCKUPS

A. Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal panel assembly as shown on Drawings, including corner, soffits, supports, attachments, and accessories.
2. Water-Spray Test: Conduct water-spray test of metal panel assembly mockup, testing for water penetration according to AAMA 501.2.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

E. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.
3. Deflection Limits: For wind loads, no greater than 1/180 of the span.

C. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E283 at the following test-pressure difference:

1. Test-Pressure Difference: [**1.57 lbf/sq. ft.**] [**6.24 lbf/sq. ft.**].

D. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E331 at the following test-pressure difference:

1. Test-Pressure Difference: [**2.86 lbf/sq. ft.**] [**6.24 lbf/sq. ft.**].

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 EXPOSED-FASTENER, LAP-SEAM METAL WALL PANELS

A. Provide factory-formed metal panels designed to be field assembled by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps. Include accessories required for weathertight installation.

B. Tapered-Rib-Profile, Exposed-Fastener Metal Wall Panels MTP-03: Formed with raised, trapezoidal major ribs and between major ribs.

1. Basis-of-Design Product: Subject to compliance with requirements, provide CENTRIA, a Nucor Brand; EcoScreen: BR5-36 or a comparable product by one of the following:

a. Berridge Manufacturing Company.
b. McElroy Metal, Inc.
c. PAC-CLAD; Petersen; a Carlisle company.

2. Aluminum Sheet: Coil-coated sheet, ASTM B209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

a. Thickness: 0.040 inch.
b. Surface: Smooth, flat finish.
c. Exterior Finish: Two-coat fluoropolymer.
d. Color: PPG UC122679F - Weathered Zinc.

3. Major-Rib Spacing: 7.2 inches o.c.
4. Panel Coverage: 36 inches.
5. Panel Height: 1.5 inches.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 hot-dip galvanized coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.4 FABRICATION

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.3 INSTALLATION OF METAL PANELS

A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
3. Copper Panels: Use copper, stainless steel, or hardware-bronze fasteners.
4. Stainless Steel Panels: Use stainless steel fasteners.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
5. Flash and seal panels with weather closures at perimeter of all openings.

E. Watertight Installation:

1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels; and elsewhere as needed to make panels watertight.
2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.

3. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.

F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engagea qualified testing agency to perform tests and inspections.

B. Water-Spray Test: After installation, test area of assembly as directed by Architect for water penetration according to AAMA 501.2.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.

D. Remove and replace metal wall panels where tests and inspections indicate that they do not comply with specified requirements.

E. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

F. Prepare test and inspection reports.

3.5 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 4213.13

SECTION 07 4213.16 - METAL PLATE WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes metal plate wall panels.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
7. Review temporary protection requirements for metal panel assembly during and after installation.
8. Review procedures for repair of metal panels damaged after installation.
9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Sustainable Design Submittals:

1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
2. Environmental Product Declaration: For each product.
3. Health Product Declaration: For each product.
4. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage, at a scale of not less than 1-1/2 inches per 12 inches.

D. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each product, tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal panel assembly as shown on Drawings, including supports, attachments, and accessories.
2. Water-Spray Test: Conduct water-spray test of mockup of metal panel assembly, testing for water penetration according to AAMA 501.2.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

1.8 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.9 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E330:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.
3. Deflection Limits: For wind loads, no greater than 1/180 of the span.

B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E283 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METAL PLATE WALL PANELS

A. Metal Plate Wall Panels **MTP-01 & MTP-02 & MTP-04**: Provide factory-formed, metal plate wall panels fabricated from single sheets of metal formed into profile for installation method indicated. Include attachment assembly components, and accessories required for weathertight system.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Dri-Design Aluminum Wall Panel System or comparable product by one of the following:

a. Alfrex, LLC.
b. Alply Insulated Panels LLC.
c. American Metalcraft Inc.
d. Architectural Specialty Products, Inc.
e. Castle Metal Products.
f. Centria.
g. Fabral; a brand of Flack Global Metals.
h. Fairview Architectural.
i. Firestone Metal Products.
j. Metal Sales & Service, Inc.
k. Protean Construction Products, Inc.
l. SAF (Southern Aluminum Finishing Company, Inc.).
m. DAMS Incorporated; D. Architectural Metal Solutions Incorporated.

B. Panel Depth: 1.25 inches.

C. Aluminum Sheet: Tension-leveled, smooth aluminum sheet, ASTM B209, 0.080 inch thick.
   1. MTP-01: 0.125 inch thick.

   2. Exterior Finish: Two-coat fluoropolymer.

      a. Color:
         1) MTP-01: PPG UC51595XL – Medium Gray, matte finish.
         2) MTP-02: PPG UC51595XL – Medium Gray, matte finish.
         3) MTP-04: Match Limestone.

D. Attachment Assembly: Subgirt and spline.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer. Provide sealant types that are compatible with panel materials, are nonstaining, and do not damage panel finish.

2.4 FABRICATION

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

3.3 INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Attachment Assembly, General: Install attachment assembly required to support metal plate wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.

1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.

E. Installation: Attach metal plate wall panels to supports at locations, spacings, and with fasteners recommended by manufacturer to achieve performance requirements specified.

F. Subgirt-and-Spline Installation: Install support assembly at locations, spacings, and with fasteners recommended by manufacturer. Use manufacturer's standard subgirts and splines that provide support and complete secondary drainage assembly, draining to the exterior at horizontal joints. Attach metal plate wall panels by interlocking perimeter extrusions attached to panels with subgirts and splines. Fully engage integral subgirt-and-spline gaskets and leave horizontal and vertical joints with open reveal. Terminate edge of panels flush with perimeter extrusions.

1. Install metal plate wall panels to allow individual panels to be installed and removed without disturbing adjacent panels.
2. Do not apply sealants to joints unless otherwise indicated.

G. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended in writing by metal panel manufacturer.

H. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal plate wall panel units within installed tolerance of 1/4 inch in 20 feet, non-accumulative, on level, plumb, and location lines as indicated, and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing agency to perform field tests and inspections.

B. Water-Spray Test: After installation, test area of assembly as directed by Architect for water penetration according to AAMA 501.2.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.

D. Remove and replace metal wall panels where tests and inspections indicate that they do not comply with specified requirements.

E. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

F. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 4213.16

SECTION 07 4293 - SOFFIT PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal soffit panels.

B. Related Requirements:

1. Section 07 4113.13 "Formed Metal Roof Panels" for lap-seam metal roof panels.
2. Section 07 4213.13 "Formed Metal Wall Panels" for lap-seam metal wall panels.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Metal soffit panels.

B. Product Data Submittals:

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

C. Sustainable Design Submittals:

1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.

D. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

E. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

F. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

1. Metal Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each product, tests performed by a qualified testing agency.

C. Sample Warranties: For special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical roof eave, including fascia, and soffit as shown on Drawings; approximately four panels wide by full eave width, including attachments and accessories.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of

water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

E. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.8 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.9 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested according to ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than <Insert value> percent.

B. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E1592:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.
3. Deflection Limits: For wind loads, no greater than 1/180 of the span.

C. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E283 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

D. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft..

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METAL SOFFIT PANELS

A. Provide metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.

B. Flush-Profile Metal Soffit Panels MTP-05: Solid panels formed with vertical panel edges and a flat pan between panel edges; with flush joint between panels.

1. Basis-of-Design Product: Subject to compliance with requirements, provide PAC-CLAD; Petersen; a Carlisle company; Flush/Reveal soffit panels or comparable product by one of the following:

a. ATAS International, Inc.
b. Berridge Manufacturing Company.
c. CertainTeed
d. Drexel Metals.
e. Elevate; Holcim Building Envelope.
f. Merchant & Evans Inc.
g. Sentrigard; NB Handy Company.

2. Panel Coverage: 12 inches.
3. Panel Height: 1.0 inch.

C. Reveal-Joint-Profile Metal Soffit Panels MTP-05: Solid panels formed with vertical panel edges and a flat pan between panel edges; with recessed reveal joint between panels.

1. Basis-of-Design Product: Subject to compliance with requirements, provide PAC-CLAD; Petersen; a Carlisle company; Flush/Reveal soffit panel or comparable product by one of the following:

a. ATAS International, Inc.
b. Berridge Manufacturing Company.
c. CertainTeed
d. Drexel Metals.
e. Elevate; Holcim Building Envelope.
f. Merchant & Evans Inc.
g. Sentrigard; NB Handy Company.

2. Aluminum Sheet: Coil-coated sheet, ASTM B209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

a. Thickness: 0.040 inch.
b. Surface: Smooth, flat finish.
c. Exterior Finish: Two-coat fluoropolymer.
d. Color: As selected by Architect from manufacturer's full range of wood grain finishes.

3. Panel Coverage: 12 inches.
4. Panel Height: 1.0 inch.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C645, cold-formed, metallic-coated steel sheet, ASTM A653/A653M, G90 hot-dip galvanized coating designation or ASTM A792/A792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.4 FABRICATION

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal soffit panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal panel manufacturer.
2. Examine sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal panel manufacturer.

a. Verify that air- or water-resistive barriers been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

1. Soffit Framing: Wire tie or clip furring channels to supports, as required to comply with requirements for assemblies indicated.

3.3 INSTALLATION OF METAL SOFFIT PANELS

A. Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Aluminum Panels: Use aluminum or stainless steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
3. Copper Panels: Use copper, stainless steel, or hardware-bronze fasteners.
4. Stainless Steel Panels: Use stainless steel fasteners.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.

E. Watertight Installation:

1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels and elsewhere as needed to make panels watertight.
2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.

3. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.

F. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel system including trim, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

G. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling, and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to achieve waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.4 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 4293

SECTION 07 9513.16 - EXTERIOR EXPANSION JOINT COVER ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior expansion joint covers.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each expansion joint cover assembly.

1. Include plans, elevations, sections, details, splices, block-out requirement, attachments to other work, and line diagrams and a tabular schedule of expansion joint cover assemblies.

C. Samples: For each exposed expansion joint cover assembly and for each color and texture specified.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

A. Furnish units in longest practicable lengths to minimize field splicing.

B. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion joint cover assemblies.

2.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Expansion joint cover assemblies shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Fire-Resistance Ratings: Provide expansion joint cover assemblies with fire barriers identical to those of systems tested for fire resistance according to UL 2079 or ASTM E1966 by a qualified testing agency.

1. Hose Stream Test: Wall-to-wall and wall-to-soffit assemblies shall be subjected to hose stream testing.

C. Expansion Joint Design Criteria:

1. Type of Movement: Wind sway.

a. Nominal Joint Width: As indicated on Drawings.
b. Minimum Joint Width: As indicated on Drawings.
c. Maximum Joint Width: As indicated on Drawings.

2. Seismic Movement:

a. Joint Movement: As indicated on Drawings.

2.3 EXTERIOR EXPANSION JOINT COVERS

A. Exterior Metal-Plate Joint Cover: Assembly consisting of sliding metal cover plate in continuous contact with gaskets mounted on metal frames fixed to sides of joint gap.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Construction Specialties, Inc. XLP or comparable product by one of the following:

a. Architectural Art Manufacturing; a division of Pittcon Architectural Metals, LLC.
b. Balco; a CSW Industrials Company.
c. MM Systems Corporation.
d. Nystrom, Inc.
e. Watson Bowman Acme Corp.
f. inpro Corporation.

2. Application: Wall to wall.
3. Installation: Surface mounted.
4. Exposed Metal:

a. Aluminum: High-performance organic finish.

1) Color: As selected by Architect from full range of industry colors and color densities.

B. Exterior Elastomeric-Seal Joint Cover: Assembly consisting of elastomeric seal anchored to surface-mounted frames fixed to sides of joint gap.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Construction Specialties, Inc. VF or comparable product by one of the following:

a. Architectural Art Manufacturing; a division of Pittcon Architectural Metals, LLC.
b. Balco; a CSW Industrials Company.
c. MM Systems Corporation.
d. Nystrom, Inc.
e. Watson Bowman Acme Corp.
f. inpro Corporation.

2. Application: Wall to wall.
3. Installation: Recessed.

4. Seal: Preformed elastomeric membrane or extrusion.

a. Color: As selected by Architect from manufacturer's full range.

2.4 MATERIALS

A. Aluminum: ASTM B221, Alloy 6063-T5 for extrusions; ASTM B209, Alloy 6061-T6 for sheet and plate.

B. Elastomeric Seals: Manufacturer's standard preformed elastomeric membranes or extrusions to be installed in metal frames.

C. Fire Barriers: Any material or material combination, to comply with performance criteria for required fire-resistance rating.

D. Moisture Barrier: Manufacturer's standard, flexible elastomeric material.

2.5 ALUMINUM FINISHES

A. Mill finish.

B. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70percent PVDF resin by weight in color coat.
1. Color and Gloss: match PPG UC51595XL - Medium Gray.

2.6 ACCESSORIES

A. Moisture Barriers: Manufacturer's standard moisture barrier consisting of a continuous, waterproof membrane within joint and attached to substrate on sides of joint.

1. Provide where indicated on Drawings.

B. Manufacturer's standard attachment devices, as indicated or required for complete installations.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Prepare substrates according to expansion joint cover assembly manufacturer's written instructions.

B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion joint cover assemblies. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion joint cover assemblies.

C. Comply with manufacturer's written instructions for storing, handling, and installing expansion joint cover assemblies and materials unless more stringent requirements are indicated.

D. Metal Frames: Perform cutting, drilling, and fitting required to install expansion joint cover assemblies.

1. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
2. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation.

3. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
4. Install frames in continuous contact with adjacent surfaces.

    a. Shimming is not permitted.

5. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.

E. Seals: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.

1. Provide in continuous lengths for straight sections.
2. Seal transitions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.
3. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.

F. Install with hairline mitered corners where expansion joint cover assemblies change direction or abut other materials.

G. Terminate exposed ends of expansion joint cover assemblies with field- or factory-fabricated termination devices.

H. Fire-Resistance-Rated Assemblies: Coordinate installation of expansion joint cover assembly materials and associated work so complete assemblies comply with performance requirements.

1. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and field splices.

I. Moisture Barrier Drainage: If indicated, provide drainage fitting and connect to drains.

J. Transition to Roof Expansion Joint Covers: Coordinate installation of exterior wall and soffit expansion joint covers with roof expansion joint covers specified in Section 07 7129 "Manufactured Roof Expansion Joints." Install factory-fabricated units at transition between exterior walls and soffits and roof expansion joint cover assemblies.

3.2 PROTECTION

A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.

B. Protect the installation from damage by work of other Sections.

END OF SECTION 07 9513.16

SECTION 08 4213 – EXTRUDED ALUMINUM BALANCED ENTRANCE DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Integral balanced door units consisting of doors, jambs, frames .

1.2 ACTION SUBMITTALS

A. Product Data:

1. Integral balanced door systems.

B. Product Data Submittals: For each product.

1. Construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Operating characteristics, electrical characteristics, and furnished accessories.

C. Shop Drawings:

1. Plans, elevations, sections, full-size details, and attachments to other work.
2. Details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
3. Full-size isometric details of each type of vertical-to-horizontal intersection of aluminum-framed entrance door systems, showing the following:

a. Joinery, including concealed welds.
b. Anchorage.
c. Expansion provisions.
d. Glazing.
e. Flashing and drainage.

4. Connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
5. Point-to-point wiring diagrams showing the following:

a. Power requirements for each electrically operated door hardware.
b. Location and types of switches, signal device, conduit sizes, and number and size of wires.

D. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish.

E. Samples for Verification: Actual sample of finished products for each type of exposed finish.

F. Sustainable Design Submittals:

1. Product Data: For sealants, indicating VOC content.

2. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.
3. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
4. Environmental Product Declaration: For each product.
5. Health Product Declaration: For each product.
6. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

1.3 INFORMATIONAL SUBMITTALS

A. Energy Performance Certificates: For aluminum-framed entrance door systems, accessories, and components, from manufacturer.

1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed entrance.

B. Product Test Reports: For aluminum-framed entrance door systems, for tests performed by a qualified testing agency.

C. Field Quality-Control Reports: For aluminum-framed entrance door systems.

D. Qualification Statements:

1. For Installer and field testing agency.

E. Sample Warranties: For aluminum-framed entrance door systems.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For Integral balanced door systems.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:
1. The manufacturer must have been regularly engaged in the manufacture of “Balanced Doors” for a period of no less than ten (10) years.
2. All door, frame and balanced hardware must be engineered and fabricated by the same manufacturer.
3. In order to ensure proper coordination between all elements of the balanced entrance system, the balanced hardware including the hydraulic check must be engineered, cast, machined and assembled in the same facility with the engineering and fabrication of the door and frame material.
4. The manufacturer must have a quality system registered to the ISO9001 standard including design engineering.

B. Testing Agency Qualifications: Qualified in accordance with ASTM E699 for testing indicated and accredited by IAS or ILAC Mutual Recognition Arrangement as complying with ISO/IEC 17025 and acceptable to Owner and Architect.

C. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated

by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.6 WARRANTY

A. Special Warranty: Manufacturer and Installer agree to repair or replace components of door systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures
b. Faulty operation
c. Deterioration of metals and other materials beyond normal weathering or use.

2. Warranty Period: Ten years from date of Substantial Completion.

B. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Warranty Period: 20 years from date of Substantial Completion.

C. DELIVERY, STORAGE AND HANDLING
1. Materials shall be packed, unloaded, stored and protected to avoid abuse and damage.
2. Protect finished surfaces with wrapping and/or strippable coating.
3. When unloading, remove all paper type wrappings that are wet or which could become wet.
4. Store inside in a clean well drained area free of dust and corrosive fumes.
5. Stack vertically or on edge so that water cannot accumulate on or within materials, using wood or plastic shims between components to provide water drainage and air circulation.
6. Cover materials with tarpaulins or plastic hung on frames to provide air circulation.
7. When installing, protect materials from lime, mortar, run-off from concrete and copper, weld splatter, acids, roofing tar, solvents and abrasive cleaners.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain all components of aluminum-framed entrance door systems, including framing and accessories, from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing of entrance door systems representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

B. Structural Loads:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.

C. Structural: Test in accordance with ASTM E330/E330M as follows:

1. When tested at 150 percent of positive and negative wind-load design pressures, entrance doors, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
2. Test Durations: As required by design wind velocity, but not less than 10 seconds.

D. Water Penetration under Static Pressure: Test in accordance with ASTM E331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas of entrance doors when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..

E. Energy Performance: Certified and labeled by manufacturer for energy performance as follows:

1. Thermal Transmittance (U-factor):
   a. Entrance Doors: U-factor of not more than 0.68 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.

2. Solar Heat-Gain Coefficient (SHGC):
   a. Entrance Doors: SHGC of not more than 0.22 as determined in accordance with NFRC 200.

3. Air Leakage:
   a. Entrance Doors: Air leakage of not more than 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..

4. Condensation Resistance Factor (CRF):
   a. Entrance Doors: CRF of not less than 68 as determined in accordance with AAMA 1503.

F. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.3 ALUMINUM-FRAMED ENTRANCE DOOR SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Ambico Limited
2. C.R. Laurence Company

3. Dawson Metal Co.
4. EFCO, LLC
5. Ellison Bronze
6. INKAN Ltd.
7. Kawneer
8. Tajima Corp.

B. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.
1. Doors:
2. Door thickness: 2 inch (51 mm).
3. Top rail: 4-3/4 inch (121 mm).
4. Bottom rail: 10 inch (254 mm).
5. Vertical trim narrow stile: 1 inch (25 mm) wide.
6. Glass: As specified in section 08 8100.
7. Frames: Frames for door jambs and header (sidelights and transom material where applicable) shall be: 3 inch (76 mm) face x 6 inch (152 mm) deep.
   a. Frames shall be erected without the use of exposed screws where feasible.
8. Hinge shaft configuration: Concealed with portion of the hinge jamb to be removable for access to operating hardware.
9. Glass stops (at sidelight and transom areas, where applicable) to be applied to framing and shall be permanently fixed on exterior side and snap-on type on interior side with vinyl glazing bead.
10. Glass: as specified in section 08 8000.

11. Door Finish: High-performance organic finish.

C. Framing Members: Manufacturer's standard extruded aluminum, minimum 0.125 inch thick and reinforced as required to support imposed loads.

1. Nominal Size: As indicated on Drawings.
2. Exterior Framing Construction: Thermally broken.
3. Interior Vestibule Framing Construction: Nonthermal.
4. Finish: Match door finish.

D. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

E. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

F. Materials:

1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

   a. Sheet and Plate: ASTM B209.
   b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.
   c. Structural Profiles: ASTM B308/B308M.

2. Steel Reinforcement:

   a. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
   b. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
   c. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.

3. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods in accordance with recommendations in SSPC-SP COM, and prepare surfaces in accordance with applicable SSPC standard.

G. Recycled Content of Aluminum Components: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

H. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

2.4 ENTRANCE DOOR HARDWARE

A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 08 7100 "Door Hardware."

B. Balanced hardware:
1. All balanced door hardware, including hydraulic check, shall be cast bronze and shall be cast, machined and assembled by the door and frame fabricator. Exposed hardware shall be finished as specified below.
2. Cast bronze mechanism and other integral parts must be heavy duty and must be designed to allow variation in adjustments to meet this particular job with respect to door size, door weight and varying or internal building pressures.
3. Balanced hardware shall consist of the following items:
   a. Cast bronze hydraulic check shall be concealed in the head frame and have first and second speed adjustment. The hydraulic check unit must be removable without requiring the removal of the door, head frame or any other hardware. Closer arms are unacceptable.
   b. Each door to have a heavy-duty steel tube hinge shaft 1-3/4 inch (44 mm) diameter with 1/4 inch (6 mm) minimum wall thickness. Hinge shaft to be furnished complete with spring closing mechanism. The spring closer shall be adjustable at the floor to meet varying wind or building conditions. Top and bottom arms shall be one piece bronze castings, welded to hinge shaft. Two-piece arms, aluminum arms, or steel painted arms will not be acceptable.
   c. Hardware shall include a spring-cushioned door roller bumper located in the guide channel. The operating mechanism in the head shall include ball bearing pivots, cast bronze hydraulic check and cast bronze door guide channel with minimum dimensions of 2-3/8 inch (60 mm) by 3/4 inch (19 mm) thick and a minimum wall thickness of 9/16 inch (14 mm).
   d. Means shall be provided which make possible field adjustment for proper perimeter clearance of each door leaf in relation to its finished framework to accommodate on-site conditions.
   e. All doors shall have a semi-automatic hold open device located in the bottom rail.
4. Doors shall have a maximum of 8 lbs. spring tension adjustment at pull handle. The Ellison hydraulic check shall be adjusted so that from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.

C. Weather Stripping: Manufacturer's standard replaceable components.
1. Manufacturer’s standard polypropylene pile.
2. Locations:
   a. Concealed at door top and bottom rails.
   b. At both sides of exposed hinge shaft if used.
   c. Vertically at meeting stiles on pairs of doors.

d. At door stops at both hinge and strike jambs

2.5 GLAZING

A. Glazing: Comply with Section 08 8000 "Glazing."

B. Glazing Gaskets: As recommended by manufacturer.

C. Glazing Sealants: As recommended by manufacturer.

1. Verify sealant has a VOC content of 250 g/L or less.
2. Verify sealant complies with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.6 ACCESSORIES

A. Automatic Door Operators: Section 08 7113 "Power Door Operators."

B. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members as required to receive fastener threads.
3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.

C. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.

1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A123/A123M or ASTM A153/A153M requirements.

D. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.

E. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil thickness per coat.

F. Rigid PVC filler.

2.7 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
5. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

1. At interior and exterior doors, provide compression weather stripping at fixed stops.

E. Entrance Doors: Reinforce doors as required for installing entrance door hardware.

1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
2. At exterior doors, provide weather sweeps applied to door bottoms.

F. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

G. After fabrication, clearly mark components to identify their locations in Project in accordance with Shop Drawings.

2.8 ALUMINUM FINISHES

A. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70percent PVDF resin by weight in color coat.

1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Color and Gloss: Match Curtain Wall Framing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF ALUMINUM-FRAMED ENTRANCE DOOR SYSTEMS

A. Comply with manufacturer's written instructions.

B. Do not install damaged components.

C. Fit joints to produce hairline joints free of burrs and distortion.

D. Rigidly secure nonmovement joints.

E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

F. Seal perimeter and other joints watertight unless otherwise indicated.

G. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by the manufacturer for this purpose or installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

H. Set continuous sill members and flashing in full sealant bed, as specified in Section 07 9200 "Joint Sealants," to produce weathertight installation.

I. Install joint filler behind sealant as recommended by sealant manufacturer.

J. Install components plumb and true in alignment with established lines and grades.

K. Install entrance doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

L. Install glazing as specified in Section 08 8000 "Glazing."

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests.

B. Tests: Perform the following tests on aluminum-framed entrance door systems.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect to be tested in accordance with AAMA 501.2 and to not evidence water penetration.
2. Air Leakage: ASTM E783 at 1.5 times the rate specified for laboratory testing in "Performance Requirements" Article but not more than 0.09 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft..
3. Water Penetration: ASTM E1105 at a minimum uniform and cyclic static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in "Performance Requirements" Article, but not less than 6.24 lbf/sq. ft., and to not evidence water penetration.

C. Aluminum-framed entrance door systems will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

3.4 MAINTENANCE SERVICE

A. Entrance Door Hardware Maintenance:

1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of entrance door hardware.

END OF SECTION 08 4213

SECTION 08 4413 - GLAZED ALUMINUM CURTAIN WALLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glazed aluminum curtain wall systems.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For sealants, indicating VOC content.
2. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.
3. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
4. Environmental Product Declaration: For each product.
5. Health Product Declaration: For each product.
6. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Shop Drawings: Include plans, elevations, sections, full-size details, and attachments to other work.

1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

D. Samples: For each type of exposed finish required.

E. Delegated-Design Submittal: For glazed aluminum curtain walls, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Energy Performance Certificates: NFRC-certified energy performance values for each glazed aluminum curtain wall.

B. Product test reports.

C. Source quality-control reports.

D. Field quality-control reports.

E. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer and that employs a qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AGM) contractors and that employs glazing technicians certified under the Architectural Glass and Metal Technician (AGMT) certification program.

B. Testing Agency Qualifications: Qualified in accordance with ASTM E699 for testing indicated and accredited by IAS or ILAC Mutual Recognition Arrangement as complying with ISO/IEC 17025 and acceptable to Owner and Architect.

C. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.7 WARRANTY

A. Special Assembly Warranty: Manufacturer and Installer agrees to repair or replace components of glazed aluminum curtain wall that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of baked enamel, powder coat, or organic finishes within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

C. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes within specified warranty period.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 4000 "Quality Requirements," to design glazed aluminum curtain walls.

B. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Glazed aluminum curtain walls shall withstand movements of supporting structure, including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
2. Failure also includes the following:

a. Thermal stresses transferring to building structure.
b. Glass breakage.
c. Noise or vibration created by wind and thermal and structural movements.
d. Loosening or weakening of fasteners, attachments, and other components.
e. Failure of operating units.

C. Structural Loads:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings.

D. Deflection of Framing Members Supporting Glass: At design wind load, as follows:

1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans of greater than 13 feet 6 inches.
2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.

a. Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.

3. Cantilever Deflection: Limited to 2l/175 at unsupported cantilevers.

E. Structural: Test in accordance with ASTM E330/E330M as follows:

1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Water Penetration under Static Pressure: Test in accordance with ASTM E331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas when tested in accordance with a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..

G. Energy Performance: Certified and labelled by manufacturer for energy performance as follows:

1. Thermal Transmittance (U-factor):

a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.36 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.

2. Solar Heat Gain Coefficient (SHGC):

a. Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.22 as determined in accordance with NFRC 200.

3. Air Leakage:

a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft. when tested in accordance with ASTM E283.

4. Condensation Resistance Factor (CRF):

a. Fixed Glazing and Framing Areas: CRF for the system of not less than 79 as determined in accordance with AAMA 1503.

H. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 GLAZED ALUMINUM CURTAIN WALL SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. EFCO Corporation.
2. Kawneer Company, Inc.; Arconic Corporation.
3. OldCastle BuildingEnvelope (OBE).
4. Trulite Glass & Aluminum Solutions, LLC.
5. U.S. Aluminum; C.R. Laurence Co., Inc.; CRH Americas, Inc.
6. YKK AP America Inc.

B. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Construction: Thermally broken.
2. Glazing System: Retained mechanically with gaskets on four sides.
3. Glazing Plane: Front.
4. Finish: High-performance organic finish.
5. System: unitized system.
6. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

7. Steel Reinforcement: As required by manufacturer.

C. Pressure Caps: Manufacturer's standard aluminum components that mechanically retain glazing.
1. Include snap-on aluminum trim that conceals fasteners, in standard and custom profiles as indicated on Drawings.

D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

2.3 GLAZING

A. Glazing: Comply with Section 08 8000 "Glazing."

B. Glazing Gaskets: ASTM C509 or ASTM C864. Compression-type, replaceable EPDM.

1. Color: Black.

C. Glazing Sealants: Comply with Section 08 8000 "Glazing."

1. Verify sealant has a VOC content of 250 g/L or less.
2. Verify sealant complies with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.4 MATERIALS

A. Sheet and Plate: ASTM B209.

B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.

C. Structural Profiles: ASTM B308/B308M.

D. Steel Reinforcement:

1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.

E. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods in accordance with recommendations in SSPC-SP COM, and prepare surfaces in accordance with applicable SSPC standard.

F. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

G. Recycled Content of Aluminum Components: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

2.5 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
5. Provisions for field replacement of glazing from exterior.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Fabricate components to resist water penetration as follows:

1. Internal guttering system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
2. Pressure-equalized system or double barrier design with primary air and vapor barrier at interior side of glazed aluminum curtain wall and secondary seal weeped and vented to exterior.

E. Curtain-Wall Framing: Fabricate components for assembly using manufacturer's standard assembly method.

F. Factory-Assembled Frame Units:

1. Rigidly secure nonmovement joints.
2. Prepare surfaces that are in contact with structural sealant in accordance with sealant manufacturer's written instructions, to ensure compatibility and adhesion.
3. Preparation includes, but is not limited to, cleaning and priming surfaces.
4. Seal joints watertight unless otherwise indicated.
5. Install glazing to comply with requirements in Section 08 8000 "Glazing."

G. After fabrication, clearly mark components to identify their locations in Project in accordance with Shop Drawings.

2.6 ALUMINUM FINISHES

A. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70percent PVDF resin by weight in color coat.
1. Color and Gloss: match PPG UC51595XL - Medium Gray.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with manufacturer's written instructions.

B. Do not install damaged components.

C. Fit joints to produce hairline joints free of burrs and distortion.

D. Rigidly secure nonmovement joints.

E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

F. Where welding is required, weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.

G. Seal joints watertight unless otherwise indicated.

H. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with primer, applying sealant or tape, or installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

I. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.

J. Install components plumb and true in alignment with established lines and grades.

3.2 INSTALLATION OF GLAZING

A. Install glazing as specified in Section 08 8000 "Glazing."

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Test Area: Perform tests on representative areas of glazed aluminum curtain walls and mockups.

C. Field Quality-Control Testing: Perform the following test on representative areas of glazed aluminum curtain walls and mockups.

1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested in accordance with AAMA 501.2 and shall not evidence water penetration.

a. Perform a minimum of three tests in areas as directed by Architect.

D. Glazed aluminum curtain walls will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

END OF SECTION 08 4413

SECTION 08 8000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glass products.
2. Insulating glass.
3. Glazing sealants.
4. Glazing tapes.
5. Miscellaneous glazing materials.

B. Related Requirements:
1. Section 08 4423 "Structural-Sealant-Glazed Curtain Walls" for glazing sealants used in structural-sealant-glazed curtain walls.

1.2 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.

C. IBC: International Building Code.

D. Interspace: Space between lites of an insulating-glass unit.

1.3 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances to achieve proper safety margins for glazing retention under each design load case, load case combination, and service condition.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review temporary protection requirements for glazing during and after installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Data: For sealants, indicating VOC content.
2. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.

C. Glass Samples: For each type of glass product; 12 inches square.

D. Glazing Accessory Samples: For sealants and colored spacers, in 12-inch lengths.

E. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

F. Delegated Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by qualified professional engineer responsible for their preparation.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, manufacturers of fabricated glass units, glass testing agency, and sealant testing agency.

B. Product Certificates: For glass.

C. Product Test Reports: For fabricated glass and glazing sealants, for tests performed by a qualified testing agency.

1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

D. Preconstruction adhesion and compatibility test report.

E. Sample Warranties: For special warranties.

1.7 QUALITY ASSURANCE

A. Fabricated-Glass Manufacturer Qualifications: A qualified manufacturer of fabricated glass units who is approved and certified by primary glass manufacturer.

B. Installer Qualifications: A qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AG&M) contractors and who employs glazing technicians certified under the Architectural Glass and Metal Technician (AGMT) certification program.

C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated.

E. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Install glazing in mockups specified in Section 08 4413 "Glazed Aluminum Curtain Walls" to match glazing systems required for Project, including glazing methods.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
2. Use ASTM C1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
3. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
4. Schedule enough time for testing and analyzing results to prevent delaying the Work.
5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.10 FIELD CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F.

1.11 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Glass: Obtain coated glass from single source from single manufacturer.

B. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 4000 "Quality Requirements," to design glazing.

C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined in accordance with the IBC and ASTM E1300:

1. Design Wind Pressures: As indicated on Drawings.

a. Wind Design Data: As indicated on Drawings.

2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.
3. Thermal Loads: Design glazing to resist thermal stress breakage induced by differential temperature conditions and limited air circulation within individual glass lites and insulated glazing units.

D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.

3. U-Factors: Center-of-glazing values, in accordance with NFRC 100 and based on most current non-beta version of LBL's WINDOW computer program, expressed as Btu/sq. ft. x h x deg F.
4. SHGC and Visible Transmittance: Center-of-glazing values, in accordance with NFRC 200 and based on most current non-beta version of LBL's WINDOW computer program.
5. Visible Reflectance: Center-of-glazing values, in accordance with NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. NGA Publications: "Glazing Manual."
2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR A7, "Sloped Glazing Guidelines."
3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the IGCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than thickness indicated.

1. Minimum Glass Thickness for Exterior Lites: 6 mm.
2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.

E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

A. Clear Annealed Float Glass: ASTM C1036, Type I, Class 1 (clear), Quality-Q3.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. AGC Glass Company North America, Inc.
b. Guardian Glass LLC.
c. Pilkington North America; NSG Group.
d. Saint-Gobain Glass Corp.

e. Vitro Architectural Glass.

B. Low-Iron Annealed Float Glass: ASTM C1036, Type I, Class I (clear), Quality-Q3; and with visible light transmission of not less than 91 percent and SHGC of not less than 0.87.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. AGC Glass Company North America, Inc.
b. Guardian Glass LLC.
c. Pilkington North America; NSG Group.
d. Saint-Gobain Glass Corp.
e. Vitro Architectural Glass.

C. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

D. Heat-Strengthened Float Glass: ASTM C1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

E. Reflective- and Low-E-Coated Vision Glass: ASTM C1376.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Guardian Glass LLC.
b. Pilkington North America; NSG Group.
c. Saint-Gobain Glass Corp.
d. Vitro Architectural Glass.

F. Ceramic-Coated Vision Glass: ASTM C1048, Condition C, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3; and complying with Specification No. 95-1-31 in NGA's "Engineering Standards Manual."

G. Ceramic-Coated Spandrel Glass: ASTM C1048, Type I, Condition B, Quality-Q3.

H. Reflective- and Low-E-Coated Spandrel Glass: ASTM C1376, Kind CS.

2.5 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified in accordance with ASTM E2190.

1. Sealing System: Dual seal, with polyisobutylene and silicone primary and secondary sealants.
2. Perimeter Spacer: Polypropylene-covered stainless steel in color selected by Architect.

a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Saint-Gobain Glass Corp.
2) Technoform Glass Insulation North America.
3) Thermix; a brand of Ensinger USA.

3. Desiccant: Molecular sieve or silica gel, or a blend of both.

2.6 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Verify sealant complies with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
4. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of industry colors.

B. Neutral-Curing Silicone Glazing Sealant, Class 100/50: Complying with ASTM C920, Type S, Grade NS, Use NT.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. GE Construction Sealants; Momentive Performance Materials Inc.
b. Pecora Corporation.
c. Sika Corporation.
d. The Dow Chemical Company.
e. Tremco Incorporated.

2.7 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.8 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks:

1. Silicone with Shore A durometer hardness of 85, plus or minus 5.
2. Type recommended in writing by sealant or glass manufacturer.

D. Spacers:

1. Neoprene blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
2. Type recommended in writing by sealant or glass manufacturer.

E. Edge Blocks:

1. Silicone with Shore A durometer hardness per manufacturer's written instructions.
2. Type recommended in writing by sealant or glass manufacturer.

F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.9 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.

a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep systems.
3. Minimum required face and edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches.

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

2. Provide 1/8-inch-minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.

H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended in writing by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

A. Immediately after installation, remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.8 MONOLITHIC GLASS SCHEDULE

A. Clear Glass Type: float glass.

1. Minimum Thickness: 6 mm.

1. Safety glazing as required by code or performance.

B. Low-Iron Glass Type: Heat-strengthened float glass.

1. Basis-of-Design Product: Vitro Acuity.
2. Minimum Thickness: 6 mm.
1. Safety glazing as required by code or performance.

C. Ceramic-Coated Spandrel Glass Type: float glass.
1. Glass: Low-iron float glass.
2. Coating Color: As selected by Architect from manufacturer's full range.
3. Minimum Thickness: 6 mm.
4. Coating Location: Second surface.
5. Safety glazing as required by code or performance.

3.9 INSULATING GLASS SCHEDULE

A. Low-Iron Insulating Glass Type GL-06:

1. Basis-of-Design Product: Vitro Acuity + Acuity Glass.
2. Overall Unit Thickness: 1 inch.
3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Low-iron heat-strengthened float glass.
5. Interspace Content: Argon.
6. Indoor Lite: Low-iron heat-strengthened float glass.
7. Winter Nighttime U-Factor: 0.47 maximum.
8. Safety glazing as required by code or performance.

B. Low-E-Coated, Clear Insulating Glass Type GL-01:

1. Basis-of-Design Product: Vitro SolarBan 90 Acuity + Acuity Glass.
2. Overall Unit Thickness: 1 inch.
3. Minimum Thickness of Each Glass Lite: 6 mm.
4. Outdoor Lite: Low-iron heat-strengthened float glass.
5. Interspace Content: Argon.
6. Indoor Lite: Low-iron heat-strengthened float glass.
7. Low-E Coating: Pyrolytic or sputtered on second surface.
8. Winter Nighttime U-Factor: 0.24 maximum.
9. Visible Light Transmittance: 53 percent minimum.
10. SGHC: 0.23 maximum.
11. Safety glazing required.

C. Ceramic-Coated, Low-E-Coated, Insulating Vision Glass Type GL-02:

1. Basis-of-Design Product: Vitro SolarBan 90 Acuity + Acuity Glass.
2. Ceramic Coating Color and Pattern: Bird Safe ¼” dots spaced 2” x 4”, color as selected by Architect from manufacturer's full range.
3. Overall Unit Thickness: 1 inch.
4. Minimum Thickness of Each Glass Lite: 6 mm.
5. Outdoor Lite: Low-iron heat-strengthened float glass.
6. Interspace Content: Argon.
7. Indoor Lite: Low-iron heat-strengthened float glass.
8. Low-E Coating: Pyrolytic or sputtered on second surface.
9. Ceramic Coating Location: First surface.

1. Winter Nighttime U-Factor: 0.24 maximum.
2. Visible Light Transmittance: 53 percent minimum.
3. SGHC: 0.23 maximum.
1. Safety glazing as required by code or performance.

D. Ceramic-Coated, Low-E-Coated, Insulating Vision Glass Type GL-04:

1. Basis-of-Design Product: Vitro SolarBan 90 Acuity + Acuity Glass.
2. Ceramic Coating Color and Pattern: Custom frit pattern from floor to 36” A.F.F., color as selected by Architect from manufacturer's full range.
3. Overall Unit Thickness: 1 inch.
4. Minimum Thickness of Each Glass Lite: 6 mm.
5. Outdoor Lite: Low-iron heat-strengthened float glass.
6. Interspace Content: Argon.
7. Indoor Lite: Low-iron heat-strengthened float glass.
8. Low-E Coating: Pyrolytic or sputtered on second surface.
9. Ceramic Coating Location: Third surface.
10. Winter Nighttime U-Factor: 0.24 maximum.
11. Visible Light Transmittance: 53 percent minimum.
12. SGHC: 0.23 maximum.

E. Ceramic-Coated, Low-E-Coated, Insulating Vision Glass Type GL-05:

1. Basis-of-Design Product: Vitro SolarBan 90 Acuity + Acuity Glass.
2. Ceramic Coating Color and Pattern: Custom frit pattern color as selected by Architect from manufacturer's full range.
3. Overall Unit Thickness: 1 inch.
4. Minimum Thickness of Each Glass Lite: 6 mm.
5. Outdoor Lite: Low-iron heat-strengthened float glass.
6. Interspace Content: Argon.
7. Indoor Lite: Low-iron heat-strengthened float glass.
8. Low-E Coating: Pyrolytic or sputtered on second surface.
9. Ceramic Coating Location: Third surface.
10. Winter Nighttime U-Factor: 0.24 maximum.
11. Visible Light Transmittance: 53 percent minimum.
12. SGHC: 0.23 maximum.
13. Safety glazing as required by code or performance.

F. Ceramic-Coated, Low-E, Insulating Spandrel Glass Type GL-03:

1. Basis-of-Design Product: Vitro SolarBan 90 Acuity + Acuity Glass..
2. Coating Color: As selected by Architect from manufacturer's full range.
3. Overall Unit Thickness: 1 inch.
4. Minimum Thickness of Each Glass Lite: 6 mm.
5. Outdoor Lite: Low-iron heat-strengthened float glass.
6. Interspace Content: Argon.
7. Indoor Lite: Low-iron heat-strengthened float glass.
8. Low-E Coating: Pyrolytic or sputtered on second surface.
9. Opaque Coating Location: Fourth surface.
10. Winter Nighttime U-Factor: 0.24 maximum.
11. Safety glazing as required by code or performance.

END OF SECTION 08 8000

SECTION 08 9119 - FIXED LOUVERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes fixed extruded-aluminum louvers.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.

B. Sustainable Design Submittals:

1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
2. Environmental Product Declaration: For each product.
3. Health Product Declaration: For each product.
4. Sourcing of Raw Materials: Corporate sustainability report for each manufacturer.

C. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.

D. Samples: For each type of metal finish required.

E. Delegated Design Submittal: For louvers indicated to comply with structural and seismic performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on tests performed according to AMCA 500-L.

B. Sample warranties.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.5 WARRANTY

A. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of baked enamel, powder coat, or organic finishes within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design louvers, including comprehensive engineering analysis by a qualified professional engineer, using structural performance requirements and design criteria indicated.

B. Structural Performance: Louvers withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures are considered to act normal to the face of the building.

1. Wind Loads:

a. Determine loads based on pressures as indicated on Drawings.

C. Seismic Performance:

1. As indicated on Drawings.

D. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

2.2 FIXED EXTRUDED-ALUMINUM LOUVERS

A. Horizontal Drainable-Blade Louver, Extruded Aluminum:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Construction Specialties, Inc.
b. Greenheck Fan Corporation.
c. Ruskin; Air Distribution Technologies, Inc.; Johnson Controls, Inc.

2. Louver Depth: 4 inches.
3. Frame and Blade Nominal Thickness: Not less than 0.060 inch for blades and 0.080 inch for frames.
4. Mullion Type: Exposed.
5. Louver Performance Ratings: TBD

6. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.3 LOUVER SCREENS

A. General: Provide screen at each exterior louver.

1. Screen Location for Fixed Louvers: Interior face.
2. Screening Type: Insect screening.

B. Louver Screen Frames: Same type and form of metal as indicated for louver to which screens are attached.

C. Louver Screening for Aluminum Louvers:
1. Bird Screening, Stainless Steel: 1/2-inch-square mesh, 0.047-inch wire.

2.4 BLANK-OFF PANELS

A. Uninsulated Blank-Off Panels: Metal sheet attached to back of louver.

1. Aluminum sheet for aluminum louvers, not less than 0.050-inch nominal thickness.
2. Panel Finish: Same finish applied to louvers.
3. Attach blank-off panels with clips.

B. Insulated Blank-Off Panels: Laminated panels consisting of an insulating core surfaced on back and front with metal sheets and attached to back of louver.

1. Thickness: 2 inches.
2. Metal Facing Sheets, Aluminum: Not less than 0.032-inch nominal thickness.
3. Insulating Core: Rigid, glass-fiber-board insulation or extruded-polystyrene foam Insert insulation material.
4. Edge Treatment: Trim perimeter edges of blank-off panels with louver manufacturer's standard extruded-aluminum-channel frames, not less than 0.080-inch nominal thickness channel frames, with corners mitered and with same finish as panels.
5. Seal perimeter joints between panel faces and louver frames with gaskets or sealant.
6. Panel Finish: Same finish applied to louvers.
7. Attach blank-off panels with clips.

2.5 MATERIALS

A. Aluminum Extrusions: ASTM B221, Alloy 6063-T5, T-52, or T6.

B. Aluminum Sheet: ASTM B209, Alloy 3003 or 5005, with temper as required for forming, or as otherwise recommended by metal producer for required finish.

C. Fasteners: Use types and sizes to suit unit installation conditions.

1. Use hex-head or Phillips pan-head screws for exposed fasteners unless otherwise indicated.
2. For fastening aluminum, use aluminum or 300 series stainless steel fasteners.
3. For color-finished louvers, use fasteners with heads that match color of louvers.

D. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, fabricated from stainless steel components, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing according to ASTM E488/E488M conducted by a qualified testing agency.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

F. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

G. Recycled Content of Aluminum Components: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

2.6 FABRICATION

A. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

B. Join frame members to each other and to fixed louver blades with fillet welds concealed from view unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.7 ALUMINUM FINISHES

A. High-Performance Organic Finish, Two-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70percent PVDF resin by weight in color coat.

1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Color and Gloss: PPG UC122679F - Weathered Zinc, matte finish.

PART 3 -

3.1 INSTALLATION

A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

D. Protect unpainted galvanized- and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

3.2 ADJUSTING

A. Restore louvers damaged during installation and construction, so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

END OF SECTION 08 9119

SECTION 14 2123.16 - MACHINE ROOM-LESS ELECTRIC TRACTION ELEVATORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Machine-room-less electric traction elevators.

B. Related Requirements:
1. Section 03 3000 "Cast-in-Place Concrete" for setting sleeves, inserts, and anchoring devices in concrete.
2. Section 05 1200 "Structural Steel Framing" for the following:

a. Attachment plates, angle brackets, and other preparation of structural steel for fastening guide-rail brackets.
b. Divider beams.
c. Hoist beams.
d. Structural-steel shapes for subsills.

3. Section 05 5000 "Metal Fabrications" for the following:
a. Pit ladders.

1.2 DEFINITIONS

A. Definitions in ASME A17.1/CSA B44 apply to work of this Section.

B. Service Elevator: A passenger elevator that is also used to carry freight.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Machine-room-less electric traction elevators.

B. Product Data Submittals: For each product.

1. Include capacities, sizes, performances, operations, safety features, finishes, and similar information.
2. Include Product Data for car enclosures, hoistway entrances, and operation, control, and signal systems.

C. Shop Drawings:

1. Include plans, elevations, sections, and large-scale details indicating service at each landing, coordination with building structure, relationships with other construction, and locations of equipment.
2. Include large-scale layout of car-control station and standby power operation control panel.

3. Indicate maximum dynamic and static loads imposed on building structure at points of support, and maximum and average power demands.

D. Samples for Initial Selection: For each type of exposed finish involving color selection.

E. Samples for Verification: For exposed car, hoistway door and frame, and signal equipment finishes; 3-inch-square Samples of sheet materials; and 4-inch lengths of running trim members.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Seismic Qualification Certificates: For elevator equipment, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Manufacturer Certificates: Signed by elevator manufacturer certifying that hoistway and pit layout and dimensions, as indicated on Drawings, and electrical service including standby power generator, as shown and specified, are adequate for elevator system being provided.

D. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.

1. Submit manufacturer's or Installer's standard operation and maintenance manual, in accordance with ASME A17.1/CSA B44 including diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.

B. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

C. Continuing Maintenance Proposal:

1. Submit a continuing maintenance proposal from Installer to Owner, in the form of a standard five-year maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.
2. Submit a continuing maintenance proposal from Installer to Owner with terms, conditions, and obligations as set forth in, and in same form as, a "Draft of Elevator Maintenance Agreement" at end of this Section, starting on date initial maintenance service is concluded.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Elevator manufacturer or an authorized representative who is trained and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle materials, components, and equipment in manufacturer's protective packaging. Store materials, components, and equipment off of ground, under cover, and in a dry location.

1.8 COORDINATION

A. Coordinate installation of inserts, sleeves, block outs, elevator equipment with integral anchors, and other items that are embedded in concrete or masonry for elevator equipment. Furnish templates, inserts, sleeves, elevator equipment with integral anchors, and installation instructions and deliver to Project site in time for installation.

B. Coordinate locations and dimensions of work specified in other Sections that relates to electric traction elevators including pit ladders; sumps and floor drains in pits; entrance subsills; electrical service; and electrical outlets, lights, and switches in hoistways and pits.

1.9 WARRANTY

A. Manufacturer's Special Warranty: Manufacturer agrees to repair, restore, or replace elevator work that fails in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.
2. Warranty Period: 2 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with ASME A17.1/CSA B44.

B. Accessibility Requirements: Comply with requirements for accessible elevators in the United States Access Board's ADA-ABA Accessibility Guidelines and with ICC A117.1.

C. Seismic Performance: Elevator system shall withstand the effects of earthquake motions determined in accordance with ASCE/SEI 7 and shall comply with elevator seismic requirements in ASME A17.1/CSA B44.

1. The term "withstand" means "the system will remain in place without separation of any parts when subjected to the seismic forces specified and the system will be fully operational after the seismic event."

2. Project Seismic Design Category: A.
3. Elevator Component Importance Factor: 1.5.
4. Provide earthquake equipment required by ASME A17.1/CSA B44.
5. Provide seismic switch required by ASCE/SEI 7.

2.2 ELEVATORS

A. Elevator System, General: Manufacturer's standard elevator systems. Unless otherwise indicated, manufacturer's standard components shall be used, as included in standard elevator systems and as required for complete system.

B. Elevator Description: Central Core Passenger Elevators – 6 elevators.
1. Rated Load: 3500 lb.
2. Rated Speed: 350 fpm.
3. Operation System: Group automatic operation with demand-based dispatching.
4. Car Enclosures:

    a. Inside Width: Not less than 65 inches from side wall to side wall.
    b. Inside Depth: Not less than 80 inches from back wall to front wall (return panels).
    c. Inside Height: Not less than 93 inches to underside of ceiling.
    d. Front Walls (Return Panels): Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    e. Car Fixtures: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    f. Side and Rear Wall Panels: Textured stainless steel.
    g. Reveals: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    h. Door Faces (Interior): Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    i. Door Sills: Nickel silver.
    j. Ceiling: Satin stainless steel, ASTM A480/A480M, No. 4 finish .
    k. Handrails: 1-1/2 inches round satin stainless steel, at sides of car.
    l. Floor recessed and prepared to receive ceramic tile (specified in Section 09 3013 "Ceramic Tiling").

5. Hoistway Entrances:

    a. Width: 42 inches.
    b. Height: 84 inches.
    c. Type: Single-speed center opening.
    d. Frames: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    e. Doors and Transoms: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    f. Sills: Nickel silver.
        1) Provide nickel silver or chrome plated cast iron sill plate at entrance threshold as manufactured by Plymouth Engineering Shapes of Hopkinsville, Kentucky www.plymouth.com/ or approved substitute

6. Hall Fixtures: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
7. Additional Requirements:

    a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, ASTM A480/A480M, No. 4 finish.
    b. Provide hooks for protective pads in all cars and complete set(s) of full-height protective pads.

C. Elevator Description: West Core Service Elevators – 2 elevators.
1. Rated Load: 5000 lb.

2. Rated Speed: 200 fpm.
3. Operation System: Group automatic operation.
4. Car Enclosures:

    a. Inside Width: Not less than 71 inches from side wall to side wall.
    b. Inside Depth: Not less than 102 inches from back wall to front wall (return panels).
    c. Inside Height: Not less than 93 inches to underside of ceiling.
    d. Front Walls (Return Panels): Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    e. Car Fixtures: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    f. Side and Rear Wall Panels: Textured stainless steel.
    g. Reveals: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    h. Door Faces (Interior): Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    i. Door Sills: Nickel silver.
    j. Ceiling: Satin stainless steel, ASTM A480/A480M, No. 4 finish .
    k. Handrails: 1-1/2 inches round satin stainless steel, at sides of car.
    l. Floor recessed and prepared to receive ceramic tile (specified in Section 09 3013 "Ceramic Tiling").

5. Hoistway Entrances:

    a. Width: 54 inches.
    b. Height: 96 inches.
    c. Type: Two-speed side sliding.
    d. Frames: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    e. Doors and Transoms: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    f. Sills: Nickel silver.
        1) Provide nickel silver or chrome plated cast iron sill plate at entrance threshold as manufactured by Plymouth Engineering Shapes of Hopkinsville, Kentucky www.plymouth.com/ or approved substitute

6. Hall Fixtures: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
7. Additional Requirements:

    a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, ASTM A480/A480M, No. 4 finish.
    b. Provide hooks for protective pads in all cars and complete set(s) of full-height protective pads.

D. Elevator Description: South Core Passenger Elevators – 2 elevators.
1. Rated Load: 3500 lb.
2. Rated Speed: 350 fpm.
3. Operation System: Group automatic operation.
4. Car Enclosures:

    a. Inside Width: Not less than 65 inches from side wall to side wall.
    b. Inside Depth: Not less than 80 inches from back wall to front wall (return panels).
    c. Inside Height: Not less than 93 inches to underside of ceiling.
    d. Front Walls (Return Panels): Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    e. Car Fixtures: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    f. Side and Rear Wall Panels: Textured stainless steel.
    g. Reveals: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    h. Door Faces (Interior): Satin stainless steel, ASTM A480/A480M, No. 4 finish.
    i. Door Sills: Nickel silver.
    j. Ceiling: Satin stainless steel, ASTM A480/A480M, No. 4 finish .

k. Handrails: 1-1/2 inches round satin stainless steel, at sides of car.
l. Floor recessed and prepared to receive ceramic tile (specified in Section 09 3013 "Ceramic Tiling").

5. Hoistway Entrances:

a. Width: 42 inches.
b. Height: 84 inches.
c. Type: Single-speed sliding.
d. Frames: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
e. Doors and Transoms: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
f. Sills: Nickel silver.
1) Provide nickel silver or chrome plated cast iron sill plate at entrance threshold as manufactured by Plymouth Engineering Shapes of Hopkinsville, Kentucky www.plymouth.com/ or approved substitute

6. Hall Fixtures: Satin stainless steel, ASTM A480/A480M, No. 4 finish.
7. Additional Requirements:

a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, ASTM A480/A480M, No. 4 finish.
b. Provide hooks for protective pads in all cars and complete set(s) of full-height protective pads.

2.3 MACHINE ROOM-LESS ELECTRIC TRACTION ELEVATORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Canton Elevator, Inc.
2. KONE Inc.
3. Otis Worldwide Corporation.
4. Schindler Elevator Corp.
5. ThyssenKrupp Elevator.

B. The following Elevator Installing Companies may supply and install elevator equipment purchased from third party manufacturers but must meet the requirements of this standard and be approved by the University Project manager; including, but not limited to:
1. DC Elevator
2. The Murphy Elevator Co., Inc.
3. Oracle Elevator Company

C. Source Limitations: Obtain elevators from single manufacturer.

1. Major elevator components, including driving machines, controllers, signal fixtures, door operators, car frames, cars, and entrances, shall be manufactured by single manufacturer.
2. Controllers:
a. Non-proprietary controllers:
1) Elevator Controls Corp. www.elevatorcontrols.com
2) Virginia Controls, Inc. http://www.vacontrols.com
3) Smartrise Engineering, Inc. www.smartrise.us
4) G. A. L. Manufacturing Corp. www.gal.com

b. The controller shall be capable of continuous operation in ambient temperatures between 65 degrees F and 90 degrees F.
c. Specialized diagnostic devices used to check the operation of themicroprocessor and not permanently attached to the controller, shall beprovided as part of the contract and shall become university property.
d. Diagnostic tools or devices requiring “reloading” or “recharging” by the manufacturer shall not be used on a University of Kentucky project.

3. Controllers:
a. Provide only door operator equipment that includes drive operator, hangers, locks, closures, etc. as manufactured by GAL manufacturing Corp. (www.gal.com) 1-877-425-3538.

2.4 TRACTION SYSTEMS

A. Elevator Machines: Permanent magnet, variable-voltage, variable-frequency, ac-type hoisting machines and solid-state power converters.

1. Provide regenerative system.
2. Provide regenerative system that complies with the IgCC.
3. Limit total harmonic distortion of regenerated power to 5 percent in accordance with IEEE 519.
4. Provide means for absorbing regenerated power when elevator system is operating on standby power.
5. Provide line filters or chokes to prevent electrical peaks or spikes from feeding back into building power system.

B. Fluid for Hydraulic Buffers: Fire-resistant fluid.

C. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work. Device installation is specified in another Section.

D. Machine Beams: Provide steel framing to support elevator hoisting machine and deflector sheaves from the building structure. Comply with Section 05 5000 "Metal Fabrications" for materials and fabrication.

E. Car Frame and Platform: Bolted- or welded-steel units.

F. Guides: Roller guides or polymer-coated, nonlubricated sliding guides. Provide guides at top and bottom of car and counterweight frames.

2.5 OPERATION SYSTEMS

A. Provide manufacturer's standard microprocessor operation systems as required to provide type of operation indicated.

B. Group Automatic Operation with Demand-Based Dispatching: Provide reprogrammable group automatic system that assigns cars to hall calls based on a dispatching program designed to minimize passenger wait time. System automatically adjusts to demand changes for different

traffic conditions including heavy incoming, heavy two-way, heavy outgoing, and light off-hours as variations of normal two-way traffic.

C. Auxiliary Operations:
1. Group Standby Power Operation:
a. On activation of standby power, cars are returned, one at a time, to a designated floor and parked with doors open. If a car cannot be returned, it is removed from the system. When all cars have been returned or removed from the system, one car can be put in service on standby power by a selector switch in control panel located at fire-command station.
2. Automatic Dispatching of Loaded Car: When car load exceeds 80 percent of rated capacity, doors begin closing.
3. Nuisance-Call Cancel: When car calls exceed a preset number while car load is less than a predetermined weight, all car calls are canceled. Preset number of calls and predetermined weight can be adjusted.
4. Loaded-Car Bypass: When car load exceeds 80 percent of rated capacity, car responds only to car calls, not to hall calls.
5. Distributed Parking: When cars are not required for response to calls, they are parked with doors closed and distributed in predetermined zones throughout the building. One zone to include the main floor and adjacent floors; remaining floors to be divided into approximately equal zones.
6. Off-Peak Operation: During periods of low traffic, half of the elevators in a group to be taken out of service and switched to sleep, low power mode.
7. Independent Service: Keyswitch in car-control station removes car from group operation and allows it to respond only to car calls. Key cannot be removed from keyswitch when car is in independent service. When in independent service, doors close only in response to door close button.
8. Priority Service: Service is initiated by a keyswitch at designated floors. One elevator is removed from group operation and directed to the floor where service was initiated. On arriving at the floor, elevator opens its doors and parks and a lighted sign directs passengers to exit elevator. Car is placed in operation by selecting a floor and pressing door close button or by operating keyswitch to put car in independent service. After responding to floor selected or being removed from independent service, car is returned to group operation. If car is not placed in operation within a preset time after being called, it is returned to group operation.

9. Keys and switches:
a. Provide switches for lights, fan (2-speed), emergency stop and service and/or inspection.
1) Toggle switches shall be located behind a locked door keyed with a best 7-pin small format cylinder. Door to have “Slam door lockset for service cabinet with a Yale or Best 7-pin security switch with removable core by Innovation Industries, Inc. or equal.
2) Key should be removable only in the normal locked position.
3) Use Best Cylinder with removable core and 7-pin small format
b. Provide a two-speed fan switch; key should be removable in all positions; use Best Cylinder with removable core
c. Provide each car-operating panel with an emergency stop key switch, key should be removable in all positions; use Best Cylinder with removable core.
1) Position the cylinder near the bottom of the pushbuttons with the key removable in either position and with one set of normally closed contacts.
2) Mark the switch with etched, engraved, or embossed “ON” and “OFF.”
d. Where special key switches or card readers and/or other devices are used to lock out particular floor and/or functions:
1) Wire controls so as not to interfere with Fire Service operation.

2) Provide temporary inactivated push buttons for each floor even if a key switch, card reader, and/or other devices are required.

e. For restricted access to a Penthouse mechanical room, provide lock-out keyed switch on the Penthouse push button (the push button is to be activated by the keyed switch); key shall not be removable in the activation position. (Use Best Cylinder with removable core)

D. Security features may not affect emergency firefighters' service.

1. Card-Reader Operation: System uses card readers at car-control stations and hall push-button stations to authorize calls. Security system determines which landings and at what times calls require authorization by card reader. Provide required conductors in traveling cable and panel in machine room for interconnecting card readers, other security access system equipment, and elevator controllers. Allow space for card reader in car.

a. Security access system equipment is specified in Section 28 1500 "Access Control Hardware Devices."

2. Keyswitch Operation: Push buttons are activated and deactivated by security keyswitches at car-control stations and hall push-button stations. Key is removable in either position.

3. Car-to-Lobby Feature: Feature, activated by keyswitch at main lobby, that causes all cars in a group to return immediately to lobby and open doors for inspection. On deactivation by keyswitch, calls registered before keyswitch activation are completed and normal operation is resumed.

2.6 DOOR REOPENING DEVICES

A. Infrared Array: Provide door reopening device with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more light beams causes doors to stop and reopen.

B. Nudging Feature: After car doors are prevented from closing for predetermined adjustable time, through activating door reopening device, a loud buzzer sounds and doors begins to close at reduced kinetic energy.

2.7 CAR ENCLOSURES

A. Provide steel-framed car enclosures with nonremovable wall panels, withcar roof, access doors, power door operators, and ventilation.

1. Provide standard railings complying with ASME A17.1/CSA B44 on car tops where required by ASME A17.1/CSA B44.
2. See "Elevator Car Allowances" Paragraph in "Allowances" Article for items to be provided under the Elevator Car Allowance. Provide items not included in the Elevator Car Allowance as needed for finished car including materials and finishes specified below.

B. Materials and Finishes: Manufacturer's standards, but not less than the following:

1. Subfloor:
a. Exterior, C-C Plugged grade plywood, not less than 7/8-inch nominal thickness.

2. Floor Finish: As indicated in Finish Schedule.
3. Stainless Steel Wall Panels: Flush, formed-metal construction; fabricated from stainless steel sheet.
4. Fabricate car with recesses and cutouts for signal equipment.
5. Fabricate car door frame integrally with front wall of car.
6. Stainless Steel Doors: Flush, hollow-metal construction; fabricated from stainless steel sheet.
7. Sight Guards: Provide sight guards on car doors.
8. Sills: Extruded or machined metal, with grooved surface, 1/4 inch thick.
9. Luminous Ceiling: Fluorescent light fixtures and ceiling panels of translucent acrylic or other permanent rigid plastic.
10. Ceiling: Metal flush panels, with four low-voltage downlights in each panel. Align ceiling panel joints with joints between wall panels.
11. Light Fixture Efficiency: Not less than 35 lumens/W.
12. Ventilation Fan Efficiency: Not less than 3.0 cfm/W.

2.8 HOISTWAY ENTRANCES

A. Hoistway Entrance Assemblies: Manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories. Frame size and profile to accommodate hoistway wall construction.

1. Where gypsum board wall construction is indicated, frames to be self-supporting with reinforced head sections.

B. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies to comply with NFPA 80 and be listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction based on testing at as close-to-neutral pressure as possible in accordance with NFPA 252 or UL 10B.

1. Fire-Protection Rating: 1-1/2 hours with 30-minute temperature rise of 450 deg F.

C. Materials and Fabrication: Manufacturer's standards, but not less than the following:
1. Stainless Steel Frames: Formed from stainless steel sheet.
2. Star of Life Symbol: Identify emergency elevators with star of life symbol, not less than 3 inches high, on both jambs of hoistway door frames.
3. Stainless Steel Doors and Transoms: Flush, hollow-metal construction; fabricated from stainless steel sheet.
4. Sight Guards: Provide sight guards on doors matching door edges.
5. Sills: Extruded or machined metal, with grooved surface, 1/4 inch thick.
6. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M.

2.9 SIGNAL EQUIPMENT

A. Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Provide vandal-resistant buttons and lighted elements illuminated with LEDs.

B. Car-Control Stations: Provide manufacturer's standard recessed car-control stations. Mount in return panel adjacent to car door unless otherwise indicated.

1. Mark buttons and switches for required use or function. Use both tactile symbols and Braille.

2. Provide "No Smoking" sign matching car-control station, either integral with car-control station or mounted adjacent to it, with text and graphics as required by authorities having jurisdiction.

C. Swing-Return Car-Control Stations: Provide car-control stations mounted on rear of hinged return panel adjacent to car door and with buttons, switches, controls, and indicator lights projecting through return panel but substantially flush with face of return panel.

1. Mark buttons and switches for function. Use both tactile symbols and Braille.
2. Provide "No Smoking" sign matching car-control station, either integral with car-control station or mounted adjacent to it, with text and graphics as required by authorities having jurisdiction.

D. Emergency Communication System: Two-way voice communication system, with visible signal, which dials preprogrammed number of monitoring station and does not require handset use. System is contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.
1. The emergency phone shall be Ramtel model RR833-OEM and be mounted flush on the back of a hinged door at the bottom portion of the in-car control panel and locked with a barrel key #EX513.
2. The communication device shall be as manufactured by Ramtel model RR833- OEM to match the existing elevator emergency communication system including remote location indicator and other existing features now in use.
3. A stand-alone flush box-type device is not to be used without approval of the Owner.
4. The face plate shall have, including but not necessarily limited to: EMERGENCY PHONE UNIVERSITY OF KENTUCKY (include UK logo - Contact UK Public Relations for most recent logo updates)
5. RAVE Eyewitness Signage should be included in every University of Kentucky owned elevator. The signs are 7.5 inches wide and 5.5 inches tall and should be installed at eye level as close to the emergency elevator call box as possible inside the elevator car. The signs are constructed from a hard plastic with quality 3M 467MP 200MP adhesive on the back. They should be UK Blue with white wording. The University Sign Shop has this on file.

E. Firefighters' Two-Way Telephone Communication Service: Provide flush-mounted cabinet in each car and required conductors in traveling cable for firefighters' two-way telephone communication service specified in Section 28 4621.11 "Addressable Fire-Alarm Systems."
1. In-car Fireman Service Controls shall be in a reachable, recessed, and in a locked panel in the control panel and at the top portion of the panel.
    a. Engrave, etch, or emboss fire service instructions inside the fixture cover inaccordance with ASME A17.1a.
    b. Key number shall be FEOK1 (Barrel shaped Key) for all campus buildings.

F. Car Position Indicator: Provide illuminated, vandal-resistant digital-type car position indicator, located above car door or above car-control station. Also, provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served. Include travel direction arrows if not provided in car-control station.

G. Hall Push-Button Stations: Provide one hall push-button station at each landing for each single elevator or group of elevators, but not less than one station for each four elevators in a group.

1. Provide manufacturer's standard wall-mounted units.
2. Equip units with buttons for calling elevator and for indicating desired direction of travel.

    a. Provide for connecting units to building security access system so a card reader can be used to register calls.

3. Provide telephone jack in each unit for firefighters' two-way telephone communication service specified in Section 28 4621.11 "Addressable Fire-Alarm Systems."

H. Hall Lanterns: Units with illuminated arrows; but provide single arrow at terminal landings. Provide the following:
1. Units with flat faceplate for mounting with body of unit recessed in wall and with illuminated elements projecting from faceplate for ease of angular viewing.

I. Hall Annunciator: With each hall lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.

1. At manufacturer's option, audible signals may be placed on cars.

J. Hall Position Indicators: Provide illuminated, digital-display-type position indicators, located above each hoistway entrance at ground floor. Provide units with flat faceplate and with body of unit recessed in wall.

1. Integrate ground-floor hall lanterns with hall position indicators.

K. Standby Power Elevator Selector Switches: Provide switches, as required by ASME A17.1/CSA B44, where indicated. Adjacent to switches, provide illuminated signal that indicates when normal power supply has failed. For each elevator, provide illuminated signals that indicate when they are operational and when they are at the designated emergency return level with doors open.

L. Fire-Command-Center Annunciator Panel: Provide panel containing illuminated position indicators for each elevator, clearly labeled with elevator designation; include illuminated signal that indicates when elevator is operational and when it is at the designated emergency return level with doors open. Provide standby power elevator selector switch(es), as required by ASME A17.1/CSA B44, adjacent to position indicators. Provide illuminated signal that indicates when normal power supply has failed.

M. Emergency Pictorial Signs: Fabricate from materials matching hall push-button stations, with text and graphics as required by authorities having jurisdiction, indicating that in case of fire, elevators are out of service and exits should be used instead. Provide one sign at each hall push-button station unless otherwise indicated.

2.1 ACCESSORY EQUIPMENT

A. Provide a lockable secure storage box on the Priority 1 floor for the firemen's service key(s). Request storage box keying information from the UK Fire Marshal.
1. Provide the Fire Service key switch at the main fire-recall lobby pushbutton.
   a. Provide a lighted jewel to indicate Fire Service Operation.
   b. Engrave, etch, or emboss fire service instructions on the fixture cover in accordance with ASME A17.1a.
   c. Provide etched, embossed, or engraved Fire Service Signage located on each hall pushbutton cover.
   d. All Campus (CPPD) Fireman Service Keying requirements shall be for key number FEOK1 (Barrel shaped Key).

2.2 FINISH MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, commercial steel, Type B, exposed, matte finish.

B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, commercial steel, Type B, pickled.

C. Stainless Steel Sheet: ASTM A240/A240M, Type 304.

D. Textured Stainless Steel Sheet: ASTM A240/A240M, Type 304 with embossed texture rolled into exposed surface.

1. Product: Subject to compliance with requirements, provide small-patterned Rimex Metals 5WL.
2. Metal surface is satin polished after texturing.

E. Stainless Steel Bars: ASTM A276/A276M, Type 304.

F. Stainless Steel Tubing: ASTM A554, Grade MT 304.

G. Aluminum Extrusions: ASTM B221, Alloy 6063.

H. Nickel Silver Extrusions: ASTM B151/B151M, Alloy UNS No. C74500 or UNS No. C77600.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Examine hoistways, hoistway openings, and pits as constructed; verify critical dimensions; and examine supporting structure and other conditions under which elevator work is to be installed.

B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF MACHINE ROOM-LESS ELECTRIC TRACTION ELEVATORS

A. Comply with manufacturer's written instructions.

B. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.

C. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts to minimize vibration transmission to structure and structure-borne noise due to elevator system.

D. Lubricate operating parts of systems, including ropes, as recommended by manufacturers.

E. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with car. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.

F. Leveling Tolerance: 1/8 inch, up or down, regardless of load and travel direction.

G. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.

H. Locate hall signal equipment for elevators as follows unless otherwise indicated:

1. For groups of elevators, locate hall push-button stations between two elevators at center of group or at location most convenient for approaching passengers.
2. Place hall lanterns either above or beside each hoistway entrance.
3. Mount hall lanterns at a minimum of 72 inches above finished floor.

3.3 FIELD QUALITY CONTROL

A. Acceptance Testing: On completion of elevator installation and before permitting elevator use (either temporary or permanent), perform acceptance tests as required and recommended by ASME A17.1/CSA B44 and by governing regulations and agencies.

B. Operating Test: Load each elevator to rated capacity and operate continuously for 30 minutes over full travel distance, stopping at each level and proceeding immediately to the next. Record temperature rise of elevator machine during 30-minute test period. Record failure to perform as required.

C. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times that tests are to be performed on elevators.

3.4 PROTECTION

A. Temporary Use: Comply with the following requirements for each elevator used for construction purposes:

1. Provide car with temporary enclosure, either within finished car or in place of finished car, to protect finishes from damage.
2. Provide strippable protective film on entrance and car doors and frames.
3. Provide padded wood bumpers on entrance door frames covering jambs and frame faces.
4. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
5. Do not load elevators beyond their rated weight capacity.
6. Engage elevator Installer to provide full maintenance service. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleanup, and adjustment as necessary for proper elevator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
7. Engage elevator Installer to restore damaged work, if any, so no evidence remains of correction. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate, adjust, and maintain elevator(s).

B. Check operation of each elevator with Owner's personnel present before date of Substantial Completion and again not more than one month before end of warranty period. Determine that operation systems and devices are functioning properly.

3.6 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service to include 24 months' full maintenance by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Parts and supplies to be manufacturer's authorized replacement parts and supplies.

1. Perform maintenance during normal working hours.
2. Perform emergency callback service during normal working hours with response time of two hours or less.
3. Include 24-hour-per-day, 7-day-per-week emergency callback service with response time of two hours or less.

END OF SECTION 14 2123.16

SECTION 20 0100 - GENERAL PROVISIONS - MECHANICAL

1. GENERAL

A. The Advertisement for Bids, Instructions to Bidders, Bidding Requirements, General, Special and Supplementary Conditions, and all other contract documents shall apply to the Contractor's work as well as to each of his Sub-Contractor's work. All manufacturers, suppliers, fabricators, contractors, etc. submitting proposals to any part if for work, services, materials or equipment to be used on or applied to this project are hereby directed to familiarize themselves with all documents pertinent to this Contract. In case of conflict between these General Provisions and the General and/or Special Conditions, the affected Contractor shall contact the Engineer for clarification and final determination.

B. Each Proposer shall also be governed by any unit prices and Addenda insofar as they may affect his part of the work or services.

C. The work included in this division consists of the furnishing of all labor, equipment, transportation, excavation, backfill, supplies, material, appurtenances and services necessary for the satisfactory installation of the complete and operating Mechanical System(s) indicated or specified in the Contract Documents.

D. Any materials, labor, equipment or services not mentioned specifically herein which may be necessary to complete or perfect any part of the Mechanical Systems in a substantial manner, in compliance with the requirements stated, implied or intended in the drawings and/or specifications, shall be included as part of this Contract.

E. It is not the intent of this section of the specifications to make any Contractor, other than the General Contractor (or Construction Manager, if applicable), responsible to the Owner, Architect and Engineer. All transactions such as submittal of shop drawings, claims for extra costs, requests for equipment or materials substitution, shall be routed through the General Contractor to the Architect (if applicable), then to the Engineer. Also, this section of the specifications shall not be construed as an attempt to arbitrarily assign responsibility of work, material, equipment or services to a particular trade or Contractor. Unless stated otherwise, the subdivision and assignment of work under the various sections shall be optional.

F. It is the intent of this Contract to deliver to the Owners a "like new" project once work is complete. Although plans and specifications are complete to the extent possible, it shall be the responsibility of the Contractors involved to remove and/or relocate or re-attach any existing or new systems which interfere with new equipment or materials required for the complete installation without additional cost to the Owner.

G. In general, and to the extent possible, all work shall be accomplished without interruption of existing facilities operations. The Contractor shall advise the Owners at least two weeks prior to the interruption of any services or utilities. The Owners shall be advised of the exact time that interruption will occur and the length of time the interruption will last. Failure to comply with this requirement may result in complete work stoppage by the Contractors involved until a complete schedule of interruptions can be developed.

H. Definitions and Abbreviations

(1) Contractor - Any Contractor whether proposing or working independently or under the supervision of a General Contractor and/or Construction Manager and who installs any type of

mechanical work (Controls, Plumbing, HVAC, Sprinkler, Gas Systems, etc.) or, the General Contractor.

(2) Engineer - The Consulting Mechanical-Electrical Engineers either consulting to the Owners, Architect, other Engineers, etc. In this case: CMTA, Inc., Consulting Engineers.

(3) Architect - The Architect of Record for the project.

(4) Furnish - Deliver to the site in good condition and turn over to the Contractor who is to install.

(5) Provide - Furnish and install complete, tested and ready for operation.

(6) Install - Receive and place in satisfactory operation.

(7) Indicated - Listed in the Specifications, shown on the Drawings or Addenda thereto.

(8) Typical - Where indicated repeat this work, method or means each time the same or similar condition occurs whether indicated or not.

(9) Contract Documents - All documents pertinent to the quality and quantity of work to be performed on this project. Includes, but not limited to: Plans, Specifications, Instructions to Bidders, General and Special Conditions, Addenda, Alternates, Lists of Materials, Lists of Sub-Contractors, Unit Prices, Shop Drawings, Field Orders, Change Orders, Cost Breakdowns, Schedules of Value, Periodical Payment Requests, Construction Contract with Owners, etc.

(10) Proposer - Any person, agency or entity submitting a proposal to any person, agency or entity for any part of the work required under this contract.

(11) OSHA - Office of Safety and Health Administration.

(12)KBC - Kentucky Building Code.

(13)The Project - All of the work required under this Contract.

(14)NEC - National Electrical Code.

(15)NFPA - National Fire Protection Association.

(16)ASME - American Society of Mechanical Engineers.

(17)AGA - American Gas Association.

(18)SMACNA - Sheet Metal and Air Conditioning Contractors National Association.

(19)ANSI - American National Standards Institute.

(20)ASHRAE - American Society of Heating, Refrigeration and Air Conditioning Engineers.

(21)NEMA - National Electrical Manufacturers Association.

(22)UL - Underwriters Laboratories.

(23)ADA - Americans with Disabilities Act.

(24)IMC - International Mechanical Code.

(25)IECC - International Energy Conservation Code.

(26)IFGC - International Fuel Gas Code.

I. Required Notices:

(1) Ten days prior to the submission of a proposal, each proposer shall give written notice to the Engineer of any materials or apparatus believed inadequate or unsuitable; in violation of laws, ordinances, rules or regulations of authorities having jurisdiction; and any necessary items of work omitted. In the absence of such written notice, Proposers signify that they have included the cost of all required items in the proposal and that the Proposer will be responsible for the safe and satisfactory operation of the entire system.

J. All work shall conform to University of Kentucky official design standards. A complete copy of the design standards is located at the following location:
https://www.uky.edu/cpmd/design-standards/divisions-20---29---facility-services-subgroup
All contractors shall familiarize themselves with this standard and bid the project accordingly. If a conflict arises between the specifications and the facility standard, the proposer shall notify the engineer of the conflict prior to his bid.

2. INTENT

A. It is the intention of the Contract Documents to call for finished work, tested and ready for operation.

B. Details not usually shown or specified, but necessary for the proper installation and operation of systems, equipment, materials, etc., shall be included in the work, the same as if herein specified or indicated.

3. DRAWINGS AND SPECIFICATIONS

A. The drawings are diagrammatic only and indicate the general arrangement of the systems and are to be followed. If deviations from the layouts are necessitated by field conditions, detailed layouts of the proposed departures shall be submitted to the Engineer for approval before proceeding with the work. The drawings are not intended to show every item which may be necessary to complete the systems. All proposers shall anticipate that additional items may be required and submit their bid accordingly.

B. The drawings and specifications are intended to supplement each other. No Proposer shall take advantage of conflict between them, or between parts of either. Should this condition exist, the Proposer shall request a clarification not less than twelve days prior to the submission of the proposal so that the condition may be clarified by Addendum. In the event that such a condition arises after work is started, the interpretation of the Engineer shall be final.

C. The drawings and specifications shall be considered to be cooperative and anything appearing in the specifications which may not be indicated on the drawings or conversely, shall be considered as part of the Contract and must be executed the same as though indicated by both.

D. Contractor shall make all his own measurements in the field and shall be responsible for correct fitting. He shall coordinate this work with all other branches of work in such a manner as to cause a minimum of conflict or delay.

E. The Engineer shall reserve the right to make adjustments in location of piping, ductwork, equipment, etc. where such adjustments are in the interest of improving the project.

F. Should conflict or overlap (duplication) of work between the various trades become evident, this shall be called to the attention of the Engineer. In such event neither trade shall assume that he is to be relieved of the work which is specified under his branch until instructions in writing are received from the Engineer.

G. Unless dimensioned, the mechanical drawings only indicate approximate locations of equipment, piping, ductwork, etc. Dimensions given in figures on the drawings shall take precedence over scaled dimensions and all dimensions, whether given in figures or scaled, shall be verified in the field to ensure no conflict with other work.

H. Each Proposer shall review all drawings including Architectural, Mechanical, Electrical, Fire Protection, Landscaping, Structural, Surveys, etc., to ensure that the work he intends to provide does not encroach a conflict with or affect the work of others in any way. Where such effect does occur, it shall be the Proposer's responsibility to satisfactorily eliminate any such encroachment conflict or effect prior to the submission of his proposal. Each Proposer shall in particular ensure that there is adequate space to install his equipment and materials. Failure to do so shall result in the correction of such encroachment conflict or effect of any work awarded the proposer and shall be accomplished fully without expense to others and that they are reasonably accessible for maintenance. Check closely all mechanical and electrical closets, chases, ceiling voids, wall voids, crawl spaces, etc., to ensure adequate spaces.

I. Where on the drawings a portion of the work is drawn out and the remainder is indicated in outline, or not indicated at all, the parts drawn out shall apply to all other like portions of the work. Where ornamentation or other detail is indicated by starting only, such detail shall be continued throughout the courses or parts in which it occurs and shall also apply to all other similar parts of the work, unless otherwise indicated.

J. Details not usually shown or specified, but necessary for the proper installation and operation of systems, equipment, materials, etc., shall be included in the work, the same as if herein specified or indicated.

K. Where on the Drawings or Addenda the word typical is used, it shall mean that the work method or means indicated as typical shall be repeated in and each time it occurs whether indicated or not.

4. EXAMINATION OF SITE AND CONDITIONS

A. Each Proposer shall inform himself of all of the conditions under which the work is to be performed, the site of the work, the structure of the ground, above and below grade, the obstacles that may be encountered, the availability and location of necessary facilities and all relevant matters concerning the work. Each Proposer shall also fully acquaint himself with all existing conditions as to ingress and egress, distance of haul from supply points, routes for transportation of materials, facilities and services, availability of utilities, etc. His proposal shall cover all expenses or disbursements in connection with such matters and conditions. No allowance will be made for lack of knowledge concerning such conditions after bids are accepted.

5. EQUIPMENT AND MATERIALS SUBSTITUTIONS OR DEVIATIONS

A. When any Contractor requests approval of materials and/or equipment of different physical size, capacity, function, color, access, it shall be understood that such substitution, if approved, will be

made without additional cost to anyone other than the Contractor requesting the change regardless of changes in connections, space requirements, electrical characteristics, electrical services, etc., from that indicated. In all cases where substitutions affect other trades, the Contractor requesting such substitutions shall advise all such Contractors of the change and shall remunerate them for all necessary changes in their work. Any drawings, Specifications, Diagrams, etc., required to describe and coordinate such substitutions or deviations shall be professionally prepared at the responsible Contractor's expense. Review of Shop Drawings by the Engineers does not in any way absolve the Contractor of this responsibility.

B. Notwithstanding any reference in the specifications to any article, device, product, material, fixture, form, or type of construction by name, make or catalog number, such reference shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition; any devices, products, materials, fixtures, forms, or types of construction which, in the judgment of the Engineer, are equivalent to those specified are acceptable, provided the provisions of Paragraph (A) immediately preceding are met. Requested substitutions shall be submitted to the Engineer a minimum of twelve days prior to bids.

C. Wherever any equipment and material is specified exclusively only such items shall be used unless substitution is accepted in writing by the Engineers.

D. Each Proposer shall furnish along with his proposal a list of specified equipment and materials which he is to provide. Where several makes are mentioned in the specifications and the Contractor fails to state which he proposes to furnish, the Engineer shall choose any of the makes mentioned without change in price. Inclusion in this list shall not ensure that the Engineers will approve shop drawings unless the equipment, materials, etc., submitted in shop drawings is satisfactorily comparable to the items specified and/or indicated.

6. SUPERVISION OF WORK

A. The Contractor shall personally supervise the work for which he is responsible or have a competent superintendent, approved by the Engineers, on the work at all times during progress with full authority to act for him.

7. CODES, RULES, PERMITS, FEES, INSPECTIONS, REGULATIONS, ETC.

A. The Contractor shall give all necessary notices, obtain and pay for all permits, government sales taxes, fees, inspections and other costs, including all utility connections, meters, meter settings, taps, tap fees, extensions, water and/or sewer system development charge, etc. in connection with his work. He shall also file all necessary plans, prepare all documents and obtain all necessary approvals of all governmental departments and/or the appropriate municipality or utility company having jurisdiction, whether indicated or specified or not. He shall hire an independent Registered Engineer to witness installations and provide necessary certifications where required by utility companies, municipal agencies or others that have review authority. He shall also obtain all required certificates of inspection for his work and deliver same to the Engineers before request for acceptance and final payment for the work. Ignorance of Codes, Rules, Regulations, Laws, etc. shall not render the Contractor irresponsible for compliance. The Contractor shall also be versed in all Codes, Rules and Regulations pertinent to his part of the work prior to submission of a proposal.

B. The Contractor shall include in his work, without extra cost, any labor, materials, services, apparatus and drawings in order to comply with all applicable laws, ordinances, rules and regulations, whether or not indicated or specified.

C. All materials furnished and all work installed shall comply with the National Fire Codes of the National Fire Protection Association, with the requirements of local utility companies, or municipalities and with the requirements of all governmental agencies having jurisdiction.

D. All materials and equipment so indicated and all equipment and materials for the electrical portion of the mechanical systems shall bear the approval label of, or shall be listed by the Underwriters' Laboratories (UL), Incorporated. Each packaged assembly shall be approved as a package. Approval of components of a package shall not be acceptable. Where required by the Code and/or the Authority Having Jurisdiction, provide the services of a field labeling agency to provide a UL label for the entire system in the field under evaluation.

E. All plumbing work is to be constructed and installed in accordance with plans and specifications which have been approved in their entirety and/or reflect any changes requested by the State Department of Health. Plumbing work shall not commence until such plans are in the hands of the Contractor.

F. All Heating, Ventilation and Air Conditioning work shall be accomplished in accordance with the Kentucky Building Code (KBC) and amendments thereto, the latest standards recognized by the American Society of Heating, Refrigerating and Air Conditioning and the National Fire Protection Association. Contractor shall secure a permit from the Division of HVAC. Final inspection certificate shall be provided by Contractor and a copy included in Operation and Maintenance Manuals.

G. All pressure vessel installations shall comply with the State, and/or Federal Code applicable. A Certificate of Final Boiler Inspection shall be required.

H. The Contractor shall upload copies of all Final Inspection Certificates obtained to the Engineer via EComm when work is complete. Final payment for work will be contingent upon compliance with this requirement.

I. Where minimum code requirements are exceeded in the Design, the Design shall govern.

J. The Contractor shall ensure that his work is accomplished in accord with the OSHA Standards and that he conducts his work and the work of his personnel in accord with same.

K. The installation of all fuel storage tanks and associated piping, whether interior or exterior, shall be inspected by the State Fire Marshal, Hazardous Materials Section, before backfill. Submit certificate of this inspection to the Engineers.

L. All work relating to the handicapped shall be in accord with regulations currently enforced by the Department of Housing, Buildings and Construction, Commonwealth of Kentucky and the American Disabilities Act.

M. All work in conjunction with a natural gas installation shall, in addition to all other Codes, Rules, Regulations, Standards, etc., comply with the requirements of the local gas supplier and/or standards and recommendations of the American Gas Association.

N. All work in relation to domestic water systems shall, in addition to all other Codes, Rules, Regulations and Standards, be in compliance with the requirements of the local water utility company and the adopted edition of the 10 States Standards.

O. All work in relation to the installation of sanitary or storm sewers shall, in addition to all other Codes, Rules, Regulations and Standards, be in compliance with the local agency governing such installations and the adopted edition of the 10 States Standards.

P. All work relating to the handicapped shall be in accord with regulations currently enforced by the Department of Housing, Buildings, and Construction, Commonwealth of Kentucky and the American Disabilities Act.

8. EQUIPMENT AND PIPING SUPPORT

A. Each piece of equipment, apparatus, piping, or conduit suspended from the structure or mounted above the floor level shall be provided with suitable structural support, pipe stand, platform or carrier in accordance with the best recognized practice. Such supporting or mounting means shall be provided by the Contractor for all equipment and piping. Exercise extreme care that structural members of building are not overloaded by such equipment. Provide any required additional bracing, cross members, angles, support, etc., as indicated or required by the Structural Engineer. This, in some instances, will require the Contractor to add an angle to a joist to transfer the load to a panel point. If in doubt, contact the Structural Engineer.

9. DUCT AND PIPE MOUNTING HEIGHTS

A. All exposed or concealed ductwork, piping, etc., shall be held as high as possible unless otherwise noted and coordinated with all other trades. Exposed piping and ductwork shall, insofar as possible, run perpendicular or parallel to the building structure.

10. COST BREAKDOWNS (SCHEDULE OF VALUES)

A. Within thirty days after acceptance of the Contract, the Contractor shall furnish to the Engineer, one copy of a detailed cost breakdown on each respective area of work. These cost breakdowns shall be made in a format approved by the Engineer. Payments will not be made until satisfactory cost breakdowns are submitted.

11. CORRECTION PERIOD

A. All equipment, apparatus, materials, and workmanship shall be the best of its respective kind. The Contractor shall replace all parts at his own expense, which are proven defective as described in the General Conditions. The effective date of completion of the work shall be the date of the Architect's or Engineer's Statement of Substantial Completion. Items of equipment which have longer guarantees, as called for in these specifications, shall have warranties and guarantees completed in order, and shall be in effect at the time of final acceptance of the work by the Engineer. The Contractor shall present the Engineer with such warranties and guarantees at the time of final acceptance of the work. The Owner reserves the right to use equipment installed by the Contractor prior to date of final acceptance. Such use of equipment shall not invalidate the guarantee except that the Owner shall be liable for any damage to equipment during this period, due to negligence of his operator or other employees. Refer to other sections for any special or extra warranty requirements.

B. It is further clarified that all required and specified warranties shall begin on the date of Substantial Completion, not at the time of equipment start-up.

12. CHANGES IN MECHANICAL WORK

REFER TO GENERAL AND SPECIAL CONDITIONS.

13. CLAIMS FOR EXTRA COST

REFER TO GENERAL AND SPECIAL CONDITIONS.

14. SURVEY, MEASUREMENTS AND GRADE

A. The Contractor shall lay out his work and be responsible for all necessary lines, levels, elevations and measurements. He must verify the figures shown on the drawings before laying out the work and will be held responsible for any error resulting from his failure to do so.

B. The Contractor shall base all measurements, both horizontal and vertical from established bench marks. All work shall agree with these established lines and levels. Verify all measurements at the site and check the correctness of same as related to the work.

C. Should the Contractor discover any discrepancy between actual measurements and those indicated, which prevents following good practice or the intent of the contract documents, he shall promptly notify the Engineer and shall not proceed with this work until he has received instructions from the Engineer on the disposition of the work.

15. TEMPORARY SERVICES

A. The Contractor shall arrange any temporary water, electrical and other services which he may require to accomplish his work. Refer also to General and Special Conditions.

16. RECORD DRAWINGS

A. The Contractor shall ensure that any deviations from the Design are as they occur recorded on a set of documents kept either electronically or on the jobsite. Refer to Architectural and CM specifications for specific requirements for document management. The Engineer shall review the record documents from time to time to ensure compliance with this specification. Compliance shall be a contingency of final payment. Pay particular attention to the location of under floor sanitary and water lines, shut-off valves, cleanouts and other appurtenances important to the maintenance and operation of Mechanical Systems. Also, pay particular attention to Deviations in the Control Systems and all exterior utilities. Keep information in a set of drawings set aside at the job site especially for this purpose. Deliver these record drawings electronically in AutoCAD 2007 format along with the hand marked field set to the Engineer. Electronic bid drawings will be furnished to the Contractor for his use.

17. MATERIALS AND WORKMANSHIP

A. All equipment, materials and articles incorporated in the work shall be new and of comparable quality to that specified. Each Proposer shall determine that the materials and/or equipment he proposes to furnish can be brought into the building(s) and installed within the space available. In certain cases, it may be necessary to remove and replace walls, floors and/or ceilings and this work shall be the responsibility of the Contractor. All equipment shall be installed so that all parts are readily accessible for inspection, maintenance, replacement of filters, etc. Extra compensation will not be allowed for relocation of equipment for accessibility or for dismantling equipment to obtain entrance into the building(s). Ensure, through coordination, that no other Contractor seals off access to space required for equipment, materials, etc.

B. Materials and equipment, where applicable, shall bear Underwriters' Laboratories label where such a standard has been established.

C. Use extreme care in the selection of equipment and its installation to ensure that noise and vibration are kept at a minimum. The Engineer's determination shall be final and corrections to such discrepancies shall be made at the cost of the Contractor.

D. Each length of pipe, fitting, trap, fixture and device used in the plumbing or drainage systems shall be stamped or indelibly marked with the weight or quality thereof and with the manufacturer's mark or name.

E. All equipment shall bear the manufacturer's name and address. All electrically operated equipment shall bear a data plate indicating required horsepower, voltage, phase and ampacity.

18. COOPERATION AND COORDINATION WITH OTHER TRADES

A. The Contractor shall give full cooperation to all other trades and shall furnish in writing with copies to the Engineer, any information necessary to permit the work of other trades to be installed satisfactorily and with the least possible interference or delay.

B. Where any work is to be installed in close proximity to, or will interfere with work of other trades, each shall cooperate in working out space conditions to make a satisfactory adjustment. If so directed by the Engineer, the Contractor shall prepare composite working drawings and sections at a suitable scale not less than 1/4” = 1'-0”, clearly indicating how his work is to be installed in relation to the work of other trades, or so as not to cause any interference with work of other trades. He shall make the necessary changes in his work to correct the condition without extra charge.

C. The Contractor shall furnish to other trades, as required, all necessary templates, patterns, setting plans, and shop details for the proper installation of work and for the purpose of coordinating adjacent work.

19. QUALIFICATIONS OF WORKMEN

A. All mechanical work shall be accomplished by qualified workmen competent in the area of work for which they are responsible. Untrained and incompetent workmen, as evidenced by their workmanship, shall be summarily relieved of their responsibilities in areas of incompetency. The Engineer shall reserve the right to determine the quality of workmanship of any workman and unqualified or incompetent workman shall refrain from work in areas not satisfactory to him. Requests for relief of a workman shall be made through the normal channels of Architect, Contractor, etc.

B. All plumbing work shall be accomplished by Journeymen Plumbers under the direct supervision of a Master Plumber as defined and clarified under Kentucky State Plumbing Law Regulations and Code. Proof and Certification may be requested by the Engineer.

C. All sheet metal, insulation and pipe fitting work shall be installed by workmen normally engaged or employed in these respective trades, except where only small amounts of such work are required and are within the competency of workmen directly employed by the Contractor involved.

D. All automatic control systems shall be installed by workmen normally engaged or employed in this type work, except in the case of minor control requirements (residential type furnaces, packaged HVAC equipment with integral controls, etc.) in which case, if a competent workman is the employee of this Contractor, he may be utilized subject to review of his qualifications by the Engineer and after written approval from same.

E. All electrical work shall be installed only by competent workmen under direct supervision of a fully qualified Electrician.

20. CONDUCT OF WORKMEN

A. The Contractor shall be responsible for the conduct of all workmen under his supervision. Misconduct on the part of any workman to the extent of creating a safety hazard, or endangering the lives and property of others, shall result in the prompt relief of that workman. The consumption of alcoholic beverages or other intoxicants, narcotics, barbiturates, hallucinogens or debilitating drugs on the job site is strictly forbidden.

21. PROTECTION OF MATERIALS AND EQUIPMENT

A. The Contractor shall be entirely responsible for all material and equipment furnished by him in connection with his work and special care shall be taken to properly protect all parts thereof from physical, sun, and weather damage during the construction period. Such protection shall be by a means acceptable to the manufacturer and Engineer. All rough-in soil, waste, vent and storm piping, ductwork, etc., shall be properly plugged or capped during construction in a manner approved by the Engineer. Equipment damaged, stolen or vandalized while stored on site, either before or after installation, shall be repaired or replaced by the Contractor at his own expense.

22. SCAFFOLDING, RIGGING AND HOISTING

A. The Contractor shall furnish all scaffolding, rigging, hoisting and services necessary for erection and delivery onto the premises of any equipment and apparatus furnished. All such temporary appurtenances shall be set up in strict accord with OSHA Standards and Requirements. Remove same from premises when no longer required.

23. BROKEN LINES AND PROTECTION AGAINST FREEZING

A. No conduits, piping, troughs, etc. carrying water or any other fluid subject to freezing shall be installed in any part of the building where danger of freezing may exist without adequate protection being given by the Contractor whether or not insulation is specified or indicated on the particular piping. All damages resulting from broken and/or leaking lines shall be replaced or repaired at the Contractor's own expense. If in doubt, contact the Engineer. Do not install piping across or near openings to the outside whether they are carrying static or moving fluids or not. Special Note: Insulation on piping does not necessarily ensure that freezing will not occur.

24. CLEANING

A. The Contractor shall, at all times, keep the area of his work presentable to the public and clean of rubbish and debris caused by his operations; and at the completion of the work, shall remove all rubbish, debris, all of his tools, equipment, temporary work and surplus materials from and about the premises, and shall leave the area clean and ready for use. If the Contractor does not attend to such cleaning upon request, the Engineer may cause cleaning to be done by others and charge the cost of same to the Contractor. The Contractor shall be responsible for all damage from fire which originates in, or is propagated by, accumulations of his rubbish or debris.

B. After completion of all work and before final acceptance of the work, the Contractor shall thoroughly clean all equipment and materials and shall remove all foreign matter such as grease, dirt, plaster, labels, stickers, etc., from the exterior of piping, equipment, fixtures and all other associated or adjacent fabrication.

25. CONCRETE WORK

A. The Contractor shall be finally responsible for the provisions of all concrete work required for the installation of any of his systems or equipment. He may, at his option, arrange with the others to provide the work. This option, however, will not relieve the Contractor of his responsibilities relative to dimensions, quality of workmanship, locations, etc. In the absence of other concrete specifications, all concrete related to Mechanical work shall be 3000 psi minimum compression strength at 28 days curing and shall conform to the standards of the American Concrete Institute Publication AC1-318. Heavy equipment shall not be set on pads for at least seven (7) days after pour. Insert 6-inch steel dowel rods into floors to anchor pads.

B. All mechanical equipment (tanks, heaters, chillers, boilers, pumps, air handling units, etc.) shall be set on a minimum of 4” tall concrete pads. Pads shall be taller where required for condensate traps. All concrete pads shall be complete with all pipe sleeves, anchor bolts, reinforcing steel, concrete, etc. as required. Pads larger than 18” in width shall be reinforced with ½” round bars on 6” centers both ways. Bars shall be approximately 3” above the bottom of the pad. All parts of pads and foundations shall be properly rodded or vibrated. If exposed parts of the pads and foundations are rough or show honeycomb after removing forms, all surfaces shall be rubbed to a smooth surface. Chamfer all square edges one-half inch.

C. In general, concrete pads for equipment shall extend four (4) inches beyond the equipment's base dimensions. Where necessary, extend pads 30 inches beyond base or overall dimensions to allow walking and servicing space.

D. Exterior concrete pads shall be four (4) inches minimum above grade and four (4) inches below grade on a tamped four (4) inch dense grade rock base unless otherwise indicated or specified. Surfaces of all foundations and bases shall have a smooth finish with one-half (1/2) inch chamfer on exposed edges.

E. All exterior below grade concrete structures (utility vaults, grease traps, manholes, etc.) shall be provided with exterior waterproofing. Waterproofing shall be hot-fluid applied rubberized-asphalt waterproofing membrane with elastomeric sheets at edges, corners, and terminations of membrane for continuous watertight construction. Apply in layers and reinforce as required to provide uniform seamless membrane minimum 4mm thickness. Also, seal penetrations into and out of the structure watertight. Provide Link-Seal modular seal or equal.

26. NOISE, VIBRATION OR OSCILLATION

A. All work shall operate under all conditions of load without any sound or vibration which is objectionable in the opinion of the Engineer. In case of moving machinery, sound or vibration noticeable outside of room in which it is installed, or annoyingly noticeable inside its own room, will be considered objectionable. Sound or vibration conditions considered objectionable by the Engineer shall be corrected in an approved manner by the Contractor at his expense.

B. All equipment subject to vibration and/or oscillation shall be mounted on vibration supports whether indicated or not suitable for the purpose of minimizing noise and vibration transmission, and shall be isolated from external connections such as piping, ducts, etc. by means of flexible connectors, vibration absorbers, or other approved means. Unitary equipment, such as small room heating units, small exhaust fans, etc., shall be rigidly braced and mounted to wall, floor or ceiling as required and tightly gasketed and sealed to mounting surface to prevent air leakage and to obtain quiet operation. Flush and surface mounted equipment such as diffusers, grilles, etc., shall be gasketed and affixed tightly to their mounting surface.

C. The Contractor shall provide supports for all equipment furnished by him. Supports shall be liberally sized and adequate to carry the load of the equipment and the loads of attached equipment, piping, etc. All equipment shall be securely fastened to the structure either directly or indirectly through supporting members by means of bolts or equally effective means. If strength of supporting structural members is questionable, contact Engineers.

27. ACCESSIBILITY

A. The Contractor shall be responsible for the sufficiency of the size of shafts and chases, the adequate clearance in double partitions and hung ceilings for the proper installation of his work. He shall cooperate with all others whose work is in the same space. Such spaces and clearances shall, however, be kept to the minimum size required.

B. The Contractor shall locate and install all equipment so that it may be serviced, and maintained as recommended by the manufacturer. Allow ready access and removal of the entire unit and/or parts such as valves, filters, fan belts, motors, prime shafts, etc.

C. The Contractor shall provide access panels for each concealed valve, control damper or other device requiring service as shown on engineer's plans or as required. Locations of these panels shall be identified in sufficient time to be installed in the normal course of work.

28. RESTORATION OF NEW OR EXISTING SHRUBS, PAVING, SURFACES, ETC.

A. The Contractor shall at his expense restore to their original conditions all paving, curbing, surfaces, drainage ditches, structures, fences, shrubs, existing or new building surfaces and appurtenances, and any other items damaged or removed by his operations. Replacement and repairs shall be in accordance with good construction practice and shall match materials employed in the original construction of the item and shall be to the satisfaction of the Architect and/or Engineer.

29. MAINTENANCE OF EXISTING UTILITIES AND LINES

A. The locations of all piping, conduits, cables, utilities and manholes existing, or otherwise, that comes within the contract construction site, shall be subject to continuous uninterrupted service with no other exception than the Owner of the utilities permission to interrupt same temporarily.

B. Utilities and lines, where known, are indicated on the drawings. Locations and sizes are approximate. Prior to any excavation being performed, the Contractor shall ascertain that no utilities or lines are endangered by new excavation. Exercise extreme caution in all excavation work.

C. If utilities or lines occur in the earth within the construction site, the Contractor shall probe and locate the lines prior to machine excavation or blasting in the respective area. Electromagnetic utility locators and acoustic pipe locators shall be utilized to determine where metallic and non-metallic piping is buried prior to any excavation.

D. Cutting into existing utilities and services where required shall be done in coordination with and only at times designated by the Owner of the utility.

E. The Contractor shall repair to the satisfaction of the Engineer, any surfaces or subsurface improvements damaged during the course of the work, unless such improvement is shown to be abandoned or removed.

F. Machine excavation shall not be permitted with ten feet of electrical lines or lines carrying combustible and/or explosive materials. Hand excavate only.

G. Protect all new or existing lines from damage by traffic, etc. during construction. Repairs or replacement of such damage shall be at the sole expense of the party responsible.

30. SMOKE AND FIRE PROOFING

A. The Contractor shall fire and smoke stop all openings made in fire or smoke rated walls, chases, ceilings and floors in accord with the KBC. Patch all openings around ductwork and piping with appropriate type material to stop smoke at smoke walls and provide commensurate fire rating at fire walls, floors, ceilings, roofs, etc. Back boxes in rated walls shall be a minimum distance apart as allowed by code to maintain the rating. If closer provide rated box or fireproofing in code approved manner.

31. MOTORS

A. Motors shall be built in accordance with the latest standards of NEMA and as specified. Motors shall be tested in accordance with standards of A.S.A. C50, conforming to this and all applicable standards for insulation resistance and dielectric strength.

B. Each motor shall be provided by the equipment supplier, installer or manufacturer with conduit terminal box, and N.E.C. required disconnecting means as specified or required. Three-phase motors shall be provided with external thermal overload protection in their starter units. Single-phase motors shall be provided with thermal overload protection, integral to their windings or external, in control unit. All motors shall be installed with NEMA-rated starters as specified and shall be connected per the National Electrical Code.

C. The capacity of each motor shall be sufficient to operate associated driven devices under all conditions of operation and load and without overload, and at least of the horsepower indicated or specified. Each motor shall be selected for quiet operation, maximum efficiency and lowest starting KVA per horsepower. Motors producing excessive noise or vibration shall be replaced by the responsible contractor. See Division 26 of Specifications for further requirements related to installation of motors.

32. CUTTING AND PATCHING

A. The Contractor shall provide his own cutting and patching necessary to install his work. Patching shall match adjacent surfaces and shall be to the satisfaction of the Architect and Engineer.

B. No structural members shall be cut without the approval of the Engineer and all such cutting shall be done in a manner directed by him.

C. When installing conduit, pipe, or any other work in insulated concrete form (ICF) walls, the responsible subcontractor for the work shall provide spray foam insulation to patch the rigid insulation to maintain full integrity of the insulating value of the wall after the mechanical and electrical work is complete. Furthermore, all new work shall NOT be installed in concrete center of wall. All mechanical and electrical installations shall be on the interior side of the concrete.

33. CURBS, PLATES, ESCUTCHEONS & AIR TIGHT PENETRATIONS

A. Seal all duct, pipe, conduit, etc., penetrations through walls and floors air tight. If wall or floor assembly is rated then use similarly rated sealing method. For below grade walls, seal watertight.

34. WEATHERPROOFING

A. Where any work pierces waterproofing including waterproof concrete, the method of installation shall be as approved by the Engineer before work is done. The Contractor shall furnish all necessary sleeves, caulking and flashing required to make openings permanently watertight.

35. OPERATING INSTRUCTIONS, MAINTENANCE MANUALS AND PARTS LISTS

A. Upon completion of all work tests, the Contractor shall instruct the Owner or his representative(s) fully in the operations, adjustment and maintenance of all equipment furnished. The time and a list of representatives required to be present will be as directed by the Engineer. Turn over all special wrenches, keys, etc., to the owner at this time.

B. The Contractor shall furnish an electronic set to the Engineer of typewritten and/or blueprinted instructions for operating and maintaining all systems and equipment included in this contract prior to substantial completion. All instructions shall be submitted in draft, for approval, prior to final issue. Manufacturer's advertising literature or catalogs alone will not be acceptable for operating and maintenance instructions.

C. The Contractor, in the instructions, shall include a preventive maintenance schedule for the principal items of equipment furnished under this contract and a detailed, parts list and the name and address of the nearest source of supply.

D. Per University standards, provide as part of the IOM, an equipment schedule list. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules), plus the specification section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

E. Per University standards, provide as part of IOM, a detailed valve schedule list. Refer to valve identification specification for details.

F. Per University standards, IOM information shall include a complete copy of the reviewed TAB report.

36. PAINTING

A. In general, all finish painting shall be accomplished under the Painting Section of the specifications by the Contractor; however, unless otherwise specified under other sections of these specifications, the following items shall be painted:

(1) All exposed piping, valve bodies and fittings (bare and insulated), including hangers, platforms, etc.

(2) All mechanical equipment not factory finished. Aluminum and stainless-steel equipment, motors, identification plates, tags, etc. shall not be painted. All rust and foreign matter shall be thoroughly removed from surfaces prior to painting. All baked enamel factory finish of equipment which may have been scratched or chipped shall be touched up with the proper paint as recommended and supplied by the manufacturer.

(3) All insulated piping, ductwork and equipment shall be properly prepared for painting by the Contractor where mechanical items are to be painted. In the case of externally insulated duct and pipe, the Contractor shall provide 6 oz. canvas jacket with fire retardant lagging. The jacket shall be allowed to dry properly before applying paint to avoid shrinking after painting and exposing unpainted surfaces. The Contractor, at his option, may provide double wall ductwork in lieu of externally insulated ductwork with canvas jacket and lagging.

37. ELECTRICAL CONNECTIONS

A. The Contractor shall furnish and install all (1) temperature control wiring; (2) equipment control wiring and (3) interlock wiring. The Contractor shall furnish and install all power wiring complete from power source to motor or equipment junction box, including power wiring thru starters, and shall furnish and install all required starters not factory mounted on equipment.

B. The Contractor shall, regardless of voltage, furnish and install all temperature control wiring and all associated interlock wiring, all equipment control wiring and conduit for the equipment that the Contractor furnishes. He may, at his option, employ at his own expense, the Electrical Contractor to accomplish this work.

C. After all circuits are energized and completed, the Contractor shall be responsible for all power wiring, and all control wiring shall be the responsibility of the Contractor. Motors and equipment shall be provided for current characteristics as shown on the drawings.

D. The Contractor shall furnish motor starters of the type and size required by the manufacturer for all equipment provided by him, where such starters are necessary. Starters shall have overloads for each phase.

38. FINAL CONNECTIONS TO EQUIPMENT

A. The Contractor shall finally connect to mechanical services, any terminal equipment, appliances, etc., provided under this and other divisions of the work. Such connections shall be made in strict accord with current codes, safety regulations and the equipment manufacturer's recommendations. If in doubt, contact the Engineers prior to installation.

39. REQUIRED CLEARANCE FOR ELECTRICAL EQUIPMENT

A. The NEC has specific required clearances above, in front, and around electrical gear, panels etc. The Contractor shall not install any piping, ductwork, etc., in the required clearance. If any appurtenance is located in the NEC required clearance, it shall be relocated at no additional cost.

40. INDEMNIFICATION

A. The Contractor shall hold harmless and indemnify the Engineer, employees, officers, agents and consultants from all claims, loss, damage, actions, causes of actions, expense and/or liability resulting from, brought for, or on account of any personal injury or property damage received or sustained by any person, persons, (including third parties), or any property growing out of, occurring, or attributable to any work performed under or related to this contract, resulting in whole or in part from the negligence of the Contractor, any subcontractor, any employee, agent or representative.

41. HAZARDOUS MATERIALS

A. The Contractor is hereby advised that it is possible that asbestos and/or other hazardous materials are or were present in this building(s). Any worker, occupant, visitor, inspector, etc., who encounters any material of whose content they are not certain shall promptly report the existence and location of that material to the Contractor and/or Owner. The Contractor shall, as a part of his work, ensure that his workers are aware of this potential and what they are to do in the event of suspicion. He shall also keep uninformed persons from the premises during construction. Furthermore, the Contractor shall ensure that no one comes near to or in contact with any such material or fumes therefrom until its content can be ascertained to be non-hazardous.

B. CMTA, Inc., Consulting Engineers, have no expertise in the determination of the presence of hazardous materials. Therefore, no attempt has been made by them to identify the existence or location of any such material. Furthermore, CMTA nor any affiliate thereof will neither offer nor make any recommendations relative to the removal, handling or disposal of such material.

C. If the work interfaces, connects or relates in any way with or to existing components which contain or bear any hazardous material, asbestos being one, then, it shall be the Contractor's sole responsibility to contact the Owner and so advise him immediately.

D. The Contractor by execution of the contract for any work and/or by the accomplishment of any work thereby agrees to bring no claim relative to hazardous materials for negligence, breach of contract, indemnity, or any other such item against CMTA, its principals, employees, agents or consultants. Also, the Contractor further agrees to defend, indemnify and hold CMTA, its principals, employees, agents and consultants, harmless from any such related claims which may be brought by any subcontractors, suppliers or any other third parties.

42. BELOW GRADE AND FINAL PUNCH LISTS

A. The Contractor shall review each area and prepare a punch list for each of the subcontractors, as applicable, for at least two stages of the project:

(1) For review of below grade work that will be concealed backfill or other materials well before substantial completion.
(2) For review of all other work as the project nears substantial completion.

B. When all work from the Contractor's punch list is complete at each of these stages and prior to completing ceiling installations (or at the final punch list stage), the Contractor shall request that the Engineer develop a punch list. This request is to be made in writing seven days prior to the proposed date. After all corrections have been made from the Engineer's punch list, the Contractor shall review and initial off on each item. This signed-off punch list shall be submitted to the Engineer. The Engineer shall return to the site once to review each punch list and all work prior to the ceilings being installed and at the final punch list review.

Phone: 859 253-0892 Fax: 859 231-8357

The following is CMTA's guide for Division 20-25 required information relative to the Schedule of Values. Please utilize all items that pertain to this project and add any specialized system as required. A thorough and detailed schedule of values will allow for fair and equitable Pay Application approval and minimize any discrepancies as to the status of the job.

DIVISION 20-25 – MECHANICAL **Field Representative:** _____
Project Engineer: _____

Description of Work	Scheduled Value	Labor	Material
Shop Drawings			
Mobilization/Permits			
Demolition			
Steam Piping			
Site Sanitary			
Boiler Inspection			
Factory Start-Up Reports			
Owner Training			
Record Drawings			
O & M Manuals			
Punchlist/Closeout			
Controls Check-out			
Plumbing Shop Drawings			
Mechanical Shop Drawings			

END OF SECTION 20 0100

SECTION 20 0200 - SCOPE OF THE MECHANICAL WORK

1. GENERAL

A. The Mechanical work for this Contract shall include all labor, materials, equipment, fixtures, excavation, backfill and related items required to completely install, test, place in service and deliver to the Owner the complete mechanical systems in accordance with the accompanying plans and all provisions of these specifications. This work shall primarily include, but is not necessarily limited to the following:

(1) Complete steam system modifications.

(2) All insulation associated with mechanical systems.

(3) Complete natural gas piping systems.

(4) All required demolition of the Kelly Building and Annex 5. All utilities and mechanical and plumbing systems within the building shall be completely removed from the site. Each utility shall be decommissioned and shut off in accordance with the requirements of the Utility and University. Unless noted otherwise, utility lines shall be capped at the service mains and not abandoned.

(5) All applicable services and work specified in Section 200100; General Provisions - Mechanical.

(6) All specified or required control work.

(7) Provide all required motor starters, etc. not provided under the electrical sections.

(8) One year guarantee of all mechanical equipment, materials and workmanship.

(9) Thorough instruction of the owner’s maintenance personnel in the operation and maintenance of all mechanical equipment.

(10) Thorough coordination of the installation of all piping, equipment and any other material with other trades to ensure that no conflict in installation.

(11) Approved supervision of the mechanical work.

(12) Excavation, backfilling, cutting, patching, sleeving, concrete work, etc., required to construct the mechanical systems.

(13) Prior to submitting a bid, the Contractor shall contact all serving utility companies to determine exactly what each utility company will provide and exactly what is required of the Contractor and shall include such requirements in his base bid.

(14) Procurement of all required permits and inspections, including fees for all permits and inspection services and submission of final certificates of inspection to the Engineers (Plumbing, Boiler, HVAC, etc.).

(15) All necessary coordination with gas, water, and sewer utility companies, etc., to ensure that work, connections, etc., that they are to provide is accomplished.

END OF SECTION 20 0200

SECTION 20 0300 - SHOP DRAWINGS, DESCRIPTIVE LITERATURE, MAINTENANCE MANUALS, PARTS LISTS, SPECIAL KEYS & TOOLS

1. GENERAL

A. The Contractor's attention is directed also to the General and Special Conditions and Section 200100 - General Provisions - Mechanical as well as to all other Contract Documents as they may apply to his work.

B. The Contractor shall prepare and submit to the Engineer, through the General Contractor and the Architect (where applicable) within thirty (30) days after the date of the Contract, all shop drawings, certified equipment drawings, installation, operating and maintenance instructions, samples, wiring diagrams, etc. on all items of equipment specified hereinafter through Ecomm. In addition to the electronic submittal, hard copies of the Fire Protection drawings shall be submitted.

C. Submittal data shall include specification data including metal gauges, finishes, accessories, etc. Also, the submittal data shall include certified performance data, wiring diagrams, dimensional data, and a spare parts list. Submittal data shall be reviewed by the Engineer before any equipment or materials is ordered or any work is begun in the area requiring the equipment.

D. All submittal data shall have the stamp of approval of the Contractor submitting the data as well as the General Contractor and the Architect (if applicable) to show that the drawings have been reviewed by the Contractor. Any drawings submitted without these stamps of approval may not be considered and will be returned for proper resubmission.

E. It shall be noted that review of shop drawings by the Engineer applies only to conformance with the design concept of the project and general compliance with the information given in the contract documents. In all cases, the Contractor alone shall be responsible for furnishing the proper quantity of equipment and/or materials required, for seeing that all equipment fits the available space in a satisfactory manner and that piping, electrical and all other connections are suitably located.

F. The Engineers review of shop drawings, schedules or other required submittal data shall not relieve the Contractor from responsibility for: adaptability of the item to the project; compliance with applicable codes, rules, regulations and information that pertains to fabrication and installation; dimensions and quantities; electrical characteristics; and coordination of the work with all other trades involved in this project. Any items that differ from the Drawings or Specifications shall be flagged by the Contractor so the Engineer will be sure to see the item. Do not rely on the Engineer to “catch” items that do not comply with the Drawings or Specifications. The Contractor is responsible for meeting the Drawings and Specification requirements, regardless of whether or not something does not get caught by the Contractor or Engineer during shop drawing reviews.

G. Equipment shall not be ordered and no final rough-in connections, etc., shall be accomplished until reviewed equipment shop drawings are in the hands of the Contractor. It shall be the Contractor's responsibility to obtain reviewed shop drawings and to make all connections, etc. in the neatest and most workmanlike manner possible. The Contractor shall coordinate with all the other trades having any connections, roughing-in, etc. to the equipment.

H. If the Contractor fails to comply with the requirements set forth above, the Engineer shall have the option of selecting any or all items listed in the Specifications or on the drawings; and the Contractor shall be required to furnish all materials in accordance with this list.

I. Colors for equipment in other than mechanical spaces shall be selected from the Manufacturer's standard and factory optional colors. Color samples shall be furnished with the shop drawing submission for such equipment.

J. Shop Drawing Submittals

(1) All submittals for HVAC equipment shall include all information specified. This shall include air and water pressure drops, RPM, noise data, face velocities, horsepower, voltage motor type, steel or aluminum construction, and all accessories clearly marked.

(2) All items listed in the schedules shall be submitted for review in a tabular form similar to the equipment schedule.

(3) All items submitted shall be designated with the same identifying tag as specified on each sheet.

(4) Any submittals received in an unorganized manner without options listed and with incomplete data will be returned for resubmittal.

2. SHOP DRAWINGS

Shop Drawings, descriptive literature, technical data and required schedules shall be submitted on the following:

Steam Piping
Pipe Insulation
Valves
Hydronic Specialties

SPECIAL NOTES:

1) Upon substantial completion of the project, the Contractor shall deliver to the Engineers (in addition to the required Shop Drawings) three (3) complete copies of operation and maintenance instructions and parts lists for each item marked (1) above. These documents shall include at least:

a. Detailed operating instructions
b. Detailed maintenance instructions including preventive maintenance schedules.
c. Addresses and phone numbers indicating where parts may be purchased.

2) Shop drawings for the Control Systems shall include detailed, scaled plans and schematic diagrams indicating the function and operation of the system.

3) Shop drawings for the Building Fire Protection System shall be prepared and stamped by a Certified Contractor and shall meet the criteria of the Department of Housing, Buildings and Construction and submitted to the Engineer. After the Engineer's review, they shall be submitted by the Contractor to the proper state authorities along with the required State review fee.

4) The Contractor shall submit to the Boiler Inspector's Office the required documentation and review fees for a boiler permit. The boiler permit shall be submitted to the Engineer along with the Boiler Shop Drawings.

3. SPECIAL WRENCHES, TOOLS, ETC.

(1) The Contractor shall furnish, along with equipment provided, any special wrenches or tools necessary to dismantle or service equipment or appliances installed under the Contract. Wrenches shall include necessary keys, handles and operators for valves, cocks, hydrants, etc. A reasonable number of each shall be furnished.

END OF SECTION 20 0300

SECTION 20 0400 - DEMOLITION AND SALVAGE

1. GENERAL

A. The Contractor's attention is directed to the General and Special Conditions, General Conditions-Mechanical and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to all other sections of the Contract Documents which affect the work of this section and which are hereby made a part of the work specified in this section.

2. DEMOLITION

A. INTENT

It is the intent of this section to completely remove all components of any existing mechanical system no longer in use. All systems that serve the Annex Building or Kelly Building shall be demolished and the site utilities shall be demolished back to the main as shown on the site plans.

B. PLUMBING

(1) All existing piping not to be reused, shall be demolished.

(2) Unless otherwise indicated, the Contractor shall be responsible for patching and repairing all holes, etc. in the ceilings, walls, and floors where plumbing piping is removed.

(3) All lines abandoned in place shall be made safe in compliance with the Kentucky Plumbing Code.

C. HVAC

(1) Remove from the project area all piping not to be reused and hangers, specialties, etc. that are accessible or that become accessible during construction and/or interfere in any way with any part of the construction or would be exposed in the completed building.

(2) Remove all temperature controls and related items that are accessible or become accessible during construction. Refer to Salvage spec below and coordinate with UK UEM group on any required control equipment salvage.

(3) Remove all existing heating and ventilating equipment not indicated to be reused from the building.

(4) The Contractor shall be responsible for the removal and/or relocation of any HVAC piping, equipment, fittings, valves, etc. which may, in the course of construction, interfere with the installation of any new and/or relocated Architectural, Structural, Mechanical or Electrical Systems at no increase in the contract price.

(5) Unless otherwise indicated, the Contractor shall be responsible for the patching and repairing of all holes, etc. in the ceiling, wall and floors where HVAC equipment is removed.

(6) Unless otherwise noted, when removing equipment sitting on a concrete pad, also remove the concrete pad and patch and repair floor to match adjacent surfaces.

D. REFRIGERANT RECOVERY

(1) The Contractor shall have a licensed refrigerant recovery technician evacuate all refrigerants from all refrigeration equipment being removed in accordance with EPA guidelines and regulations. The Contractor shall take all necessary precautions to not accidentally vent refrigerants to the atmosphere. The recovered refrigerant shall be offered to the Owner. If the Owner refuses it then it becomes the property of the Contractor.

E. THERMOSTAT, THERMOMETER, AND MERCURY BEARING DEVICE DISPOSAL

(1) The Contractor shall dispose of all mercury bearing materials in accordance with state and federal guidelines. The Contractor shall take all necessary precautions to not accidentally allow mercury to be released from the device during demolition.

3. SALVAGE

A. It is the intent of this section to deliver to the owner all components of any mechanical system which may be economically reused by him. The Contractor shall make every effort to remove reusable components without damage and deliver them to a location designated by the Owner.

B. Components to be delivered to the owner shall be specifically identified by the owner's representative prior to beginning the demolition. These components shall include, but are not limited to the following:

(1) All DDC controllers.

C. Other items become the property of the Contractor and are to be removed from the site.

END OF SECTION 20 0400

SECTION 20 1100 - SLEEVING, CUTTING, PATCHING AND REPAIRING

1. GENERAL

   A. The Contractor's attention is directed to the General and Special Conditions, General Conditions-Mechanical and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to all other sections of the Contract Documents which affect the work of this section and which are hereby made a part of the work specified in this section.

   B. The Contractor shall be responsible for all openings, sleeves, trenches, etc., that he may require in floors, roofs, ceilings, walls, etc., and shall coordinate all such work with the General Contractor and all other trades. Coordinate with the General Contractor, any openings which he is to provide before submitting a bid proposal in order to avoid conflict and disagreement during construction. Improperly located openings shall be reworked at the expense of the Contractor.

   C. The Contractor shall plan his work ahead and shall place sleeves, frames or forms through all walls, floors and ceilings during the initial construction, where it is necessary for piping, ductwork, conduit, etc., to go through; however, when this is not done, the Contractor shall do all cutting and patching required for the installation of his work, or he shall pay other trades for doing this work when so directed by the Engineer. Any damage caused to the buildings by the workmen of the responsible Contractor must be corrected or rectified by him at is own expense.

   D. The Contractor shall notify other trades in due time where he will require openings or chases in new concrete or masonry. He shall set all concrete inserts and sleeves for his work. Failing to do this, he shall cut openings for his work and patch same as required at his own expense.

   E. The Contractor shall be responsible for properly shoring, bracing, supporting, etc., any existing and/or new construction to guard against cracking, settling, collapsing, displacing or weakening while openings are being made. This includes supporting any utilities during excavation as necessary to prevent movement of the existing utility. Any damage occurring to the existing and/or new structures, due to failure to exercise proper precautions or due to action of the elements shall be promptly and properly made good to the satisfaction of the Engineer.

   F. All work improperly done or not done at all as required by the Mechanical Trades in this section, will be performed by the Contractor at the direction of the trade whose work is affected.

2. SLEEVES, PLATES AND ESCUTCHEONS

   A. The Contractor shall provide and locate all sleeves and inserts required for his work before the floors and surface being penetrated are built, otherwise the Contractor shall core drill for pipes where sleeves and inserts were not installed, or where incorrectly located. Core drilling is the only acceptable alternative to sleeves. Do not chisel openings. Where sleeves are placed in exterior walls or in slabs on grade, the space between the pipe or conduit and the sleeves shall be made completely and permanently water tight.

   B. At all other locations either pipe sleeves or core drilled openings are acceptable.

   C. Where thermal expansion does not occur, the wall may be sealed tight to the pipe or insulation.

   D. Insulation, that requires a vapor barrier (i.e., cold water or refrigerant piping, etc.), must be continuous through the sleeve/cored hole. For other piping, insulation may stop on either side of the sleeve.

E. Sleeves shall be constructed of 24-gauge galvanized sheet steel with lock seam joints or Schedule 40 pipe. Sleeves in floors shall extend 1" above finished floor level.

F. Fasten sleeves securely in floors, walls, so that they will not become displaced when concrete is poured or when other construction is built around them. Take precautions to prevent concrete, plaster or other materials being forced into the space between pipe and sleeve during construction.

G. Escutcheon plates shall be provided for all pipes and conduit passing thru walls, floors and ceilings. Plates shall be nickel plated, of the split ring type, of size to match the pipe or conduit. Where plates are provided for pipes passing thru sleeves which extend above the floor surface, provide deep recessed plates to conceal the pipe sleeves.

3. CUTTING

A. All rectangular or special shaped openings in plaster, stucco or similar materials, including gypsum board, shall be framed by means of plaster frames, casing beads, wood or metal angle members as required. The intent of this requirement is to provide smooth even termination of wall, floor and ceiling finishes as well as to provide a fastening means for grilles, diffusers, lighting fixtures, etc.

B. Mechanical, plumbing, and fire protection contractors shall coordinate all openings in new and existing masonry walls with the General Contractor; and, unless otherwise indicated on the Architectural drawings, provide lintels for all openings required for the work (Louvers, wall boxes, exhaust fans, etc.). Lintels shall be sized as follows:

(1) New Openings under 48" in width: Provide one 3-1/2"x3-1/2"x3/8" steel angle for each 4" of masonry width. Lintel shall have 8" bearing on either side.

C. No cutting is to be done at points or in a manner that will weaken the structure and unnecessary cutting must be avoided. If in doubt, contact the Engineer.

D. Pipe openings in slabs and walls shall be cut with core drill. Hammer devices will not be permitted. Edges of trenches and large openings shall be scribe cut with a masonry saw.

E. Openings in metal wall panels shall be made in strict accord with building suppliers recommendations.

4. PATCHING AND REPAIRING

A. Patching and repairing made necessary by work performed under this division shall be included as a part of the work and shall be done by skilled mechanics of the trade or trades for work cut or damaged, in strict accordance with the provisions herein before specified for work of like type to match adjacent surfaces and in a manner acceptable to the Engineer.

B. Where portions of existing lawns, shrubs, paving, etc. are disturbed for installation of work of this Division, such items shall be repaired and/or replaced to the satisfaction of the Engineer.

C. Piping passing through floors, ceilings and walls in finished areas, unless otherwise specified, shall be fitted with chrome plated brass escutcheons of sufficient outside diameter to amply cover the sleeved openings and an inside diameter to closely fit the pipe around which it is installed.

D. Where ducts, pipes, and conduits pass through interior or exterior walls, the wall openings shall be sealed air tight. This shall include sealing on both sides of the wall to ensure air does not enter or exit the wall cavity. This is especially critical on exterior walls where the wall cavity may be vented to the exterior.

END OF SECTION 20 1100

SECTION 20 1200 - EXCAVATION, TRENCHING, BACKFILLING AND GRADING

1. GENERAL

   A. The Contractor's attention is directed to the General and Special Conditions, General Conditions-Mechanical and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to all other sections of the Contract Documents which affect the work of this section and which are hereby made a part of the work specified in this section.

   B. The Contractor shall include all excavating, filling, grading, and related items required to complete his work as shown on the drawings and specified herein or as required to complete, connect and place all mechanical systems in satisfactory operation.

   C. Unless otherwise shown or required, provide separate trenches for sewers, water lines and other underground raceways, with a minimum of 10 feet measured from outside diameter between pipes. In locations, such as close to buildings where separate trenches for sewers and water lines are impractical, lay the water pipe on a solid shelf at least 2'-0" above the top of the sewer and 2-0" to the side. Electric and fuel lines shall always be placed in a separate trench. All exterior lines shall have a minimum earth cover of thirty (30) inches to top of pipe, unless otherwise indicated.

   D. Water lines crossing under sewer lines, or crossing less than 2 feet above sewer lines, must be encased for a distance not less than 5 feet on either side of the point of crossover.

2. SUBSURFACE DATA

   A. Materials to be excavated shall be unclassified, and shall include earth, rock, or any other material encountered in the excavating to the depth and extent indicated on the drawings and specified herein. No adjustment in the Contract sum will be made on account of the presence or absence of rock, shale, or other materials encountered in the excavating. This paragraph is written to include the removal of all rock with no extras, whether rock is indicated or not.

3. BENCH MARKS AND MONUMENTS

   A. Maintain carefully all bench marks, monuments and other reference points. If disturbed or destroyed, replace as directed.

4. EXCAVATION

   A. Excavate trenches of sufficient width for proper installation of the work. When the depth of backfill over sewer pipe exceeds 10 feet, keep the trench at the level of the top of the pipe as narrow as practicable. Trench excavation for piping eight inches and smaller shall not exceed thirty-inch width for exterior lines and twenty-four-inch width for interior lines.

   B. Sheet and brace trenches as necessary to protect workmen and adjacent structures. Comply with local regulations or, in the absence thereof, with the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America, Inc., and current OSHA Standards. Do not remove sheeting until trench is backfilled sufficiently to protect pipe and prevent injurious caving. Where removal of sheeting and/or bracing is hazardous, leave in place. Cut off such sheeting not to be removed at least 3 feet below finished grade.

C. Rules and regulations governing the respective utilities shall be observed in executing all work under this heading. Active utilities discovered in the course of excavation shall be protected or relocated in accordance with written instructions from the Engineer. Inactive and abandoned utilities encountered in trenching operations shall be removed and abandoned with ends plugged or capped in accord with current codes and safe practice. If in doubt, contact Engineers. Machine excavation shall not be allowed within ten (10) feet of existing electric lines or lines carrying combustible materials. Use only hand tools.

D. The removal of rock shall be accomplished by use of hand or power tools only. Blasting shall not be permitted unless authorized in writing by the Engineer. Any damage to existing structures, exterior services, or rock intended for bearing, shall be corrected at the Contractor's expense.

E. Perform final grading of trench bottoms by hand tools; carry machine excavation only to such depth that soil bearing for pipes and raceways will not be disturbed. Grade the bottom of trenches evenly to ensure uniform bearing for all piping and raceways. Cut bell holes as necessary for joints and jointmaking. Except as hereinafter specified, bottom of trenches for bell and spigot pipe, flanged pipe, etc. shall be shaped to the lower quadrant of pipe with additional excavation for bell or flange. Piping installed where it rests on bell, or flange and/or is supported with blocks or wedges will not be accepted.

F. Keep trenches free from water while construction therein is in progress. Under no circumstances lay pipe or appurtenances in water. Pump or bail water from bell holes to permit proper jointing of pipe. Any water pumping from this Contractor's trenches which is required during construction, shall be included in this Contract.

G. In no case shall excavation work be accomplished that will damage in any way the new structure, existing structures, equipment, utility lines, large trees to remain, etc. The Contractors shall take the necessary steps to prevent flow of eroded earth by water or landslide onto the property of others, or against the structures. The repair of all such damage or any other damage incurred in the course of excavation shall be borne by the responsible Contractor.

H. Use surveyor's level to establish elevations and grades.

I. The Contractor shall accept the site as he finds it and remove all trash, rubbish and material from the site prior to starting excavation of his work.

J. The Contractor shall provide and maintain barricades and temporary bridges around excavations as required for safety. Temporary bridges shall be provided where excavations cross paved areas and walks. The Contractor shall maintain these bridges in a safe and passable condition for all traffic until removal. Refer to OSHA Standards for such installations and comply with same in all details.

K. Pay particular attention to existing utilities and lines to avoid damage. The locations of existing lines which are indicated on the plans were taken unconfirmed from drawings prepared for previous construction and locations are approximate only. Also, certain water, gas, electric, storm and sanitary sewer lines and other underground appurtenances, active or abandoned, may not appear on the drawings. It shall be each Mechanical Contractor's responsibility to ascertain the location of all lines and excavate with caution in their area.

5. BACKFILL AND SURFACE REPAIR

A. Backfilling for mechanical work shall include all trenches, manhole pits, storage tank pits, and/or any other earth and/or rock openings which are excavated under this Contract. Backfilling shall

be carefully performed and the surface restored to its original level to receive new finish. Wherever trenches and earth openings have not been properly filled and/or settlement occurs, they shall be re-excavated, re-filled and properly compacted, smoothed off and finally made to conform to the level of the original ground surface.

B. Unless otherwise indicated or specified, all piping shall be bedded on four (4) inches minimum of compacted naturally or artificially graded mixture of crushed gravel, crushed stone, or crushed sand with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve on undisturbed soil excavated as described hereinbefore. Install tracer wire above pipe. Cover the pipe with twelve (12) inches of compacted backfill to prevent settlement above and around the new pipe. The backfill shall be naturally or artificially graded mixture of crushed gravel, crushed stone, or crushed sand with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve. Prior to placing this second level of backfill, apply all required coatings and coverings to pipe, apply required tests and check the grading of the pipe to ensure that it is correct and that the pipe is free of swags, bows or bends. Also check lines for leaks at this point and repair as required. Once all of the preceding is accomplished, continue backfill with clean, debris and rock free earth tamped at six (6) inch intervals. Finish the backfill as specified following. Note: Water settling of backfill will be permitted only as an aid to mechanical compacting.

   (1) When installing any type of pipe below building footing, parallel or perpendicular to the footing, the area underneath the footing and in the zone of influence shall be backfilled with cementitious flowable fill. The zone of influence is the area within a 45-degree angle projecting down from the bottom edge of footers on all sides of the footing. Piping within flowable fill shall be isolated from the fill by a layer of heavy duty felt paper. Piping installed in trenches backfilled with flowable fill shall be anchored to the soil below prior to backfilling.

C. Backfill beneath areas to be seeded or sodded within six (6) inches of finished grade. The remaining six (6) inches shall be backfilled with clean top soil.

D. Backfill beneath paved areas, walks, etc. shall be brought to proper grade to receive the sub-base and paving. No paving shall be placed on uncompacted fill or unstable soil.

E. Backfill for natural gas lines shall be in strict accordance with the utility company or local municipalities requirements. If in doubt, contact the utility company or local municipality and/or the Engineer.

F. Backfill for underground tanks shall be in accord with the tank manufacturer’s recommendations. If in doubt, contact the Engineers.

G. Wherever, in the opinion of the Engineer, the soil at or below the requisite pipe grade is unsuitable for supporting piping, special support shall be provided as directed by the Engineer.

H. Unsuitable material and surplus excavated material not required for backfill shall be removed from the site. The location of dump and length of haul shall be the affected Contractor's responsibility.

I. Provide and place any additional fill material from off the site as may be required for backfill. Fill obtained from off site shall be of kind and quality as specified for backfill and the source approved by the Engineer and shall be brought to the site by the Contractor requiring the fill.

J. In the absence (if not specified or indicated elsewhere in the drawings or specifications to be done by others) of such work by others, the Contractor shall lay new sod over his excavation work. Level, compress and water in accord with sound sodding practice.

K. When running any type of piping below a footer or in the zone of influence the piping shall be backfilled with cementitious flowable fill. The zone of influence is the area under the footer within a 45-degree angle projecting down from the bottom edge of the footer on all sides of the footer. Additionally, grease traps, manholes, vaults, and other underground structures shall be held away from building walls far enough to be outside of the zone of influence.

L. Warning Tape and Tracer Wire

Per University standards, provide a bright-colored plastic tape in all trenches 6" above the buried utility that is appropriately marked to identify the utility about to be encountered. Tape to be continuous printed, intended for direct burial service, not less than 6” wide by 4 mils thick. Tape to be multi-ply consisting of solid aluminum foil core between 2-layres of plastic tape. For non-metallic pipe a #12 copper wire shall also be laid in the trench to aid in future location of the piping. A foil faced warning tape may be used in lieu of the plastic tape and wire. Per University

M. Utility Service Markers: Install per University standards to identify under-grade utilities.

(1) Markers shall consist of bronze plates, ground and polished, and marked to identify the service. Markers shall also be stamped with arrows indicating the direction the service extends.
(2) Markers locating services at the building shall be installed in masonry or concrete walls 2 ft above grade. Markers locating services elsewhere on the site shall be installed inj concrete walks or curbs, or in 6”x6” steel reinforced concrete posts. Refer to detail.

N. All manholes, vaults, and similar underground structures shall have the top elevation set flush with finished grade unless specifically noted otherwise.

6. MINIMUM DEPTHS OF BURY (TO TOP OF PIPE)

In the absence of other indication, the following shall be the minimum depth of bury of exterior utility lines. (Check drawings for variations).

A. Domestic Water Lines .....36 inches.

B. Fire Protection Lines .....42 inches.

C. Storm Lines .....20 inches.

D. Sanitary Lines (Exterior).....36 inches.

E. Natural Gas Lines .....36 inches.

F. Fuel Oil Lines .....36 inches.

G. Other lines carrying combustible and/or hazardous materials.....36 inches.

END OF SECTION 20 1200

SECTION 20 1300 - PIPE, PIPE FITTINGS AND PIPE SUPPORT

1. GENERAL

A. The Contractor's attention is directed to the General and Special Conditions, General Conditions-Mechanical and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to all other sections of the Contract Documents which affect the work of this section and which are hereby made a part of the work specified in this section.

B. When a pipe size is not indicated, the Contractor shall request the pipe size from the Engineers. All piping shall be installed straight and true, parallel or perpendicular to the building construction. Piping shall be installed so as to allow for expansion without damage to the building finishes, structure, pipe, equipment, etc., use offsets, U-bends or expansion joints as required. Where a section of piping is not indicated but is obviously required for completion of the system, the Contractor shall provide same at no additional cost to the project. No mitered joints or field fabricated pipe bends shall be accepted. Pipe shall clear all windows, doors, louvers and other building openings.

C. All pipe shall be supported in a neat and workmanlike manner and wherever possible, parallel runs of horizontal piping shall be grouped together on trapeze type hangers. Vertical risers shall be supported at each floor line with approved steel pipe riser clamps. The use of wire or perforated metal to support pipes will not be permitted. Hanging pipes from other pipes shall not be permitted. Spacing of pipe supports shall not exceed eight feet for pipes up to 1-1/4 inches and ten feet on all other piping. Small vertical pipes (1 inch and less) shall be bracketed to walls, structural members, etc. at four (4) foot intervals so as to prevent vibration or damage by occupants. Insulated piping shall be supported on a rigid insulation block at each hanger so as to prevent crushing of insulation by hangers. Hangers shall pass completely around the insulation jacket and a steel protective saddle shall be applied to prevent compression of the insulation. (Refer to Specifications Section entitled INSULATION-MECHANICAL).

D. Where piping rests directly on a hanger, clip, bracket or other means of support, the support element shall be of the same material as the pipe, (e.g., copper to copper, ferrous to ferrous, etc.) or shall be electrically isolated one from the other so as to prevent pipe damage by electrolysis. Pay particular attention and do not allow copper pipe to rest on ferrous structural members, equipment, etc. without electrolytic isolation.

E. In general, piping shall be installed concealed except in Mechanical, Janitor Rooms, etc. unless otherwise indicated, and shall be installed underground or beneath concrete slabs only where indicated. All lines at ceilings shall be held as high as possible and shall run so as to avoid conflicts with other trades, and to facilitate the Owner's use and maintenance. Location of pipe in interior partitions shall be carefully coordinated with whoever will construct the partitions after the piping is in place. Where exposed risers occur, they shall be kept as close to walls as possible.

F. Installation of pipe shall be in such a manner as to provide complete drainage of the system toward the source. Drain valves shall be provided at all drainage points on pipes. Drain valves shall be 1/2" size gate type with 3/4" hose thread end and vacuum breaker. Label each drain valve.

G. All hot and cold-water piping shall be kept a sufficient distance apart so as to prevent heat transfer between them. Cold water piping shall also be kept apart from refrigerant hot gas lines.

H. Piping carrying water or other fluids subject to freezing shall not be installed in locations subject to freezing; if in doubt, consult Engineer.

I. Piping for all drainage systems shall be installed to permit flow, trapping, and venting in accord with current codes and sound practice.

J. All cast iron soil pipe and fittings shall be coated inside and out with coal tar varnish.

K. Non-metallic piping shall be installed in strict accordance with the manufacturer's instructions. If no such instructions are available, consult Engineers.

L. Per University standards, no plastic pipe is to be used inside any building or structure unless explicitly approved within the project specification.

M. Nipples shall be of the same material, composition and weight classification as pipe with which installed.

N. Where piping is not indicated on the plans, but is obviously or apparently required, contact the Engineers prior to submission of a bid proposal.

O. Pay particular attention to conflict of piping with other work. Do not install until conflict is resolved. If necessary, contact Engineers.

P. Piping materials in each system shall, to the extent practicable, be of the same material. Frequent changes of material (for example, from copper to steel) shall be avoided and in no case, shall be accomplished without use of insulating unions and permission of the Engineers.

Q. Apply approved pipe dope (for service intended) to all male threaded joints. Pay particular attention to dope for fuel gas lines. The dope shall be listed for such use.

R. High points of closed loop hot water heating systems shall have manual or automatic air vents as indicated or required unless automatic air vents are specifically indicated. Pipe to suitable drainage point.

S. All piping shall be capped or plugged during erection as required to keep clean and debris and moisture free.

T. Provide expansion joints where shown on the plans and where required by good practice. Expansion joints shall be guided and anchored in accordance with the recommendations of the Expansion Joint Manufacturer's Association.

U. Where plastic pipe penetrates a fire rated assembly, it shall be replaced with a metal threaded adapter and a metal pipe per code.

V. Where piping penetrates interior or exterior walls, the wall shall be sealed air tight. Refer to the sleeving, cutting, patching and repairing section of the specifications for additional requirements.

W. Provide thrust blocks on all storm, sanitary, water, steam, hot, chilled, condenser, etc., and any other piping subject to hammering. Thrust blocks shall be provided at all turns.

X. Ends of piping shall be reamed and , where applicable, all threads shall be sharp and true.

Y. All piping shall be pressure tested prior to being placed into operation. The Contractor shall provide means to apply the pressure test and pieces and parts required to achieve and document

the system pressure. For pressurized piping systems, this pressure shall be 1.5 times the operating pressure unless otherwise noted.

2. UNIONS AND FLANGES AND WELDED TEES

A. Screwed unions, soldered unions or bolted flanges shall be provided as required to permit removal of equipment, valves and piping accessories from the piping system. Keep adequate clearances for coil removal, rodding, tube replacement, motor lubrication, filter replacement, etc. Flanged joints shall be assembled with appropriate flanges, gaskets and bolting. Gaskets for steam piping systems shall be flexitalic spiral wound type. The clearance between flange faces shall be such that the connections can be gasketed and bolted tight without imposing undue strain on the piping system.

B. Dielectric insulating unions or couplings shall be used wherever the adjoining materials being connected are of dissimilar metals such as connections between copper and steel pipe.

C. Tee connections for welded pipe shall be made up with welding fittings. Where the size of the side outlet is such that a different connection technique than on the run is required, a weldolet, sockolet, or threadolet type fitting may be used for the branch in place of reducing tees only where the branch is 2/3 the run size or smaller.

3. SPECIFICATIONS STANDARDS

All piping and material shall be new, full weight, made in the United States and shall conform to the following minimum applicable standards:

A. Steel pipe; ASTM A-120, A-53 Grade A, A-53 Grade B.

B. Copper tube; Type K, L, M; ASTM B88-62; Type DWV ASTM B306-62.

C. Cast iron soil pipe; ASA A-40.I and CS 188-59.

D. Cast iron drainage fittings; ASA B16.12.

E. Cast iron screwed fittings; ASA B16.4.

F. Welding fittings; ASA B16.9.

G. Cast brass and wrought copper fittings; ASA B16.18.

H. Cast brass drainage fittings; ASA B16.23.

I. Reinforced concrete pipe; ASTM-C-76-64T.

J. Solder; Handy and Harmon, United Wire and Supply; Air Reduction Co. or equivalent.

4. PITCH OF PIPING

All piping systems shall be installed so as to drain to a low point. Certain minimum pitches shall be required for this drainage. For proper flow and/or for proper operation, the following pitches shall be required:

A. Interior Soil, Waste and Vent Piping:

1/4 inch per foot in direction of flow where possible but in no case less than 1/8" per foot.

B. Exterior Sanitary Lines:

Not less than one (1) percent fall in direction of flow and no greater than indicated.

C. Roof Leaders:

1/8 inch per foot where possible. Where not possible, run dead level.

D. High and Low-Pressure Steam Mains:

One inch in 20 feet in direction of flow.

E. Steam Condensate Return Lines:

One inch in 20 feet in direction of flow.

F. All Other Lines:

Provide ample pitch to a low point to allow 100 percent drainage of the system.

5. APPLICATIONS

A. Sanitary Sewer – Exterior

Note: All underground building drain pipe and fittings to be Cast Iron Soil Pipe ASTM A74, service weight, hub and spigot soil pipe and fittings.

Hub and Spigot Cast Iron Soil Pipe and Fittings: Hub and Spigot Cast Iron pipe and fittings shall be manufactured from gray cast iron and shall conform to ASTM A 74. All pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute ® and listed by NSF® International. Pipe and fittings to be:

□ Service (SV) or

□ Extra Heavy (XH)

Joints can be made using a compression gasket manufactured from an elastomer meeting the requirements of ASTM C 564. All pipe and fittings to be produced by a single manufacturer and are to be installed in accordance with manufacturer's recommendations and applicable code requirements. The system shall be hydrostatically tested after installation to 10 ft. of head (4.3 psi maximum).

B. Natural Gas Piping - Exterior

Exterior natural gas piping shall be thermoplastic gas pressure pipe with fittings complying with ASTM D 2513. All gas piping shall be installed per NFPA 54.

Columbia Gas of Kentucky requires, in compliance with Sections 192.283 and 192.285 of Title 49 of the Code of Federal Regulations, that Contractors installing plastic pipe be qualified in the

procedures for joining plastic pipe. Contractors not previously qualified by Columbia should contact the local Columbia Gas office for information on the necessary procedures for qualifying under this requirement.

C. Steam and Condensate Piping in a Vault

(1) 75 PSI - 175 PSI Steam Pressure: Steam and condensate return piping shall be Schedule 80 black steel pipe with 300 PSI fittings ASTM A106 Grade B. All joints shall be welded or screw type. Screw fittings may be used for pipes 2” and smaller in size only. All piping 2 1-2” and larger shall be welded. Welding neck flanges shall be used for connection to valves and flanged equipment. Install welded tees.

D. Sump Pump Discharge

(1) Type “M” copper with solder joints.

E. Lab Waste and Vent Piping - (Below Slab and Grade or Above Slab)

(1) Below slab: Schedule 40 non-flame retardant polypropylene pipe conforming to ASTM D4101 with joints made in accordance with the Kentucky Plumbing Code. Below grade piping shall be installed with fusion joint fittings.

(2) Above slab, pipe in non-plenum area: Schedule 40 flame retardant polypropylene pipe conforming to ASTM D4101 with joints made in accordance with the Kentucky Plumbing Code. Piping shall be installed with fusion joints within concealed spaces and with mechanical joints in accessible areas. All mechanical couplings below casework or exposed shall have the clamp edges smoothed or covered to keep sharp edges from cutting people

(3) Above slab, pipe in plenum: Schedule 40 PVDF per ASTM F1673 with mechanical joint fittings meeting ASTM E84 for flame spread and smoke generation (less than 25 and 50 respectively).

(4) Piping shall be protected from sunlight in accordance with the manufacturer's recommendations.

(5) Acceptable manufacturers of acid waste and vent piping materials: Enfield (Ipex), Orion, or G.F. Sloane.

END OF SECTION 20 1300

SECTION 20 1310 - WELDING

1. GENERAL

A. All welding accomplished by the Contractor shall comply with provision of the latest revision of applicable codes, whether ASME Boiler and Pressure Vessel Code for pressure piping or such State and Local requirements as may supersede these codes.

B. Welds shall be of sound metal thoroughly fused to the base metal at all points, free from cracks and reasonably free from oxidation blow holes and non-metallic inclusions. No fins or weld metal shall project within the pipe and should they occur they shall be removed. All pipe beveling shall be done by machine. The surface of all parts to be welded shall be thoroughly cleaned free from paints, oil, rust or scale at the time of welding, except that a light coat of oil may be used to preserve the beveled surfaces from rust.

C. Pipe and fittings shall be carefully aligned with adjacent parts and this alignment must be preserved in a rigid manner during the process of welding.

D. Each Contractor shall be responsible for quality of welding done by his organization and shall repair or replace any work not done in accordance with specifications. If required by the Architect/Engineer, the Contractor shall cut out at least three (3) welds during the job for X-raying and testing. These welds shall be selected at random by the Resident Inspector and shall be tested as a part of the Contractor's Contract. Certifications of these tests and X-rays shall be submitted, in triplicate to the Engineer. In case a faulty weld is discovered, the Contractor shall be required to furnish additional tests.

2. WELDING QUALIFICATIONS

A. It is required that all welding of piping covered by this specification, regardless of conditions of service, be installed as follows:

(1) Pipe welding shall comply with the provisions of the latest revision of the applicable codes, whether ASME Boiler and Pressure Vessel Code, ASA Code for Pressure Piping, or such state or local requirements as may supercede codes mentioned above.

(2) Before any pipe welding is performed, submit to the Owner or his authorized representative, a copy of the welding procedure specifications, together with proof of its qualification as outlined and required by the most recent issue of the code having jurisdiction.

(3) Before any welder shall perform any pipe welding, submit to the Owner or his authorized agent the operator's qualification record in conformance with the provisions of the code having jurisdiction, showing that the operator was tested under the proven procedure specifications submitted.

(4) Standard Procedure Specifications and Welders qualified by the National Certified Pipe Welding Bureau shall be considered as conforming to the requirements of these specifications.

(5) “R” Stamp: Any welder performing modifications, repairs, etc. to boilers, pressure vessels, or other pressure retaining items shall have a current R stamp issued by the National Board of Boiler and Pressure Vessel Inspectors.

(6) “PP” Stamp: Any welder working with steam systems exceeding 15 PSIG shall have a current PP stamp issued by ASME. This shall apply up to the first stop valve for single boiler installations and up to the second stop valve for multiple boiler installations.

B. MATERIALS

(1) Welding fittings shall conform to ASA B16.9; of the same materials, thickness, etc., as the pipe being jointed; see ASA B36.10.

END OF SECTION 20 1310

SECTION 20 2100 - VALVES AND COCKS

1. GENERAL

   A. The con Contractor's attention is directed to the General and Special Conditions, General Conditions-Mechanical and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to all other sections of the Contract Documents which affect the work of this section and which are hereby made a part of the work specified herein.

   B. The Contractor shall provide all valves required to control, maintain and direct flow of all fluid systems indicated or specified. This shall include, but may not be limited to all valves of all types including balancing cocks, air cocks, lubricated plug cocks, packed plug cocks, special valves for special systems, etc., for all Mechanical Systems.

   C. All valves shall be designed and rated for the service to which they are applied.

   D. The following type valves shall not be acceptable: Zinc, plastic, fiber or non-metallic.

   E. Ball valves with temperature and pressure ports are not an acceptable alternative to the balancing valves specified herein. Valves that do not comply with these specifications shall be removed and replaced by the Contractor with no increase in contract price.

   F. Each type of valve shall be of one manufacturer, i.e., gate valves, one manufacturer, globe valves, one manufacturer, silent check valves, one manufacturer, etc. The following valve manufacturers shall be acceptable: Lunkenheimer, Tour & Anderssen, Powell, Nibco, Crane, Jenkins, T & S Brass, Walworth, DeZurik, Consolidated Valve Industries, Inc., Adams, Bell & Gossett, Flow Design, Watts.

   G. All valves shall comply with current Federal, State and Local Codes.

   H. All valves shall be new and of first quality.

   I. All valves shall be full line size. Valves and hydronic specialties shall not be reduced to coil or equipment connection size. Size reductions shall be made at the connection to the equipment.

   J. Angle stops for plumbing fixtures shall be quarter turn ball type.

   K. All valves for use in potable water systems shall comply with federal lead-free requirements that the lead content of wetted surfaces cannot exceed 0.25% by weight.

2. WORKMANSHIP AND DESIGN

   A. Handwheels for valves shall be of a suitable diameter to allow tight closure by hand with the application of reasonable force without additional leverage and without damage to stem, seat and disc. Seating surfaces shall be machined and finished to ensure tightness against leakage for service specified and shall seat freely. All screwed valves shall be so designed that when the screwed connection is properly made, no interference with, nor damage to the working parts of the valve shall occur. The same shall be true for sweat valves when solder or brazing is applied.

3. TYPES AND APPLICATION

   A. GENERAL APPLICATIONS

(1) All valves shall conform to University valve pressure classification requirements. Refer to the following schedules:

VALVES 2.5” AND SMALLER

SERVICE	GATE	GLOBE	BALL	CHECK
High Pressure Steam and High Pressure Steam Condensate ** Designed for 500 deg F steam at 300 psig	300**	300**	-	300**

VALVES LARGER THAN 2.5”

SERVICE	GATE	GLOBE	BALL	CHECK
High Pressure Steam and High Pressure Steam Condensate ** Designed for 500 deg F steam at 300 psig (cast steel)	300**	300**	-	300**

B. GATE VALVES

Gate Valves shall be of the wedge disc type, permit straight line flow, complete shut-off and designed so that when the valve is wide open, it can be packed under pressure. Valves 1-1/2 inches and smaller shall be bronze, with ends to suit piping and non-rising stem. The valve shall have a deep stuffing box for long contact with the stem, packing gland and filled with high quality packing. Valves 2 inches thru 4 inches shall be iron body bronze mounted with flanged ends and non-rising stem. Boiler stop valves and valves larger than 4 inches shall be iron body bronze mounted flanged ends with outside screw and yoke with rising stem. Working pressure for bronze valves shall be 150 pounds and iron valves 125 pounds when installed in piping with system pressures up to 100 pounds per square inch and 250 pounds for 100 pounds per square inch and over. 2" and under NIBCO T133, greater than 2" NIBCO F619. All gate valves 2” and smaller for use in potable water systems shall meet federal requirement to be lead free containing less than 0.25% lead by weight of wetted area. NIBCO F768B.

C. GLOBE VALVES

Globe Valves shall permit control of flow rate from full flow to complete shut-off and designed that when the valve is wide open it can be repacked under pressure, and have a deep stuffing box with gland and filled with high quality packing. Valves 1-1/2 inches and smaller shall be bronze with ends to suit piping union bonnet, and with stainless steel plug type disc and seat of not less than 500 Brinnell hardness. Valves 2 inches and larger shall be iron body bronze mounted with flanged ends, yoke bonnet, and disc guide. Working pressure for bronze valves shall be 150 pounds and iron valves 125 pounds when installed in piping with system pressures up to 100 pounds per square inch and 250 pounds for 100 pounds per square inch and over. 1-1/2" and under NIBCO T256AP, greater than 1-1/2" NIBCO F768B.

D. CHECK VALVES

Check Valves shall be horizontal swing type with two-piece hinges, disc construction seats to be bronze and bronze discs or with composition face depending on service and provide silent operation. Valves 1-1/2 inches and smaller shall be bronze with ends to suit piping, have full area "Y" pattern body and integral seats. Valves 2 inches and larger shall be iron body brass mounted and with flanged ends. Working pressure for bronze valves shall be 150 psi and iron valves 125 psi when installed in piping with system pressures up to 100 psi and 250 psi for 100 psi and over. 3" and under NIBCO T433Y, greater than 3" NIBCO F918B (for less than 100 psi systems) greater than 3” NIBCO F968B (for 100 psi or greater systems).

E. BALL VALVES (NON-POTABLE)

Ball Valves shall have removable lever handle with vinyl grip, adjustable stem gland screw, reinforced Teflon stuffing box ring, blow out proof stem, bronze body, reinforced Teflon seats, chrome plated steel ball as manufactured by Consolidated Valve Industries, Inc., Lunkenheimer, Apollo, Jenkins, Nibco or equivalent. Provide a stem extension so that the base of the handle is 1/4" above the insulation similar to Nibseal. NIBCO T5800-70.

F. BALL VALVES (POTABLE WATER)

All valves for use in potable water systems 2” and smaller contain less than 0.25% lead by weight and comply with federal lead free potable water requirements. Ball valves shall have a removable lever handle with vinyl grip, adjustable stem gland screw, reinforced Teflon stuffing box ring, blowout proof stem, stainless steel or bronze body, reinforced Teflon seats, stainless steel or chrome plate steel ball as manufactured by Apollo, Aslo, Nibco, Milwaukee, or equivalent. Provide a stem extension so that the base of the handle is ¼” above the insulation similar to Nibseal. NIBCO S-585-66-LF.

G. BUTTERFLY VALVES

Butterfly valves shall be line sized cast iron body, lug style, 200 PSI rating (bubble tight) EPT or Viton seat, cartridge type; high strength stem. Disc to have ground and polished seating surface. Operator shall be locking lever style. Quality equivalent to Crane Monarch series. 3" and under NIBCO LD3222-3, greater than 3" NIBCO LD322-5. Valves 6” and over shall have gear driven operators. For domestic water service, provide Milwaukee Valve HP series (or equal) with stainless steel body, disc, stem, bearing, and seat.

A. Triple Rotary Valve (2-1/2" and larger): USE FOR ALL HIGH PRESSURE STEAM VALVES

This specification covers the design and testing of quarter turn valves for tight shutoff with metal to metal seats. Valves shall be rated for 300 psi and 500 degrees F minimum.

1.0 APPLICABLE STANDARDS

The following standards apply:

ASME B16.5: Pipe Flanges and Flanged Fitting

ASME B16.34: Valves – Flanged and Buttwelding End

MSS-SP-25: Standard Marking System for Valves, Fitting, Flanges and Unions

MSS-SP-6: Standard Finishes for Contact Faces of Pipe Flanges and Connecting-End Flanges of Valves and Fittings

API 598: Valve Inspection and Testing (Low Pressure Closure Test)

API 609: Butterfly Valves: Double-Flanged, Lug and Wafer Type

ASTM: Materials of Construction

2.0 DESIGN REQUIREMENTS

A. Valves shall be quarter turn, metal to metal seated, incorporating “inclined conical” geometry creating triple offset design. Valves shall be torque seated. Valves will provide bi-directional bubble tight shut-off and be designed in accordance with ASME B16.34 and B31.3. The design of the valve components shall take into account the maximum output torque of the operating mechanism required to operate the valve against the maximum differential pressure as per the specified class. All recommended spare parts must be interchangeable for same size and pressure rating.

B. Valve bodies shall be double flanged for valves within the building, cast carbon steel, able to withstand induced pipe loads without distortion and affect on the movement of the disc. Face to face dimensions shall conform to ISO 5752, series 13 for class 150, series 14 for class 300/600. Valves located within vaults shall be buttwelded.

C. Valve disc shall be single piece cast 316 (CF8M) stainless steel. Threaded connections on the disc shall not be allowed. Disc attachment to the shaft shall be by means of parallel keys (splined connection for 600 class). Pins of any kind shall not be used for torque transmission.

D. The valve shaft diameter shall provide adequate strength to operate the valve at full rated design conditions. Shaft shall be one piece. A thrust bearing shall be provided to absorb thrust in both directions and provide blowout protection. The shaft diameter shall be reduced at the actuator connection so as to put the weakest point outside the valve above the packing. The shaft surface roughness at the packing area shall be 0.8μm or smoother.

E. The seal ring shall consist of laminations of 316SS and graphite (min. 4-stainless/3 graphite). The seal ring seating surface shall be machined on the inside diameter and shall secured by means of a retainer to insure no movement. The replaceable seal shall be located in the body to be fully protected from the flow stream and shall not require indexing or special positioning. Retainer bolting on internal rotating parts is not allowed. To prevent leakage behind the seal ring, a static graphoil gasket shall be used. Dynamic gaskets are not allowed.

F. The packing gland shall be provided with a minimum of four studs for precision adjustment and compression of the packing. A minimum of five packing rings shall be provided.

G. Valves will incorporate solid metal, press fit shaft bearings which are sealed from the ingress of particulate or contaminants. Sufficient differential hardness between the shaft and bearing surfaces shall be provided to insure smooth, non-galling rotation.

H. Gear operated valves shall be provided with self-locking gears. The actuator mounting bracket shall be rigidly dowel pinned to the body to absorb torque loads and shall be centered by machined register between bracket and body.

I. Valves shall be tested in accordance with ASME B16.34-1996 and API 598-1996. When specified, the valves shall be tested for seat leakage from both sides of the disc. Written test certificates shall be available upon request.

J. Painting of non-stainless steel components shall be in accordance with customer specifications or manufacturer standards suitable for the operating conditions and environment. A written painting procedure must be available.

K. When all final testing is completed the valves shall be prepared for shipment. The external surface of the valves shall be free of grease or oil. The machined surfaces shall be protected with anticorrosive preparation. Valves shall be packaged adequately for transportation by surface or airfreight shipment as specified.

H. AIR COCKS

Straight nose; Lunkenheimer Fig. 476; bronze; tee handle; bent nose; Lunkenheimer Fig. 478, 125#; bronze; tee handle.

I. GAUGE COCKS

Straight, Lunkenheimer, Fig. 1178; 125#; bronze; tee handle. FIP.

J. LUBRICATED PLUG COCKS

2" and under; Homestead Fig. 601; 150#; semi-steel; screwed; 2-1/2" and over; Homestead Fig. 602; ±50#; semi-steel; flanged.

K. PACKED PLUG COCKS

2" and under; DeZurik Fig. 425-S; 175#; semi-steel; screwed. 2-1/2" and over; DeZurik Fig. 425-F; 175#; semi-steel; flanged.

END OF SECTION 20 2100

SECTION 20 2200 - INSULATION - MECHANICAL

1. GENERAL

   A. The Contractor's attention is directed to the General and Special Conditions, General Conditions-Mechanical and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to all other sections of the Contract Documents which affect the work of this section and which are hereby made a part of the work specified herein.

   B. Work under this section shall include all labor, equipment, accessories, materials and services required to furnish and install all insulation, fittings and finishes for all mechanical systems specified herein and/or as indicated.

   C. Application of insulation materials shall be done in accordance with manufacturer's written recommendations. Where thickness of insulation is not specified, use applicable thickness recommended by manufacturer for specific use. Insulation shall be applied by a company regularly engaged in the application of insulation and any work deemed unacceptable by the Engineers shall be removed and properly installed at the expense of the Contractor.

2. MANUFACTURERS

   A. Insulation shall be as manufactured by Manville, Knauf, CertainTeed, Owens-Corning, Armacell or approved equivalent. Insulation sundries, adhesives, and jackets/covers shall be as made by Benjamin Foster, Zeston, Speedline, Proto, Childers, Vimasco or approved equivalent.

3. FIRE RATINGS AND STANDARDS

   A. Insulations, jackets and facings shall have composite fire and smoke hazard ratings as tested by ASTM E-84, NFPA 255 and UL 723 procedures not exceeding Flame Spread 25, Smoke Developed 50.

   B. Adhesives, mastics, tapes and fitting materials shall have component ratings as listed above.

   C. All products and their packaging shall bear a label indicating above requirements are not exceeded.

   D. Duct linings shall meet the Erosion Test Method in compliance with UL Publication No. 181.

4. GENERAL APPLICATION REQUIREMENTS

   A. Insulation shall be applied on clean, dry surfaces in a neat and workmanlike manner reflecting the best current practices in the trade. Insulation shall not be applied to piping, ductwork or equipment until tested, inspected and released for insulation.

   B. All insulation shall be continuous through walls, ceiling openings and sleeves. However, insulation shall be broken through fire walls. All covered pipe and ductwork is to be located a sufficient distance from walls, other pipe, ductwork and other obstacles to permit the application of the full thickness of insulation specified. If necessary, extra fittings and pipe are to be used. No noticeable deformation of insulation or discontinuity of vapor seal, where required, will be accepted.

   C. "Concealed", where used herein, shall mean hidden from sight as in trenches, chases, furred spaces, pipe shafts, or above hung finished ceilings. "Exposed" shall mean that piping or equipment is not "concealed" as defined above. Piping and equipment in service tunnels, mechanical equipment rooms, mechanical platform, mezzanine, penthouse, etc. storage areas, or unfinished rooms is to be considered as "exposed".

D. Existing and/or new insulation removed and/or damaged during course of construction shall be repaired or replaced as directed by the Engineer.

E. Vapor barrier jackets shall be applied with a continuous unbroken vapor seal. Do not use staples thru the jacket. NO EXCEPTIONS!

F. All insulation shall be installed with joints butted firmly together.

G. The Contractor shall ensure that all insulation (piping, ductwork, equipment, etc.) is completely continuous along all conduits, equipment, connection routes, etc. carrying cold fluids (air, water, other) and that condensation can, in no way, collect in or on the insulation, equipment, conduits, etc. Any such occurrence of condensation collection and/or damage therefrom shall be repaired solely at the expense of the Contractor.

5. PIPING SYSTEMS

A. GENERAL

(1) Bevel insulation and jacket at all points where insulation terminates at unions, flanges, valves and equipment. Note: Applies to hot water lines only; cold water lines require continuous insulation.

(2) Pipe insulation shall extend around valve bodies to above drain pans in hydronic equipment over pumps, etc. to ensure no condensation drip or collection.

(3) Factory molded fittings may be installed in lieu of built-up fittings. Jackets to be the same as adjoining insulation. Insulated fittings must have same or better K factors than adjoining straight run insulation.

(4) Valves, flanges and unions shall only be insulated when installed on piping whose surface temperature will be at or below the dew point temperature of the ambient air.

(5) Insulation shall not extend through fire and smoke walls. A UL-listed penetration system shall be used for each fire or smoke wall penetration in accordance with KBC. Materials used such as caulk, sleeves, etc. shall be manufactured by 3M, Hilti, or equal.

B. INSULATION SHIELDS

(1) Metal insulation shields are required at all pipe hangers where the piping is insulated. Metal shields shall be constructed of galvanized steel, formed to a 180-degree arc. Insulation shields shall be the following size:

PIPE SIZE	SHIELD GAUGE	SHIELD LENGTH
2" AND LESS	20	12"
2 1/2" TO 4"	18	12"
5" TO 10"	16	18"
12" AND GREATER	14	24"

C. INSULATION MATERIAL (FOR THE FOLLOWING SYSTEMS)

Insulation shall be Pyrogel-XTE, or approved equivalent aerogel pipe insulation. The insulation shall be a heavy density, pipe insulation with a K factor .24 at 500°F mean temperature. Where multiple layers are being installed to achieve the specified thickness, the joints shall be offset. All circumferential joints shall be vapor sealed per manufacturers requirements. All insulation shall be installed in strict accordance with the manufacturers' recommendations. The following pipes shall be insulated with the thickness of insulation as noted.

(1) High Pressure Steam and/or High Temperature Hot Water (306°F-450°F)

a.	1" and less pipe size:	1 1/4" thick
b.	1 ¼" thru 1 ½" pipe size:	1 1/4" thick
c.	2" thru 4" pipe size:	1 1/2" thick
d.	5" and larger pipes:	1 3/4" thick

(2) Steam Condensate

a.	1 ½" and less pipe size:	1" thick
b.	2" and larger pipe size:	1/1/2" thick

(1) Insulate all surfaces not requiring constant access.

(2) Provide removable insulation for surfaces requiring periodic access.

(3) Insulate all surfaces creating a burn hazard.

(4) Exposed piping in any room including vaults and all piping in boiler or mechanical rooms shall have an 8-oz. canvas jacket applied over the fiberglass factory ASU/SSL jacketing to further protect the insulation from abuse. This jacketing must be properly applied with lagging adhesive, such that the outer surface is smooth and free of wrinkles. The canvas jacketing in all mechanical areas is to be prepared by painting, and then painted according to the University of Kentucky standard piping color coding. All chilled water piping insulation shall be completely sealed so that a perfect vapor barrier is achieved.

D. JACKETS

(1) Exposed (Utility Vaults)

All insulated piping installed in the above areas shall have a canvas or PVC jacket:

a. 6 oz. canvas jacket with fire retardant lagging. Apply to the insulation specified for the piping.

E. STEAM/STEAM CONDENSATE VALVE REMOVABLE JACKETING INSULATION

(1) All steam pressure reducing stations shall be installed with removable jacketing insulation to allow service to the station. This includes all fittings, valves, etc. on the steam pressure reducing stations and valves in mechanical room and penthouse.. All steam condensate pumps shall be installed with removable jacketing insulation over reservoir. All steam traps 2 1/2" and larger shall have removable jacket insulation. All

steam control valves shall be installed with removable jackets for maintenance. Provide removable jacket for hydronic hot water valves over 4" located in the mechanical room and penthouse.

(2) Insulation shall meet at minimum the following specification:

a. Non-Asbestos Glass mat, type E needled fiber.
b. Temperature maximum of 450°F, Maximum water vapor transmission of 0.00 perm, and maximum moisture absorption of 0.2 percent by volume.
c. Jacket Material: Silicon/fiberglass compressed as required to give maximum 130F surface temperature depending on fluid medium in piping.
d. Construction: One piece jacket body with three-ply braided pure Teflon or Kevlar thread and insulation sewn as part of jacket.
e. Sewn lock stitch with a minimum 4 to 6 stitches per inch. The thread must be able to withstand the skin temperatures without degradation.
f. Hog rings, staples and wire are not are not acceptable methods of closure. Velcro straps alone are not acceptable unless written permission from UK (hook & loop method required).
g. No raw cut jacket edges shall be exposed.
h. Jackets shall be fastened using hook and loop (Velcro) straps
i. Provide a permanently attached Aluminum or stainless steel nameplate on each jacket to identify its location, size and tag number.
j. The insulation shall be designed to minimize the convection current in the space between the hot metal surface and the inner layer of insulation. To this end, during jacket fabrication, the layers of insulating mat shall be placed in an overlapping pattern.
k. Insulation must be sewn as integral part of the jacket to prevent shifting of the insulation.
l. Insulation thickness: As required for Touch Temperature Exterior of all jacket < 130F.

END OF SECTION 20 2200

SECTION 20 2400 – IDENTIFICATIONS, TAGS, CHARTS, ETC.

1. GENERAL

A. The Contractor's attention is directed to the General and Special Conditions, General Conditions-Mechanical and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to all other Contract Documents which affect the work of this section and which are hereby made a part of the work specified herein.

2. PIPING IDENTIFICATION

A. GENERAL

(1) Manufactured Pipe Labels: Pre-printed, color coded, with lettering indicating service and showing flow direction. This applies to vaults and within buildings only. This does not apply to direct bury piping.

(2) Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.

(3) Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.

(4) Stencils: Prepared with letter sizes according to ASME A13.1.

a. Stencil Material: Fiberboard or metal
b. Stencil Paint: Exterior, gloss, acrylic enamel black unless otherwise indicated. Paint may be in pressurized spray-can.
c. Identification Paint: Exterior Acrylic enamel in colrs according to ASME A13.1 unless otherwise indicated.

(5) Pipe Label Contents: Include identification of piping service using the same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
a. Flow Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
b. Lettering size: At least 1.5".

B. WHERE REQUIRED:

(1) In mechanical rooms and vaults, piping shall be labeled every 10 feet.

3. EQUIPMENT IDENTIFICATION

A. All equipment, except in finished rooms, shall be identified per University standards and shall conform to the following requirements:
(1) Material and Thickness: Mulitlayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick and having predrilled holes for attachment hardware.
(2) Letter Color: Black
(3) Background Color: White
(4) Maximum Temp: Able to withstand temperatures up to 160 deg F.

(5) Minimum label size: Length and width vary for required label content, but not less than 2.5" by .75".
(6) Minimum Letter Size: .25" for name of units if viewing distance is less than 24 inches, ½" for viewing distances up to 72" and proportionally larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of the principal lettering.
(7) Fasteners: Stainless-steel rivets or self-tapping screws.
(8) Label Content: Include equipment's drawing designation or unique equipment number, drawing numbers where equipment is indicated (plans, details, and schedules), plus the specification section number and title where equipment is specified.
(9) Equipment label schedule: Refer to IOM Requirements.

END OF SECTION 20 2400

SECTION 20 2500 - HANGERS, CLAMPS, ATTACHMENTS, ETC.

1. GENERAL

   A. The Contractor's attention is directed to the General and Special Conditions, General Provisions - Mechanical and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to other sections of the Contract Documents which affect the work of this section and which are hereby made a part of the work specified in this section.

   B. Each Contractor's attention is also directed to Section 201300, Pipe, Pipe Fittings and Pipe Support.

   C. This section includes, but is not limited to, furnishing and installing dampers, supports, anchors, and accessories for piping, ductwork, equipment, etc. Furnishing and installing shall be by each trade for the completion of their work.

   D. Power driven anchors and expansion anchors shall be permitted only when permission is granted in writing by the Architect and Engineer.

2. MATERIALS AND EQUIPMENT

   A. Hangers, Clamps, Attachments, Etc.:

	SIZE	SPECIFICATION
1. Pipe Rings	2" pipe and smaller	Adjustable swivel split ring or split pipe ring, Grinnell Figures 104 and 108, Elcen, Fee & Mason, or approved equivalent.
2. Pipe Clevis	2-1/2" pipe and larger	Adjustable wrought Clevis type, Grinnell Figure 260, Elcen, Fee & Mason, or approved equivalent.
3. Pipe Clevis	All	Steel Clevis for insulated pipe, Elcen Figure 12A, Grinnell, Fee & Mason or approved equivalent.
4. Rise Clamps	All	Extension pipe or riser clamp, Grinnell Figure 261, Elcen, Fee & Mason or approved equivalent.
5. Beam Clamps and Attachments	All	Grinnell Figure numbers listed or, Elcen, Fee & Mason, or approved equivalent. Malleable beam clamp with extension piece figure 229; I-beam clamp figure 131; C-clamp figures 83, 84, 85, 86, 87, and 88.
6. Brackets	All	Welded steel brackets medium weight, Grinnell Figure 195, Elcen, Fee & Mason or approved equivalent.
7. Concrete Inserts	All	Grinnell Figure numbers listed or, Elcen, Fee & Mason or approved equivalent. Wrought steel insert Figure 280 and wedge type insert Figure 281.

8. Concrete Fasteners	All	Self-drilling concrete inserts, Phillips, Grinnell, Elcen or approved equivalent.
9. Ceiling	All	Grinnell Figure numbers listed or Elcen, Fee & Mason, or approved equivalent. Pipe hanger flange Figure 153, adjustable swinging hanger flange Figure 155, ceiling flanges Figures 128 and 128R, and adjustable ceiling flange Figure 116.
10. Rod Attachments	All	Grinnell Figure numbers listed or Elcen, Fee & Mason, or approved equivalent. Extension piece Figure 157, rod coupling Figure 136, and forged steel turnbuckle Figure 230.
11. U-Bolts	All	Standard, U-bolt, Grinnell Figure 137, Elcen, Fee & Mason, or approved equivalent.
12. Welded Pipe Saddles	All	Pipe covering protection saddle sized for thickness of insulation, Grinnell Figure 186, Elcen, Fee & Mason or approved equivalent.
13. Pipe Roll	All	Adjustable swivel pipe roll, Grinnell Figure 174, Elcen, Fee & Mason, or approved equivalent.
14. Protection Saddle	All	18-gauge sheet metal pipe protection saddle, Elcen Figure 219, Fee & Mason, Power Strut, or approved equivalent.
15. Hanger Rods	All	Steel, diameter of the hanger threading, ASTM A-107.
16. Miscellaneous Steel	All	Steel angles, rods, bars, channels, etc., used in framing for supports and fabricated brackets, anchors, etc., shall conform to ASTM-A-7.
17. Concrete Channel Inserts	All	Continuous slot inserts, Unistrut, or approved equivalent. Heavy duty Series P-3200 or Light Duty Series P-3300 as required.
18. Adjustable Spot Insert	All	Adjustable spot insert Unistrut, or approved equivalent, P-3245. Design load 1000 lbs.

3. INSTALLATION

A. Unless otherwise specifically indicated or hereinafter specified in the specifications, all supporting, hanging and anchoring of piping, ductwork, equipment, etc., shall be done by each trade as is necessary for completion of the work and shall be as directed in the following paragraphs:

(1) Supporting and hanging shall be done so that excessive load will not be placed on any one hangers so as to allow for proper pitch and expansion of piping. Hangers and supports shall be placed as near as possible to joints, turns and branches.

(2) For concrete construction, utilize adjustable concrete inserts for fasteners. Expansion anchors and power-driven devices may be used when approved in writing by the Architect/Engineer. Utilize beam clamps for fastening to steel joists and beams and expansion anchors in masonry construction. When piping is run in joists, piping shall be top mounted on trapeze type hangers with each pipe individually clamped to trapeze hanger.

(3) Trapeze hangers shall be supported by steel rods of sufficient diameter to support piping from joists or concrete construction. Where desired or required, piping may be double mounted on trapeze hangers. Where conditions permit, trapeze hangers may be surface mounted on exposed joists by means of approved beam clamps, or to concrete construction by means of approved adjustable inserts or expansion anchors.

(4) Install all miscellaneous steel other than designed building structural members as required to provide means of securing hangers, supports, etc., where piping does not pass directly below or cross steel joists.

(5) Piping shall not be supported by the equipment to which it is connected. Support all piping so as to remove any load or stress from the equipment.

(6) Where piping, etc., is run vertically, approved riser clamps, brackets or other means shall be utilized at approximately 10'-0" center to center minimum and an approved adjustable base stand or fitting on concrete support base shall be utilized at the base of the vertical run.

(7) Where piping is run along walls, knee braced angle frames or pipe brackets with saddles, clamps, and rollers (where required) mounted on structural brackets fastened to walls or columns shall be used.

(8) Support all ceiling hung equipment, with approved vibration isolators.

(9) Where copper tubing is specified, hangers shall be of copper clad type when piping is uninsulated.

(10) Uninsulated piping hung from above shall be supported with ring and clevis type pipe hangers. Uninsulated piping mounted on trapeze and wall bracket type support shall be held in place with U-bolts. U-bolts shall allow for axial movement in the piping.

(11) All insulated piping shall be supported with clevis type and/or pipe roll hangers. Hangers shall be sized to allow the pipe insulation to pass through the hangers. Install insulation protection saddles at all hanger locations. Welded pipe saddles shall be installed at all hangers on piping 5" and larger. The pipe saddles shall be sized for the thickness of insulation used. Hangers shall fit snugly around outside of insulation saddles.

(12) Under no conditions will perforated band iron or steel wire driven hangers be permitted.

(13) In general, support piping at the following spacing:

a. Steel and copper piping - 5 feet intervals for piping 3/4" and smaller. 6 feet intervals for 1 ¼" and 1" pipe. 8-foot intervals for piping 1 ½" to 3". 10-foot intervals piping 3 ½" and larger.

b. Polyethylene piping – 4-foot intervals for piping 2" and smaller. 5-foot intervals for 3" pipe. 6-foot intervals for 4", 6", and 8" pipe. 7-foot intervals for 10" and larger pipe.

c. PVC piping – 4-foot intervals for piping 1 1/2" and smaller. 5-foot intervals for 2 and 2 ½" piping. 6-foot intervals for 3" pipe and larger.

d. Where the manufacturer of the pipe has more strict guidelines, the manufacturer's recommendations shall be followed.

END OF SECTION 20 2500

SECTION 221113 - FACILITY WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes water-distribution piping and related components outside the building for **fire suppression.**

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Detail precast concrete vault assemblies and indicate dimensions, method of field assembly, and components.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control test reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Comply with requirements of the Kentucky American Water Company, the Lexington Fire Department and the University of Kentucky. Include tapping of water mains and backflow prevention, if necessary.
2. Comply with standards of the University of Kentucky and Kentucky American Water Company for fire suppression-water-service piping, including materials, hose threads, installation and testing.

B. Piping materials shall bear label, stamp, or other markings of specified testing agency.

C. Comply with ASTM F 645 for selection, design, and installation of thermoplastic water piping.

D. Comply with FMG's "Approval Guide" or UL's "Fire Protection Equipment Directory" for fire-service-main products.

E. NFPA Compliance: Comply with NFPA 24 for materials, installations, tests, flushing, and valve and hydrant supervision for fire-service-main piping for fire suppression.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Water-Distribution Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water-distribution service according to requirements indicated:

1. Notify **Owner** no fewer than **two weeks** in advance of proposed interruption of service.
2. Do not proceed with interruption of water-distribution service without **Owner's** written permission.

1.7 COORDINATION

A. Coordinate connection to water main with the University of Kentucky.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Provide pipe materials as required by the University of Kentucky standards for fire suppression water piping.

B. Cement lined Ductile-Iron Pipe: AWWA C151, rated 150 psi.

2.2 GATE VALVES

A. Provide valves as required by KAWC for fire hydrants.

B. Valve Boxes: Comply with AWWA M44 for cast-iron valve boxes. Include top section, adjustable extension of length required for depth of burial of valve, plug with lettering "WATER," and bottom section with base that fits over valve and with a barrel approximately 5 inches in diameter.

1. Operating Wrenches: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.

2.3 FIRE HYDRANTS

A. Provide Fire Hydrant as required by Kentucky American Water Company and the Lexington Fire Department:

2.4 FIRE DEPARTMENT CONNECTIONS

A. Provide Fire Department Connection as required by the Lexington Fire Department. Provide FDC with threads, connections size and signage as directed by the LFUCG fire department, Acron Brass or approved equal, single 4” nozzle, clapper, etc.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Refer to Division 31 Section "Earth Moving" for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS

A. General: Use pipe, fittings, and joining methods for piping systems according to the following applications.

3.3 PIPING INSTALLATION

A. Water-Main Connection: Contractor shall perform tap of size and in location indicated in water main. Owner shall be provided two weeks notice prior to tap and given the opportunity to witness the work.

B. Water-Main Connection: Tap water main according to requirements of water utility company and of size and in location indicated.

C. Make connections larger than NPS 2 with tapping machine according to the following:

1. Install tapping sleeve and tapping valve according to MSS SP-60.
2. Install tapping sleeve on pipe to be tapped. Position flanged outlet for gate valve.
3. Use tapping machine compatible with valve and tapping sleeve; cut hole in main. Remove tapping machine and connect water-service piping.
4. Install gate valve onto tapping sleeve. Comply with MSS SP-60. Install valve with stem pointing up and with valve box.

D. Comply with NFPA 24 for fire-service-main piping materials and installation.

E. Install ductile-iron, water-service piping according to AWWA C600 and AWWA M41.

F. Bury piping with depth of cover over top at least **30 inches,** with top at least **12 inches** below level of maximum frost penetration.

G. Extend water-service piping and connect to water-supply source and fire hydrant or FDC as indicated on plans in locations and pipe sizes indicated.

H. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.

3.4 JOINT CONSTRUCTION

A. See Division 22 Section "Common Work Results for Plumbing" for basic piping joint construction.

B. Make pipe joints according to the following:
1. Ductile-Iron Piping, Gasketed Joints for Fire-Service-Main Piping: UL 194.

2. Ductile-Iron Piping, Grooved Joints: Cut-groove pipe. Assemble joints with grooved-end, ductile-iron-piping couplings, gaskets, lubricant, and bolts according to coupling manufacturer's written instructions.

3.5 ANCHORAGE INSTALLATION

A. Anchorage, General: Install water-distribution piping with restrained joints. Anchorages and restrained-joint types that may be used include the following:

1. Concrete thrust blocks.
2. Locking mechanical joints.

B. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
1. Fire-Service-Main Piping: According to NFPA 24.

C. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

3.6 VALVE INSTALLATION

A. AWWA Gate Valves: Comply with AWWA C600 and AWWA M44. Install each underground valve with stem pointing up and with valve box.

B. UL/FMG, Gate Valves: Comply with NFPA 24. Install each underground valve and valves in vaults with stem pointing up and with vertical cast-iron indicator post.

3.7 FIRE HYDRANT INSTALLATION

A. General: Install each fire hydrant with separate gate valve in supply pipe, anchor with restrained joints or thrust blocks, and support in upright position.

B. Wet-Barrel Fire Hydrants: Install with valve below frost line. Provide for drainage.

C. AWWA Fire Hydrants: Comply with AWWA M17.

D. UL/FMG Fire Hydrants: Comply with NFPA 24.

3.8 FIRE DEPARTMENT CONNECTION INSTALLATION

A. Install FDC per University of Kentucky, KAWC and Lexington Fire Department Standards.

3.9 CONNECTIONS

A. Connect water-distribution piping to **existing water piping.**

B. Hydrostatic Tests: Test at not less than one-and-one-half times working pressure for two hours.

1. Increase pressure in 50-psig increments and inspect each joint between increments. Hold at test pressure for 1 hour; decrease to 0 psig. Slowly increase again to test

pressure and hold for 1 more hour. Maximum allowable leakage is 2 quarts per hour per 100 joints. Remake leaking joints with new materials and repeat test until leakage is within allowed limits.

C. Prepare reports of testing activities.

3.10 IDENTIFICATION

A. Install continuous underground warning tape during backfilling of trench for underground water-distribution piping. Locate below finished grade, directly over piping. Underground warning tapes are specified in Division 31 Section "Earth Moving."

3.11 CLEANING

A. Clean and disinfect water-distribution piping as follows:

1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in NFPA 24 for flushing of piping. Flush piping system with clean, potable water until dirty water does not appear at points of outlet.

B. Prepare reports of purging and disinfecting activities.

END OF SECTION 221113

SECTION 26 0501 - GENERAL PROVISIONS - ELECTRICAL

PART 1 - GENERAL

A. The Instructions to Bidders, General and Special Conditions, and all other contract documents shall apply to the Contractor's work as well as to each of his Sub Contractor's work. Each Contractor is directed to familiarize himself in detail with all documents pertinent to this Contract. In case of conflict between these General Provisions and the General and/or Special Conditions, the affected Contractor shall contact the Engineer for clarification and final determination.

B. Each Contractor shall be governed by any alternates, unit prices and Addenda or other contract documents insofar as they may affect his part of the work.

C. The work included in this division consists of the furnishing of all labor, equipment, transportation, supplies, material and appurtenances and performing all operations necessary for the satisfactory installation of complete and operating Electrical Systems indicated on the drawings and/or specified herein.

D. Any materials, labor, equipment or services not mentioned specifically herein which may be necessary to complete or perfect any part of the Electrical Systems in a substantial manner, in compliance with the requirements stated, implied, or intended in the drawings and specifications, shall be included as part of this Contract. The Contractor shall give written notice of any materials or apparatus believed inadequate or unsuitable; in violation of laws, ordinances, rules or regulations of authorities having jurisdiction; and any necessary items of work omitted a minimum of ten days prior to bid. In the absence of such written notice and by the act of submitting his bid, it shall be understood that the Contractor has included the cost of all required items in his bid, and that he will be responsible for the approved satisfactory functioning of the entire system without extra compensations.

E. It is not the intent of this section of the specifications (or the remainder of the contract documents) to make any specific Contractor, other than the Contractor holding the prime contract, responsible to the Owner, Architect and Engineer. All transactions such as submittal of shop drawings, claims for extra costs, requests for equipment or materials substitution, shall be done through the Contractor to the Architect (if applicable), then to the Engineer.

F. This section of the Specifications or the arrangement of the contract documents shall not be construed as an attempt to arbitrarily assign responsibility for work, material, equipment or services to a particular trade Contractor or Sub-Contractor. Unless stated otherwise, the subdivision and assignment of work under the various sections shall be the responsibility of the Contractor holding the prime contract.

G. It is the intent of this Contract to deliver to the Owners a "like new" project once work is complete. Although plans and specifications are complete to the extent possible, it shall be responsibility of the Contractors involved to remove and/or relocate or re-attach any existing or new systems, which interfere with new equipment or materials to be installed by other trades without additional cost to the Owner.

H. In general, and to the extent possible, all work shall be accomplished without interruption of the existing facilities' operations. Each Contractor shall advise the Architect, Construction Manager, Owner and Engineer in writing at least one week prior to the deliberate interruption of any services. The Owners shall be advised of the exact time that interruption will occur and the length of time the interruption will occur. Failure to comply with this requirement may result in complete work stoppage by the Contractors involved until a complete schedule of interruptions can be developed. Contractor will not be entitled to additional compensation due to work stoppage mandated by unscheduled interruption.

I. Whenever utilities are interrupted, either deliberately or accidentally, the Contractor shall work continuously to restore said service. The Contractor shall provide tools, materials, skilled

journeymen of his own and other trades as necessary, premium time as needed and coordination with all applicable utilities, including payment of utility company charges (if any), all without requests for extra compensation to the Owner, except where otherwise provided for in the contract for the work. The contractor shall abide by the requirements on the Special Conditions and the University's outage request program.

J. Definitions:

1. Prime Contractor - The Contractor who has been engaged by the Owner in a contractual relationship to accomplish the work.
2. Electrical Contractor - Any Contractor whether bidding or working independently or under the supervision of a Construction Manager, that is: the one holding the Prime Contract and who installs any type of Electrical work, such as: power, lighting, television, telecommunications, data, fiber optic, intercom, fire detection and alarm, security, video, underground or overhead electrical, etc.
3. Electrical Sub-Contractor - Each or any Contractor contracted to, or employed by, the Electrical Contractor for any work required by the Electrical Contractor.
4. Engineer - The Consulting Mechanical-Electrical Engineers either consulting to the Owner, Architect, other Engineers, etc.
5. Architect - The Architect of Record for the project, if any.
6. Furnish - Deliver to the site in good condition.
7. Provide - Furnish and install in complete working order.
8. Install - Install equipment furnished by others in complete working order.
9. Contract Documents - All documents pertinent to the quality and quantity of all work to be performed on the project. Includes, but not limited to: Plans, Specifications, Addenda, Instructions to Bidders, (both General and Sub-Contractors), Unit Prices, Shop Drawings, Field Orders, Change Orders, Cost Breakdowns, Construction Manager's Assignments, Architect's Supplemental Instructions, Periodical Payment Requests, etc.

K. Note: Any reference within these specifications to a specific entity, i.e., "Electrical Contractor" is not to be construed as an attempt to limit or define the scope of work for that entity or assign work to a specific trade or contracting entity. Such assignments of responsibility are the responsibility of the Contractor or Construction Manager holding the prime contract, unless otherwise provided herein.

PART 2 - INTENT

A. It is the intent of these specifications and all associated drawings that the Contractor provide finished work, tested, and ready for operation. Wherever the word "provide" is used, it shall mean "furnish and install complete and ready for use."

B. Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work, the same as if herein specified or shown.

PART 3 - ELECTRICAL DRAWINGS AND SPECIFICATIONS

A. The drawings are diagrammatic only and indicate the general arrangement of the systems and are to be followed insofar as possible. If deviations from the layouts are necessitated by field conditions, detailed layouts of the proposed departures shall be submitted in writing to the Engineer for approval before proceeding with the work. The Contract Drawings are not intended to show every vertical or horizontal offset, which may be necessary to complete the systems. Contractors shall, however, anticipate that additional offsets may be required and submit their bid accordingly.

B. The drawings and specifications are intended to supplement each other. No Contractor or supplier shall take advantage of conflict between them, or between parts of either, but should this condition exist, the Contractor or supplier shall request a clarification of the condition at least ten days prior to the submission of bids so that the condition may be clarified by

Addendum. In the event that such a condition arises after work is started, the interpretation of the Engineer shall be the determining factor. In all instances, unless modified in writing and agreed upon by all parties thereto, the Contract to accomplish the work shall be binding on the affected Contractor.

C. The drawings and specifications shall be considered to be cooperative and complimentary and anything appearing in the specifications which may not be indicated on the drawings or conversely, shall be considered as part of the Contract and must be executed the same as though indicated by both.

D. This Contractor shall make all his own measurements in the field and shall be responsible for correct fitting. He shall coordinate this work with all other branches of work in such a manner as to cause a minimum of conflict or delay.

E. The Engineer shall reserve the right to make minor adjustments in location of conduit, fixtures, outlets, switches, etc., where he considers such adjustments desirable in the interest of concealing work or presenting a better appearance.

F. Each Contractor shall evaluate ceiling heights called for on Architectural Plans. Where the location of Electrical equipment may interfere with ceiling heights, the Contractor shall call this to the attention of the Engineer in writing prior to making the installation. Any such changes shall be anticipated and requested sufficiently in advance so as to not cause extra work on the part of the Contractor or unduly delay the work.

G. Should overlap of work between the various trades become evident, this shall be called to the attention of the Engineer. In such event neither trade shall assume that he is to be relieved of the work which is specified under his branch until instructions in writing are received from the Engineer.

H. The Electrical drawings are intended to show the approximate location of equipment, materials, etc. Dimensions given in figures on the drawings shall take precedence over scaled dimensions and all dimensions whether given in figures or scaled shall be verified in the field. In case of conflict between small and large-scale drawings, the larger scale drawings shall take precedence.

I. The Electrical Contractor and his Sub Contractors shall review all drawings in detail as they may relate to his work (structural, architectural, site survey, mechanical, etc.). Review all drawings for general coordination of work, responsibilities, ceiling clearances, wall penetration points, chase access, fixture elevations, etc. Make any pertinent coordination or apparent conflict comments to the Engineers at least ten days prior to bids, for issuance of clarification by written addendum.

J. Where on any of the drawings a portion of the work is drawn out and the remainder is indicated in outline, or not indicated at all, the parts drawn out shall apply to all other like portions of the work. Where ornament or other detail is indicated by starting only, such detail shall be continued throughout the courses or parts in which it occurs and shall also apply to all other similar parts of the work, unless otherwise indicated.

K. Special Note: Always check ceiling heights indicated on Drawings and Schedules and insure that these heights may be maintained after all mechanical and electrical equipment is installed. If a conflict is apparent, notify the Engineer in writing for instructions.

PART 4 - EXAMINATION OF SITE AND CONDITIONS

A. Each Contractor shall inform himself of all of the conditions under which the work is to be performed, the site of the work, the structure of the ground, the obstacles that may be encountered, the availability and location of necessary facilities and all relevant matters concerning the work. All Contractors shall carefully examine all Drawings and Specifications and inform themselves of the kind and type of materials to be used throughout the project and which may, in any way, affect the execution of his work.

B. Each Contractor shall fully acquaint himself with all existing conditions as to ingress and egress, distance of haul from supply points, routes for transportation of materials, facilities and services, availability of temporary or permanent utilities, etc. The Contractor shall include in his work all expenses or disbursements in connection with such matters and conditions. Each Contractor shall verify all work shown on the drawings and conditions at the site, and shall report in writing to the Engineer ten days prior to bid, any apparent omissions or discrepancies in order that clarifications may be issued by written addendum. No allowance is to be made for lack of knowledge concerning such conditions after bids are accepted.

PART 5 - EQUIPMENT AND MATERIALS SUBSTITUTIONS OR DEVIATIONS

A. When any Contractor requests review of substitute materials and/or equipment, and when under an approved formal alternate proposal, it shall be understood and agreed that such substitution, if approved, will be made without additional cost regardless of changes in connections, spacing, service, mounting, etc. In all cases where substitutions affect other trades, the Contractor offering such substitutions shall advise all such Contractors of the change and shall reimburse them for all necessary changes in their work. Any drawings, Specifications, Diagrams, etc., required to describe and coordinate such substitutions or deviations shall be professionally prepared at the responsible Contractor's expense. Special Note: Review of Shop Drawings by the Engineer does not absolve the Contractor of this responsibility.

B. References in the specifications to any article, device, product, material, fixture, form, or type of construction by name, make, or catalog number shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. Each Contractor, in such cases, may, at his option, use any article, device, product, material, fixture, form, or type of construction which in the judgment of the Engineer is equivalent to that specified, provided the provisions of paragraph (A) immediately preceding are met. Substitutions shall be submitted to the Engineer a minimum of ten days prior to bid date for approval to bid in written form thru addenda or other method selected by the Engineer. If prevailing laws of cities, towns, states or countries are more stringent than these specifications regarding such substitutions, then those laws shall prevail over these requirements.

C. Wherever any equipment and material is specified exclusively only such items shall be used unless substitution is accepted in writing by the engineers.

D. Each Contractor shall furnish along with his proposal a list of specified equipment and materials which he proposes to provide. Where several makes are mentioned in the Specifications and the Contractor fails to state, which he proposes to furnish, the Engineer shall have the right to choose any of the makes mentioned without change in price.

PART 6 - SUPERVISION OF WORK

A. Each Contractor and Sub-Contractors shall personally supervise the work or have a competent superintendent on the project site at all times during progress of the work, with full authority to act for him in matters related to the project.

PART 7 - CODES, RULES, PERMITS, FEES, REGULATIONS, ETC.

A. The Contractor shall give all necessary notices, obtain and pay for all permits, government sales taxes, fees, and other costs including utility connections or extensions, in connection with his work. As necessary, he shall file all required plans, utility easement requests and drawings, survey information on line locations, load calculations, etc., prepare all documents and obtain all necessary approvals of all utility and governmental departments having jurisdiction; obtain all required certificates of inspection for his work and deliver same to the Engineer before request for acceptance and final payment for the work.

B. Ignorance of Codes, Rules, regulations, utility company requirements, laws, etc., shall not diminish or absolve Contractor's responsibilities to provide and complete all work in compliance with such.

C. The Contractor shall include in the work, without extra cost, any labor, materials, services, apparatus or drawings required in order to comply with all applicable laws, ordinances rules and regulations, whether or not shown on drawings and/or specified.

D. All materials furnished and all work installed shall comply with the current edition of the National Electrical Codes, National Fire Codes of the National Fire Protection Association, the requirements of local utility companies, and with the requirements of all governmental agencies or departments having jurisdiction.

E. All material and equipment for the electrical systems shall bear the approval label, or shall be listed by the Underwriters' Laboratories, Incorporated. Listings by other testing agencies may be acceptable with written approval by the Engineer.

F. All electrical work is to be constructed and installed in accordance with plans and specifications, which have been approved in their entirety and/or reflect any changes requested by the University Fire Marshal, as applicable or required. Electrical work shall not commence until such plans are in the hands of the Electrical Contractor.

G. The Contractor shall insure that his work is accomplished in accord with OSHA Standards and any other applicable government requirements.

H. Where conflict arises between any code and the plans and/or specifications, the code shall apply except in the instance where the plans and specifications exceed the requirements of the code. Any changes required as a result of these conflicts shall be brought to the attention of the Engineer at least ten working days prior to bid date, otherwise the Contractor shall make the required changes at his own expense. The provisions of the codes constitute minimum standards for wiring methods, materials, equipment and construction and compliance therewith will be required for all electrical work, except where the drawings and specifications require better materials, equipment, and construction than these minimum standards, in which case the drawings and specifications shall be the minimum standards.

PART 8 - COST BREAKDOWNS

A. Within thirty days after acceptance of the Contract, each Contractor is required to furnish to the Engineer one copy of a detailed cost breakdown on each respective area of work. These cost breakdowns shall be made on forms provided or approved by the Engineer or Architect. Payments will not be made until satisfactory cost breakdowns are submitted.

PART 9 - GUARANTEES AND WARRANTIES

A. Each Contractor shall unconditionally guarantee all equipment, apparatus, materials, and workmanship entering into this Contract to be the best of its respective kind and shall replace all parts at his own expense, which fail or are deemed defective within one year from final acceptance of the work by the Engineer. The effective date of completion of the work shall be the date each or any portion of the work is accepted by the Engineer as being substantially complete.

B. Items of equipment which have longer guarantees, as called for in these specifications or as otherwise offered by the manufacturer, such as generators, engines, batteries, transformers, etc., shall have warranties and guarantees completed in order, and shall be in effect at the time of final acceptance of the work by the Engineer. The Contractor shall present the Engineer with such warranties and guarantees at the time of final acceptance of the work. The Owner reserves the right to use equipment installed by the Contractor prior to date of final acceptance. Such use of equipment shall in no way invalidate the guarantee except that Owner shall be

liable for any damage to equipment during this period due to negligence of his operator or other employee.

PART 10 - INSPECTION, APPROVALS AND TESTS

A. Before requesting a final review of the installation from the Architect and/or Engineer, the Contractor shall thoroughly inspect his installation to assure that the work is complete in every detail and that all requirements of the Contract Documents have been fulfilled. Failure to accomplish this may result in charges from the Architect and/or Engineers for unnecessary and undue work on their part.

B. The Contractor shall provide as a part of this contract electrical inspection by a competent Electrical Inspection Agency, licensed to provide such services. The name of this agency shall be included in the list of materials of the Form of Proposal by the Contractor. All costs incidental to the provision of electrical inspections shall be borne by the Electrical Contractor.

C. The Contractor shall advise each Inspection Agency in writing (with an information copy of the correspondence to the Architect and/or Engineer) when he anticipates commencing work. Failure of the Inspection Agency to inspect the work in the stage following and submit the related reports may result in the Contractor’s having to expose concealed work not so inspected. Such exposure will be at the expense of the responsible Contractor.

D. Inspections shall be scheduled for rough as well as finished work. The rough inspections shall be divided into as many inspections as may be necessary to cover all roughing-in without fail. Report of each such inspection visit shall be submitted to the Architect, Engineer and the Contractor within three days of the inspection.

E. Approval by an Inspector does not relieve the Contractor from the responsibilities of furnishing equipment having a quality of performance equivalent to the requirements set forth in these plans and specifications. All work under this contract is subject to the review of the Architect and/or Engineer, whose decision is binding.

F. Before final acceptance, the Contractor shall furnish three copies of the certificates of final approval by the Electrical Inspector (as well as all other inspection certificates) to the Engineer with one copy of each to the appropriate government agencies, as applicable. Final payment for the work shall be contingent upon completion of this requirement.

G. The Contractor shall test all wiring and connections for continuity and grounds before equipment and fixtures are connected, and when indicated or required, demonstrate by Megger Test the insulation resistance of any circuit or group of circuits. Where such tests indicate the possibility of faulty insulation, locate the point of such fault, pull out the defective conductor, replacing same with new and demonstrate by further test the elimination of such defect.

PART 11 - CHANGES IN ELECTRICAL WORK

A. REFER TO GENERAL AND SPECIAL CONDITIONS.

PART 12 - CLAIMS FOR EXTRA COST

A. REFER TO GENERAL AND SPECIAL CONDITIONS.

PART 13 - SURVEYS, MEASUREMENTS AND GRADES

A. The Contractor shall lay out his work and be responsible for all necessary lines, levels, elevations and measurements. He must verify the figures shown on the drawings before laying out the work and will be held responsible for any error resulting from his failure to do so.

B. The Contractor shall base all measurements, both horizontal and vertical from established benchmarks. All work shall agree with these established lines and levels. Verify all measurements at site and check the correctness of same as related to the work.

C. Should the Contractor discover any discrepancy between actual measurements and those indicated, which prevents following good practice or the intent of the drawings and specifications, he shall notify the Engineer thru normal channels of job communication and shall not proceed with his work until he has received instructions from the Engineer.

PART 14 - TEMPORARY USE OF EQUIPMENT

A. The permanent electrical equipment, when installed, may be used for temporary services, subject to an agreement among the Contractors involved, the Owner, and with the consent of the Engineer. Should the permanent systems be used for this purpose, each Contractor shall pay for all temporary connections required and any replacements required due to damage without cost, leaving the equipment and installation in “as new” condition. The Contractor may be required to bear utility costs, user fees, etc.

B. Permission to use the permanent equipment does not relieve the Contractors who utilize this equipment from the responsibility for any damages to the building construction and/or equipment, which might result because of its use.

PART 15 - TEMPORARY SERVICES

A. The Contractor shall arrange for temporary electrical and other services, which he may require to accomplish his work. In the absence of other provisions in the contract, the Contractor shall provide for his own temporary services of all types, including the cost of connections, utility company fees, construction, removal, etc., in his bid.

PART 16 - RECORD DRAWINGS

A. The Contractor shall insure that any deviations from the design are being recorded daily or as necessary on record drawings being maintained by the Contractor. Dimensions from fixed, visible permanent lines or landmarks shown in vertical and horizontal ways shall be utilized. Compliance shall be a requirement for final payment. Pay particular attention to the location of underfloor or underground exterior in-contract or utility-owned or leased service lines, main switches and other appurtenances important to the maintenance and safety of the Electrical System. Deliver these record drawings to the Engineer at the completion of the work.

PART 17 - MATERIALS AND WORKMANSHIP

A. All electrical equipment, materials and articles incorporated in the work shall be new and of comparable quality to that specified. All workmanship shall be first-class and shall be performed by electricians skilled and regularly employed in their respective trades. The Contractor shall determine that the equipment he proposes to furnish can be brought into the building(s) and installed within the space available. All equipment shall be installed so that all parts are readily accessible for inspection, maintenance, replacement, etc. Extra compensation will not be allowed for relocation of equipment for accessibility or for dismantling equipment to obtain entrance into the building(s).

B. All conduit and/or conductors shall be concealed in or below walls, floors or above ceilings unless otherwise noted. All fixtures, devices and wiring required shall be installed to make up complete systems as indicated on the drawings and specified herein.

C. All materials, where applicable, shall bear Underwriters’ Laboratories label or that of another Engineer-approved testing agency, where such a standard has been established.

D. Each length of conduit, wireway, duct, conductor, cable, fitting, fixture and device used in the electrical systems shall be stamped or indelibly marked with the makers mark or name.

E. All electrical equipment shall bear the manufacturer's name and address and shall indicate its electrical capacity and characteristics.

F. All electrical materials, equipment and appliances shall conform to the latest standards of the National Electric Manufacturers Association (NEMA) and the National Board of Fire Underwriters (NBFU) and shall be approved by the Owner's insuring agency if so required.

PART 18 - QUALIFICATIONS OF WORKMEN

A. All electrical contractors bidding this project must have been a licensed company for a minimum of three years to qualify to bid this project. Individual employee experience does not supercede this requirement.

B. All subcontractors bidding the electrical work must have completed one project of 70% this subcontract cost size and two projects of 50% this subcontract cost size.

C. All electrical work shall be accomplished by qualified workmen competent in the area of work for which they are responsible. Untrained and incompetent workmen as evidenced by their workmanship shall be relieved of their responsibilities in those areas. The Engineer shall reserve the right to determine the quality of workmanship of any workman and unqualified or incompetent workmen shall refrain from work in areas not satisfactory to him. Requests for relief of a workman shall be made through the normal channels of responsibility established by the Architect or the contract document provisions.

D. All electrical work shall be accomplished by Journeymen electricians under the direct supervision of a licensed Electrician. All applicable codes, utility company regulations, laws and permitting authority of the locality shall be fully complied with by the Contractor.

E. Special electrical systems, such as Fire Detection and Alarm Systems, Telecommunications or Data Systems, Video Systems, Special Electronic Systems, Control Systems, etc., shall be installed by workmen normally engaged or employed in these respective trades. As an exception to this, where small amounts of such work are required and are, in the opinion of the Engineer, within the competency of workmen directly employed by the Contractor involved, they may be provided by this Contractor. See 16710 for qualification requirements for telecommunication contractor who is responsible for the network cable and equipment installation.

PART 19 - CONDUCT OF WORKMEN

A. The Contractor shall be responsible for the conduct of all workmen under his supervision. Misconduct on the part of any workmen to the extent of creating a safety hazard, or endangering the lives and property of others, shall result in the prompt relief of that workman. The consumption or influence of alcoholic beverages, narcotics or illegally used controlled substances on the jobsite is strictly forbidden.

PART 20 - COOPERATION AND COORDINATION BETWEEN TRADES

A. The Contractor is expressly directed to read the General Conditions and all detailed sections of these specifications for all other trades and to study all drawings applicable to his work, including Architectural, Mechanical, Structural and other pertinent Drawings, to the end that complete coordination between trades will be effected.

B. Refer to Coordination Among Trades, Systems Interfacing and Connection of Equipment Furnished by Others section of these Specifications for further coordination requirements.

PART 21 - PROTECTION OF EQUIPMENT

A. The Contractor shall be entirely responsible for all material and equipment furnished by him in connection with his work and special care shall be taken to properly protect all parts thereof from damage during the construction period. Such protection shall be by a means acceptable to the Engineer. All rough-in conduit shall be properly plugged or capped during construction in a manner approved by the Engineer. Equipment damaged while stored on site either before or after installation shall be repaired or replaced (as determined by the Engineer) by the responsible Contractor.

PART 22 - SMOKE AND FIRE PROOFING

A. The Contractor shall not penetrate rated firewalls, ceilings or floors with conduit, cable, bus duct, wireway or other raceway system unless all penetrations are protected in a code compliant manner which maintains the rating of the assembly. Smoke and fire stop all openings made in walls, chases, ceiling and floors. Patch all openings around conduit, wireway, bus duct, etc., with appropriate type material to smoke stop walls and provide needed fire rating at fire walls, ceilings and floors. Smoke and fire proofing materials and method of application shall be approved by the local authority having jurisdiction.

B. Contractor to provide heat detectors in the area of construction with complete fire detection until fire alarm system is operational and construction is complete.

PART 23 - QUIET OPERATION, SUPPORTS, VIBRATION AND OSCILLATION

A. All work shall operate under all conditions of load without any objectionable sound or vibration, the performance of which shall be determined by the Engineer. Noise from moving machinery or vibration noticeable outside of room in which it is installed, or annoyingly noticeable noise or vibration inside such room, will be considered objectionable. Sound or vibration conditions considered objectionable by the Engineer shall be corrected in an approved manner by the Contractor (or Contractors responsible) at his expense.

B. All equipment subject to vibration and/or oscillation shall be mounted on vibration supports suitable for the purpose of minimizing noise and vibration transmission, and shall be isolated from external connections such as piping, ducts, etc., by means of flexible connectors, vibration absorbers or other approved means. Surface mounted equipment such as panels, switches, etc., shall be affixed tightly to their mounting surface.

C. The Contractor shall provide supports for all equipment furnished by him using an approved vibration isolating type as needed. Supports shall be liberally sized and adequate to carry the load of the equipment and the loads of attached equipment, piping, etc. All equipment shall be securely fastened to the structure either directly or indirectly through supporting members by means of bolts or equally effective means. No work shall depend on the supports or work of unrelated trades unless specifically authorized in writing by the Architect or Engineer.

PART 24 - FINAL CONNECTIONS TO EQUIPMENT

A. The roughing-in and final connections to all electrically operated equipment furnished under this and all other sections of the contract documents or by others, shall be included in the Contract and shall consist of furnishing all labor and materials for connection. The Contractor shall carefully coordinate with equipment suppliers, manufacturer’s representatives, the vendor or other trades to provide complete electrical and dimensional interface to all such equipment (kitchen, hoods, mechanical equipment, panels, refrigeration equipment, etc.).

PART 25 - NOT USED

PART 26 - ACCESSIBILITY

A. The Contractor shall be responsible for the sufficiency of the size of shafts and chases, the adequate clearance in partitions and above suspended ceilings for the proper installation of his work. He shall cooperate with the Construction Manager and all other Contractors whose work is in the same space, and shall advise each Contractor of his requirements. Such spaces and clearances shall be kept to the minimum size required to ensure adequate clearance and access.

B. The Contractor shall locate all equipment, which must be serviced, operated, or maintained in fully accessible positions. Equipment shall include but not be limited to junction boxes, pull boxes, contactors, panels, disconnects, controllers, switchgear, etc. Minor deviations from drawings may be made to allow for better accessibility, and any change shall be approved where the equipment is concealed.

C. Each Contractor shall provide (or arrange for the provision by other trades) the access panels for each concealed junction box, pull box, fixtures or electrical device requiring access or service as shown on Engineer's plans or as required. Locations of these panels shall be identified in sufficient time to be installed in the normal course of work. All access panels shall be installed in accord with the Architect's standards for such work.

D. Access Doors; in Ceilings or Walls:

1. In mechanical, electrical, or service spaces: 14 gauge aluminum brushed satin finish, 1" border.
2. In finished areas: 14 gauge primed steel with 1" border to accept the architectural finishes specified for the space. Confirm these provisions with the Architect prior to obtaining materials or installing any such work.
3. In fire or smoke rated partitions, access doors shall be provided that equal or exceed the required rating of the construction they are mounted in.

PART 27 - ELECTRICAL CONNECTIONS

A. The Contractor shall furnish and install all power wiring complete from power source to motor or equipment junction box, including power wiring through starters. The Contractor shall install all starters not factory mounted on equipment. Unless otherwise noted, the supplier of equipment shall furnish starters with the equipment. Also refer to Division 20 of Specifications, shop drawings and equipment schedules for additional information.

B. All control, interlock, sensor, thermocouple and other wiring required for equipment operation shall be provided by the Contractor. All such installations shall be fully compliant with all requirements of Division 26 regardless of which trade actually installs such wiring. Motors and equipment shall be provided for current and voltage characteristics as indicated or required. All wiring shall be enclosed in raceways unless otherwise noted.

C. Each Contractor or sub-contractor, prior to bidding the work, shall coordinate power, control, sensor, interlock and all other wiring requirements for equipment or motors with all other contractors or sub-contractors, to ensure all needed wiring is provided in the Contract. Failure to make such coordination shall not be justification for claims of extra cost or a time extension to the Contract.

PART 28 - MOTORS

A. Each motor shall be provided by the equipment supplier, installer or manufacturer with conduit terminal box and N.E.C. required disconnecting means as indicated or required. Three-phase motors shall be provided with external thermal overload protection in their starter units. Single-

phase motors shall be provided with thermal overload protection, integral to their windings or external, in control unit. All motors shall be installed with NEMA-rated starters as specified and shall be connected per the National Electrical Code.

B. The capacity of each motor shall be sufficient to operate associated driven devices under all conditions of operation and load and without overload, and at least of the horsepower indicated or specified. Each motor shall be selected for quiet operation, maximum efficiency and lowest starting KVA per horsepower as applicable. Motors producing excessive noise or vibration shall be replaced by the responsible contractor. See Division 15 of Specifications for further requirements and scheduled sizes.

PART 29 - CUTTING AND PATCHING

A. Unless otherwise indicated or specified, the Contractor shall provide cutting and patching necessary to install the work specified in this Division. Patching shall match adjacent surfaces to the satisfaction of the Engineer and shall be in accord with the Architect's standards for such work, as applicable.

B. No structural members shall be cut without the approval of the Structural Engineer and all such cutting shall be done in a manner directed by him.

PART 30 - SLEEVES AND PLATES

A. Each Contractor shall provide and locate all sleeves and inserts required for his work before the floors and walls are built, or shall be responsible for the cost of cutting and patching required where sleeves and inserts were not installed, or where incorrectly located. Each Contractor shall do all drilling required for the installation of his hangers. Drilling of anchor holes may be prohibited in post-tensioned concrete construction, in which case the Contractor shall request approved methods from the Architect and shall carefully coordinate setting of inserts, etc., with the Structural Engineer and/or Architect.

B. Sleeves shall be provided for all electrical conduit passing thru concrete floor slabs and concrete, masonry, tile and gypsum wall construction. Sleeves shall not be provided for piping running embedded in concrete or insulating concrete slabs on grade, unless otherwise noted.

C. Where sleeves are placed in exterior walls below grade, the space between the pipe or conduit and the sleeves shall be packed with oakum and lead, mechanical waterstop or other approved material and made completely watertight by a method approved by the Engineer and/or Architect.

D. Where conduit motion due to expansion and contraction will occur, make sleeves of sufficient diameter to permit free movement of pipe. Check floor and wall construction finishes to determine proper length of sleeves for various locations; make actual lengths to suit the following:

1. Terminate sleeves flush with walls, partitions and ceiling.
2. In areas where pipes are concealed, as in chases, terminate sleeves flush with floor.
3. In all areas where pipes are exposed, extend sleeves ½ inch above finished floor, except in rooms having floor drains, where sleeves shall be extended 3/4 inches above floor.

E. Sleeves shall be constructed of 24 gauge galvanized sheet steel with lock seam joints for all sleeves set in concrete floor slabs terminating flush with the floor. All other sleeves shall be constructed of galvanized steel pipe unless otherwise indicated on the drawings.

F. Fasten sleeves securely in floors, walls, so that they will not become displaced when concrete is poured or when other construction occurs around them. Take precautions to prevent concrete, plaster or other materials being forced into the space between pipe and sleeve during construction. Fire and smoke stop all sleeves in a manner approved by the local authority having jurisdiction or per prevailing codes.

PART 31 - WEATHERPROOFING

A. Where any work pierces waterproofing, including waterproof concrete, the method of installation shall be as approved by the Architect and/or Engineer before work is done. The Contractor shall furnish all necessary sleeves, caulking and flashing required to make openings absolutely watertight.

B. Wherever work penetrates roofing, it shall be done in a manner that will not diminish or void the roofing guarantee or warranty in any way. Coordinate all such work with the roofing installer.

PART 32 - OPERATING INSTRUCTIONS

A. Upon completion of all work and all tests, each Contractor shall furnish the necessary skilled labor and helpers for operating his systems and equipment for a period of three days of eight hours each, or as otherwise specified. During this period, instruct the Owner or his representative fully in the operations, adjustment, and maintenance of all equipment furnished. Give at least one week's written notice to the Owner, Architect and Engineer in advance of this period. The Engineer may attend any such training sessions or operational demonstrations. The Contractor shall certify in writing to the Engineer that such demonstrations have taken place, noting the date, time and names of the Owner's representative that were present.

B. Each Contractor shall furnish three complete bound sets for approval to the Engineer of typewritten and/or blueprinted instructions for operating and maintaining all systems and equipment included in this contract. All instructions shall be submitted in draft, for approval, prior to final issue. Manufacturer's advertising literature or catalogs will not be acceptable for operating and maintenance instructions.

C. Each Contractor, in the above-mentioned instructions, shall include the maintenance schedule for the principal items of equipment furnished under this contract and a detailed, easy to read parts list and the name and address of the nearest source of supply.

PART 33 - SCAFFOLDING, RIGGING AND HOISTING

A. The Contractor shall furnish all scaffolding, rigging, hoisting, and services necessary for erection and delivery into the premises of any equipment and apparatus furnished. Remove same from premises when no longer required.

PART 34 - CLEANING

A. The Contractor shall, at all times, keep the area of his work presentable to the public and clean of rubbish caused by his operations; and at the completion of the work, shall remove all rubbish, all of his tools, equipment, temporary work and surplus materials, from and about the premises, and shall leave the work clean and ready for use. If the Contractor does not attend to such cleaning immediately upon request, the Engineer may cause cleaning to be done by others and charge the cost of same to the responsible Contractor. Each Contractor shall be responsible or all damage from fire, which originates in, or is propagated by, accumulations of his rubbish or debris.

B. After completion of all work and before final acceptance of the work, each Contractor shall thoroughly clean all equipment and materials and shall remove all foreign matter such as grease, dirt, plaster, labels, stickers, etc., from the exterior of materials, equipment and all associated fabrication. Pay particular attention to finished area surfaces such as lighting fixture lenses, lamps, reflectors, panels, etc.

PART 35 - PAINTING

A. Each fixture device, panel, junction box, etc., that is located in a finished area shall be provided with finish of color and type as selected or approved by the Architect or Engineer. If custom

color is required, it shall be provided at no additional cost to the Owner. All other equipment, fixtures or devices located in finished or unfinished areas, that are not required to have or are provided with finish color or coating shall be provided in a prime painted condition, ready to receive finish paint or coating. All galvanized metal in finished areas shall be properly prepared with special processes to receive finish paint as directed and approved by the Architect.

PART 36 - INDEMNIFICATION

A. The Contractor shall hold harmless and indemnify the Engineer, employees, officers, agents and consultants from all claims, loss, damage, actions, causes of actions, expense and/or liability resulting from, brought for, or on account of any personal injury or property damage received or sustained by any person, persons, (including third parties), or any property growing out of, occurring, or attributable to any work performed under or related to this contract, resulting in whole or in part from the negligence of the Contractor, any subcontractor, any employee, agent or representative.

PART 37 - HAZARDOUS MATERIALS

A. The Contractor is hereby advised that it is possible that asbestos and/or other hazardous materials are or were present in this building(s). Any worker, occupant, visitor, inspector, etc., who encounters any material of whose content they are not certain shall promptly report the existence and location of that material to the Contractor and/or Owner. The Contractor shall, as a part of his work, insure that his workers are aware of this potential and what they are to do in the event of suspicion. He shall also keep uninformed persons from the premises during construction. Furthermore, the Contractor shall insure that no one comes near to or in contact with any such material or fumes therefrom until its content can be ascertained to be non-hazardous.

B. CMTA, Inc., Consulting Engineers, have no expertise in the determination of the presence of hazardous materials. Therefore, no attempt has been made by them to identify the existence or location of any such material. Furthermore, CMTA nor any affiliate thereof will neither offer nor make any recommendations relative to the removal, handling or disposal of such material.

C. If the work interfaces, connects or relates in any way with or to existing components which contain or bear any hazardous material, asbestos being one, then, it shall be the Contractor’s sole responsibility to contact the Owner and so advise him immediately.

D. The Contractor by execution of the contract for any work and/or by the accomplishment of any work thereby agrees to bring no claim relative to hazardous materials for negligence, breach of contract, indemnity, or any other such item against CMTA, its principals, employees, agents or consultants. Also, the Contractor further agrees to defend, indemnify and hold CMTA, its principals, employees, agents and consultants, harmless from any such related claims which may be brought by any subcontractors, suppliers or any other third parties.

PART 38 - ABOVE-CEILING AND FINAL PUNCH LISTS

A. The Contractor shall review each area and prepare a punch list for each of the subcontractors, as applicable, for at least two stages of the project.

1. For review of the above-ceiling work that will be concealed by tile or other materials well before substantial completion.
2. For review of all other work as the project nears substantial completion.

B. When <u>all</u> work form the Contractor’s punch list is complete at each of these stages and <u>prior</u> to completing ceiling installations (or at the final punch list stage), the Contractor shall request that the Engineer develop a punch list. This request is to be made in writing seven days prior to the proposed date. After all corrections have been made from the Engineer’s punch list, the

Contractor shall review and initial off on each item. This signed-off punch list and all work prior to the ceilings being installed and at the final punch list review.

C. If additional visits are required by the Engineer to review work not completed by this review, the Engineer shall be reimbursed directly by the Contractor by check or money order (due net 10 days from date of each additional visit) at a rate of $125.00 per hour for extra trips required to complete either of the above-ceiling or final punch lists.

END OF SECTION 26 0501

SECTION 26 0502 - SCOPE OF THE ELECTRICAL WORK

PART 1 - GENERAL

A. Each Electrical Contractor's attention is directed to Section 260501 “General Provisions-Electrical,” and all other Contract Documents as they apply to his work.

PART 2 - SCOPE OF THE ELECTRICAL WORK

A. The Electrical work for this project includes all labor, materials, equipment, fixtures, and related items required to completely install, test, place in service and deliver to the Owner complete electrical systems in accordance with the accompanying plans and all provisions of these specifications. This work shall primarily include, but is not limited to the following:

Selective demolition of existing electrical and communication systems where indicated. Refer to the Section 024119 “Selective Demolition” for Salvage List and drawings for items to be removed and returned to the University.
Preparation of buildings for gross demolition, including removal of services and temporary construction necessary to allow safe removal of each structure.
Installation and maintenance of temporary electrical feeds to support infrastructure affected by demolition.
All conduits, conductors, pull boxes, manholes, fittings, etc.
Cable splicing, terminations, testing, supports, etc.
Inspection of electrical system by licensed Electrical Inspector.
Paying all necessary fees and cost for permits, inspections, work, etc.

END OF SECTION 26 0502

SECTION 26 0503 - SHOP DRAWINGS, LITERATURE, MANUALS, PARTS LISTS, AND SPECIAL TOOLS

PART 1 - SHOP DRAWINGS

A. Each Contractor shall submit to the Architect and/or Engineer, within thirty days after the date of the Contract, one set of shop drawings and/or manufacturer's descriptive literature on all equipment required for the fulfillment of his contract via eComm. Each shop drawing and/or manufacturer's descriptive literature shall have proper notation indicated on it and shall be clearly referenced so the specifications, schedules, light fixture numbers, panel names and numbers, etc., so that the Architect and/or Engineer may readily determine the particular item the Contractor proposes to furnish. All data and information scheduled, noted or specified by hand shall be noted in color red on the submittals. The Contractor shall make any corrections or changes required and shall resubmit for final review as requested. Review of such drawings, descriptive literature and/or schedules shall not relieve the Contractor from responsibility for deviation from drawings or specifications unless they have, in writing, directed the reviewer's attention to such deviations at the time of submission of drawings, literature and manuals; nor shall it relieve them from responsibility for errors or omissions of any nature in shop drawings, literature and manuals. The term "as specified" will not be accepted.

B. If the Contractor fails to comply with the requirements set forth above, the Architect and/or Engineer shall have the option of selecting any or all items listed in the specifications or on the drawings, and the Contractor will be required to provide all materials in accordance with this list.

C. Review of shop drawings by the Engineer applies only to conformance with the design concept of the project and general compliance with the information given in the contract documents. In all cases, the installing Contractor alone shall be responsible for furnishing the proper quantity of equipment and/or materials required, for seeing that all equipment fits the available space in a satisfactory manner and that piping, electrical and all other connections are suitably located.

D. The Engineer's review of shop drawings, schedules or other required submittal data shall not relieve the Contractor from responsibility for the adaptability of the equipment or materials to the project, compliance with applicable codes, rules, regulations, information that pertains to fabrication and installation, dimensions and quantities, electrical characteristics, and coordination of the work with all other trades involved in this project.

E. No cutting, fitting, rough-in, connections, etc., shall be accomplished until reviewed equipment shop drawings are in the hands of the Contractors concerned. It shall be each Contractor's responsibility to obtain reviewed shop drawings and to make all connections, etc. in the neatest and most workmanlike manner possible. Each Contractor shall coordinate with all the other Contractors having any connections, roughing-in, etc., to the equipment, to make certain proper fit, space coordination, voltage and phase relationships are accomplished.

F. In accord with the provisions specified hereinbefore, shop drawings, descriptive literature and schedules shall be submitted on each of the following indicated items as well as any equipment or systems deemed necessary by the Engineer:

1. Conduit and fittings
2. Manhole shop drawings and accessories
3. Composite pullboxes

PART 2 - SPECIAL WRENCHES, TOOLS AND KEYS

A. Each Contractor shall provide, along with the equipment provided, any special wrenches or tools necessary to dismantle or service equipment or appliances installed by him. Wrenches shall include necessary keys, handles and operators for valves, switches, breakers, etc. and keys to electrical panels, emergency generators, alarm pull boxes and panels, etc. At least two of any such special wrench, keys, etc. shall be turned over to the Architect prior to completion of

the project. Obtain a receipt that this has been accomplished and forward a copy to the Engineer.

END OF SECTION 26 0503

SECTION 26 0505 – DEMOLITION, RESTORATION AND SALVAGE

PART 1 - GENERAL

A. The Contractor's attention is directed to the General and Special Conditions and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to all other sections of the Contract Documents which affect the work of this section and which are hereby made a part of the work specified in this section.

B. It is the intent of this Section to completely remove all components of any existing electrical system in the 1937 Student Union and Alumni Gym (switchgear, switchboards, panelboards, transformers, light fixtures, outlets, fire alarm system, video surveillance, security, etc.) and items associated with the required architectural Selective demolition, Section 024119, specified in the Contract Documents. The Contractor shall field verify existing conditions prior to bid.

C. This section also includes Structural Demolition, Section 024116, of the Subsequent additions to the original Student Union as identified on the Architectural plans and specifications.

D. Existing site utilities for electrical systems are being cut and capped outside of the building footprint as part of BP#1. All utilities under existing buildings to be removed shall be completely excavated and removed.

E. Refer to Specification Section 003119 "Existing Condition Information" for list of existing drawings available to Bidders.

PART 2 - ELECTRICAL DEMOLITION

A. It is the intent of this Section to completely remove all components of the existing Electrical Systems in the 1937 Student Union and Alumni Gym and items associated with the required architectural demolition specified in the Contract Documents. The general scope of the demolition is indicated on the Architectural drawings. All electrical equipment, devices, accessories, etc. shall be removed. Also remove all associated branch circuits, feeders, conduits, hangers, concrete pads, controls, etc. Where light fixtures, outlets and equipment connections are removed, all associated conduit and conductors shall be removed in accordance with the Building Code. The Contractor shall field verify existing conditions prior to bid.

B. The major Electrical systems and components include but are not limited to:

1. Medium Voltage Transformers, Switchgear,
2. Switchboards, Motor Control Centers, Panelboards, Low Voltage Transformers,
3. Raceways, Conduit, Hangers, Supports, Conductors, Wires, Cables,
4. Disconnects, Combination Starter/Disconnects, Starters, Fuses,
5. Motor Rated Toggle Switches, Receptacles, Outlets,
6. Mechanical/Plumbing/Fire Protection Equipment Electrical Connections
7. Light Fixtures, Poles, Lamps, Ballasts,
8. Generator, Transfer Switches,
9. Grounding Systems, Lightning Protection System,
10. Fire Alarm System, Telecommunication/Voice System,
11. Security System, Video Surveillance System and Door Access System

C. UK IT Department will perform all disconnecting of cable infrastructure (fiber, copper, coax) coming into the building and remove cables back to the manholes. After UK IT Department disconnects the service entrance low-voltage cable, the Contractor shall remove all low-voltage cables (fiber, copper and coax) complete.

D. All underslab conduits and raceways abandoned in place for building that are to be renovated, shall be made safe in compliance with the Building and Electrical Code. Fill all abandoned

conduits with grout, seal and cap at time of work. Above slab conduit is not allowed to be abandoned and must be removed.

E. Remove exposed abandoned grounding and bonding components, fasteners and supports, and electrical identification components, including abandoned components above accessible ceiling finishes and below raised floor areas. Cut embedded support elements flush with walls and floors.

F. For portions of the building structure that are to remain, the Contractor shall be responsible for patching and repairing, by all qualified tradesmen, all holes, etc. in the ceilings, walls, roof and floors where electrical outlets, receptacles, cabling, conduit, sleeves, fixtures, equipment, accessories, etc. are removed.

G. Coordinate and sequence demolition so as not to cause shutdown of operation of surrounding areas.

H. Provide temporary egress signage and emergency lighting, as required.

I. Cleaning: Remove demolished materials as work progresses and keep workplace neat.

PART 3 - LAMP DISPOSAL

A. Contractor shall be responsible for the careful removal of all lamps and fluorescent tubes without breakage from existing lighting fixtures.

B. Lamps removed from fluorescent, metal halide, mercury vapor, and sodium fixtures shall be placed by the Contractor in cardboard boxes. The Contractor shall label each box with type and quantity of lamps in each box and seal the box. Boxes shall be properly disposed of.

C. Broken fluorescent, metal halide, mercury vapor, and sodium lamps shall be immediately and carefully cleaned up by the Contractor and placed in a 55-gallon steel drum. The Contractor shall properly dispose of.

D. All incandescent lamps shall be disposed of by the Contractor in his dumpster.

PART 4 - SALVAGE

A. It is the intent of this section to deliver to the Owner all components, which may be economically reused by them. The Contractor shall make every effort to remove reusable components without damage.

B. Components to be delivered to the Owner shall be specifically identified by the Owner’s representative prior to beginning the demolition. The Contractor shall prepare a letter of transmittal of all salvaged items and obtain the Owner’s signature and date of receipt.

C. The Contractor shall salvage and store the following items for the use in the new construction project:

1. 1937 Student Union: The large “Art Deco” ceiling chandelier light fixtures from the Harris Ballroom.
2. 1937 Student Union: The large “Art Deco” ceiling pendant light fixtures from the Great Hall.
3. 1937 Student Union: The “Art Deco” wall sconce light fixtures from the Great Hall.
4. 1937 Student Union: The two (2) wrought iron outdoor wall sconce light fixtures.

D. The Contractor shall salvage and package the following items and return them to the Owner at the Owner’s designated location on campus:

1. Electrical Switches from Manholes
2. Outdoor Pole Mounted Light Fixtures and Poles
3. Theatrical Light Fixtures and Dimming Systems
4. Sound Systems

5. Simplex 4100 Fire Alarm Control Panel and Devices
6. Video Surveillance Cameras
7. Primex Clock System

E. Owner will salvage the following items prior to demolition:

1. Custom Table Lamps in the 1937 Student Union Great Hall
2. Network switches
3. UPS Devices
4. Wireless Access Points
5. Key Systems/PBX
6. Security Equipment – Gateways, Controllers, etc.

F. Other items become the property of the Contractor and are to be removed from the site and disposed of properly.

G. Refer also to Selective Demolition attachment for additional items.

END OF SECTION 26 0505

SECTION 26 0508 - COORDINATION AMONG TRADES, SYSTEMS INTERFACING AND CONNECTION OF EQUIPMENT FURNISHED BY OTHERS

PART 1 - COORDINATION

A. The Contractor is expressly directed to read the General Conditions and all sections of these specifications for all other trades and to study all drawings applicable to his work, including Architectural, Plumbing Fire Protection, Mechanical and Structural drawings, to the end that complete coordination between trades will be affected. Each Contractor shall make known to all other contractors the intended positioning of materials, raceways, supports, equipment and the intended order of his work. Coordinate all work with other trades and proceed with the installation in a manner that will not create delays for other trades or affect the Owner's operations.

B. Special attention to coordination shall be given to points where raceways, fixtures, etc., must cross other ducts or conduit, where lighting fixtures must be recessed in ceilings, and where fixtures, conduit and devices must recess into walls, soffits, columns, etc. It shall be the responsibility of each Contractor to leave the necessary room for other trades. No extra compensation or time will be allowed to cover the cost of removing fixtures, devices, conduit, ducts, etc. or equipment found encroaching on space required by others.

C. The Contractor shall be responsible for coordination with all trades to insure that they have made provision for connections, operational switches, disconnect switches, fused disconnects, etc., for electrically operated equipment provided under this or any other division of the specifications, or as called for on the drawings. Any connection, circuiting, disconnects, fuses, etc. that are required for equipment operation shall be provided as a part of this contract.

D. If any discrepancies occur between accompanying drawings and these specifications and drawings and specifications covering other trade's work, each trade shall report such discrepancies to the Architect far enough in advance so that a workable solution can be presented. No extra payment will be allowed for relocation of fixtures, devices, conduit, and equipment not installed or connected in accordance with the above instructions.

E. In all areas where air diffusers, devices, lighting fixtures and other ceiling-mounted devices are to be installed, the Mechanical Trade(s) and the Electrical Trade and the General Trades shall coordinate their respective construction and installations so as to provide a combined symmetrical arrangement that is acceptable to the Architect and Engineer. Where applicable, refer to reflected ceiling plans. Request layouts from the Architect or Engineer where in doubt about the potential acceptability of an installation.

PART 2 - INTERFACING

A. Each Electrical Trade, Specialty Controls Trade, Mechanical Trade and the General Trades, etc., shall insure that coordination is effected relative to interfacing of all systems. Some typical interface points are (but not necessarily all):

1. Coordination of connection of Telecommunications (voice, video, data) lines to Owner's existing or new services.
2. Connection of all controls to equipment.
3. Electrical power connections to electrically operated (or controlled) equipment.
4. Electrical provisions for all equipment provided by other trades or suppliers within this contract.
5. Contractor is to provide conduit whips and back boxes as needed to power systems furniture.

PART 3 - CONNECTION OF EQUIPMENT FURNISHED BY OTHERS

A. Each Contractor shall make all connections to equipment furnished by others, whenever such equipment is shown on any part of the drawings or mentioned in any part of the Specifications, unless otherwise specifically specified hereinafter.

B. All drawings are complementary, one trade of the other. It is the Contractor's responsibility to examine all drawings and specifications to determine the full scope of his work. The project Engineers have arranged the specifications and drawings in their given order solely as a convenience in organizing the project, and in no way shall they imply the assignment of work to specific trades, contractors, subcontractors or suppliers.

C. Supervision to assure proper installation, functioning and operation shall be provided by the Contractor furnishing the equipment or apparatus to be connected.

D. Items indicated on the drawings as rough-in only (RIO) will be connected by the equipment supplier or Owner, as indicated. The Contractor shall be responsible for rough-in provisions only as indicated. These rough-ins shall be in accord with the manufacturer's or supplier's requirements.

E. For items furnished by others, relocated, or RIO, the Contractor shall obtain from the supplier or shall field determine as appropriate, the exact rough-in locations and connection sizes for the referenced equipment.

F. The Contractor shall be responsible for coordinating with the General and all other trades, as necessary, to determine any and all final connections that he is to make to equipment furnished by others.

END OF SECTION 26 0508

SECTION 26 0513 - MEDIUM-VOLTAGE CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this Section.

B. All materials and installation shall comply with University construction standards. These standards are available at: https://www.uky.edu/cpmd/official-design-standards. Special attention shall be given to Divisions 02, 16 and 17. In the event of a conflict between these standards and the Contract Documents the most stringent requirement shall be met.

1.2 SUMMARY

A. Section includes cable splices, terminations, and accessories for medium-voltage (2001 to 35,000 V) electrical distribution systems.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of splice and termination for cables and cable accessories.

1.4 Retain “Samples” Paragraph below for single-stage Samples, with a subordinate list if applicable.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Source quality-control reports.

C. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Installer: Engage a cable splicer, trained and certified by a nationally recognized training organization, to install, splice, and terminate medium-voltage cable.

1.7 FIELD CONDITIONS

A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Construction Manager no fewer than two weeks in advance of proposed interruption of electric service.
2. Do not proceed with interruption of electric service without Construction Manager’s written permission.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements:

1. Cable:

a. General Cable
b. Okonite

c. Pirelli

2. Cable Splicing and Terminating Products:

a. Elastimold
b. Blackburn

B. Source Limitations: Obtain cables and accessories from single source from single manufacturer.

2.2 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with IEEE C2 and NFPA 70.

2.3 CABLES TYPE

A. Cable shall be copper 15kV medium-voltage shielded power cable insulated with Ethylene Propylene Rubber (EPR), shielded and jacketed. The cable shall meet the construction requirements of ICEA S-93-639 and S-97-682 and meet the performance requirements of AEIC CS8 as well as UL 1072 and be listed for Type MV-105, i.e., for NEC® applications. The cable shall be suitable for installation aerially, underground, through direct burial, in underground duct or conduit, in duct or conduit above ground, in raceway or in cable tray. The cable shall be capable of continuous operation in wet or dry environments at a conductor temperature of 105°C in normal operation, 140°C in emergency overload operation and 250°C in short circuit operation.

B. QUALITY ASSURANCE

1. The manufacturer shall have a minimum of ten years experience manufacturing Medium-Voltage Power Cable and shall submit a user reference list on request.
2. The manufacturer shall ensure the cable core is virtually corona-free by applying the strand shield, insulation and insulation shield concurrently through a True Triple Extrusion Single-Pass process, which does not expose the EPR insulation to the atmosphere.
3. The manufacturer of the insulating and shielding material used shall minimize material contamination by filtering plant intake air and by processing and storing all materials in sealed containers not susceptible to rust and corrosion. Further, the manufacturing process shall be entirely computer controlled and employ state-of-the-art mixing and addition technology to maximize material uniformity.
4. Each length of cable shall be tested in accordance with ICEA and a notarized certified test report from the manufacturer shall be provided for each shipping reel. One Certified test Report listing all shipping reels cut from the same Master Manufacturing Reel length is acceptable.
5. Manufacturer shall certify that cable has been manufactured within last 12 months.
6. All cable ends shall be sealed with heat-shrinkable end caps at all times to prevent the entrance of moisture into insulation during shipment, storage and installation.

C. CONDUCTOR

1. The conductor shall be annealed compact stranded bare copper in compliance with ASTM B3 and B496.

D. STRAND SHIELD

1. Shall be a black extruded semi-conducting thermoset compound applied directly over the conductor. It shall be free-striping from the conductor and be uniformly and firmly bonded to the EPR insulation.

E. INSULATION

1. Insulation thickness shall be for 133 percent insulation level, ethylene propylene rubber (EPR). For 15 KV cable 220 mils minimum insulation thickness is required.
2. Insulation shall be a high quality flexible thermoset Ethylene Propylene Rubber (EPR) compound that is heat, moisture, ozone and corona resistant. The compound shall be contrasting in color with the strand and insulation shields (screens) and meet the requirements of ICEA S-93-639, ICEA S-97-682and AEIC CS8.

F. INSULATION SHIELD

1. Shall be a black extruded semi-conducting thermoset compound applied directly over the insulation. It shall consist of a material compatible with the insulation and the metallic shield.

G. METALLIC SHIELD AND JACKET

1. Metallic shield and jacket shall consist of six corrugated copper drain wires embedded longitudinally in composite layers of semi-conducting thermoset copolymer and semi-conducting thermoplastic black flame-retardant thermoplastic Chlorinated Polyethylene (CPE).
2. The cable surface shall be printed with manufacturer's identification, type of insulation, size of conductor, rated voltage, year of manufacture, insulation thickness and UL listing.

2.4 SEPARABLE INSULATED CONNECTORS

A. Description: Modular system, complying with IEEE 386, with disconnecting, single-pole, cable terminators and with matching, stationary, plug-in, dead-front terminals designed for cable voltage and for sealing against moisture. All materials shall be heat shrink, cold shrink is not acceptable.

B. Dead-Break Cable Terminators: Elbow-type T-Body unit with 600-A continuous-current rating; designed for de-energized disconnecting and connecting; coordinated with insulation diameter, conductor size, and material of cable being terminated. Include drain and test point on terminator body that is capacitance coupled.

C. Dead-Front Terminal Junctions: Modular bracket-mounted groups of dead-front stationary terminals that mate and match with above cable terminators. Two-, three-, or four-terminal units as indicated, with fully rated, insulated, watertight conductor connection between terminals and complete with grounding lug, manufacturer's standard accessory stands, stainless-steel mounting brackets, and attaching hardware.

1. Protective Cap: Insulating, electrostatic-shielding, water-sealing cap with drain wire.
2. Portable Feed-Through Accessory: Two-terminal, dead-front junction arranged for removable mounting on accessory stand of stationary terminal junction.
3. Grounding Kit: Jumpered elbows, portable feed-through accessory units, protective caps, test rods suitable for concurrently grounding three phases of feeders, and carrying case.
4. Standoff Insulator: Portable, single dead-front terminal for removable mounting on accessory stand of stationary terminal junction. Insulators suitable for fully insulated isolation of energized cable-elbow terminator.

2.5 SPLICE KITS

A. Splice Kits: Comply with IEEE 404; type as recommended by cable or splicing kit manufacturer for the application.

B. Splicing Products: As recommend, in writing, by splicing kit manufacturer for specific sizes, materials, ratings, and configurations of cable conductors. Include all components required for complete splice, with detail instructions.

1. Heat-shrink kit of uniform, cross-section, polymeric construction with outer heat-shrink jacket.

2. Separable multiway splice system with all components for the required splice configuration.

2.6 MEDIUM-VOLTAGE TAPES

A. Ethylene/propylene rubber-based, 30-mil (0.76-mm) splicing tape, rated for 130 deg C operation. Minimum 3/4 inch (20 mm) wide.

B. Silicone rubber-based, 12-mil (0.30-mm) self-fusing tape, rated for 130 deg C operation. Minimum 1-1/2 inches (38 mm) wide.

2.7 ARC-PROOFING MATERIALS

A. Arc-Proofing Tape: Fireproof tape, flexible, conformable, intumescent to 0.3 inch (8 mm) thick, and compatible with cable jacket.

2.8 FAULT INDICATORS

A. Indicators: Manually reset fault indicator arranged to clamp to cable sheath and provide a display after a fault has occurred in cable. Instrument shall not be affected by heat, moisture, and corrosive conditions and shall be recommended by manufacturer for installation conditions. Indicators to be A.B. Chance ICRD 1200 SIR or equal.

2.9 SOURCE QUALITY CONTROL

A. TESTING OF COMPLETED CABLES

1. Testing shall be done in accordance with the latest editions of ICEA S-93-639, ICEA S-97-682 and UL 1072. In addition, each reel of cable shall pass the Partial Discharge Extinction Level (Corona) Test per AEIC CS8.

B. ENVIRONMENTAL REQUIREMENTS

1. Jacket shall comply with EPA 40CFR, Part 261 for a leachable lead content of less than 5mg/L using the Toxicity Characteristic Leaching Procedure (TCLP).

C. Quality Assurance

1. The Manufacturer shall provide, upon request, adequate documentation of the ISO 9001:2000 Quality Assurance (QA) programs that will provide assurance that cables shall be manufactured in accordance with this specification and other applicable industry standards and specifications as indicated or implied in such standards and specifications.

PART 3 - EXECUTION

3.1 INSTALLATION

A. A certified Medium Voltage Cable Technician must perform all medium voltage cable splices, terminations, elbows and associated medium voltage related work. The technician must perform the work on site. Certification is to be by a nationally recognized training organization such as AVO International or equal. Typical Courses to get certified should include:

1. Cable Splicing and Testing

a. Cable Splicing and Terminating of Medium-Voltage Cables, Course 304
b. Cable testing and Fault Location, Course 133

2. Safety and Code

a. Protective Cap: Insulating, electrostatic-shielding, water-sealing cap with drain wire. Electrical Safety for Utilities, Course 223. For info: http://www.avotraining.com/

B. All three 15 KV cables shall be the same length between splices.

C. Before energizing, all new and re-terminated cables shall have a high voltage cable acceptance test performed in accordance with the UK Design Standard 16950s01 High Voltage Cable Testing.

D. Cables in manholes shall have circuit arc proof taping around the group of bundled circuit cables.

E. Perform and submit report of continuity test on all high voltage ground wire(s).

F. Install cables according to IEEE 576.

G. Prior to installing cable or pull string – pull wire brush and scrub through each conduit to clean and verify pathway.

H. Pull Conductors: Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

1. Where necessary, use manufacturer-approved pulling compound or lubricant that does not deteriorate conductor or insulation.
2. Use pulling means, including fish tape, cable, rope, and basket-weave cable grips that do not damage cables and raceways. Do not use rope hitches for pulling attachment to cable.
3. Use pull-in guides, cable feeders, and draw-in protectors as required to protect cables during installation.
4. Do not pull cables with ends unsealed. Seal cable ends with rubber tape.

I. In manholes, handholes, pull boxes, junction boxes, and cable vaults, train cables around walls by the longest route from entry to exit; support cables at intervals adequate to prevent sag. Provide 4 foot of slack in new cable plus extra length to reach all switch bushings.

J. Arc Proofing: Unless otherwise indicated, arc proof medium-voltage cable at locations not protected by conduit, cable tray, direct burial, or termination materials. In addition to arc-proofing tape manufacturer's written instructions, apply arc proofing as follows:

1. Clean cable sheath.
2. Wrap metallic cable components with 10-mil (250-micrometer) pipe-wrapping tape.
3. Smooth surface contours with electrical insulation putty.
4. Apply arc-proofing tape in one half-lapped layer with coated side toward cable.
5. Band arc-proofing tape with two layers of 1-inch- (25-mm-) wide half-lapped, adhesive, glass-cloth tape at each end of the arc-proof tape.

K. Install fault indicators on each phase of all load conductors.

L. Ground shields of shielded cable at terminations, splices, and separable insulated connectors. Ground metal bodies of terminators, splices, cable and separable insulated-connector fittings, and hardware.

M. Identify cables according to University Standards Identify phase and circuit number of each conductor at each splice, termination, pull point, and junction box. Arrange identification so that it is unnecessary to move the cable or conductor to read the identification.

3.2 RECEIVING REELS, HANDLING AND STORAGE

A. All reels shall be shipped in an up-right position on the flanges. The cable ends shall be sealed to prevent the entrance of moisture into the cable.

B. Upon delivery, the receiving party shall be responsible for inspecting each reel for visible and potential hidden damage. Any visible damage should be noted on the bill of lading, photographed and the distributor and manufacturer notified immediately. The damage should be documented on the bill of lading and signed by the driver. Any cable received being "suspect" of concealed damage should be noted on the bill of lading. Reels received in a "flopped" position

are accepted at the risk of the owner with No liability to be assumed by the manufacturer. Reels received in this position should be considered as suspect for visible or concealed damage and noted on the bill of lading.

C. Reels should not be dropped from a truck or ramp. Lifting should be by means of a bar inserted through the arbor hole with chain and spreader bar, if necessary, to prevent damage to the flange. Under no circumstances should the cable be lifted by the drum using any kind of lift equipment on the cable.

D. Reels should be stored in an upright position, never “flopped” on the flange side, and in a dry area, out of mud and covered from weather if possible. Reels should be stored out of high-traffic areas, away from equipment and other objects and such that the flange of one reel cannot roll into the drum of an adjacent reel.

E. Upon cutting of any cable from a reel, it is the installer’s responsibility to seal the cable end thoroughly to prevent the absorption of moisture into the strand. Cut ends shall be secured to the reel and not be allowed to drag on the ground. Any damage shall be reported immediately to and documented by the project supervisor.

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA ATS. Certify compliance with test parameters.
2. After installing medium-voltage cables and before electrical circuitry has been energized, test for compliance with requirements.
3. Perform direct-current High Potential test of each new conductor according to NETA ATS, Ch. 7.3.3. Do not exceed cable manufacturer’s recommended maximum test voltage.
4. Perform Partial Discharge test of each new conductor according to NETA ATS, Ch. 7.3.3 and to test equipment manufacturer’s recommendations.
5. Perform Dissipation Factor test of each new conductor according to NETA ATS, Ch. 7.3.3 and to test equipment manufacturer’s recommendations.

B. Medium-voltage cables will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 26 0513

SECTION 26 0543 - UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01, 03, 05 and 07 Specification Sections, apply to this Section.

B. All materials and installation shall comply with University construction standards. These standards are available at: https://www.uky.edu/cpmd/official-design-standards . Special attention shall be given to Divisions 02, 16 and 17. In the event of a conflict between these standards and the Contract Documents the most stringent requirement shall be met.

1.2 SUMMARY

A. Section Includes:

1. Direct-buried conduit, ducts, and duct accessories.
2. Concrete-encased conduit, ducts, and duct accessories.
3. Handholes and boxes.
4. Manholes.

1.3 DEFINITIONS

A. Trafficways: Locations where vehicular or pedestrian traffic is a normal course of events.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include duct-bank materials, including separators and miscellaneous components.
2. Include ducts and conduits and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
3. Include accessories for manholes, handholes, boxes and other utility structures.
4. Include warning tape.

B. Shop Drawings:

1. Underground Utility Structures:

a. Include structural fabrication drawings stamped by a Structural Engineer registered in the Commonwealth of Kentucky. Drawings shall detail concrete and reinforcement requirements.
b. Include plans, elevations, sections, details, attachments to other work, and accessories.
c. Include duct entry provisions, including locations and duct sizes.
d. Include reinforcement details.
e. Include frame and cover design and manhole frame support rings.
f. Include Ladder details.
g. Include grounding details.
h. Include dimensioned locations of cable rack inserts, pulling-in and lifting irons, and sumps.
i. Include joint details.

2. Factory-Fabricated Handholes and Boxes Other Than Precast Concrete:

a. Include dimensioned plans, sections, and elevations, and fabrication and installation details.
b. Include duct entry provisions, including locations and duct sizes.

c. Include cover design.

1.5 INFORMATIONAL SUBMITTALS

A. Duct-Bank Coordination Drawings: Show duct profiles and coordination with other utilities and underground structures.

1. Include plans and sections, drawn to scale, and show bends and locations of expansion fittings.
2. Drawings shall be signed and sealed by a qualified professional engineer.

B. Source quality-control reports.

C. Field quality-control reports.

1.6 MAINTENANCE MATERIALS SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

B. Furnish 30 cable-support stanchions, arms, 120 insulators and associated fasteners for installation in a future bid package.

1.7 QUALITY ASSURANCE/WARRANTY

A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

B. The manhole shall be provided with a manufacturer’s warranty against leaks in the manhole resulting from cracks in the manhole structure. The length of this warranty shall be for five years from date of installation.

1.8 FIELD CONDITIONS

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions, and then only after arranging to provide temporary electrical service according to requirements indicated:

1. Notify Construction Manager no fewer than two weeks in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without Construction Manager’s written permission.

B. Ground Water: Assume ground-water level is at grade level unless a lower water table is noted on Drawings.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR DUCTS AND RACEWAYS

A. Comply with ANSI C2.

2.2 CONDUIT

A. Rigid Steel Conduit: Galvanized. Comply with ANSI C80.1.

B. RNC: NEMA TC 2, Type EPC-40-PVC, UL 651, with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B.

2.3 NONMETALLIC DUCTS AND DUCT ACCESSORIES

A. Underground Plastic Utilities Duct: NEMA TC 2, UL 651, ASTM F 512, Type EPC-40, with matching fittings complying with NEMA TC 3 by same manufacturer as the duct.

B. Duct Accessories:

1. Duct Separators: Factory-fabricated rigid PVC interlocking spacers, sized for type and size of ducts with which used, and selected to provide minimum duct spacing indicated while supporting ducts during concreting or backfilling.
2. Warning Tape: Metallic Underground-line warning tape per published University standards.

2.4 HANDHOLES AND BOXES

A. General Requirements for Handholes and Boxes: Comply with SCTE 77. Tier 15.

1. Color: Gray.
2. Configuration: Units shall be designed for flush burial and have open bottom unless otherwise indicated.
3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.
4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
5. Cover Legend: Molded lettering, as indicated for each service.

B. Polymer Concrete Handholes and Boxes with Polymer Concrete Cover: Molded of sand and aggregate, bound together with a polymer resin, and reinforced with steel or fiberglass or a combination of the two.

2.5 PRECAST MANHOLES

A. Precast Manholes shall incorporate all features of the University's standard cast in place manhole as shown on drawing. All enclosure joints shall be keyed and waterstopped.

B. Comply with ASTM C 858.

C. Structural: Manholes shall meet or exceed the following design criteria:

1. Earth Load 2 Ft. fill at 130 lb/c.ft.
2. Surcharge 2 Ft. at 130 lb/c.ft.
3. Live Load AASHO H 20 truck load with 20% impact.
4. fc 4,500 psi
5. fy 60,000 psi

D. Precast Manholes: One-piece units and units with interlocking mating sections, complete with accessories, hardware, and features.

E. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks, plus an additional 12 inches (300 mm) vertically and horizontally to accommodate alignment variations.

1. Windows shall be located no less than 6 inches (150 mm) from interior surfaces of walls, floors, or roofs of manholes, but close enough to corners to facilitate racking of cables on walls.
2. Window opening shall have cast-in-place, welded-wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
3. Window openings shall be framed with at least two additional No. 3 steel reinforcing bars in concrete around each opening.

F. Duct Entrances in Manhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.

1. Type and size shall match fittings to duct or conduit to be terminated.
2. Fittings shall align with elevations of approaching ducts and be located near interior corners of manholes to facilitate racking of cable.

G. Concrete Knockout Panels: 1-1/2 to 2 inches (38 to 50 mm) thick, for future conduit entrance and sleeve for ground rod.

H. Ground Rod Sleeve: Provide a 3-inch (75-mm) PVC conduit sleeve in manhole floors 2 inches (50 mm) from the wall adjacent to, but not underneath, the ducts routed from the facility.

I. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.

J. Manhole shall be set on cast-in-place foundation slab.

K. Provide ventilation openings per drawings.

2.6 CAST-IN-PLACE MANHOLES

A. Description: Underground utility structures, constructed in place, complete with accessories, hardware, and features. Include concrete knockout panels for conduit entrance and sleeve for ground rod.

B. Materials: Comply with ASTM C 858 and with Section 033000 “Cast-in-Place Concrete.”

C. Structural: Manholes shall meet or exceed the following design criteria:

1. Earth Load 2 Ft. fill at 130 lb/c.ft.
2. Surcharge 2 Ft. at 130 lb/c.ft.
3. Live Load AASHO H 20 truck load with 20% impact.
4. fc 4,500 psi
5. fy 60,000 psi
6. The manhole shall utilize Grade 60 reinforcing rebar tied together to provide a fully continuous cage.
7. All concrete shall meet or exceed 4,500-psi compressive strength.

2.7 UTILITY STRUCTURE ACCESSORIES

A. Manhole Frames, Covers, and Chimney Components: Comply with structural design loading specified for manhole.

1. Frame and Cover: Weatherproof, gray cast iron complying with ASTM A 48/A 48M, Class 35 cast iron with milled cover-to-frame bearing surfaces; diameter, 32 inches.

a. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
b. Special Covers: Recess in face of cover designed to accept finish material in paved areas.

2. Cover Legend: Cast in. Selected to suit system.

a. All manhole covers shall be provided with 2 inch lettering “ELECTRIC” and with the manhole number, assigned by University of Kentucky PPD Manager of Electrical Services, welded onto the cover if not provided by the manufacturer.
b. All manhole covers shall be provided with stainless steel drop handles.

3. Manhole Chimney Components: Precast concrete rings with dimensions matched to those of roof opening.

a. Mortar for Chimney Ring and Frame and Cover Joints: Comply with ASTM C 270, Type M, except for quantities less than 2.0 cu. ft. (60 L) where packaged mix complying with ASTM C 387, Type M, may be used.
b. Seal joints watertight using preformed plastic or rubber conforming to ASTM C 990. Install sealing material according to the sealant manufacturers’ printed instructions.

B. Manhole Sump Frame and Grate: ASTM A 48/A 48M, Class 30B, gray cast iron.

C. Pulling Eyes in Concrete Walls: Eyebolt with reinforcing-bar fastening insert, 2-inch- (50-mm-) diameter eye, and 1-by-4-inch (25-by-100-mm) bolt.

1. Working Load Embedded in 6-Inch (150-mm), 4,000-psi (27.6-MPa) Concrete: 13,000-lbf (58-kN) minimum tension.

D. Pulling Eyes in Nonconcrete Walls: Eyebolt with reinforced fastening, 1-1/4-inch- (31-mm-) diameter eye, rated [2500-lbf (11-kN)] minimum tension.

E. Pulling-In and Lifting Irons in Concrete Floors: 7/8-inch- (22-mm-) diameter, hot-dip galvanized, bent steel rod; stress relieved after forming; and fastened to reinforcing rod. Exposed triangular opening.

1. Ultimate Yield Strength: 40,000-lbf (180-kN) shear and 60,000-lbf (270-kN) tension.

F. Bolting Inserts for Concrete Utility Structure Cable Racks and Other Attachments: Flared, threaded inserts of noncorrosive, chemical-resistant, nonconductive thermoplastic material; 1/2-inch (13-mm) ID by 2-3/4 inches (69 mm) deep, flared to 1-1/4 inches (31 mm) minimum at base.

1. Tested Ultimate Pullout Strength: 12,000 lbf (53 kN) minimum.

G. Ground Rod Sleeve: 3-inch (75-mm), PVC conduit sleeve in manhole floors 2 inches (50 mm) from the wall adjacent to, but not underneath, the ducts routed from the facility.

H. Expansion Anchors for Installation after Concrete Is Cast: Zinc-plated, carbon-steel-wedge type with stainless-steel expander clip with 1/2-inch (13-mm) bolt, 5300-lbf (24-kN) rated pullout strength, and minimum 6800-lbf (30-kN) rated shear strength.

I. Cable Rack Assembly: Steel, hot-dip galvanized, except insulators.

1. Stanchions: T-section or channel; 2-1/4-inch (56-mm) nominal size; punched with 14 holes on 1-1/2-inch (38-mm) centers for cable-arm attachment.
2. Arms: 1-1/2 inches (38 mm) wide, lengths ranging from 3 inches (75 mm) with 450-lb (204-kg) minimum capacity to 18 inches (450 mm) with 250-lb (114-kg) minimum capacity. Arms shall have slots along full length for cable ties and be arranged for secure mounting in horizontal position at any vertical location on stanchions.
3. Insulators: High-glaze, wet-process porcelain arranged for mounting on cable arms.

J. Duct-Sealing Compound: Nonhardening, safe for contact with human skin, not deleterious to cable insulation, and workable at temperatures as low as 35 deg F (2 deg C). Capable of withstanding temperature of 300 deg F (150 deg C) without slump and adhering to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals.

K. Fixed Manhole Ladders & Extension: wall of manhole. Ladder and mounting brackets and braces shall be fabricated from hot-dip galvanized steel Halliday LDI/LEI or equal.

2.8 SOURCE QUALITY CONTROL

A. Test and inspect precast concrete utility structures according to ASTM C 1037.

B. Nonconcrete Handhole and Pull-Box Prototype Test: Test prototypes of manholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.

1. Tests of materials shall be performed by an independent testing agency.
2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
3. Testing machine pressure gages shall have current calibration certification, complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate layout and installation of ducts, manholes, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field. Notify Architect if there is a conflict between areas of excavation and existing structures or archaeological sites to remain.

B. Coordinate elevations of ducts and duct-bank entrances into manholes, handholes, and boxes with final locations and profiles of ducts and duct banks, as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by Architect.

3.2 UNDERGROUND DUCT APPLICATION

A. Ducts for Electrical Cables More than 600 V: RNC, NEMA Type EPC-40 PVC, in concrete-encased duct bank unless otherwise indicated.

B. Ducts for Electrical Feeders 600 V and Less: RNC, NEMA Type EPC-40 PVC, in concrete-encased duct bank unless otherwise indicated.

C. Ducts for Electrical Branch Circuits: RNC, NEMA [Type EPC-80] [Type EPC-40]-PVC, in direct-buried duct bank unless otherwise indicated.

D. Underground Ducts 600V and less Crossing Driveways and Roadways: RNC, NEMA Type EPC-40-PVC, encased in reinforced concrete.

3.3 EARTHWORK

A. Excavation and Backfill: Comply with Division 31 but do not use heavy-duty, hydraulic-operated, compaction equipment.

B. Restore surface features at areas disturbed by excavation, and re-establish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply Division 32

D. Cut and patch existing pavement in the path of underground ducts and utility structures according to the “Cutting and Patching” requirements in Divisions 01.

3.4 DUCT INSTALLATION

A. Install ducts according to NEMA TCB 2.

B. Slope: Pitch ducts a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope ducts from a high point in runs between two manholes, to drain in both directions.

C. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches 1200 mm vertically and 25 feet (7.5)m, horizontally, at other locations unless otherwise indicated.

D. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer’s written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.

E. Installation Adjacent to High-Temperature Steam Lines: Where duct banks are installed parallel to underground steam lines, perform calculations showing the duct bank will not be subject to environmental temperatures above 40 deg C. Where environmental temperatures are

calculated to rise above 40 deg C, and anywhere the duct bank crosses above an underground steam line, install insulation blankets listed for direct burial to isolate the duct bank from the steam line.

F. Duct Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches (250 mm) o.c. for 5-inch (125-mm) ducts, and vary proportionately for other duct sizes.

1. Begin change from regular spacing to end-bell spacing 10 feet (3 m) from the end bell without reducing duct line slope and without forming a trap in the line.

2. Direct-Buried Duct Banks: Install an expansion and deflection fitting in each conduit in the area of disturbed earth adjacent to manhole or handhole. Install an expansion fitting near the center of all straight-line direct-buried duct banks with calculated expansion of more than 3/4 inch (19 mm).
3. Grout end bells into structure walls from both sides to provide watertight entrances.

G. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig (1.03-MPa) hydrostatic pressure.

H. Pulling Cord: Install 100-lbf- (445-N-) test nylon cord in empty ducts.

I. Concrete-Encased Ducts: Support ducts on duct separators.

1. Excavate trench bottom to provide firm and uniform support for duct bank. Prepare trench bottoms as specified in Division 31for pipes less than 6 inches (150 mm) in nominal diameter.

2. Width: Excavate trench as required to form concrete envelope.

3. Depth: Install top of duct bank at least 24 inches (600 mm) below finished grade in areas not subject to deliberate traffic, and at least 30 inches (750 mm) below finished grade in deliberate traffic paths for vehicles unless otherwise indicated.
4. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.

5. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, with not less than four spacers per 20 feet (6 m) of duct. Secure separators to earth and to ducts to prevent floating during concreting. Stagger separators approximately 6 inches (150 mm) between tiers. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.

6. Minimum Space between Ducts: 3 inches (75 mm) between ducts and exterior envelope wall, 2 inches (50 mm) between ducts for like services, and 4 inches (100 mm) between power and signal ducts.

7. Elbows: Use manufactured duct elbows for stub-ups at poles and equipment, at building entrances through floor, and at changes of direction in duct run unless otherwise indicated. Extend concrete encasement throughout length of elbow.

8. Reinforcement: Reinforce concrete-encased duct banks. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.
9. Forms: Use forms for concrete envelope.
10. Provide requirements for the specific concrete mix for duct-bank encasement. Add requirements here or by reference to specific mix in Section 033000 “Cast-in-Place Concrete.”
11. Concrete Cover: Install a minimum of 3 inches (75 mm) of concrete cover at top and bottom, and a minimum of 2 inches (50 mm) on each side of duct bank.
12. Concreting Sequence: Pour each run of envelope between manholes or other terminations in one continuous operation.

a. Start at one end and finish at the other, allowing for expansion and contraction of ducts as their temperature changes during and after the pour. Use expansion fittings installed according to manufacturer's written recommendations, or use other specific measures to prevent expansion-contraction damage.
b. If more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch (15-mm) reinforcing-rod dowels extending a minimum of 18 inches (450 mm) into concrete on both sides of joint near corners of envelope.

13. Pouring Concrete: Concrete shall be dyed red for electric or yellow for communications. Comply with requirements in Section 033000 "Cast-in-Place Concrete". Place concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto ducts. Allow concrete to flow to center of bank and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application.

J. Direct-Buried Duct Banks:

1. Excavate trench bottom to provide firm and uniform support for duct bank. Comply with requirements in Division 31 for preparation of trench bottoms for pipes less than 6 inches (150 mm) in nominal diameter.
2. Stagger spacers approximately 6 inches (150 mm) between tiers.
3. Depth: Install top of duct bank at least 36 inches (900 mm) below finished grade unless otherwise indicated.
4. Set elevation of bottom of duct bank below frost line.
5. Install ducts with a minimum of 3 inches (75 mm) between ducts for like services and 6 inches (150 mm) between power and signal ducts.
6. Elbows: Install manufactured duct elbows for stub-ups at poles and equipment, at building entrances through floor, and at changes of direction in duct run unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
7. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment, at building entrances through floor, and at changes of direction in duct run.

a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches (75 mm) of concrete.
b. For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches (1500 mm) from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.

8. After installing first tier of ducts, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand place backfill to 4 inches (100 mm) over ducts and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction. Comply with requirements in Division 31 for installation of backfill materials.

a. Place minimum 3 inches (75 mm) of sand as a bed for duct bank. Place sand to a minimum of 6 inches (150 mm) above top level of duct bank.
b. Place minimum 6 inches (150 mm) of engineered fill above concrete encasement of duct bank.

K. Warning Tape: Bury warning tape approximately 12 inches (300 mm) above all concrete-encased ducts and duct banks. Align tape parallel to and within 3 inches (75 mm) of centerline of duct bank. Provide an additional warning tape for each 12-inch (300-mm) increment of duct-bank width over a nominal 18 inches (450 mm). Space additional tapes 12 inches (300 mm) apart, horizontally.

3.5 INSTALLATION OF CONCRETE MANHOLES, HANDHOLES, AND BOXES

A. Cast-in-Place Manhole Installation:

1. Finish interior surfaces with a smooth-troweled finish.
2. Windows for Future Duct Connections: Form and pour concrete knockout panels 1-1/2 to 2 inches (38 to 50 mm) thick, arranged as indicated.
3. Comply with requirements in Section 033000 “Cast-in-Place Concrete” for cast-in-place concrete, formwork, and reinforcement.

B. Precast Concrete Handhole and Manhole Installation:

1. Comply with ASTM C 891 unless otherwise indicated.
2. Install units level and plumb and with orientation and depth coordinated with connecting ducts, to minimize bends and deflections required for proper entrances.
3. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1-inch (25-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.

C. Elevations:

1. Manhole Roof: Install with rooftop at least 15 inches (375 mm) below finished grade.
2. Manhole Frame: In paved areas and trafficways, set frames flush with finished grade. Set other manhole frames 1 inch (25 mm) above finished grade.
3. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch (25 mm) above finished grade.
4. Where indicated, cast handhole cover frame integrally with handhole structure.

D. Drainage: Install drains in bottom of manholes where indicated. Coordinate with drainage provisions indicated.

E. Manhole Access: Circular opening in manhole roof; sized to match cover size.

1. Manholes with Fixed Ladders: Offset access opening from manhole centerlines to align with ladder.
2. Install chimney, constructed of precast concrete collars and rings, to support cast-iron frame to connect cover with manhole roof opening. Provide moisture-tight masonry joints and waterproof grouting for frame to chimney.

F. Waterproofing: Apply waterproofing to exterior surfaces of manholes after concrete has cured at least three days. After ducts have been connected and grouted, and before backfilling, waterproof joints and connections, and touch up abrasions and scars. Waterproof exterior of manhole chimneys after mortar has cured at least three days.

G. Hardware: Turn over removable hardware, including pulling eyes, cable stanchions, cable arms, to Construction Manager for use during next phase.

H. Fixed Manhole Ladders: Arrange to provide for safe entry with maximum clearance from cables and other items in manholes.

I. Field-Installed Bolting Anchors in Manholes and Concrete Handholes: Do not drill deeper than 3-7/8 inches (97 mm) for manholes and 2 inches (50 mm) for handholes, for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

J. All low voltage wiring in manholes shall be in Schedule 40 PVC conduit. Junction boxes shall be rigid nonmetallic PVC with gasket.

K. All non current carrying metal parts of the manhole shall be grounded. Provide two ground rods in manhole, bonded together with coil of copper wire for future connection to cable shields.

3.6 INSTALLATION OF HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting ducts, to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of ducts, and seal joint between box and extension as recommended by manufacturer.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch (12.5-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas and trafficways, set cover flush with finished grade. Set covers of other handholes 1 inch (25 mm) above finished grade.

D. Field cut openings for ducts and conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

E. Form and pour a concrete ring encircling, and in contact with, enclosure and with top surface screeded to top of box cover frame. Bottom of ring shall rest on compacted earth.

1. Concrete: 3,000 psi (20 kPa), 28-day strength, complying with Section 033000 "Cast-in-Place Concrete," with a troweled finish.
2. Dimensions as shown on drawings.

3.7 GROUNDING

A. Ground underground ducts and utility structures with minimum of two 5/8" x 8' ground rods.

3.8 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:

1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
2. Pull solid aluminum or wood test mandrel through duct to prove joint integrity and adequate bend radii, and test for out-of-round duct. Provide a minimum 6-inch- (150-mm-) long mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.
3. Test manhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance for each manhole. If resistance exceeds 10 Ohms provide additional rods as necessary to obtain 10 Ohms or less.

B. Correct deficiencies and retest as specified above to demonstrate compliance.

3.9 CLEANING

A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

B. Clean internal surfaces of manholes, including sump. Remove foreign material.

END OF SECTION 260543

SECTION 26 1300 - MEDIUM-VOLTAGE SWITCHGEAR

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes metal-enclosed interrupter switchgear with the following optional components, features, and accessories:

1. Surge arresters.
2. Provisions for future devices.
3. Mimic bus.

1.3 DEFINITIONS

A. ATS: Acceptance Testing Specifications.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of switchgear and related equipment, include the following:

1. Rated capacities, operating characteristics, furnished specialties, and accessories for individual interrupter switches.
2. Time-current characteristic curves for overcurrent protective devices, including fusible devices.

B. Shop Drawings: For each type of switchgear and related equipment, include the following:

1. Dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show method of field assembly and location and size of each field connection. Include the following:

a. Tabulation of installed devices with features and ratings.
b. Outline and general arrangement drawing showing dimensions, shipping sections, and weights of each assembled section.
c. Drawing of cable termination compartments showing preferred locations for conduits and indicating space available for cable terminations.
d. Floor plan drawing showing locations for anchor bolts.
e. Current ratings of buses.
f. Short time and short-circuit ratings of switchgear assembly.
g. Nameplate legends.
h. Mimic-bus diagram.

2. Wiring Diagrams: For each type of switchgear and related equipment, include the following:

a. Diagrams showing connections of component devices and equipment.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Floor plans showing dimensioned layout, required working clearances, and required area above and around switchgear where piping and ducts are prohibited. Show switchgear layout and relationships between components and adjacent structural and mechanical elements. Show support locations, type of support, and weight on each support. Identify field measurements.

B. Source quality-control test reports.

C. Field quality-control test reports.

D. Operation and Maintenance Data: For switchgear and switchgear components to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 “Operation and Maintenance Data,” include the following:

1. Manufacturer’s written instructions for testing and adjusting overcurrent protective devices.
2. Time-current curves, including selectable ranges for each type of overcurrent protective device.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of switchgear and associated components through one source from a single manufacturer.

B. Product Options: Drawings indicate size, profiles, and dimensional requirements of switchgear and are based on the specific system indicated. Refer to Section 016000 “Product Requirements.”

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. Comply with IEEE C2.

E. All materials and installation shall comply with University construction standards. These standards are available at: https://www.uky.edu/cpmd/official-design-standards . Special attention shall be given to Divisions 02, 16 and 17. In the event of a conflict between these standards and the Contract Documents the most stringent requirement shall be met.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver in sections of lengths that can be moved past obstructions in delivery path as indicated.

B. Store switchgear indoors in clean dry space with uniform temperature to prevent condensation. Protect switchgear from exposure to dirt, fumes, water, corrosive substances, and physical damage.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation at indicated ampere ratings for the following conditions:

1. Ambient temperature not exceeding 140 deg F (60 deg C).
2. Altitude of 1,000 above sea level.

B. Installation Pathway: Remove and replace building components and structures to provide pathway for moving switchgear into place.

C. Product Selection for Restricted Space: Drawings indicate space available for switchgear, including clearances between switchgear and adjacent surfaces and other items. Equipment installed must make all clearance, access and replacement working space requirements of the NEC and Owner.

D. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:

1. Notify Construction Manager no fewer than 14 days in advance of proposed interruption of electrical service.

2. Do not proceed with interruption of electrical service without Construction Manager's written permission.

1.9 COORDINATION

A. Coordinate layout and installation of switchgear and components with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required clearances for workspace and equipment access doors and panels.

B. Coordinate size and location of concrete bases. Concrete, reinforcement, and formwork requirements are specified with concrete.

1.10 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Fuses: Six of each type and rating used. Include spares for future transformers, control power circuits, and fusible devices.

B. Maintenance Tools: Furnish tools and miscellaneous items required for interrupter switchgear test, inspection, maintenance, and operation. Include the following:

1. Fuse-handling tool.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 MANUFACTURED UNITS

A. Description: Factory assembled and tested, and complying with IEEE C37.20.1.

B. Ratings: Suitable for application in 3-phase, 60-Hz, solidly grounded-neutral system.

C. System Voltage: 12.47 kV nominal.

2.3 PACKAGED PAD-MOUNTED SWITCHGEAR

A. Manufacturers:

1. Basis of Design: S&C Electric Company Vista.
2. Other manufacturers may bid, subject to compliance with these specifications and Engineers approval prior to bid. Refer to contract substitution procedure specifications.

B. Compliance with Standards and Codes
The switchgear shall conform to or exceed the applicable requirements of the following standards and codes:

1. The applicable portions of ANSI C57.12.28, covering enclosure integrity for pad-mounted equipment.
2. The applicable portions of ANSI C37.71, ANSI C37.72, ANSI C37.73, IEC 56, and IEC 265-1 (Class A), which specify test procedures and sequences for the load-interrupter switches, fault interrupters, and the complete switchgear assembly.

C. Construction

1. General

    a. The switchgear shall be totally enclosed and suitable for installation in unsecured locations.
    b. Wiring and termination compartment shall be physically separated from the operating mechanism(s). Control, testing and operating interfaces shall be housed behind separate doors than the cable connections such that the switch may be operated without exposing the terminations.
    c. The switchgear shall be operable from grade level without exposure to high voltage.
    d. Operating personnel shall be able to verify the positions (closed, open, and grounded) of the load-interrupter switches and fault interrupters while standing.
    e. The gas-tight tank shall be made of Type 304L stainless steel.

2. SF6-Gas Insulation

    a. The SF6 gas shall conform to ASTM D2472.
    b. The switchgear shall be filled with SF6 gas to a pressure of 7 psig at 68º F.
    c. The gas-tight tank shall be evacuated prior to filling with SF6 gas to minimize moisture in the tank.
    d. The switchgear shall withstand system voltage at a gas pressure of 0 psig at 68º F.
    e. A gas-fill valve shall be provided.
    f. A temperature-compensated pressure gauge shall be provided that is color coded to show the operating range. The gauge shall be mounted inside the gas-tight tank (visible through a large viewing window) to provide consistent pressure readings regardless of the temperature or altitude at the installation site.

3. Gas-Tight Tank

    a. The tank shall be submersible and able to withstand up to 10 feet of water over the base.
    b. The tank shall be of welded construction and shall be made of 7-gauge mild steel or Type 304L stainless steel, as specified in Section 4.0.
    c. A means of lifting the tank shall be provided.

4. Viewing Windows

    a. Each load-interrupter switch shall be provided with a large viewing window at least 6 inches by 12 inches to allow visual verification of the switch-blade position (closed, open, and grounded) while shining a flashlight on the blades.
    b. Each fault interrupter shall be provided with a large viewing window at least 6 inches by 12 inches to allow visual verification of the disconnect-blade position (closed, open, and grounded) while shining a flashlight on the blades.
    c. Viewing windows shall be located on the opposite side of the gear from the bushings and bushing wells so that operating personnel shall not be required to perform any routine operations in close proximity to high-voltage elbows and cables.
    d. A cover shall be provided for each viewing window to prevent operating personnel from viewing the flash, which may occur during switching operations.

5. High-Voltage Bus

    a. Bus and interconnections shall withstand the stresses associated with short-circuit cur-rents up through the maximum rating of the switchgear.
    b. All bussing shall be copper.

6. Provisions for Grounding

    a. One ground-connection pad shall be provided on the gas-tight tank of the switchgear.

b. The ground-connection pad shall be constructed of stainless steel and welded to the gas-tight tank, and shall have a short-circuit rating equal to that of the switchgear.
c. When an enclosure is provided, no less than one enclosure ground pad shall be provided.

7. Connections

a. Load-interrupter switches shall be equipped with 600-ampere bushings, and fault interrupters shall be equipped with 200-ampere bushing wells.
b. Bushings and bushing wells shall be located on one side of the gear to reduce the required operating clearance.
c. The following optional feature should be specified as required:
d. Bushings rated 600 or 900 amperes continuous shall be provided without a threaded stud.

8. Bushings and Bushing Wells

a. Bushings and bushing wells shall conform to ANSI/IEEE Standard 386.
b. Bushings and bushing wells shall include a semiconductive coating.
c. Bushings and bushing wells shall be mounted in such a way that the semiconductive coating is solidly grounded to the gas-tight tank.

D. Basic Components

1. Load-Interrupter Switches

a. The three-phase, group-operated load-interrupter switches shall have a three-time and ten-time duty-cycle fault closing rating as specified under “Ratings.” This rating defines the ability to close the switch the designated number of times against a three-phase fault with asymmetrical (peak) current in at least one phase equal to the rated value, with the switch remaining operable and able to carry and interrupt rated current. Certified test abstracts establishing such ratings shall be furnished upon request.
b. The switch shall be provided with an integral ground position that is readily visible through the viewing window to eliminate the need for cable handling and exposure to high voltage to ground the equipment.
c. The ground position shall have a three-time and ten-time duty-cycle fault-closing rating.
d. The switch shall be provided with an open position that is readily visible through the viewing window to eliminate the need for cable handling and exposure to high voltage to establish a visible gap.
e. The open gaps of the switch shall be sized to allow cable testing through a feed-thru bushing or the back of the elbow.

2. Operating Mechanisms

a. Load-interrupter switches and fault interrupters shall be operated by means of a quick-make, quick-break mechanism.
b. The manual handle shall charge the operating mechanism for closing, opening, and grounding of the switches and fault interrupters.
c. A single, integrated operating mechanism shall fully operate each fault interrupter or load interrupter switch in a continuous movement, so that additional operations are not required to establish open or grounded positions.
d. Operating mechanisms shall be equipped with an operation selector to prevent inadvertent operation from the closed position directly to the grounded position, or from the grounded position directly to the closed position. The operation selector shall require physical movement to the proper position to permit the next operation.
e. Operating shafts shall be padlockable in any position to prevent operation.

f. The operation selector shall be padlockable to prevent operation to the grounded position.
g. The operating mechanism shall indicate switch position which shall be clearly visible from the normal operating position

3. Additional features

a. Potential Indication with Test Feature and provisions for low-voltage phasing. Includes LCD display to indicate presence of voltage on each phase, and solar panel to supply power for testing of complete voltage-indication circuit and phasing circuit. One potential indicator is provided for each bus-terminal, load-interrupter switch, and fault-interrupter way. Unit to be self-powered and shall not require external station power for operation.

E. Ratings and Performance:

1. The load interrupting switch shall be tested and rated per ANSI C37.71 and IEC 265 with minimal acceptable performance as follows:

a.	Maximum design voltage	15.5 kV
b.	BIL impulse withstand	95 kV
c.	AC one minute withstand	45 kV
d.	DC fifteen minute withstand	60 kV
e.	Corona extinction at 3 PC sensitivity	11 kV
f.	Open gap BIL impulse withstand	110 kV
g.	Main Bus Continuous Current	600 A
h.	Load interrupting and loop switching	600 A
i.	Magnetizing and capacitive switching	25 A
j.	Continuous Current Interrupting	600 A
k.	Asymmetrical momentary	20,000 A
l.	Symmetrical on-–e second rating	25,000 A
m.	600 A load interrupting operating endurance	1,000
n.	Mechanical life operations	2,000
o.	Lifetime due to gas leakage	30 yrs
p.	Normal operating pressure range	2-15 PSIG

2.4 SOURCE QUALITY CONTROL

A. Before shipment of equipment, perform the following tests and prepare test reports:

1. Production tests on completed switchgear assembly according to IEEE C37.20.2.

2.5 FACTORY FINISHES

A. Finish: Manufacturer’s standard color finish applied to equipment before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive switchgear for compliance with requirements for installation tolerances, required clearances, and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Anchor switchgear assembly to 4-inch (100-mm), channel-iron sill embedded in floor and attach by bolting.

B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from switchgear units and components.

3.3 IDENTIFICATION

A. Diagram and Instructions:

1. Frame under clear acrylic plastic on front of switchgear.

a. System Power Riser Diagrams: Depict power sources, feeders, distribution components, and major loads.

2. Storage for Maintenance: Include a rack or holder, near the operating instructions, for a copy of maintenance manual.

3.4 CONNECTIONS

A. Tighten bus joints, electrical connectors, and terminals according to manufacturer's published torque-tightening values.

B. Ground equipment according to the NEC and University PPD Standards

C. Connect wiring according to Section 260513.

3.5 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Test insulation resistance for each switchgear bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to perform the following:

1. Inspect switchgear, wiring, components, connections, and equipment installation. Test and adjust components and equipment.
2. Report results in writing.

C. Perform the following field tests and inspections and prepare test reports:

1. Perform each electrical test and visual and mechanical inspection stated in NETA ATS. Certify compliance with test parameters. Perform NETA tests and inspections for each of the following NETA categories:

a. Switchgear.
b. Surge arresters.

D. Remove and replace malfunctioning units and retest as specified above.

E. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform infrared scan of each switchgear. Remove front and rear panels so joints and connections are accessible to portable scanner.

1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switchgear 11 months after date of Substantial Completion.
2. Instrument: Use an infrared-scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
3. Record of Infrared Scanning: Prepare a certified report that identifies switchgear checked and that describes infrared-scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.6 CLEANING

A. On completion of installation, inspect interior and exterior of switchgear. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair damaged finishes.

3.7 PROTECTION

A. Temporary Heating: Apply temporary heat to switchgear, according to manufacturer's written instructions, throughout periods when switchgear environment is not controlled for temperature and humidity within manufacturer's stipulated service conditions.

3.8 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain switchgear. Refer to Section 017900 "Demonstration and Training."

END OF SECTION 26 1300

SECTION 311000 - SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Removing asphalt, concrete sidewalks, curb and gutters and any other pavements.
2. Protecting designated existing trees, shrubs, groundcovers and grass to remain.
3. Removing existing trees, shrubs, groundcovers and grass.
4. Clearing and grubbing.
5. Stripping and stockpiling topsoil off-site.
6. Removing above- and below-grade site improvements, including remains of foundations or basements of removed structures.
7. Relocating, disconnecting, capping or sealing, and removing site utilities.
8. Temporary erosion and sedimentation control measures.
9. Salvaging designated site elements for reinstallation.

B. Related Sections include the following:

1. Division 1 Section "Temporary Facilities and Controls" for temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and temporary erosion and sedimentation control procedures].
2. Division 1 Section "Execution" for verifying utility locations and for recording field measurements.
3. Division 31 Section "Earth Moving" for soil materials, excavating, backfilling, and site grading.

1.3 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.

B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 MATERIAL OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

A. Record drawings, according to Division 1 Section "Project Record Documents," identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Huguelet and University Drives and the sidewalks along them shall remain open and available to the public.
2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

C. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

PART 2 - EXECUTION

2.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly flag trees and vegetation to remain or to be relocated.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

2.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control Drawings and Storm Water Pollution Prevention Plan.

B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

2.3 TREE PROTECTION

A. Erect and maintain temporary chain link fencing with in-ground posts around tree protection zones before starting site clearing. Tree protection zones shall generally include the entire area within the dripline of the tree or as indicated on the Demolition Plan. Remove fence when construction is complete.

1. Do not store construction materials, debris, or excavated material within fenced area.
2. Do not permit vehicles, equipment, or foot traffic within fenced area.
3. Maintain fenced area free of weeds and trash. Mow turf within the fence weekly during the growing season.

B. Do not excavate within tree protection zones, unless otherwise indicated.

C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

1. Cover exposed roots with burlap and water regularly.
2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
3. Coat cut faces of roots more than 1-1/2 inches (38 mm) in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
4. Backfill with soil as soon as possible.

D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.

1. Employ an arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
2. Replace trees that cannot be repaired and restored to full-growth status, as determined by Architect.

2.4 UTILITIES

A. Contractor shall arrange for disconnecting and sealing indicated utilities that serve existing structures designated for demolition by drawings.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

1. Arrange with utility companies to shut off indicated utilities.

C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide alternate utility services according to requirements indicated:

1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.

D. Excavate for and remove underground utilities indicated to be removed.

2.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
3. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
4. Use only hand methods for grubbing within tree protection zone.
5. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm), and compact each layer to a density equal to adjacent original ground.

2.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and nonsoil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil materials without intermixing with subsoil at an off-site location acceptable to the Owner. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust during times of high winds prior to vegetative stabilization.

1. Do not stockpile topsoil within tree protection zones.
2. Stockpile surplus topsoil to allow for respreading deeper topsoil.
3. Surround stockpile with erosion controls such as silt fence and seed topsoil with annual rye to provide stabilization.

2.7 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove retaining walls, footings/foundations, tunnels, slabs, paving, curb and gutters throughout the limits of the job site. Aggregate base beneath removed pavements may be salvaged and used for laydown areas for new construction or mixed with subsoil for fills greater than 6 feet below designed finish grades.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

C. Remove and salvage all items as noted on the Demolition Plan and store until re-installed or return to Owner.

2.8 DISPOSAL

A. Disposal: Remove surplus soil/rock material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

1. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION 311000

SECTION 312000 - EARTH MOVING

PART 1 GENERAL

1.01 DESCRIPTION

A. Perform earthwork as shown and specified. The work includes:

1. Mass excavation, site grading and filling to indicated elevations and contours.

2. Subgrade preparation for building basement.

B. Related Work:

1. Section 311000: Site Clearing.

1.02 QUALITY ASSURANCE

A. Testing and inspection: Performed by a qualified independent testing laboratory, under the supervision of a registered professional engineer, specializing in geotechnical and soils engineering.

C. Owner shall provide and pay for testing and inspection during earthwork operations as part of Special Inspections. The Contractor shall facilitate and cooperate with the Special Inspector.

D. Materials and methods of construction shall comply with the following standards:

1. Kentucky Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition.

2. American Society for Testing and Materials, (ASTM).

3. American Association of State Highway and Transportation Officials, (AASHTO).

4. National Fire Protection Association, (NFPA).

5. Revised Report of Geotechnical Exploration by S&ME, Inc. dated August 26, 2022.

E. Special Inspections for existing site soil conditions, fill placement and load-bearing requirements shall be as required by Section 1704 of the International Building Code (IBC). The approved soils report and the documents prepared by the registered design professional in responsible charge shall be used to determine compliance. During fill placement, the special inspector shall determine that proper materials and procedures are used in accordance with the provisions of the approved soils report. The following require verification and inspection of soils:

1. Verify materials below footings, pavements and walks are adequate to achieve the design bearing capacity: Periodically during task listed.
2. Verify excavations are extended to proper depth and have reached proper material: Periodically during task listed.
3. Perform classification and testing of controlled fill materials: Periodically during task listed.

4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of controlled fill: Continuous during task listed.
5. Prior to placement of controlled fill, observe subgrade and verify that site has been properly prepared: Periodically during task listed.

1.03 SUBMITTALS

A. Facilitate and cooperate with Special Inspection personnel for collection of samples of materials proposed for use.

B. Special Inspection engineer shall submit reports and certifications for testing and inspection of the following:

1. Fill and backfill materials.

2. Compaction operations.

3. Foundation excavations and footing subgrade.

1.04 PROJECT CONDITIONS

A. Known underground and surface utility lines are indicated on the drawing. Contractor is responsible for verifying location of existing utilities.

B. Protect existing trees and other features designated to remain as part of the landscaping work.

C. Protect excavations by shoring, bracing, sheeting, underpinning, or other methods, as required to prevent cave-ins or loose dirt from entering excavations. Barricade open excavations and post warning lights at work adjacent to public streets and walks.

D. Underpin adjacent structure(s), including utility service lines, which may be damaged by excavation operations.

E. Promptly repair damage to adjacent facilities caused by earthwork operations. Cost of repair at Contractor's expense.

F. Promptly notify the Architect of unexpected sub-surface conditions.

G. Protect bottoms of excavations and soil beneath and around foundation from frost and freezing.

H. Grade at excavations to prevent surface water draining into excavated areas. Provide ditches or berms to direct surface runoff to locations where it can drain into storm sewer system or be collected and pumped from construction site.

PART 2 PRODUCTS

2.01 MATERIALS

A. All fill material is subject to testing and inspection.

B. Fill materials: Inert subsoil material free of organic matter, rubbish, debris, and rocks greater than 3" diameter and meeting the following requirements:

1. Plasticity index of not more than 30 with a maximum dry density (ASTM D698) greater than 98 pcf.

2. Moisture content of compacted fill shall be maintained at plus or minus 2 percent of optimum moisture.

3. Utilize off-site borrow fill material when borrow fill is required to complete the work. Verify suitability of off-site borrow fill material and locations with the Geotechnical Engineer prior to transporting the material to the site.

4. Proposed fill material shall be inspected and tested prior to use in the work.

5. Suitable excavated soil and rock removed to accommodate new construction shall be used as fill material subject to the parameters listed above and Geotechnical Engineer's inspection and approval. Excess soil suitable for structural fill shall be quantified and documented via haul truck tickets and stockpiled off-site for use by future construction phases. Unsuitable material shall be wasted off-site at the Contractor's expense.

C. Granular base: Dense graded aggregate for fill beneath building footings and slabs as noted on plans and details.

D. Granular fill: AASHTO M43, #2, #57 or #9 clean uniformly graded stone or gravel as noted on plans and details.

E. Rip rap: Round carbonate stones or fragmented carbonate rock, dense, sound, and free of cracks or seams, shale, clay, friable materials and debris, placed at thickness indicated on plans. Provide all rip rap materials as required to complete the work.

F. Geotextile filter fabric: KYDOH type IV soil separator.

G. Geogrid: Basis of Design: TX160 by Tensar or approved equal.

H. Silt fence: Propex (formerly Amoco) 2130 or approved equal.

I. Rock-filled Wattles: Monofilament weave, high UV resistance, 6" diameter by 48" long wattle filled with approximately 50 lbs. of #9 gravel. Basis of Design: Snake Bag by Volm Companies or approved equal.

J. Other materials required for proper completion of work: As selected by Contractor and acceptable to Architect.

PART 3 EXECUTION

3.01 PREPARATION

A. Establish extent of grading and excavation by area and elevation. Designate and identify datum elevation and project engineering reference points. Set required lines, levels, and elevations.

B. Do not cover or enclose work of this Section before obtaining required inspections, tests, approvals, and location recording.

3.02 EXISTING UTILITIES

A. Before starting grading and excavation, establish the location and extent of underground utilities in the work area by contacting utility companies. Exercise care to protect existing utilities during earthwork operations. Perform excavation work near utilities by hand and provide necessary shoring, sheeting, and supports as the work progresses. Damage to utilities will be repaired immediately in a continuous effort until complete at the Contractor's expense.

B. Maintain, protect, relocate, or extend as required existing utility lines to remain which pass through the work area. Pay costs for this work, except as covered by the applicable utility companies.

C. Protect active utility services uncovered by excavation.

D. Remove abandoned utility service lines from areas of excavation. Cap, plug, or seal abandoned lines and identify termination points at grade level with markers.

E. Accurately locate and record abandoned and active utility lines rerouted or extended on project record documents.

3.03 SITE GRADING

A. Perform grading within contract limits, including adjacent transition areas, to subgrade of new elevations, levels, profiles, and contours indicated. Provide subgrade surfaces parallel to finished surface grades. Provide uniform levels and slopes between new elevations and existing grades.

B. Grade surfaces to assure areas drain away from structures and to prevent ponding and pockets of surface drainage. Provide subgrade surfaces free from irregular surface changes and as follows:

1. Rough grading: Plus or minus 0.10 ft. subgrade tolerance. Finish required will be that ordinarily obtained from either blade-grader or scraper operations.

2. Provide subgrade surface free of exposed gravel or stone exceeding 4" in greatest dimension in paved areas or 1" in lawn and planting areas. Areas with concentrated amounts of stone of any size including smaller than 1", such as stockpile/staging areas, edges of pavement or utility trenches, shall be raked clean of stone prior to placement of topsoil.

3. Paved areas: Shape surface of subgrade areas to line, grade, and cross-section indicated. Provide compacted subgrade suitable to receive paving base materials. Subgrade tolerance plus 0, minus 1/2".

4. Granular base: Grade subgrade surface smooth and even, free of voids to the required subgrade elevation. Provide compacted subgrade suitable to receive granular base materials. Tolerance 1/2" in 10'-0".

C. Grading at existing trees to remain:

1. Perform grading, within branch spread of existing trees to remain, by hand methods to elevations indicated.

2. Cut roots cleanly to depth 3" below proposed finish grade. Coat cut roots with tree paint.

3.04 EXCAVATING

A. Excavate to subgrades necessary to accommodate building foundation system, slabs, elevator pits, tunnels, vaults, underground storage tanks, etc. as indicated by subgrades indicated on the plans. According to the Geotech Report recommendations, rock is anticipated to be weathered and therefore, drilled piers shall extend through the weathered rock to reach competent rock for designed bearing pressures. The piers shall be socketed a minimum of 12” into competent rock.

B. Excavation shall include the satisfactory removal and disposal of all materials encountered, regardless of the nature of the materials, the condition of the materials at the time they are excavated, or the manner in which they were excavated. **All excavation shall be unclassified.**

C. Shore, sheet, or brace excavations as required to maintain them as secure from caving. Remove shoring and bracing as backfilling progresses, when banks are safe against caving. **Contractor shall employ or retain a licensed professional engineer to design all shoring that meets all Federal, State and Local requirements, including OSHA excavating and trench safety standards.**

F. The use of explosives is not permitted.

G. When necessary, cut away rock in bottom of excavations to form level beds that follow natural strata. Form with sharp steps when steps are required. In utility trenches, excavate 6" below invert elevation of pipe and 24" wider than pipe diameter, minimum 36" trench width. Remove loose materials to sound base.

3.05 DRAINAGE

A. Provide necessary pumps and drainage lines and maintain excavations, including footings, basements and pits, free from water, ice and snow during excavating and subsequent work operations.

B. Provide drainage of the working area at all times.

3.06 FILLING, BACKFILLING, AND COMPACTING

A. Obtain inspection and approval of subgrade surfaces by Geotechnical Engineer prior to filling operations. Scarify, dry, and compact soft and wet areas; remove and replace unsuitable subgrade materials with an approved compacted fill material. Take corrective measures before placing fill materials.

1. Topsoil not permitted as fill or backfill material within structure limits or under paved areas.

B. Spread approved fill material uniformly in layers not greater than 8" of loose thickness over entire fill area.

1. Lift thickness requirements may be modified by Geotechnical Engineer to suit equipment and materials or other conditions when required to assure satisfactory compaction.

2. Moisture-condition fill material by aerating or watering and thoroughly mix material to obtain moisture content permitting proper compaction.

3. Place and compact each layer of fill to indicated density before placing additional fill material. Repeat filling until proposed grade, profile, or contour is attained.

4. Suspend fill operations when satisfactory results cannot be obtained because of environmental or other unsatisfactory site conditions. Do not use muddy or frozen subgrade surface. Do not place fill material on muddy or frozen subgrade surface.

5. Maintain surface conditions, which permit adequate drainage of rainwater and prevent ponding of surface water in pockets. When fill placement is interrupted by rain, remove wet surface materials or permit to dry before placing additional fill material.

C. Utility trenches shall be backfilled with clean, open graded aggregate, compacted in 8” lifts.

1. Trenches located in roads, parking lots, loading dock or loading dock access drive shall be backfilled with flowable fill or lean concrete.

2. Trenches located beneath walkways or other pedestrian areas shall be backfilled full depth to subgrade with aggregate.

3. Trenches located in lawn or landscape areas shall be backfilled with aggregate to within 18” of the finish grade and remaining depth capped with topsoil.

4. Where utility trenches extend beneath building foundations, the 5’ of trench adjacent to the building shall be backfilled with clay or flowable fill to prevent water from migrating beneath the building via utility trenches.

D. **Filling at existing trees to remain: No fill shall be permitted within the dripline of existing trees to remain, with the exception of approved topsoil. The topsoil fill must be mixed with existing soil around tree roots in order to promote consistency of growing media and drainage. Existing soil shall be air-knifed to eliminate compaction and loosen the material so that it can be mixed with the added topsoil fill.**

D. Place backfill materials in uniform layers not greater than 8” loose thickness over entire backfill area and compact each lift properly. Backfill shall be placed in uniform layers not greater than 6" loose thickness over areas where compaction is achieved with hand compactors or manual means.

E. Fill all areas of settlement to proper grade before subsequent construction operations are performed.

F. Compaction:

1. Provide compaction control for all fill and backfill.

2. Compact top 12" of subgrade and each layer of fill or backfill material for future foundations and floor slabs to 98% of maximum dry density at optimum moisture content in accordance with ASTM D698 Standard Proctor Method. Extend compaction at least 5'-0" at both sides of foundations.

2. Compact top 12" of subgrade and each layer of fill or backfill material at future paved areas to 95% of maximum dry density at optimum moisture content in accordance with ASTM D698 Standard Proctor Method. Extend compaction at least 1-0" beyond slabs-on-grade and paving.

3. Compact top 6" of subgrade and each layer of fill material at future lawns and unpaved areas to 90% of maximum dry density at optimum moisture content in accordance with ASTM D698 Standard Proctor Method.

4. Water settling, puddling, and jetting of fill and backfill materials as a compaction method are not acceptable.

5. Maintain moisture content of materials, during compaction operations within required moisture range to obtain indicated compaction density.

6. Provide adequate equipment to achieve consistent and backfill materials.

3.08 EROSION CONTROL

A. Provide erosion control measures as indicated on plans including installation of silt fencing, installation of silt check inlet controls with specified materials.

1. Install silt fence in areas indicated on plans to conform with specified details. Silt fencing shall be installed prior to all grading activity.

B. Contractor shall provide continual maintenance of erosion control structures, including but not limited to:

1. Removal of silt, trash, mud, debris from ditches, channel and from silt fences.

2. Replacement of silt fence that has been damaged or destroyed.

C. Contractor shall keep all public roads free of silt, dirt, mud and debris throughout the entire project. Contractor shall remove and clean any silt, dirt, mud and debris from roadways at their expense.

E. Contractor shall thoroughly read and comply with all aspects of the SWPPP plan. The plan includes certifications that must be signed and submitted by the contractor and appropriate sub-contractors prior to approval of the first application of payment.

F. The Contractor shall be named a co-permittee of the KPDES or General KYR10 Permit and shall agree to the following certification:

“I certify under penalty of law that I understand the terms and conditions of the general Kentucky Pollutant Discharge Elimination System (KPDES) or General KYR10 Permit that authorized the storm water discharges associated with industrial activity from the construction site identified as part of this certification.”

The Contractor shall be responsible for preparing and submitting the Notice of Intent to governing agency 30 days prior to site disturbance.

3.09 FINISH GRADING

A. No finish grading is required in this phase. Rock, lean clay subsoils and other suitable structural fill materials excavated on-site and stripped topsoil shall remain stockpiled at an approved off-site location for future use by the next phase of construction.

3.10 FIELD QUALITY CONTROL

A. Contractor shall provide adequate notice, cooperate with, provide access to the work, obtain samples, and assist testing agency and their representatives in execution of their function.

B. Fill materials: Test proposed materials to verify suitability for use, gradation of material, moisture-density relation by ASTM D698 Standard Proctor Method, design bearing value, and percent of organic materials.

C. Subgrade surfaces: Based on visual examination at the site, provide bearing tests as required to verify questionable subgrade surfaces are adequate and meet or exceed design bearing values.

1. Structure slabs and paved areas: Make at least 1 test for each 2,000 sq. ft. of questionable surface.

D. Compaction operations: Coordinate full-time inspection and testing during filling and compaction operations. Test each lift to fill to verify compaction meets specified requirements. Provide periodic inspection and testing during site area filling and compaction operations.

1. Future structure slabs and paved areas: Make at least 1 test for each 5,000 sq. ft. of each 8” thick fill lift. A minimum of two tests per each lift are required.

2. Future foundation wall and retaining wall backfill: Make at least 2 tests at locations and elevations directed by the Geotechnical Engineer.

E. Foundation excavations: Based on visual examination at the site, provide bearing tests as required to verify bearing surfaces are adequate and meet or exceed design bearing values.

1. Make at least 2 tests at locations directed by the Geotechnical Engineer.

F. When, during progress of work, field tests or observations indicate that installed compacted materials do not meet specified requirements, provide additional compaction until specified density is achieved, or remove and replace defective materials with new materials as directed by the Geotechnical Engineer. Cost of additional labor, materials, and testing to attain specified density shall be provided at Contractor's expense.

3.11 DISPOSAL OF WASTE MATERIALS

A. Stockpile, haul from site, and legally dispose of waste materials, including deleterious soil, trash, and debris.

B. Maintain disposal route clear, clean, and free of debris. Disposal in any floodplain is not allowed.

3.12 CLEANING

A. Upon completion of earthwork operations, clean areas within contract limits, remove tools, and equipment. Provide site clear, clean, free of debris, and suitable for site work operation.

END OF SECTION 312000

SECTION 312001 - STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following documents comprise the SWPPP:

1. Specification Section 311000, 312000
2. Best Management Practices (BMP) Plan
3. Notice of Intent for Storm Water Construction Activities (NOI-SWCA)
4. Notice of Termination (NOT)
5. CMs BMP implementation schedule
6. Operation and Maintenance Plan Checklist

1.2 SUBMITTALS

A. Notice of Intent: A minimum of **7 days** prior to beginning any work, the Construction Manager (CM) shall submit a Notice of Intent for Storm Water Construction Activities (NOI-SWCA) for a General Permit to the Kentucky Division of Water via their online e-permitting web site located at:

https://dep.gateway.ky.gov/eForms/default.aspx?FormID=7.

A paper NOI-SWCA may be submitted to the DOW a minimum of 30 days prior to commencement of construction activities if the CM is unable to submit electronically. A copy shall be sent to the office of CARMAN and shall be kept on file with the BMP Plan and the SWPPP.

B. CMs BMP implementation schedule: Prior to mobilizing on the site, the CM shall submit a detailed schedule to the design professional outlining the sequence of major activities that includes the installation of all controls, earth disturbing activities and stabilization activities. This implementation schedule will become part of the SWPPP.

C. Notice of Termination: Upon final stabilization of the construction site and removal of all temporary erosion and sediment control measures, the CM shall submit a Notice of Termination (NOT) to the Kentucky Division of Water. A copy shall be sent to the office of CARMAN and shall be retained with the BMP Plan and the SWPPP for a period of one year after filing the NOT. A copy of the NOT is included at the end of this section.

1.3 QUALITY ASSURANCE

A. Inspections: The CM shall employ an erosion control inspector to inspect all storm water control measures as outlined in the KPDES Storm Water General Permit (KYR10). Qualified inspector shall be certified by the Kentucky Erosion Prevention and Sediment Control Program (KEPSC). Inspections shall be made at least once every 7 days and within 24 hours of the end of a storm event that is 0.5 inches or greater. Areas that have been temporarily or finally stabilized shall be inspected at least once every month. Revisions to the BMP plan based on the results of the inspection shall be implemented within seven (7) days of the inspection.

B. Reports: The qualified inspector conducting the inspections shall prepare a report summarizing the scope of the inspection, names and qualifications of personnel making the inspection, the date of the inspection, major observations relating to the implementation of the BMP plan, and any corrective actions taken shall be made and kept as part of the BMP plan for at least three (3) years after the date of the inspection, or until one (1) year after coverage under the General Permit (KYR10) ends. The report is to be signed by the qualified inspector. A copy of the report is to be delivered to CARMAN and the CM via the same transmittal and at the same time.

C. The SWPPP implementation and methods of construction shall comply with the following standards

1. KPDES General Permit No.: KYR10, General KPDES Permit for Storm Water Point Source Discharges Construction Activities.
2. EPA 832-R-92-005: Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 PROJECT DESCRIPTION

A. General: The proposed development and land disturbance activity is located in Fayette County on land bordered by Huguelet and University Drives. Veterans Drive also terminates at the south end of the site. The Kelley Building and Medical Annex #5, as well as surface parking are located on the property owned by the University of Kentucky, adjacent to the Dimmock Building, Combs Cancer Center, Whitney Hendrickson Cancer Center and the Bosomworth Health Sciences Building, all of which will remain. The University owns all of the surrounding property across the streets to the north and the east. At this time, the land disturbance will be limited to excavation of the basement of the building, encompassing 1.4 acres. Upon completion of the project, the average post-construction runoff coefficient will not exceed the pre-construction runoff coefficient. The latitude and longitude are 38°01’53.29” and -84°30’17.03” respectively.

B. Soils: The Fayette County Soil Survey was researched to determine the soil types for the affected watershed on this project. The entire 1.4 acres of disturbance is within the limits of the downtown urban center of Lexington and outside the limits of detailed soil mapping.

C. Site Conditions: The topography of the site slopes approximately 9 feet in elevation from the northeast to the southwest. The site is at the top of the Wolf Run Creek watershed. The site development will not result in an increase in the amount of impervious surface, therefore a stormwater detention system will not be required. Stormwater discharge will occur to the existing storm sewers to the south in Veterans Drive.

D. Critical Areas:

1. Huguelet, University and Veterans Drives: It is crucial for the motoring public to prevent mud and debris from entering the roadway.
2. Wolf Run Creek: Sediment controls must be in place prior to land disturbance activities to prevent sediment laden runoff from reaching the public sewer system and ultimately the receiving water.

1.5 MATERIAL INVENTORY

A. The material or substances listed below are expected to be present onsite during construction. The CM shall amend this list as appropriate as part of the overall SWPPP.

1. Concrete

2. Detergents
3. Paints (enamel and latex)
4. Metal studs
5. Tar
6. Metal roofing
7. Fertilizers
8. Masonry Block
9. Wood
10. Petroleum products

PART 2 - CONTROLS

2.1 EROSION AND SEDIMENT CONTROL MEASURES

A. The erosion and sediment control measures will be typical of a small scale earth moving site including:

1. Construction Entrance
2. Dust and Pollutant Control
3. Fertilizer Application Control
4. Mulching-Permanent and Temporary
5. Silt Traps
6. Silt Fence Silt Control
7. Land Grading
8. Permanent Seeding/Sodding
9. Inlet Protection

2.2 BMP PLAN

A. The permittee shall modify the BMP plan when there is a change in design, construction, operation, or maintenance of the site which has significant effect on the potential for the discharge of pollutants to the waters of the Commonwealth and shall implement the changes within seven (7) days.

B. The permittee shall amend the BMP plan if it proves to be ineffective in controlling the discharge of pollutants to the waters of the Commonwealth and shall implement the changes within seven (7) days.

2.3 STABILIZATION PRACTICES

A. Temporary Stabilization: Temporary stabilization of top soil stockpiles and disturbed portions of the site shall begin within 14 days on areas where construction activities have temporarily (for 21 days or more) ceased. Temporary stabilization can be accomplished through seeding Rye (grain) applied at 120 pounds per acre and/or straw mulching at a rate of 4,000 pounds of straw per acre.

B. Permanent Stabilization: Disturbed portions of the site where construction activities permanently ceases shall be stabilized with permanent seed or sodded no later than 14 days after the last construction activity. Most areas will be sodded, however, seeded areas will

receive the following. The permanent seed mix shall consist of 90% tall fescue (Festuca arundinacea) blend of minimum three (3) cultivars and 10% annual rye sown at a rate of 175-lbs/acre. Prior to seeding, ground agricultural limestone at rate specified by soil test and 220 lbs/acre of 20-26-6 fertilizer shall be applied to each acre stabilized. Seeding shall be done with a hydroseeding process as specifed. Steep slopes and drainage channels shall be sodded. Follow specs for post fertilization and maintenance for watering, etc.

C. Dust Control: Apply water, polyacrylamide, or other stabilizers to bare areas if windblown dust becomes a problem. Vegetative cover is the most effective means of dust and erosion control.

D. Storm water management: The development of the site will not result in increased runoff during construction. However, the CM shall conduct all operations responsibly to prevent off-site sedimentation. Curb and gutter, catch basins, yard drains and piping will provide storm water capture and control. Roof drains will be piped underground to the storm drain system to prevent surface splash and erosion. The structural control measures detailed on the Erosion Control Plan are proposed to minimize the impact of erosion. A water quality unit will provide permanent water quality to runoff before it leaves the site and enters the public storm sewer.

E. The CM shall also manage the site as needed according to the following checklist:

1. Manage the site to infiltrate stormwater into the ground and keep sediment out of storm drains.
2. Minimize the amount of exposed soil on site at any one time to the extent possible.
3. Plan the project in stages to minimize the amount of area that is bare and subject to erosion.
4. Vegetate disturbed areas with permanent or temporary seeding immediately upon reaching final grade.
5. Vegetate or cover stockpiles that will not be used immediately.
6. Reduce the velocity of stormwater both onto and away from the project area.
7. Use interceptors, diversions, vegetated buffers, and check dams to slow down stormwater as it travels across and away from the project site.
8. Construct temporary diversion measures to direct flow away from exposed areas toward stable portions of the site.
9. Protect defined channels immediately with measures adequate to handle the storm flows expected.
10. Use sod, geotextile, natural fiber, riprap, or other stabilization measures to allow channels to carry water without causing erosion.
11. Maintain all BMPs to ensure their effectiveness during the life of the project.
12. Maintain fences that protect sensitive areas, silt fences, diversion structures, and other BMPs.

2.4 OTHER CONTROLS

A. Waste Materials: All waste materials will be collected and stored in a secure metal dumpster rented from licensed waste management company. Dumpster shall meet all local and site solid waste regulations. All trash and construction debris will be deposited in the dumpster. The dumpster will be emptied when 90% full and trash hauled to the respective approved landfill. No construction waste will be buried on site. All personnel will be instructed regarding the correct procedure for waste disposal. Notices stating these practices will be posted at the office trailer and the site superintendent will be responsible for seeing that these procedures are followed.

B. Hazardous Waste: The use of any hazardous material is not anticipated at this site. But in such an event all hazardous waste materials will be disposed of in a manner specified by local or state regulation or by manufacturer. Site personnel will be instructed in these practices, and the site superintendent will be responsible for seeing that these practices are followed.

C. Sanitary Waste: All sanitary waste will be collected from portable units at a minimum of one time per week by a licensed sanitary waste contractor as required by local regulation.

D. Offsite vehicle tracking: Stabilized construction entrances shall be provided to help reduce vehicle tracking of sediments at the primary points of entry to the site. The adjacent paved street will be swept to remove any excess mud, dirt or rock tracked from site. Dump trucks hauling material from the site will be covered with a tarpaulin.

E. Non-Storm Water Discharges: It is expected that the following non-storm water discharges could occur from the site during the construction period

1. Water from water line sterilization/flushing. All water to be treated, neutralized, and handled per Kentucky Division of Water regulations.
2. Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred).
3. Uncontaminated ground water (from dewatering excavation as applicable).

2.5 SEQUENCE OF MAJOR ACTIVITIES

A. The CM shall prepare his BMP implementation schedule based on the following outline of major activities.

Construction Activity	Schedule Consideration
Construction Access-entrance to site, construction routes, equipment parking areas	This is the first land disturbing activity. As soon as construction begins, stabilize any bare areas with gravel and temporary vegetation.
Sediment traps and sediment fences	After construction site is accessed, principal sediment fence barriers, as applicable, should be installed, with addition of temporary traps and barriers as needed during grading operation.
Runoff control-diversions, perimeter dikes, water bars, outlet protection	Key practices should be installed after the installation of principal sediment traps and before land grading. Additional runoff control measures may be installed during grading as required.
Land clearing and grading-site preparation(topsoil strip, excavation, fill placement, grading, sediment traps, barriers, diversions, drains, surface roughening)	Implement major clearing and grading after installation of principal sediment and run off control measures, and install additional control measures as grading continues. Clear borrow and disposal areas as required, and mark tree and buffers for preservation. Clearing will be kept to a minimum.
Surface stabilization-temporary and permanent seeding, mulching, sodding, riprap	Temporary or permanent stabilizing measure should be applied immediately to any disturbed areas where work has been either completed or delayed 21 days. Land disturbance will be scheduled to limit exposure of bare soils to erosive elements to the extent possible.

Building construction-buildings, utilities, storm piping, curb and gutter, paving	During construction, install any erosion and sediment control measures that are needed per the attached specific sediment control plan and according to local regulatory agency, i.e., additional inlet control, etc. Install gravel areas for building material lay down and for vehicular traffic.
Landscaping and final stabilization-backfilling, topsoil replacement, trees, shrubs, permanent seeding, sodding, riprap	Last construction phase. Vegetation and mulch will be applied to applicable areas immediately after final grading is completed. Stabilize all open areas, including, borrow and fill areas, remove and stabilize temporary control measures as prescribed on the accompanying erosion control plan sheets.

B. Timing of controls/measures: As indicated on the Sequence of Major Activities, silt fences and construction entrances will be constructed prior to clearing or grading on other portions of the site. Areas where construction activity ceases for more than 21 days will be stabilized with temporary seed and mulch within 14 days of the last disturbance. Once construction activity ceases permanently in an area, that area will be stabilized with permanent seed and mulch or sod as specified. After the entire site is stabilized, the accumulated sediment will be removed from the trap or basin and the check dams and silt fence removed as applicable.

2.6 SPILL PREVENTION

A. Good Housekeeping: The following are material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to storm water runoff.

1. An effort will be made to store only enough product to do the job.
2. All materials stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
3. Portable restrooms are to be located so that any spill will not enter into the stormwater runoff.
4. Products will be kept in their original containers with original manufacturers label.
5. Substances will not be mixed with one another unless recommended by manufacturer.
6. Whenever possible, all of a product will be used up before disposing of the container.
7. Manufacturers' recommendations for proper use and disposal will be followed.
8. The site superintendent will inspect daily to ensure proper use and disposal of materials onsite.
9. Petroleum products if stored on-site are to be contained within a double wall steel tank. Tank is to be inside of a bermed area lined with 6 mil plastic. Containment area is to be capable of withholding the entire contents of the tank in the event of a catastrophic spill.

B. Hazardous Products: Hazardous materials are not expected to be brought to the site, if they are required then the guidelines below should be followed.

1. Product will be kept in original containers unless they are not resealable.
2. Original labels and material safety data sheets will be retained for product information.
3. If surplus product must be disposed of, manufacturer's, local government, and state recommended methods for proper disposal shall be followed.

C. Petroleum Products: All onsite vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chances of leakage. Petroleum products will be stored in

tightly sealed containers, which are clearly labeled. Portable equipment fuel tanks will be located as far away from surface water bodies as possible. All oils drained from equipment will be captured in pans or other suitable equipment and placed in drums for removal from site for disposal at an approved off-site location.

D. Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

E. Paints: All containers will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewer system, but will be properly disposed of according to manufacturers' instructions or State and local regulations.

F. Concrete trucks will be required to wash out or discharge surplus concrete or drum wash water into a wash out pit. The wash out pit shall be designated in an area that does not receive significant runoff and does not drain into a storm network. Upon the completion of the project, this area would be cleared of the concrete and the site restored.

G. Any asphalt substances used onsite will be applied according to KYDOH standards.

H. Spill Control Practices: In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup.

1. Manufacturers' recommended methods for spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the locations of the information and cleanup supplies.
2. Materials and equipment necessary for spill cleanup will be kept in the material storage are onsite. Equipment and materials will include but not limited to brooms, dustpans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically designed for this purpose.
3. All spills will be cleaned up immediately after discovery.
4. The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
5. Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, regardless of size.
6. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring and how to clean up the spill is there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.
7. The site superintendent responsible for the day-to-day site operations will be the spill prevention and cleanup coordinator. He will designate at least three other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area in the office trailer onsite.

I. Spill Notification: In the event of a spill, make the appropriate notification(s) consistent with the following procedures.

1. Any spill of gasoline greater than 25 gallons in a 24-hour period or spill of diesel fuel greater than 75 gallons in a 24-hour period must be reported to the Kentucky Environmental Response Team at (800) 928-2380.
2. Any spill of oil that 1) violates water quality standards, 2) produces a "sheen" on a surface water, or 3) causes a sludge or emulsion must be reported to the Kentucky Environmental Response Team at (800) 928-2380.

3. Any spill of oil or hazardous substance to waters of the state must be reported immediately by the telephone to the List State agency and phone number.
4. Any release of a hazardous substance that may be a threat to human heath or the environment must be reported to the List State agency and phone number immediately upon discovery.

PART 3 - CERTIFICATION

3.1 CONTRACTORS AND SUBCONTRACTORS

A. As part of the BMP implementation schedule, the CM shall clearly state the Contractor or Subcontractor that will implement each control measure identified on the BMP plan.

B. All Contractors and Subcontractors identified in the BMP plan must sign a copy of the certification statement below before conducting any professional service at the site.

1. Construction Manager

a. “I certify under penalty of law that I understand the terms and conditions of the general National Pollution Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.”

_____ _____
Company Name, Address and Phone Name
_____ _____
Title
_____
_____ _____
Site Address

2. Earthwork Contractor

a. “I certify under penalty of law that I understand the terms and conditions of the general National Pollution Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.”

_____ _____
Company Name, Address and Phone Name
_____ _____
Title
_____
_____ _____
Site Address

3. Storm Sewer Contractor

   a. “I certify under penalty of law that I understand the terms and conditions of the general National Pollution Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.”

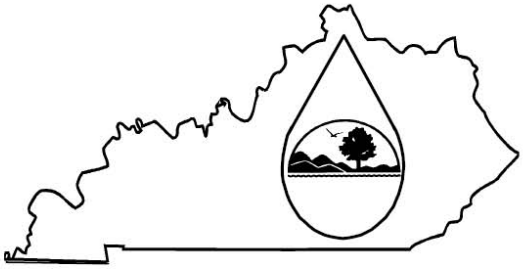
_____	_____
Company Name, Address and Phone	Name
_____	_____
	Title
_____	
	_____
_____	Site Address

4. Site Utility Contractor

   a. “I certify under penalty of law that I understand the terms and conditions of the general National Pollution Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.”

_____	_____
Company Name, Address and Phone	Name
_____	_____
	Title
_____	
	_____
_____	Site Address

KPDES FORM NOT-SW



Kentucky Pollutant Discharge Elimination System (KPDES)

NOTICE OF TERMINATION (NOT)
of Coverage Under the KPDES General Permit for Storm Water Discharges Associated with Industrial Activity

Submission of this Notice of Termination constitutes notice that the party identified in Section II of this form is no longer authorized to discharge storm water associated with industrial activity under the KPDES program.

ALL NECESSARY INFORMATION MUST BE PROVIDED ON THIS FORM.
(Please see instructions on back before completing this form.)

I. PERMIT INFORMATION
KPDES Storm Water General Permit Number:
Check here if you are no longer the Operator of the Facility: ☐
Check here if the Storm Water Discharge is Being Terminated: ☐
II. FACILITY OPERATOR INFORMATION
Name:
Address:
City/State/Zip Code:
Telephone Number:
III. FACILITY/SITE LOCATION INFORMATION
Name:
Address:
City/State/Zip Code:

Certification: I certify under penalty of law that all storm water discharges associated with industrial activity from the identified facility that are authorized by a KPDES general permit have been eliminated or that I am no longer the operator of the facility or construction site. I understand that by submitting this Notice of Termination, I am no longer authorized to discharge storm water associated with industrial activity under this general permit, and that discharging pollutants in storm water associated with industrial activity of waters of the Commonwealth is unlawful under the Clean Water Act and Kentucky Regulations where the discharge is not authorized by a KPDES permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violations of this permit or the Kentucky Revised Statutes.

NAME (Print or Type)	TITLE
SIGNATURE	DATE

Revised June 1999

INSTRUCTIONS
NOTICE OF TERMINATION (NOT) OF COVERAGE UNDER THE KPDES GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY

Who May File a Notice of Termination (NOT) Form
Permittees who are presently covered under the Kentucky Pollutant Discharge Elimination System (KPDES) General Permit for Storm Water Discharges Associated with Industrial Activity may submit a Notice of Termination (NOT) form when their facilities no longer have any storm water discharges associated with industrial activity as defined in the storm water regulations at 40 CFR 122.26 (b)(14), or when they are no longer the operator of the facilities.

For construction activities, elimination of all storm water discharges associated with industrial activity occurs when disturbed soils at the construction site have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with industrial activity from the construction site that are authorized by a KPDES general permit have otherwise been eliminated. Final stabilization means that all soil-disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 70% of the cover for unpaved areas and areas not covered by permanent structures has been established, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles have been employed.

Where to File NOT Form
Send this form to the following address:

Section Supervisor
Inventory & Data Management Section
KPDES Branch, Division of Water
14 Reilly Road, Frankfort Office Park
Frankfort, KY 40601

Completing the Form
Type or print legibly in the appropriate areas and according to the instructions given for each section. If you have questions about this form, call the Storm Water Contact, Industrial Section, at (502) 564-3410.

Section I - Permit Information
Enter the existing KPDES Storm Water General Permit number assigned to the facility or site identified in Section III. If you do not know the permit number, **call the Storm Water Contact, Industrial Section at (502) 564-3410.**

Indicate your reason for submitting this Notice of Termination by checking the appropriate box:

If there has been a change of operator and you are no longer the operator of the facility or site identified in Section III, check the corresponding box.

If all storm water discharges at the facility or site identified in Section III have been terminated, check the corresponding box.

Section II - Facility Operator Information
Give the legal name of the person, firm, public organization, or any other entity that operates the facility or site described in this application. The name of the operator may or may not be the same name as the facility. The operator of the facility is the legal entity which controls the facility's operation, rather than the plant or site manager. Do not use a colloquial name. Enter the complete address and telephone number of the operator.

Section III - Facility/Site Location Information
Enter the facility's or site's official or legal name and complete address, including city, state and ZIP code. If the facility lacks a street address, indicate the state, the latitude and longitude of the facility to the nearest 15 seconds, or the quater, section, township, and range (to the nearest quarter section) of the approximate center of the site.

Section IV - Certification
Federal statutes provide for severe penalties for submitting false information on this application form. Federal regulations require this application to be signed as follows:

For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor; or

For a municipality, State, Federal, or other public facility: by either a principal executive

Revised June 1999

LFUCG EROSION PREVENTION AND SEDIMENT CONTROL
INSPECTION REPORT

Project Name: _____ Grading Permit #: _____

Facility Operator Name on KPDES Form NOI-SW _____

Inspection Date: ___/___/___ Time: _____ Inspected by:_____

Yes	No	N/A	
☐	☐	☐	Engineer's Erosion and Sediment Control (ESP) Plan is on site and being followed
☐	☐	☐	Weekly inspection reports by Facility Operator are on site
☐	☐	☐	Environmentally Sensitive Areas are marked with orange fence and protected from sediment
☐	☐	☐	Floodplain is free of grading except as shown on ESC Plan
☐	☐	☐	25-foot buffer strip along streams is free of grading
☐	☐	☐	Disturbed areas inactive for 14 days are stabilized with seed and mulch
☐	☐	☐	Maximum area exposed without mulch is 25 acres
☐	☐	☐	Construction entrance and parking areas are stabilized with stone
☐	☐	☐	Diversion channels are installed and stabilized
☐	☐	☐	Silt fence is installed and maintained
☐	☐	☐	Stormwater pipe inlets/outlets are protected
☐	☐	☐	Check dams are installed and maintained
☐	☐	☐	Sediment ponds/traps are installed and maintained
☐	☐	☐	Impact stilling basins are installed
☐	☐	☐	Soil stockpiles are stabilized with seed/mulch
☐	☐	☐	Erosion blanket is installed and maintained
☐	☐	☐	Channels are stabilized with proper channel lining
☐	☐	☐	Stream crossings are installed and maintained
☐	☐	☐	Dewatering operations are filtered before discharging to the stream
☐	☐	☐	Pump-around flow diversions are in operation
☐	☐	☐	Mud is being kept off public streets

COMMENTS: _____
_____
_____
_____
_____
_____

10/6/04

END OF SECTION 312001

SECTION 312319 - DEWATERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes construction dewatering.

B. Related Requirements:

1. Section 013233 "Photographic Documentation" for recording preexisting conditions and dewatering system progress.
2. Section 312000 "Earth Moving" for excavating, backfilling, site grading, and controlling surface-water runoff and ponding.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Verify availability of Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review condition of site to be dewatered including coordination with temporary erosion-control measures and temporary controls and protections.
3. Review geotechnical report.
4. Review proposed site clearing and excavations.
5. Review existing utilities and subsurface conditions.
6. Review observation and monitoring of dewatering system.

1.4 ACTION SUBMITTALS

A. Shop Drawings: For dewatering system, prepared by or under the supervision of a qualified professional engineer employed by the Contractor.

1. Include plans, elevations, sections, and details.
2. Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, and discharge lines; and means of discharge, control of sediment, and disposal of water.
3. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
4. Include written plan for dewatering operations including sequence of well and well-point placement coordinated with excavation shoring and bracings and control procedures to be adopted if dewatering problems arise.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and professional engineer.

B. Field quality-control reports.

C. Existing Conditions: Using photographs or video recordings, show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by dewatering operations. Submit before Work begins.

D. Record Drawings: Identify locations and depths of capped wells and well points and other abandoned-in-place dewatering equipment.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer that has specialized in design of dewatering systems and dewatering work.

1.7 FIELD CONDITIONS

A. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of a geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by a geotechnical engineer. Owner and design team (architect, landscape architect and engineers) are not responsible for interpretations or conclusions drawn from this data.

1. Make additional test borings and conduct other exploratory operations necessary for dewatering according to the performance requirements.
2. The geotechnical report is included elsewhere in Project Manual.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

1. Design dewatering system, including comprehensive engineering analysis by a qualified professional engineer.
2. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, prevention of flooding in excavation, and prevention of damage to subgrades and permanent structures.
3. Prevent surface water from entering excavations by grading, dikes, or other means.
4. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
5. Remove dewatering system when no longer required for construction.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning dewatering. Comply with water- and debris-disposal regulations of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.

1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site or surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Provide temporary grading to facilitate dewatering and control of surface water.

D. Protect and maintain temporary erosion and sedimentation controls, which are specified in the drawings and Section 311000 "Site Clearing," during dewatering operations.

3.2 INSTALLATION

A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.

1. Space well points or wells at intervals required to provide sufficient dewatering.
2. **Use filters or other means to prevent pumping/discharge of fine sediments onto surrounding properties or rights-of-way or into storm sewers or streams. 80% of total suspended solids must be filtered from the water prior to discharge.**

B. Place dewatering system into operation to lower water to specified levels before excavating below ground-water level.

C. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

D. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails.

3.3 OPERATION

A. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.

B. Operate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.

1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
2. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
3. Maintain piezometric water level a minimum of 24 inches below bottom of excavation.

C. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.

D. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches below overlying construction.

3.4 FIELD QUALITY CONTROL

A. Observation Wells: Provide observation wells or piezometers, take measurements, and maintain at least one at the low end of the building pad; additional observation wells may be required by authorities having jurisdiction.

1. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
2. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. In areas where observation wells are not functioning properly, suspend construction activities until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.
3. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.

B. Survey-Work Benchmarks: Resurvey benchmarks regularly during dewatering and maintain an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Architect if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

C. Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.

D. Prepare reports of observations.

3.5 PROTECTION

A. Protect and maintain dewatering system during dewatering operations.Promptly repair damages to adjacent facilities caused by dewatering.

END OF SECTION 312319

SECTION 329200 - TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
1. Temporary Seeding.

B. Related Sections include the following:
1. Section 312000 "Earth Moving" for excavation, filling and backfilling, and rough grading.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

C. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for sod, identifying source, including name and telephone number of supplier.

C. Product Certificates: For soil amendments and fertilizers, signed by product manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.6 SCHEDULING

A. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.7 LAWN MAINTENANCE

A. Mow lawn on all portions of site with temporary or existing grass growth at least weekly. Grass on topsoil stockpile or other steep slopes shall also be cut with a weedeater every two weeks to prevent unsightly appearance. Grass should be left at 3” height to ensure continued growth and stabilization of site.

1.8 PAYMENT

A. All costs associated with the installation and continual maintenance of the Turf and Grasses shall be included in the price bid for the work.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species: State-certified seed of grass species, as follows:

C. Seed Species: Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:

1. Proportioned by weight as follows:

a. 100 percent annual rye.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 LAWN PREPARATION

A. Limit lawn subgrade preparation to areas to be planted.

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches (100 mm).

3.4 SEEDING

A. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Sow seed at a total rate of 120 lbs/ac..

C. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.

3.5 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

END OF SECTION 329200

University of Kentucky

Tree Protection Standards

010000S02 Tree Protection Standards

Dated: 05/2017
Applies to: All Projects
University of Kentucky

Article 56 is in addition to, and takes precedence over the provisions of the Special Conditions for the Project.

ARTICLE 56
PART 1 –GENERAL

56.1.1 SUMMARY

A. The scope of work includes all labor, materials, tools, equipment, facilities, transportation and services necessary for, and incidental to performing all operations in connection with protection of existing trees and other plants as shown on the drawings and as specified herein.

1. Provide preconstruction evaluations and Arborist Report.
2. Provide tree and plant protection fencing.
3. Provide protection of root zones and above ground tree parts and plants.
4. Provide pruning of existing trees and plants.
5. Provide all insect and disease control.
6. Provide maintenance of existing trees and plants including irrigation during the construction period as recommended by the Arborist Report.
7. Provide maintenance of existing trees and plants including irrigation during the post construction plant maintenance period.
8. Remove tree protection fencing and other protection from around and under trees and plants.
9. Clean up and disposal of all excess and surplus material.

56.1.2 CONTRACT DOCUMENTS

A. Shall consist of specifications, general conditions and the drawings. The intent of these documents is to include all labor, materials, and services necessary for the proper execution of the work. The documents are to be considered as one. Whatever is called for by any parts shall be as binding as if called for in all parts.

B. It is the intent of this section that the requirements apply to all sections of the project specification such that any subcontractor must comply with the restrictions on work within designated Tree and Plant Protection Areas.

56.1.3 RELATED DOCUMENTS AND REFERENCES

A. Related Documents:

1. Drawings and general provisions of contract including general and supplementary conditions and Division I specifications apply to work of this section.
2. Section -Planting Soil
3. Section -Irrigation
4. Section -Planting
5. Section –Lawn

B. References: The following specifications and standards of the organizations and documents listed in this paragraph form a part of the specification to the extent required by the references thereto. In the event that the requirements of the following referenced standards and specification conflict with this specification section the requirements of this specification shall prevail. In the event that requirements of any of the following referenced standards and specifications conflict with each other the more stringent requirement shall prevail.

1. ANSI A 300 (Part 5) – Standard Practices for Tree, Shrub and other Woody Plant Maintenance, Management of Trees & Shrubs During Site Planning, Site Development & Construction. Most current editions.
2. ANSI A 300 (Part 1) – Standard Practices for Tree, Shrub and other Woody Plant Maintenance, Pruning. Most current editions.
3. ANSI Z133 Safety Requirements for Arboricultural Operations.
4. Glossary of Arboricultural Terms, International Society of Arboriculture, Champaign IL, most current edition.

56.1.4 VERIFICATION

A. All scaled dimensions on the drawings are approximate. Before proceeding with any work, the Contractor shall carefully check and verify all dimensions and quantities, and shall immediately inform the Owner's Representative of any discrepancies between the information on the drawings and the actual conditions, refraining from doing any work in said areas until given approval to do so by the Owner's Representative.

56.1.5 PERMITS AND REGULATIONS

A. The Contractor shall obtain and pay for all permits related to this section of the work unless previously excluded under provision of the contract or general conditions. The Contractor shall comply with all laws and ordinances bearing on the operation or conduct of the work as drawn and specified. If the Contractor observes that a conflict exists between permit requirements and the work outlined in the contract documents, the Contractor shall promptly notify the Owner's Representative in writing including a description of any necessary changes and changes to the contract price resulting from changes in the work.

B. Wherever references are made to standards or codes in accordance with which work is to be performed or tested, the edition or revision of the standards and codes current on the effective date of this contract shall apply, unless otherwise expressly set forth.

C. In case of conflict among any referenced standards or codes or between any referenced standards and codes and the specifications, the more restrictive standard shall apply or Owner's Representative shall determine which shall govern.

56.1.6 PROTECTION OF WORK, PROPERTY AND PERSON

A. The Contractor shall protect the work, adjacent property, and the public, and shall be responsible for any damages or injury due to his/her actions.

56.1.7 CHANGES IN THE WORK

A. The Owner's Representative may order changes in the work, and the contract sum should be adjusted accordingly. All such orders and adjustments plus claims by the Contractor for extra compensation must be made and approved in writing before executing the work involved.

56.1.8 DEFINITIONS

All terms in this specification shall be as defined in the "Glossary of Arboricultural Terms" or as modified below.

A. Owner's Representative: The person appointed by the Owner to represent their interest in the Tree and Plant Protection and approval of the work and to serve as the contracting authority with the Contractor. The Owner's Representative may appoint other persons to review and approve any aspects of the work.

B. Reasonable and Reasonably: When used in this specification is intended to mean that the conditions cited will not affect the establishment or long term stability, health or growth of the plant. This specification recognizes that plants are not free of defects, and that plant conditions change with time. This specification also recognizes that some decisions cannot be totally based on measured findings and that professional judgment is required. In cases of differing opinion, the Owner's Representative expert shall determine when conditions within the plant are judged as reasonable.

C. Shrub: Woody plants with mature height approximately less than 25 feet.

D. Tree and Plant Protection Area: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and defined by a circle centered on the trunk with each tree with a radius equal to the crown dripline unless otherwise indicated by the owner's representative.

E. Tree: Single and multi-stemmed plants with anticipated mature height approximately greater than 25 feet or any plant identified on the plans as a tree.

56.1.9 SUBMITTALS

A. ARBORIST REPORT: Prior to the start of construction, submit, for approval by the Owner's Representative, the report of a consulting arborist who is a Registered Consulting Arborist® (RCA) with American Society of Consulting Arborists or an ISA Board Certified Master Arborist, which details the following information for all trees to remain within the area designated on the drawings as the Tree and Plant Protection Area. The report shall include the following:

1. A description of each tree to protect indicating the following:
    a. Genus and species
    b. Condition including any visible damage to the root system or soil within the root zone
    c. Tree diameter at 4.5 feet above grade
    d. Tree height
    e. Crown width
    f. Any visible disease and/or insect infestations
    g. Branch and/or trunk structural deficiencies.
    h. Appraisal of value
    i. Appraisal of benefits (storm water interception, heating/cooling, carbon sequestration)
2. The report shall note all trees or parts of trees, which are considered a hazard or significant or extreme risk level. Include the International Society of Arboriculture Tree Risk Assessment evaluation sheet for each tree, which may reasonably be identified as a potential hazard tree.
3. Recommendations as to treatment of all insect, disease and structural problems encountered.
4. Recommendations for fertilizer treatments, if any.
5. A plan of the site showing the location of all trees included in the report.

B. PRODUCT DATA: Submit manufacturer product data and literature describing all products required by this section to the Owner's Representative for approval. Provide submittal four weeks before the start of any work at the site.

C. QUALIFICATIONS SUBMITTAL: For each applicable person expected to work on the project, provide copies of the qualifications and experience of the Consulting Arborist, proof of either the registered Consulting Arborist® (RCA) with American Society of Consulting Arborists or an ISA Board Certified Master Arborist and any required Herbicide/Pesticide license to the Owner's Representative, for review prior to the start of work.

56.1.10 OBSERVATION OF THE WORK

A. The Owner's Representative may inspect the work at any time.

56.1.11 PRE-CONSTRUCTION CONFERENCE

A. Schedule a pre-construction meeting with the Owner's Representative at least seven (7) days before beginning work to review any questions the Contractor may have regarding the work, administrative procedures during construction and project work schedule.

1. The following Contractors shall attend the preconstruction conference:

a. General Contractor.

b. Consulting Arborist.

c. Subcontractor assigned to install Tree and Plant Protection measures.

d. Earthwork Contractor.

e. All site utility Contractors that may be required to dig or trench into the soil.

f. Landscape subcontractor.

g. Irrigation subcontractor

B. Prior to this meeting, mark all trees and plants to remain and or be removed as described in this specification for review and approval by the Owner's Representative.

56.1.12 QUALITY ASSURANCE

A. Contractor qualifications:

1. All pruning, branch tie back, tree removal, root pruning, and fertilizing required by this section shall be performed by or under the direct supervision of an ISA Certified Arborist. Submit aforementioned individual's qualifications for approval by the Owner's Representative.

2. All applications of pesticide or herbicide shall be performed by a person maintaining a current state license to apply chemical pesticides valid in the jurisdiction of the project. Submit copies of all required state licensing certificates including applicable chemical applicator licenses.

56.1.13 DAMAGE OR LOSS TO EXISTING PLANTS TO REMAIN

A. Specimen trees within or adjacent to construction areas will be identified by the Owner's Representative and the Architect, and marked with green tags. Loss of any of these trees will result in fines assessed at a minimum of $10,000 (or higher appraised amount that may be determined by the University prior to construction) per tree. Damage to all other trees on the property will be assessed at the rate of $200 per diameter inch of the tree measured 4.5' above grade.

B. Any trees or plants designated to remain and which are damaged by the Contractor shall be replaced in kind by the Contractor at their own expense in addition to fines and penalties.

Tree(s) shall be replaced with a tree(s) of similar species and equivalent trunk diameter to the tree(s) being replaced. For example, if a 20" diameter tree is to be replaced, the Contractor can provide ten (10) two inch diameter trees. Depending on site accommodations and landscape design, the replacement trees may be installed outside of the project site as directed by the Owner's Representative. Shrubs shall be replaced with a plant of similar species and equal size or the largest size plants reasonably available whichever is less. Where replacement plants are to be less than the size of the plant that is damaged, the Owner's Representative shall approve the size and quality of the replacement plant.

1. All trees and plants shall be installed per the requirements of Specification Section Planting.

C. Plants that are damaged shall be considered as requiring replacement or appraisal in the event that the damage affects more than 25 % of the crown, 25% of the trunk circumference, or root protection area, or the tree is damaged in such a manner that the tree could develop into a potential hazard. Trees and shrubs to be replaced shall be removed by the Contractor at his own expense.

1. The Owner's Representative may engage an independent arborist to assess any tree or plant that appears to have been damaged to determine their health or condition.

D. Any tree that is determined to be dead, damaged or potentially hazardous by the Owner's arborist and upon the request of the Owner's Representative shall be immediately removed by the Contractor at no additional expense to the owner. Tree removal shall include all clean-up of all wood parts and grinding of the stump to a depth sufficient to plant the replacement tree or plant, removal of all chips from the stump site and filling the resulting hole with topsoil.

E. Any remedial work on damaged existing plants recommended by the Consulting Arborist shall be completed by the Contractor at no cost to the owner. Remedial work shall include but is not limited to: soil compaction remediation and vertical mulching, pruning and or cabling, insect and disease control including injections, compensatory watering, additional mulching, and could include application tree growth regulators (TGR). Any remedial work is to be performed by an ISA Certified Arborist, ISA Board Certified Master Arborist or a Registered Consulting Arborist.

F. Remedial work may extend up to two years following the completion of construction to allow for any requirements of multiple applications or the need to undertake applications at required seasons of the year.

56.1.14 LOSS OF TREES DUE TO CONSTRUCTION FOOT PRINT

A. Any trees or plants designated as removals to accommodate construction shall be replaced. Tree(s) shall be replaced with a tree(s) of similar species and equivalent trunk diameter to the tree(s) removed. For example, if a 20" diameter tree is removed, the Contractor can provide ten (10) two inch diameter trees. Depending on site accommodations and landscape design, the replacement trees may be installed outside of the project site as

directed by the Owner's Representative. Shrubs shall be replaced with a plant of similar species and equal size or the largest size plants reasonably available whichever is less.

PART 2 –PRODUCTS

56.2.1 MULCH

The coarse grade Mulch specified here is considered superior for its water retention and soil building properties in areas of tree and shrub roots when irrigation is drip, bubblers or flood methods.

A. Mulch shall be coarse, ground, from tree and woody brush sources. The minimum range of fine particles shall be 3/8 inch or less in size and a maximum size of individual pieces shall be approximately 1 to 1-1/2 inch in diameter and maximum length of approximately 4 to 8 inches. No more that 25% of the total volume shall be fine particles and no more than 20% of total volume be large pieces. Mulch will be applied to a depth of 3 to 5 inches. Mulch shall not come into contact with the tree trunk.

1. It is understood that Mulch quality will vary significantly from supplier to supplier and region to region. The above requirements may be modified to conform to the source material from locally reliable suppliers as approved by the Owner's Representative.

B. Submit supplier's product data that product meets the requirements and two-gallon sample for approval.

56.2.2 WOOD CHIPS

A. Wood Chips from an arborist chipping operation with less than 20% by volume green leaves. Chips stockpiled from the tree removal process may be used. Mulch will be applied to a depth of 5 to 8 inches. Mulch shall not come into contact with the tree trunk.

56.2.3 TREE PROTECTION FENCING

A. Chain link fencing shall be installed around all existing trees to remain. Fencing shall be 6' tall galvanized nine gauge, with 3" end and line post and 1" minimum top rails, and bottom tension wire a maximum of 3" off the ground. Post shall be driven into the ground and spacing shall not exceed 8 feet.

6 feet tall metal chain link fence set in metal frame panels on movable core drilled concrete blocks of sufficient size to hold the fence erect in areas of existing paving to remain.

B. Orange plastic fencing shall be installed on the outside of the chain link fencing to provide high visibility.

C. GATES: For each fence type and in each separate fenced area, provide a minimum of one 3-foot-wide gate. Gates shall be lockable. The location of the gates shall be approved by the Owner's Representative.

D. Submit supplier's product data that product meets the requirements for approval.

56.2.4 TREE PROTECTION SIGN

A. Heavy-duty laminated or all weather signs, 11 inches x 17 inches, white colored background with black 2 inch high or larger block letters. The signs shall be attached to the tree protection fence every 50 feet. The tree protection sign shall read:

"Tree Protection Area - Keep Out"

The following information shall also be included on the sign:

i. Genus and species
ii. Tree diameter
iii. Tree height
iv. Appraised value of tree
v. Benefits provided
    1. Storm water interception in gallons
    2. Carbon sequestration in pounds
    3. Energy Savings

56.2.5 TREE (Plant) GROWTH REGULATOR (TGR/PGR)

A. Active ingredient Paclobutrazol i.e. (ShortStop, Cambistat 25C, Profile 2SC or other)

B. Submit supplier's product data that product meets the requirements for approval.

56.2.6 SOIL & ROOT PROTECTION

On projects where the tree protection fencing cannot be installed to create the desired protection zone.

A. Matting for vehicle and work protection shall be heavy duty matting designed for vehicle loading over tree roots, Alturnamats as manufactured by Alturnamats, Inc. Franklin, PA 16323 or approved equal.

B. 1/2"Steel plates - Following the recommendations of the project arborist steel plates shall be installed to protect the roots from Construction activities.

C. Submit suppliers' product data that product meets the requirements for approval.

56.2.7 GEOGRID

A. Geogrid shall be woven polyester fabric with PVC coating, Uni-axial or biaxial geogrid, inert to biological degradation, resistant to naturally occurring chemicals, alkalis, acids.

Manufacturers: GSE Environmental, TenCate, Terram

B. Submit suppliers' product data that product meets the requirements for approval.

56.2.8 GEOTEXTILE

A. Geotextile shall be nonwoven polypropylene fibers, inert to biological degradation and resistant of naturally occurring chemicals, alkalis and acids.

Manufacturers: GSE Environmental, TenCate, Terram

B. Submit supplier's product data that product meets the requirements for approval.

PART 3 –EXECUTION

56.3.1 SITE EXAMINATION

A. Examine the site, tree, plant and soil conditions. Notify the Owner's Representative in writing of any conditions that may impact the successful Tree and Plant Protections that is the intent of this section.

56.3.2 COORDINATION WITH PROJECT WORK

A. The Contractor shall coordinate with all other work that may impact the completion of the work.

B. Prior to the start of Work, prepare a detailed schedule of the work for coordination with other trades.

C. Coordinate the relocation of any irrigation lines currently present on the irrigation plan, heads or the conduits of other utility lines or structures that are in conflict with tree locations. Root balls shall not be altered to fit around lines. Notify the Owner's Representative of any conflicts encountered.

56.3.3 TREE AND PLANT PROTECTION AREA

A. The Tree and Plant Protection Area is defined as all areas indicated on the tree protection plan. Where no limit of the Tree and Plant Protection area is defined on the drawings, the limit shall be the drip line (outer edge of the branch spread) of each tree.

56.3.4 PREPARATION

A. Prior to the preconstruction meeting, layout the limits of the Tree and Plant Protection Area and then alignments of required Tree and Plant Protection Fencing and root pruning. Obtain the Owner's Representative's approval of the limits of the protection area and the alignment of all fencing and root pruning.

B. Flag all trees and shrubs to be removed by wrapping blue plastic ribbon around the trunk and obtain the Owner's Representative's approval of all trees and shrubs to be removed prior to the start of tree and shrub removal. After approval, mark all trees and shrubs to be removed with blue paint in a band completely around the base of the shrub(s) and around the trunk of the tree(s) 4.5 feet above the ground.

C. Flag all trees and shrubs to remain with green plastic ribbon tied completely around the trunk or each tree and on a prominent branch for each shrub. Obtain the Owner's Representative's approval of all trees and shrubs to remain prior to the start of tree and shrub removal.

D. Prior to any construction activity at the site including utility work, grading, storage of materials, or installation of temporary construction facilities, install all tree protection fencing, Geotextile Fabric, silt fence, tree protection signs, Geogrid, Mulch and or Wood Chips as shown on the drawing.

56.3.5 SOIL MOISTURE

A. Volumetric soil moisture level, in all soils within the Tree and Plant Protection Area shall be maintained above permanent wilt point to a depth of at least 8 inches. No soil work or other activity shall be permitted within the Tree and Plant Protection Area when the volumetric soil moisture is above field capacity. The permanent wilt point and field capacity for each type of soil texture shall be defined as follows (numbers indicate percentage volumetric soil moisture).

Soil Type	Permanent wilt point v/v	Field Capacity v/v
Sand, Loamy sand, Sandy Loam	5-8%	12-18%
Loam, Sandy clay, Sandy clay loam	14-25%	27-36%
Clay loam, Silt loam	11-22%	31-36%
Silty clay, Silty clay loam	22-27%	38-41%

1. Volumetric soil moisture shall be measured with a digital, electric conductivity meter. The meter shall be the Digital Soil Moisture Meter, DSMM500 by General Specialty Tools and Instruments, or approved equivalent meter.

B. The Contractor shall confirm the soil moisture levels with a moisture meter. If the moisture is too high, suspend operations until the soil moisture drains to below field capacity.

56. 3.6 ROOT PRUNING

A. Prior to any excavating into the existing soil grade within 25 feet of the limit of the Tree and Plant Protection Area or trees to remain, root prune all existing trees to a depth of 24 inches below existing grade in alignments following the edges of the Tree and Plant Protection Area or as directed by the Owner's Representative. Root pruning shall be in conformance with ANSI A300 Root Management Standard (part 8) latest edition.

1. Using an air excavation tool to expose roots within 2 feet of the limit of grading.

2. After completion of excavation, make clean cuts with a lopper, saw or pruner to sever roots so they will not be torn, ripped or damaged by the excavation, and backfill the trench immediately with existing soil, filling all voids.

56.**3.7 INSTALLATION OF GEOGRIDS, GEOTEXTILE FABRICS, MATTING, WOOD CHIPS AND OR MULCH**

A. Install geogrids, geotextile fabric, matting, wood chips and or mulch in areas and depths shown on the plans and details or as directed by the Owner's representative. In general, it is the intent of this specification to provide the following levels of protection:

1. All areas within the Tree and Plant Protection area provide a minimum of 5 inches of wood chips or mulch.

2. Areas where foot traffic or storage of lightweight materials is anticipated to be unavoidable provide a layer of Filter Fabric under the 5 inches of wood chips or mulch.

3. Areas where occasional light vehicle traffic is anticipated to be unavoidable, provide approved matting or a layer of geogrids under 8 inches of wood chips or mulch.

4. Areas where heavy vehicle traffic is unavoidable provide approved matting or a layer of geogrids under 8 -12 inches of wood chips or mulch and a layer of matting over the wood chips or mulch.

B. The Owner's Representative shall approve the appropriate level of protection.

C. In the above requirements, light vehicle is defined as a track skid steer with a ground pressure of 4 psi or lighter. A heavy vehicle is any vehicle with a tire or track pressure of greater than 4 psi. Lightweight materials are any packaged materials that can be physically moved by hand into the location. Bulk materials such as soil, or aggregate shall never be stored within the Tree and Plant Protection Area.

56.3.8 PROTECTION

A. Protect the Tree and Plant Protection Area at all times from compaction of the soil; damage of any kind to trunks, bark, branches, leaves and roots of all plants; and contamination of the soil, bark or leaves with construction materials, debris, silt, fuels, oils, and any chemicals substance. Notify the Owner’s Representative of any spills, compaction or damage and take corrective action immediately using methods approved by the Owner’s Representative.

56.3.9 GENERAL REQUIREMENTSAND LIMITATIONS FOR OPERATIONS WITHIN THE TREE AND PLANT PROTECTION AREA:

A. The Contractor shall not engage in any construction activity within the Tree and Plant Protection Area without the approval of the Owner's Representative including: operating, moving or storing equipment; storing supplies or materials; locating temporary facilities including trailers or portable toilets and shall not permit employees to traverse the area to access adjacent areas of the project or use the area for lunch or any other work breaks. Permitted activity, if any, within the Tree and Plant Protection Area may be indicated on the drawings along with any required remedial activity as listed below.

B. In the event that construction activity is unavoidable within the Tree and Plant Protection Area, notify the Owner's Representative and submit a detailed written plan of action for approval. The plan shall include: a statement detailing the reason for the activity including why other areas are not suited; a description of the proposed activity; the time period for the activity, and a list of remedial actions that will reduce the impact on the Tree and Plant Protection Area from the activity. Remedial actions shall include but shall not be limited to the following:

1. In general, demolition and excavation within the drip line of trees and shrubs shall proceed with extreme care either by the use of hand tools, directional boring and or air excavation where indicated or with other low impact equipment that will not cause damage to the tree, roots or soil.

2. When encountered, exposed roots, 1 inches and larger in diameter shall be worked around in a manner that does not break the outer layer of the root surface (bark). These roots shall be covered in Wood Chips and shall be maintained above permanent wilt point at all times. Roots one inch and larger in diameter shall not be cut without the approval of the Owner's Representative. Excavation shall be tunneled under these roots without cutting them. In the areas where roots are encountered, work shall be performed and scheduled to close excavations as quickly as possible over exposed roots.

3. Tree branches that interfere with the construction may be tied back or pruned to clear only to the point necessary to complete the work. Other branches shall only be removed when specifically indicated by the Owner's Representative. Tying back or trimming of all branches and the cutting of roots shall be in accordance with accepted arboricultural practices (ANSI A300, parts 1 and 8) and be performed by or direct under supervision of an ISA Certified Arborist.

4. Matting: Install temporary matting over the Wood Chips or Mulch to the extent indicated. Do not permit foot traffic, scaffolding or the storage of materials within the Tree and Plant Protection Area to occur off of the temporary matting.

5. Trunk Protection: Protect the trunk of each tree to remain by covering it with a ring of 8-foot-long 2-inch x 6 -inch planks loosely banded onto the tree with 3 steel bands.

Staple the bands to the planks as necessary to hold them securely in place. Trunk protection may be kept in place no longer than 12 months. If construction requires work near a particular tree to continue longer than 12 months, the steel bands shall be inspected every six months and loosened if they are found to have become tight.

6. Air Excavation Tool: If excavation for footings or utilities is required within the Tree and Plant Protection Area, air excavation tool techniques shall be used where practical or as designed on the drawings.

a. Remove the Wood Chips from an area approximately 18 inches beyond the limits of the hole or trench to be excavated. Cover the Wood Chips for a distance of not less than 15 feet around the limit of the excavation area with Filter Fabric, tarp plastic sheeting to protect the Wood Chips from silt. Mound the Wood Chips so that the plastic slopes towards the excavation.

b. Using a sprinkler or soaker hose, apply water slowly to the area of the excavation for a period of at least 4 hours, approximately 12 hours prior to the work so that the ground water level is at or near field capacity at the beginning of the work. For excavations that go beyond the damp soil, rewet the soil as necessary to keep soil moisture near field capacity.

c. Using an air excavation tool specifically designed and manufactured for the intended purpose, and at pressures recommended by the manufacturer of the equipment, fracture the existing soil to the shape and the depths required. Work at rates and using techniques that do not harm tree roots. Air pressure shall be a maximum of 90-100 psi.

i. The air excavation tool shall be either the “Air-Spade” as manufactured by Division of Guardair Corporation 47 Veterans Drive Chicopee, MA 01022 (800)-482-7324, or Supersonic Air Knife as manufactured by Easy Use Air Tools, Inc. Allison Park, Pa (866) 328-5723 or approved equal.

d. Using a commercial, high-powered vacuum truck if required, remove the soil from the excavation produced by the Air Knife excavation. The vacuum truck should generally operate simultaneously with the hose operator, such that the soil produced is picked up from the excavation hole, and the exposed roots can be observed and not damaged by the ongoing operation. Do not drive the vacuum truck into the Tree and Plant Protection Area unless the area is protected from compaction as approved in advance by the Owner’s Representative.

e. Remove all excavated soil and excavated wood chips, and contaminated soil at the end of the excavation.

f. Schedule the work so that foundations or utility work is completed immediately after the excavation. Do not let the roots dry out. Mist the roots several times during the day. If the excavated area must remain open overnight, mist the roots and cover the excavation with black plastic.

g. Dispose of all soil in a manner that meets local laws and regulations.

h. Restore soil within the trench as soon as the work is completed. Utilize soil of similar texture to the removed soil and lightly compact with hand tools. Leave soil mounded over the trench to a height of approximately 10% of the trench depth to account for settlement.

i. Restore any geogrids, filter fabric, wood chips or mulch and or matting that was required for the area.

56.3.10 GRADING AND FILLING AROUND TREES

A. Maintain existing grade within drip line of trees. Any variance to this will be executed only after consultation and recommendation from the Campus Arborist.

B. Where existing grade is above new finish grade shown around trees, carefully hand excavate within drip line to new grade. Cut exposed roots approximately 3" below elevation of new finish grade. Engage an ISA certified Arborist to recommend procedures to compensate for loss of roots and to provide initial services such as pruning of branches and stimulation of root growth. Provide subsequent maintenance during contract period as recommended by the arborist. Provide Grounds Superintendent with typed instructions for recommended long range maintenance procedures to be followed after completion of construction operations.

C. For minor fills where the existing grade is 4" or less below elevation of finish grade shown, use a topsoil type fill material rich in organic matter and loamy in texture. Place in single layers not more than two inches at a time and do not compact.

D. Fills greater than four inches shall only be attempted after consultation with the Campus Arborist. Detailed shop drawings of proposed work shall be submitted and approved by the Campus Arborist prior to any work. A progress schedule shall be established to monitor the work.

56.3.11 TREE REMOVAL:

A. Tree removals shall be performed by ISA Certified Arborists and companies shall have appropriate licenses and insurance for tree removal operations.

B. Remove all trees indicated by the drawings and specifications, as requiring removal, in a manner that will not damage adjacent trees or structures or compacts the soil.

C. Remove trees that are adjacent to trees or structures to remain, in sections, to limit the opportunity of damage to adjacent crowns, trunks, ground plane elements and structures.

D. Do not drop trees with a single cut unless the tree will fall in an area not included in the Tree and Plant Protection Area and there are no underground utilities that may be damaged. No tree to be removed within 50 feet of the Tree and Plant Protection Area shall be pushed over or up-rooted using a piece of grading equipment.

E. Protect adjacent paving, soil, trees, shrubs, ground cover plantings and understory plants to remain from damage during all tree removal operations, and from construction operations. Protection shall include the root system, trunk, limbs, and crown from breakage or scarring, and the soil from compaction.

F. Remove stumps and immediate root plate from existing trees to be removed. Grind trunk bases and large buttress roots to a depth of the largest buttress root or at least 18 inches below the top most roots whichever is less and over the area of three times the diameter of the trunk (DBH).

1. For trees where the stump will fall under new paved areas, grind roots to a total depth of 18 inches below the existing grade. If the sides of the stump hole still have greater than approximately 20% wood visible, continue grinding operation deeper and or wider until the resulting hole has less than 20% wood. Remove all wood chips produced by the grinding operation and back fill in 8 inch layers with controlled fill of a quality acceptable to the site engineer for fill material under structures, compacted to 95% of the maximum dry density standard proctor. The Owner's Representative shall approve each hole at the end of the grinding operation.

2. In areas where the tree location is to be a planting bed or lawn, remove all woodchips and backfill stump holes with planting soil as defined in Specification Section Planting Soil, in maximum of 12 inch layers and compact to 80-85% of the maximum dry density standard proctor.

G. Wood salvaged for up cycling will be identified by the Owner's Representative.

1. Sections of salvaged wood shall have a clean, flat cut across both ends.

2. Ends of wood sections shall be sealed with AnchorSeal after being cut and before being loaded. Branch cuts on the length of wood sections shall be sealed with AnchorSeal.

3. Care shall be taken when loading wood and logs not to damage the bark connection to the wood.

4. Wood and logs shall be stored so there is no contact with the ground. Wood and logs should be elevated from the ground by placing on cross beams of wood, concrete or steel. Wood and logs may also be stored on a gravel, concrete or asphalt pad.

56.3.12 PRUNING:

A. Within six months of the estimated date of substantial completion, prune all dead or hazardous branches larger than 2 inch in diameter from all trees to remain.

B. Implement all pruning recommendations found in the Arborist Report.

C. Prune any low, hanging branches and vines from existing trees and shrubs that overhang walks, streets and drives, or parking areas as follows:

1. Walks - within 7 feet vertically of the proposed walk elevation.

2. Parking areas - within 10 feet vertically of the proposed parking surface elevation.

3. Streets and drives - within 12 feet vertically of the proposed driving surface elevation.

D. All pruning shall be done in accordance with ANSI A300 (part 1), ISA BMP Tree Pruning (latest edition, and the "Structural Pruning: A Guide for the Green Industry", Edward Gilman, Brian Kempf, Nelda Matheny and Jim Clark, 2013 Urban Tree Foundation, Visalia CA.

E. Perform other pruning task as indicated on the drawings or requested by the Owner's Representative.

F. Where tree specific disease vectors require, sterilize all pruning tools between the work in individual trees.

56.3.13 TREE (Plant) GROWTH REGULATOR APPLICATION (TGR/PGR)

A. At the start of, or prior to, the construction contract period, treat all trees indicated on the Plan with Tree Growth Regulator at the recommended rates, time of year and methods indicated by the product distributor.

56.3.14 WATERING

A. The Contractor shall be fully responsible to ensure that adequate water is provided to all plants to be preserved during the entire construction period. Adequate water is defined to be maintaining soil moisture above the permanent wilt point to a depth of 8 inches or greater.

B. The Contractor shall adjust the automatic irrigation system, if available, and apply additional water, using hoses or water tanks as required.

C. Periodically test the moisture content in the soil within the root zone to determine the water content.

56.3.15 TURF AND WEED MAINTENANCE

A. Turf areas within the Tree and Plant Protection area shall be maintained in a manner that is consistent with University turf maintenance standards. This includes mowing, weed eating, edging, fertilization, weed control and leaf collection.

B. During the construction period, control any plants that seed in and around the fenced Tree and Plant Protection area at least three times a year.

1. All plants that are not shown on the planting plan or on the Tree and Plant Protection Plan to remain shall be considered as weeds.

C. At the end of the construction period provide one final mowing and weeding of the Tree and Plant Protection Area.

56.3.16 INSECT AND DISEASE CONTROL

A. Monitor all plants to remain for disease and insect infestations during the entire construction period. Provide all disease and insect control required to keep the plants in a healthy state using the principles of Integrated Plant Management (IPM). All pesticides shall be applied by a certified pesticide applicator.

56.3.17 CLEAN-UP

A. During tree and plant protection work, keep the site free of trash, pavements reasonably clean and work area in an orderly condition at the end of each day. Remove trash and debris in containers from the site no less than once a week.

1. Immediately clean up any spilled or tracked soil, fuel, oil, trash or debris deposited by the Contractor from all surfaces within the project or on public right of ways and neighboring property.

B. Once tree protection work is complete, wash all soil from pavements and other structures. Ensure that Mulch is confined to planting beds.

C. Make all repairs to grades, ruts, and damage to the work or other work at the site.

D. Remove and dispose of all excess Mulch, Wood Chips, packaging, and other material brought to the site by the Contractor.

56.3.18 REMOVAL OF FENCING AND OTHER TREE AND PLANT PROTECTION

A. At the end of the construction period or when requested by the Owner's Representative remove all fencing, Wood Chips or Mulch, Geogrids and Geotextile Fabric, trunk protection and or any other Tree and Plant Protection material.

END OF SECTION