University of Kentucky
Procurement Services

INVITATION FOR BIDS

CCK-2590.50-1-25

Asset Preservation Pool - Patterson Office Tower Partial Renovation (5th Floor)

ADDENDUM #2

04/25/25

IMPORTANT: BID AND ADDENDUM MUST BE RECEIVED BY: 05/06/25 @ 3:00 P.M. LEXINGTON, KY TIME

Bidder must acknowledge receipt of this and any addendum as stated in the Invitation for Bids.

ITEM #1: BIDDER NOTICES

- Pre-bid sign-in sheet attached

ITEM #2: UPDATES/REVISIONS TO ORIGINAL BID DOCUMENTS

- "Tab 3 Form of Proposal" has been updated with alternates. Please use the enclosed "Tab 3 Form of Proposal – Revised" document for your bid submission.
- Please refer to and incorporate into your proposal the enclosed additional information from the project team.

OFFICIAL APPROVAL
UNIVERSITY OF KENTUCKY

04/25/2025

Ken Scott
_____

Ken Scott / (859) 257-9102

SIGNATURE

_____

_____
Typed or Printed Name

University of Kentucky
Procurement Services
322 Peterson Service Building
Lexington, KY 40506-0005

PRE-BID MEETING AGENDA

Asset Preservation Pool - Patterson Office Tower Partial Renovation (5th Floor) PROJECT NUMBER CCK 2590.50-1-25

Template Updated: November 2024

Date/Time: April 22, 2025 @ 1pm

Location: Patton Student Center, Executive Boardroom 375A

Gwen Kraessig — KFI Engineers — 859-509-8767 — gwkraessig@kfi-eng.com

SIGN IN SHEET

Name	Organization	Phone	E-mail address
Tabitha McFarland	UK Purchasing	859-218-9103	tabitha.mcfarland.uky.edu
John Haddix	Varboe Const	859-595-6414	jhaddix@varboeconstruction.com
Adam Ogden	Finney Co	859-253-0659	Tom@finneycompany.net
Darrell Warner	CINFAB	513-431-8368	dwarner@cinfab.com
Dan Zornes	Glenwood Elec.	859-393-3263	DWZ @ GLENWOODELECTRIC.COM
Blake Roberts	KBR Solutions Group	859-321-4684	BLAKE@KBRSOLUTIONSGROUP.COM
Doug Royé	KBR Solutions Group	502-750-1464	doug@kbrsolutionsgroup.com
Austin Collins	Absolute	606-404-1700	Austin@absolutePlumbing.Net
Kenny Collins	SK-MGT	606-308-1623	Kenny@SK-mgt.net
Taylor Collins	Absolute	606-282-0865	
William George Tillery	UPI	(859)621-1790	gtillery@universalpiping.com
Tanner Thompson	Sunesis Env.	859-327-1160	tthompson@sunesisenv.com
DAVID LOSH	TEKTON Construction	859-894-2286	david@tekton-builder.com
Casey McGinness	EDG	859-250-5979	Cmcginness@edgllc.biz
Kyle Crist	Magna Contracting	859-421-5078	kylecrist@magnacontracting ky.com
Brandon Helton	Marrillia	859-551-8100	BHELTON@MARRILLIA.COM
Andrea Schramm	Pepper Const.	513-846-4998	aschramm@pepperconstruction.com
Brian Beams	"	513-316-1924	bbeams@pepperconstruction.com
BRIAN SCHWEDMAN	JRA		mdeluca@jrarchitects.com
MATTHEW DELUCA			
Joe Kane	UCCPM	8045761433	Joseph.Kane@UKY.edu

University of Kentucky

UNIVERSITY OF KENTUCKY
CONSTRUCTION PROCUREMENT

FORM OF PROPOSAL
REVISED 04/25/25

Project No. 2590.5 Project Title: The project includes renovation of the 5th floor (9,675 GSF) of the Patterson Office Tower.

Purchasing Officer: Tabitha McFarland

NOTE: The following Form of Proposal shall be followed exactly in submitting a proposal for this work. If this copy is lost, an additional copy will be furnished upon written request to the authority issuing Contract Documents.

This Proposal is submitted by: _____
(NAME AND ADDRESS OF BIDDER)

Date: _____ _____

Telephone: _____ _____

TO: BID CLERK
UNIVERSITY OF KENTUCKY
CONSTRUCTION
PROCUREMENT
RM. 322 PETERSON SERVICE BUILDING
LEXINGTON, KY. 40506-0005

INVITATION TO BID: CCK-2590.50-1-25

DEADLINE: 3:00PM LEXINGTON KY TIME

05/06/2025
(DATE)

The Bidder, in compliance with your Invitation for Bids 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.

The Bidder hereby acknowledges receipt of the following Addenda:

ADDENDUM NO. _____ DATED _____

ADDENDUM NO. _____ DATED _____

ADDENDUM NO. _____ DATED _____

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.)

Contractor Report of Prior Violations of
Chapters 136,139, 141, 337, 338, 341, and 342

Pursuant to KRS 45A.485, the Contractor shall, prior to the award of a Contract, reveal final determinations of any violations of the provisions of KRS Chapters 136, 139, 141, 337, 338, 341, and 342 by the Contractor that have occurred in the previous five (5) year period.

This statute also requires for the duration of the Contract established, the Contractor be in continuous compliance with the provisions of Chapters 136, 139, 141, 337, 338, 341, and 342 that apply to the Contractor's operations. The Contractor's failure to reveal a final determination of a violation of KRS Chapters 136, 139, 141, 337, 338, 341, and 342, or failure to comply with any of the above cited statutes for the duration of the Contract shall be grounds for the cancellation of the Contract, and the disqualification from eligibility for future contracts for a period of two (2) years.

The Contractor, by signing and submitting a Bid on this Invitation, agrees as required by KRS 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 these statutes during the duration of any contract that may be established. Final determinations of any violations of these statutes, must be provided to the University by the successful Contractor prior to the award of a Contract.

LUMP SUM PROPOSAL

The Bidder agrees to furnish all labor, materials, supplies and services required to complete the Work, for the above referenced Project, for the 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.

FOR THE LUMP SUM OF_____
(USE WORDS)
_____DOLLARS AND_____CENTS.
(USE WORDS) (USE WORDS)

($_____)
(USE FIGURES)

BID ALTERNATES

Add Alternate No. 1 New Partitions, Doors, and Hardware:
Base Bid: Where shown on the base bid drawings, existing doors not scheduled to be demolished will remain with no work. The existing hollow metal frames will be painted as noted on the finish material schedule. The existing doors will not receive new hardware. Small conference room 532 will be built as a singular space with no temporary dividing wall.
Alternate Bid: Refer to the Alternate Drawings. The corridor doors as noted will be replaced with new doors, transoms, sidelites, and associated hardware as scheduled. This work will involve demo of the existing doors and the walls as needed according to new work. Refer to the reflected ceiling plans. Small conference room 532 will be dividable by a dual-layered roll-up fabric partition (labeled RP-1 on the Drawings). The alternate will involve material and installation of the partition, including wiring for power.
Add $_____

Alternate No. 2: Singular VAV Units per Private Office:
Base Bid: Refer the 5th Floor HVAC plans. Groups of 1, 2, or 3 offices will share a singular VAV box sized for the volume of the respective grouping.
Alternate Bid: Each VAV unit will serve no more than one (1) private office and will be sized appropriately for each space.
Add $_____

Alternate No. 3: Elevator Lobby finishes:
Base Bid: Refer to the Drawings: No work will be done at the Elevator Lobby 500 except for the appropriate patching at the existing finishes adjacent to new work. Benches will not be provided at Corridor 500N
Alternate Bid: Elevator Lobby 500 will be outfitted with new wall, floor and ceiling finishes in accordance with the drawings. Corridor 500N will receive built-in benches in accordance with the drawings.
Add $_____

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

I hereby certify:

1. That I am the Bidder (if the Bidder is an individual), a partner in the Bidder (if the Bidder is a partnership), or an officer or employee of the bidding corporation having authority to sign on its behalf (if the Bidder is a corporation);

2. That the submitted Bid or Bids covering Construction Procurement Section Invitation No. CCK-2590.50-1-25 have been arrived at by the Bidder independently and have been submitted without collusion with, and without any agreement, understanding or planned common course of action with, any other contractor, vendor of materials, supplies, equipment or services described in the Invitation to Bid, designed to limit independent bidding or competition; as prohibited by provision KRS 45A.325;

3. That the contents of the Bid or Bids have not been communicated by the Bidder or its employees or agents to any person not an employee or agent of the Bidder or its surety on any bond furnished with the Bid or Bids and will not be communicated to any such person prior to the official opening of the Bid or Bids;

4. That the Bidder is legally entitled to enter into the contracts with the University of Kentucky and is not in violation of any prohibited conflict of interest, including those prohibited by the provisions of KRS 164.390, and 45A.330 to 45A.340 and 45A.455;

5. This offer is good for 60 calendar days from the date this Bid is opened. In submitting the above, it is expressly agreed that upon proper acceptance by the Construction Procurement Section of any or all items Bid above, a contract shall thereby be created with respect to the items accepted;

6. That I have fully informed myself regarding and affirm the accuracy of all statements made in this Form of Proposal including Bid Amount.

7. Unless otherwise exempted by KRS 45.590, the Bidder intends to comply in full with all requirements of the Kentucky Civil Rights Act and to submit data required by the Kentucky Equal Employment Act upon being designated the successful contractor.

8. That the bidding contractor and all subcontractors to be employed do not and will not maintain any facilities they provide for employees in a segregated manner, and they are in full compliance with provisions of 41 CFR 60-1.8 that prohibits the maintaining of segregated facilities.

9. 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 the bidder will not violate any provision of the campaign finance laws of the Commonwealth of Kentucky.

READ CAREFULLY - SIGN IN SPACE BELOW - FAILURE TO SIGN INVALIDATES BID

SIGNED BY_____ TITLE_____

PRINT NAME_____ FIRM_____

ADDRESS_____ AREA CODE & PHONE _____

_____

CITY STATE ZIP CODE

BIDDER'S EMAIL _____ DATE_____

VENDOR NUMBER: It is imperative that you furnish your KENTUCKY Secretary of State Organization Number in the space provided below. Failure to do so may delay the processing of purchase orders issued to your firm.

_____

(Nine Digit Number)

BIDDER'S QUALIFICATIONS

The Commonwealth of Kentucky Model Procurement Code (KRS 45A.080) requires contracts to be awarded, "to the responsive and responsible bidder whose bid offers the best value" to the University of Kentucky. In order to determine if the Bidder has the experience, qualifications, resources and necessary attributes to provide the quality workmanship, materials and management required by the plans and specifications, the Bidder may be required to complete and submit the information requested on the University of Kentucky Contractor Bidder Determination of Responsibility questionnaire. Failure to provide the information requested on the questionnaire or failure to provide any additional submittals or information that may be requested to make this determination may be grounds for a declaration of non-responsibility with respect to the Bidder. A sample of the Contractor Determination of Responsibility questionnaire was provided with the bidding documents.

TIME LIMIT FOR EXECUTION OF CONTRACT DOCUMENTS

It is further agreed, that in the event this Proposal is accepted by the Owner and the undersigned shall fail to execute the Contract and furnish satisfactory Payment and Performance Bond within ten (10) consecutive calendar days from the date of notification of the award of the Contract, the Owner may at his option, determine that the undersigned has abandoned the Contract and thereupon, the Proposal shall become null and void and the Bid guarantee, check or Bid bond which accompanied it shall be forfeited and become the property of the Owner as liquidated damages for each failure and no protest pursuant to such action will be made. If the Undersigned shall execute the Contract, and furnish satisfactory Payment Bond and Performance Bond, it is understood that the Bid Guarantee or Bid Bond will be returned to the undersigned by the Owner.

UNIT PRICES

NOTE: Unit Prices shall include the furnishing of all labor, materials, supplies and services and shall include all items of cost, overhead and profit for the Contractor and any subcontractor involved, and shall be used uniformly without modifications for either additions or deductions. The Unit Prices as established shall be used to determine the equitable adjustment of the Contract Price in connection with changes, deletions or extra work performed under the Contract and the "Rules of Measurement" set forth in the General Conditions shall govern.

All Bidders will be required to complete and submit the following information Unit Prices with the bid.

The apparent low bidder is requested to attend a post bid meeting which will be scheduled at a later date.

DESCRIPTION OF WORK	UNIT PRICE	Type

BIDDER'S PROPOSED MAJOR SUBCONTRACTORS AND SUPPLIERS

******DUE BY BID DEADLINE******

For the purposes of this form, a major subcontractor or supplier is a person or entity that will have a direct or assigned contract or purchase order for the performance or supply of any item listed below if the bidder is successful.

All subcontractors must comply with the laws of the Commonwealth of Kentucky and the policies and procedures of the University of Kentucky as administrated by the UK Construction Procurement Section and Capital Project Management Division.

If the bidder will self-perform these items, list "Self-Perform" for each applicable item.

No major subcontractor or supplier may be added or changed without written consent of the Owner's representative after the bid deadline.

The apparent low bidder may be required to attend a post bid review meeting which will be scheduled at a later date.

Division of Work	Name of Subcontractor
Selective Demolition	
Concrete	
Masonry	
Steel	
Metal Fabrications	
Rough Carpentry	
Interior Woodwork	
Doors, Frames, & Hardware	
Glazed Interior Wall Assemblies	
Glazing	
Gypsum Assemblies	
Ceilings	
Flooring	
Painting	
Specialties	
Roller Shades	
HVAC	
Sheet Metal	
Fire Protection	
Plumbing System	
Electrical	
Telecommunication	
Fire Alarm	
Access Control (Security)	
Utilities	

LIST OF MATERIALS AND EQUIPMENT

Each item listed under the different phases of construction must be clearly identified so that the Owner will definitely know what the Bidder proposes to furnish.

The use of a manufacturer's or dealer's name only, or stating "as per Plans and Specifications," will not be considered as sufficient identification.

Where more than one "Make" or "Brand" is listed for any one item, the Owner has the right to select the one to be used.

The apparent low bidders will be required to complete and submit the following information by twelve o'clock (12) noon of the first working day following the bid opening. The information requested in this submittal is required to assist the University in determining contractor responsibility to complete the project being bid.

The apparent low bidder may be required to attend a post bid review meeting which will be scheduled at a later date.

Materials and Equipment	Brand or Manufacturer
Concrete Supplier	
Masonry Supplier	
Steel Fabricator	
Cold Formed Framing	
Solid Surface Fabrications	
Quartz Agglomerate Fabricators	
Hollow Metal Doors & Frames	
Flush Wood Doors	
Access Doors and Frames	
Glazed Interior Wall System	
Non-Structural Metal Framing	
Gypsum Board	
Ceramic Tile	
Acoustical Panel Ceilings	
Polyester Felt Fiber Ceiling Panels	
Resilient Base and Accessories	
Porcelain Tile Flooring	
Tile Carpeting	
Paint	
Toilet Compartments	
Toilet Accessories	
Wall Coverings	
Room-Identification Signs	
Fire Protection Cabinets	
Roller Shades	
Water Heaters	

Water Closets / Urinals	
Lavatory	
Flush Valves – Sensor Operated	
Temperature Controls	
Laboratory Exhaust Controls	
Hydronic Pumps	
Air Cooled Chiller	
Boilers	
Air Handling Unit	
General Exhaust Fans	
Grilles, Registers, Diffusers	
VAV Boxes	
Electrical Switchgear	
Generator	
Panelboards/Disconnect Switches	
Lighting Control System	
Lighting Fixture Types (Attach List)	
Wiring Devices	
Occupancy Sensors	
Network (Ethernet) Cable	
A/V System	
Water Piping	
Sanitary Sewer Piping	

ADDENDUM NO. 2.00

04/24/2025

FOR THE PROJECT TITLED:

UK PATTERSON OFFICE TOWER
FIFTH FLOOR RENOVATION
University of Kentucky
Lexington, Kentucky

To: Prospective Bidders

From: JRA Architects
301 East Vine Street
Lexington, Kentucky 40507

Project Contact: P. Matthew DeLuca, AIA

The Addendum will form a part of the Contract Documents and modifies the original Bidding Documents dated March, 2025.

Bidders must acknowledge receipt of this Addendum in the space provided on the Form of Proposal. Failure to do so may subject the bidder to disqualification.

Bidding Documents, including the Drawings and Specifications, are amended as described herein.

_____

_____

GENERAL ITEMS:

ITEM NO. 2.01
Refer to the attached documents – the following documents have been revised and attached to this document:
00 0002 Table of Contents
01 1000 Summary

STRUCTURAL ITEMS:

ITEM NO. 2.02
Refer to the specifications. The following specifications have been revised and attached to this document:
1. 05 1000 Structural Anchors
2. 05 1200 Structural Steel

MECHANICAL ITEMS:

ITEM NO. 2.03
Refer to the specifications. The following specifications have been revised and attached to this document:
1. 23 2114 Hydronic Specialties
2. 23 3300 Air Duct Accessories
3. 23 3700 Air Outlets and Inlets
4. 23 8126.13 Small Capacity Split System Air Conditioners

04/24/2025

ELECTRICAL ITEMS:

ITEM NO. 2.04
Refer to the specifications. The following specifications have been revised and attached to this document:

1. 27 0500 Common Work Results for Communications
2. 27 1000 Structured Cabling

ATTACHMENTS:
Specification:

00 0002
01 1000
05 1000
05 1200
23 2114
23 3300
23 3700
23 8126.13
27 0500
27 1000

END OF ADDENDUM NO. 2.00

VOLUME I

DIVISION 01 – GENERAL REQUIREMENTS

VOLUME II

DIVISION 02 – EXISTING CONDITIONS

DIVISION 03 – CONCRETE (Not Used)

DIVISION 04 –MASONRY

DIVISION 05 – METALS

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

DIVISION 08 – OPENINGS

END OF TABLE OF CONTENTS

SECTION 011000 - SUMMARY

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. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Purchase contracts.
5. Owner-furnished products.
6. Access to site.
7. Coordination with occupants.
8. Work restrictions.
9. Specification and Drawing conventions.
10. Miscellaneous provisions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

A. Project Identification: 2590.5 Renew/Modernize Facilities Patterson Office Tower 5th Floor.

1. Project Location: 120 Patterson Drive, Lexington, KY 40506.

B. Owner: University of Kentucky.

1. Owner's Representative: Joseph Kane, Capitol Project Management Division, 222 Peterson Service Building, Lexington, KY 40506.

C. Architect: JRA Architects, 301 E. Vine St., Lexington, KY 40507

D. Architect's Consultants: Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. Mechanical, Electrical, Plumbing Engineers: KFI Engineers, Inc., 3264 Loch Ness Drive, , Lexington, KY 40517.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. A renovation to the 5th floor of the office tower which will add individual offices, new conference spaces, and open work environments. The renovation will involve replacing finishes, including wall coverings, flooring, and ceilings, throughout the entire floor. The renovations will also include adapting the restroom spaces for current accessibility standards. Major demolition of the existing space will be completed as part of this contracted work.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 OWNER-FURNISHED PRODUCTS

A. Owner will furnish products indicated on the Drawings. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products and making building services connections.

1.6 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.

a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.7 COORDINATION WITH OCCUPANTS

A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations

to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.8 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations and with the General Conditions.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work in occupied areas of the existing building to normal business working hours of 8 a.m. to 5 p.m., Monday through Friday, unless otherwise indicated.

1. Hours for Utility Shutdowns: Refer to General Conditions .
2. Hours for noisy activity: Outside business hours.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
2. Obtain Owner's written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

1. Notify Owner not less than two days in advance of proposed disruptive operations.
2. Obtain Owner's written permission before proceeding with disruptive operations.

E. Restricted Substances: Use of tobacco products and other controlled substances within the existing building on Project site is not permitted.

F. Employee Identification: Owner will provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

G. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.

1. Maintain list of approved screened personnel with Owner's representative.

1.9 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 051000 – STRUCTURAL ANCHORS

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 post-installed metal anchors in concrete, masonry, and steel, as shown on drawings including schedules, notes, and details showing size and location of anchors, typical connections, and types of anchors required.

1. Concrete screw anchors.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 3 Section “Cast-in-Place Concrete.”
2. Division 5 Section “Structural Steel Framing.”

C. General: Furnish submittals in quantity, format, and other Conditions of the Contract and as specified in Division 1 of the Project Manual.

D. Product Data for each type of product specified. Include manufacturer’s specifications, load charts, and other data to show compliance with the specifications (including specified standards).

1.3 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. Installer Qualifications and Procedures: Submit a letter of procedure stating method of drilling, the product proposed for use, the complete installation procedure, manufacturer training date, and a list of the personnel to be trained on anchor installation. C. ICC ES Evaluation Reports/Certificates.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Anchors shall be installed by an installer with at least 1 year of experience performing installations similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Installer Training: Conduct a thorough training with the manufacturer or the manufacturer’s representative for the installer on the project. Training to consist of a review of the complete installation process for drilled-in anchors, to include but not limited to:

1. Hole drilling procedure.

2. Hole preparation & cleaning technique.

3. Rebar dowel preparation and installation.
4. Proof loading/torquing.

C. Certifications: Unless otherwise authorized by the Engineer, anchors shall have an ICC ES Evaluation Report indicating conformance with current applicable ICC ES Acceptance Criteria.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver anchors to Project site in such quantities and at such times to ensure continuity of installation.
B. Store materials to permit easy access for inspection and identification. Protect anchors and packaged materials from erosion and deterioration.
C. Keep anchors, rod materials, nuts and washers in original manufacturer's packaging with label intact until needed for use
D. Store all anchoring products in strict accordance with manufacturer's recommendations. For adhesive anchors, consider temperature, exposure to sunlight, and shelf life.

1.6 SEQUENCING

A. Supply anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, templates, instructions, and directions, as required, for installation.

PART 2 - PRODUCTS

2.1 MECHANICAL ANCHORS

A. General: Anchor length shall be as necessary to provide the appropriate projection for the material that is being connected, the washer and full (100% of depth) engagement of the nut, and specified embedment. Embedment depth shall be respective to face of substrate (not attached material). See structural drawings for required minimum embedment of mechanical anchors; where no embedment is specified, provide anchors of sufficient length to result in manufacturer's maximum recommended effective embedment depth.

B. Basis of design: Structural anchors have been designed using Hilti products as basis of design. Where alternative anchors are substituted which are manufacturer rated as a weaker product for the given application, even when listed as an approved available product, contractor shall decrease member spacing (thereby increasing quantity of anchors) by a proportional amount as part of the base bid.

C. Concrete Screw Anchors: Carbon steel, screw type anchor with double lead thread and zinch-rich coating. Anchor shall bear the diameter and length on the bolthead that is visible after installation. Size as indicated on Drawings. Suitable for fastening into concrete with drilled damp or wet holes.

1. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:

a. Hilti HUS-EZ in accordance with ICC ESR 3027.

b. DeWalt/ Powers Screw Bolt+ with ICC ESR-3889.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General

1. Drill holes with rotary impact hammer drills using carbide-tipped bits and core drills using diamond core bits. Drill bits shall be of diameters as specified by the anchor manufacturer. Unless otherwise shown on the Drawings, all holes shall be drilled perpendicular to the concrete surface. Drill hole to the specified nominal embedment as specified on drawings.
2. Embedded Items: Identify position of reinforcing steel and other embedded items prior to drilling holes. Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items. Notify the Engineer if reinforcing steel or other embedded items are encountered during drilling. Take precautions as necessary to avoid damaging prestressing tendons, electrical and telecommunications conduit, and gas lines.

B. Concrete Screw Anchors:

1. Prepare all holes per manufacturer instructions by cleaning to remove loose material and drilling dust prior to installation of anchor.
2. Install anchor with powered impact wrench. The maximum torque rating of the impact wrench shall be in compliance with the anchor manufacturer instructions.
3. Install anchor with base of head flush to supported component. Do not over tighten anchor or strip embedment hole. Do not exceed the maximum installation torque per the anchor manufacturer instructions. Notify Engineer of Record and request repair instructions if anchor embedment hole is stripped.
4. Anchor may be loosened by a maximum of one turn and retightened to facilitate fixture attachment or realignment. Complete removal and reinstallation of the anchor is not allowed.

END OF SECTION 051000

SECTION 051200 – STRUCTURAL STEEL FRAMING

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 fabrication and erection of structural steel work, as shown on drawings including schedules, notes, and details showing size and location of members, typical connections, and types of steel required.

1. Miscellaneous steel for toilet partition supports.

1.3 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.4 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. Shop Drawings detailing fabrication and erection of structural steel components.

1. Include details of cuts, connections, holes, and other pertinent data in accordance with AISC Specifications and the AISC “Detailing for Steel Construction,” latest edition.
2. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
3. Indicate type, size, and length of bolts, distinguishing between shop and field bolts.
4. Include erection plans and details. Note any cutting and/or welding required to be performed in the field.
5. Include ASTM material specifications and grade of steel.
6. Provide erection details of all field connections.
7. Indicate surface preparation for primer/coating and shop primer/coating to be used.
8. Shop drawings that show the Architect’s or Engineer’s title block, logo and/or seal will be rejected and returned unchecked.
9. Shop drawing resubmittals are reviewed for conformance with review marks only. Any changes or questions originating on a resubmittal shall be clearly clouded.

1.5 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. Mill test reports signed by manufacturers certifying that their products, including the following, comply with requirements.

1. Weld filler materials.

C. Present evidence that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification. Provide continuity log for each welder, signed by the employer, showing that the welder has engaged in the necessary processes of welding during each 6 month period since the qualification. In lieu of qualification tests and continuity log, submit AWS CW number.

D. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing, including the power source (constant current or constant voltage).

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed structural steel work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Fabricator Qualifications: Engage a firm experienced in fabricating structural steel similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to fabricate structural steel without delaying the Work. C. Comply with applicable provisions of the following specifications and documents:

1. AISC 360 “Specification for Structural Steel Buildings.”
2. AISC 303 “Code of Standard Practice for Steel Buildings and Bridges.”
3. American Welding Society’s (AWS) D1.1-2004 “Structural Welding Code – Steel.”
4. AISC – Steel Construction Manual, 14th Edition.
5. AWS – “AWS Standard for Certification AWS Certified Welders” AWS QC7-93.
6. SSPC-VIS 3 – Visual Standard for Power and Hand Tool Cleaned Steel; Steel Structures Painting Council; 1993.

D. Welding Qualifications and Standards: Qualify procedures and personnel in accordance with applicable provisions of AWS D1.1 “Structural Welding Code – Steel” and AISC 360.

1. All shop and field welding shall be performed by personnel qualified by AWS procedure and who have engaged in the necessary processes of welding during each six month period since the latest qualification.
2. Fabricator and erector shall institute a *Welder Identification System* wherein the welder who has welded a joint or member can be identified.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver structural steel to Project site in such quantities and at such times to ensure continuity of installation.

B. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

C. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.8 SEQUENCING

A. Supply anchorage items to be embedded in or attached to other construction without delaying the Work.

PART 2 - PRODUCTS

2.1 STRUCTURAL STEEL MATERIALS

A. All structural steel shapes shall be free from millscale, rust, flake, pitting, and imperfections, without bends, kinks, and distortions.

B. Channels, Angles, Plates and Bars: ASTM A572, Grade 50 or ASTM A36.

C. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. Carbon Steel Bolts, Nuts, and Washers: ASTM A307, heavy hex steel structural bolts; ASTM A563, Grade C, heavy-hex carbon-steel nuts; and ASTM F436, Type 1, hardened carbon-steel washers, uncoated. Use ordinary bolts, washers, and nuts only where required for installation access, where bolts are called to be galvanized, and at contractor’s option for snug-tight installation applications.

1. Finish: Plain, uncoated.

2.3 PRIMER

A. Primer for uncoated steel: Fast-drying, low VOC, lead- and chromate-free, non-asphaltic, rust-inhibiting primer. Primer to be formulated for application over SSPC SP2 or SP3 prepared surfaces.

2.4 FABRICATION

A. Fabricate and assemble structural steel in shop to greatest extent possible. Fabricate structural steel according to AISC 303, “ Code of Standard Practice for Steel Buildings and Bridges,” AISC 360, and other specifications referenced in this Section and in Shop Drawings.

1. Mark and match-mark materials for field assembly.

2. Fabricate for delivery a sequence that will expedite erection and minimize field handling of structural steel.
3. Complete structural steel assemblies, including welding of units, before starting shoppriming operations.
4. Comply with fabrication tolerance limits of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.

C. Holes: Provide holes required for securing other work to structural steel framing, for attaching structural steel connections and embeds to other work, and for passage of other work through steel framing members, as shown on Shop Drawings.

1. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame-cut holes or enlarge holes by burning. Drill holes in bearing plates.
2. Weld threaded nuts to framing and other specialty items as indicated to receive other work.

D. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPCSP 2, "Hand Tool Cleaning."

2.5 SURFACE PREPARATION FOR COATINGS

A. Steel fabricator shall coordinate finishing requirements with architectural documents.

B. Surface Preparation: Clean surfaces to be painted. Remove dirt, loose rust, loose mill scale, and spatter, slag, or flux deposits. Wipe steel surfaces with solvent to remove rolling oils that impair primer bond. Prepare surfaces according to SSPC specifications as follows:

1. SSPC-SP 2 "Hand Tool Cleaning," all steel except as otherwise specified.
2. SSPC-SP 3 "Power Tool Cleaning."

2.6 SHOP PRIMING

A. General: Structural steel shall not be exposed to open atmospheric conditions between surface preparation and priming. Priming operation shall be performed in continuous operation with surface preparation.

1. Prime any blast-cleaned, bare steel within 8 hours of surface preparation or before flash rusting occurs.

B. Shop prime steel surfaces, except the following:
1. Surfaces to be field welded.

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's instructions and at rate recommended by SSPC to provide a dry film thickness of not less than 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

D. Application

1. Steel to be concealed by other trades may have primer applied by brushing, spraying, rolling, flow coating, dipping or other suitable means, at the election of the fabricator.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Before erection proceeds, and with the steel erector present, verify locations of anchorages for compliance with requirements.

B. Do not proceed with erection until unsatisfactory conditions have been corrected.

3.2 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC specifications referenced in this Section.

B. Align and adjust various members that form part of complete frame or structure before permanently fastening.

3.3 FIELD CONNECTIONS

A. Install and tighten bolts as follows:

1. Bolts: ASTM A307 (ASTM A325M).
2. Connection Type: All bolts shall be snug tight. B. Do

not reuse bolts that have been tensioned.

C. Weld Connections: Comply with AWS D1.1 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding. Remove all cracks, pores, slag inclusions, incomplete fusions, and incomplete penetrations over ½" long in any weld and reweld.

1. Comply with AISC 303 and AISC 360 for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
3. The General Contractor shall provide a full-time trained Fire-Watch Captain with appropriate fire suppression equipment during all times that welding activities occur and a minimum of 30 minutes thereafter. This person shall be in addition to the workmen.

3.4 CLEANING

A. All primed steel to be left unpainted shall be thoroughly cleaned by solvent cleaning in accordance with latest edition of Steel Structures Painting Council Surface Preparation Specification No. 1 (SSPC-SP1). Hydrocarbon based solvents are prohibited.

END OF SECTION 051200

SECTION 232114 - HYDRONIC SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A Air vents.

B Strainers.

C Balancing valves.

1.2 RELATED REQUIREMENTS

A Section 232113 - Hydronic Piping.

1.3 SUBMITTALS

A See Section 013000 - Administrative Requirements for submittal procedures.

B Product Data: Provide product data for manufactured products and assemblies required for this project. Include component sizes, rough-in requirements, service sizes, and finishes. Include product description and model.

1.4 QUALITY ASSURANCE

1.5 DELIVERY, STORAGE, AND HANDLING

A Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

C Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.1 AIR VENTS

A Maximum Fluid Pressure: 150 psi (1,034 kPa).

B Maximum Fluid Temperature: 250 degrees F (121.1 degrees C).

2.2 STRAINERS

A Manufacturers:
1. Armstrong International, Inc: www.armstronginternational.com.
2. Grinnell Products: www.grinnell.com.
3. Nexus Valve, Inc: www.nexusvalve.com.

B Size 2 inch (50 mm, DN) and Under:
1. Provide threaded, grooved, or sweat brass or iron body for up to 175 psi (1,200 kPa) working pressure, Y-pattern strainer with 1/32 inch (0.8 mm) stainless steel perforated screen.

C Size 2-1/2 inch (65 mm, DN) to 4 inch (100 mm, DN):
1. Provide flanged or grooved iron body for up to 175 psi (1,200 kPa) working pressure, up to 250 degrees F (121.1 degrees C) working temperature, Y-pattern strainer with 1/16 inch (1.6 mm) or 3/64 inch (1.2 mm) stainless steel perforated screen.

2.3 AUTOMATIC FLOW LIMITING VALVES

A Manufacturers:

B Size 1/2 inch (15 mm, DN) to 14 inch (350 mm, DN):
1. Provide ball style with flow balancing, flow measurement, and shut-off capabilities, memory stops, minimum of two metering ports and NPT threaded or soldered connections.
2. Metal construction materials consist of brass.
3. Non-metal construction materials consist of Teflon or EPDM.

C Size 2-1/2 inch (65 mm, DN) to 3 inch (600 mm, DN)
1. Provide ball style with flow balancing, flow measurement, and shut-off capabilities, memory stops, minimum of two metering ports and flanged, grooved, or weld end connections.
2. Valve body construction materials consist of bronze.
3. Internal components construction materials consist of bronze.

D Size 4 inch (65 mm DN) and larger:
1. Provide ball style with flow balancing, flow measurement, and shut-off capabilities, memory stops, minimum of two metering ports and flanged connections.
2. Valve body construction materials consist of carbon steel.
3. Internal components construction materials consist of bronze.

PART 3 EXECUTION

3.1 INSTALLATION

A Install specialties in accordance with manufacturer's instructions.

END OF SECTION 232114

SECTION 233300 - AIR DUCT ACCESSORIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A Duct access doors.

B Volume control dampers.

1.2 REFERENCE STANDARDS

A NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

B SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.

1.3 SUBMITTALS

A See Section 013000 - Administrative Requirements for submittal procedures.

B Shop Drawings: Indicate for shop fabricated assemblies including volume control dampers.

PART 2 PRODUCTS

2.1 DUCT ACCESS DOORS

A Manufacturers:
1. Ductmate Industries, Inc, a DMI Company; _____: www.ductmate.com/#sle.
2. Nailor Industries, Inc; _____: www.nailor.com/#sle.
3. Ruskin Company; _____: www.ruskin.com/#sle.

B Fabrication: Rigid and close fitting of galvanized steel with sealing gaskets and quick-fastening locking devices. For insulated ducts, install minimum 1-inch (25 mm) thick insulation with sheet metal cover.
1. Less Than 12 inches (300 mm) Square: Secure with sash locks.
2. Up to 18 inches (450 mm) Square: Provide two hinges and two sash locks.
3. Up to 24 by 48 inches (600 by 1200 mm): Three hinges and two compression latches with outside and inside handles.

C Access doors with sheet metal screw fasteners are not acceptable.

2.2 VOLUME CONTROL DAMPERS

A Manufacturers:
1. Nailor Industries, Inc; _____: www.nailor.com/#sle.
2. Ruskin Company; _____: www.ruskin.com/#sle.
3. United Enertech; _____: www.unitedenertech.com/#sle.

B Fabricate in accordance with SMACNA (DCS) and as indicated.

C Single Blade Dampers:
1. Fabricate for duct sizes up to 6 by 30 inch (150 by 760 mm).
2. Blade: 24 gauge, 0.0239 inch (0.61 mm), minimum.
3. Heavy-duty Stand-off Hat-Channel locking device with wing-nut or other locking mechanism. Hat channel depth allows insulation to be installed.

PART 3 EXECUTION

3.1 INSTALLATION

A Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). See Section 233100 for duct construction and pressure class.

B Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, combination fire and smoke dampers, and elsewhere as indicated. Provide minimum 8 by 8 inch (200 by 200 mm) size access door for hand and shoulder access, or as indicated on drawings. Provide minimum 4 by 4 inch (100 by 100 mm) size access door for balancing dampers only. Review locations prior to fabrication.

C Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION 233300

SECTION 233700 - AIR OUTLETS AND INLETS

PART 1 GENERAL

1.1 SECTION INCLUDES

A Diffusers:

B Rectangular ceiling diffusers.

C Round ceiling diffusers.

D Registers/grilles:
1. Ceiling-mounted, egg crate exhaust and return register/grilles.
2. Ceiling-mounted, supply register/grilles.

E Duct-mounted supply and return registers/louvers.

1.2 RELATED REQUIREMENTS

A Section 099123 - Interior Painting: Painting of ducts visible behind outlets and inlets.

1.3 SUBMITTALS

A See Section 013000 - Administrative Requirements for submittal procedures.

B Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A Krueger-HVAC; _____: www.krueger-hvac.com/#sle.

B Price Industries; _____: www.price-hvac.com/#sle.

C Titus, a brand of Air Distribution Technologies; _____: www.titus-hvac.com/#sle.

2.2 ROUND CEILING DIFFUSERS

A Color: As selected by Architect from manufacturer's standard range.

2.3 RECTANGULAR CEILING DIFFUSERS

A Connections: Round.

2.4 DUCT-MOUNTED SUPPLY AND RETURN REGISTERS/LOUVERS

A Type: Duct-mounted, rectangular register for round-spiral duct with adjustable pivot-ended blades, end caps, built-in volume damper, and dual cover flanges to lay flush on duct surface regardless of diameter. Performance to match manufacturer's catalog data.

2.5 CEILING SUPPLY REGISTERS/GRILLES

A Construction: Made of aluminum extrusions with factory enamel finish.

2.6 CEILING EGG CRATE EXHAUST AND RETURN GRILLES

A Type: Egg crate style face consisting of 1/2 by 1/2 by 1/2 inch (13 by 13 by 13 mm) grid core.

B Fabrication: Grid core consists of aluminum with mill aluminum finish.

C Color: To be selected by Architect from manufacturer's standard range.

D Accessories: Provide plaster frame, square mesh insect screen, square mesh debris screen, prescored molded fiberglass back, and 45 degree angled eggcrate or other similar provisions for visual blocking such as angled louver or 90 degree duct elbow.

PART 3 EXECUTION

3.1 INSTALLATION

A Install in accordance with manufacturer's instructions.

B Check location of outlets and inlets and make necessary adjustments in position to comply with architectural features, symmetry, and lighting arrangement.

C Install diffusers to ductwork with air tight connection.

D Provide balancing dampers on duct take-off to diffusers and grilles and registers, despite whether dampers are specified as part of diffuser, or grille and register assembly.

3.2 PROTECTION

A Protect installed products until completion of project.

B Replace, repair, or touch-up damaged products before Substantial Completion.

END OF SECTION 233700

SECTION 238126.13 - SMALL-CAPACITY SPLIT-SYSTEM AIR CONDITIONERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A Air-source heat pumps.

B Air cooled condensing units.

C Indoor air handling (fan and coil) units for ductless systems.

D Controls.

1.2 RELATED REQUIREMENTS

A Section 260583 - Wiring Connections: Electrical characteristics and wiring connections and installation and wiring of thermostats and other controls components.

1.3 REFERENCE STANDARDS

A AHRI 210/240 - Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2023.

B ASHRAE Std 23 - Methods for Performance Testing Positive Displacement Refrigerant Compressors and Compressor Units; 2022.

C NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.

D NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2024.

E UL 207 - Standard for Refrigerant-Containing Components and Accessories, Nonelectrical; Current Edition, Including All Revisions.

1.4 SUBMITTALS

A See Section 013000 - Administrative Requirements, for submittal procedures.

B Shop Drawings: Indicate assembly, required clearances, and location and size of field connections.

C Design Data: Indicate refrigerant pipe sizing.

1.5 QUALITY ASSURANCE

A Installer Qualifications: Company specializing in performing the work of this section with minimum five years of experience and approved by manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A LG.

B SAMSUNG

C DAIKIN

2.2 SYSTEM DESIGN

A Split-System Heating and Cooling Units: Self-contained, packaged, matched factory-engineered and assembled, pre-wired indoor and outdoor units; UL listed.
1. Provide refrigerant lines internal to units and between indoor and outdoor units, factory cleaned, dried, pressurized and sealed, with insulated suction line.

B Performance Requirements: See Drawings for additional requirements.

C Electrical Characteristics: See drawings
1. Disconnect Switch: Factory mount disconnect switch on equipment under provisions of Section 260583.

2.3 INDOOR AIR HANDLING UNITS FOR DUCTLESS SYSTEMS

A Indoor Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, evaporator coil, and controls; wired for single power connection with control transformer.
1. Wall-Mounted Units:
   a. Cooling Output: 12,000 Btuh (3.517 kW).
   b. If condensate cannot be gravity drained , provide condensate pump with necessary lift to reach drain location.

B Evaporator Coils: Copper tube aluminum fin assembly, galvanized or polymer drain pan sloped in all directions to drain, drain connection, refrigerant piping connections, restricted distributor or thermostatic expansion valve.
1. Construction and Ratings: In accordance with AHRI 210/240 and UL 207.
2. Manufacturer: System manufacturer.

2.4 OUTDOOR UNITS

A Outdoor Units: Self-contained, packaged, pre-wired unit consisting of cabinet, with compressor and condenser.
1. Construction and Ratings: In accordance with AHRI 210/240 with testing in accordance with ASHRAE Std 23 and UL 207.

B Accessories: Filter drier, high-pressure switch (manual reset), low pressure switch (automatic reset), service valves and gauge ports, thermometer well (in liquid line).
1. Provide thermostatic expansion valves.

C Operating Controls:
1. Provide BACnet Card.
a. Control by room thermostat to maintain room temperature setting.

PART 3 EXECUTION

3.1 INSTALLATION

A Install in accordance with NFPA 90A and NFPA 90B.

END OF SECTION 238126.13

SECTION 270500 - COMMON WORK RESULTS FOR COMMUNICATIONS

PART 1 - GENERAL

1.1 REVIT

A The plans, sections and risers were made with REVIT. This program has some limitations on the types of valves, fittings, taps, accessories, etc. that can be shown. The contractor should review the specifications and details for the proper type of valves, fittings, taps, accessories, etc. because what is shown on the plans may be the "closest" available within the limitations of REVIT and not exactly what is required by the contract specifications and details.

B Mounting heights may have been modified to show elements on the correct floor plan for bidding. Coordinate with the architect and engineer if it is not clear.

C Components may be orientated for clarity. Actual components shall be orientated as required by specifications, service requirements or manufacturers recommendations.

D All pathway installations required for this division are to be installed by the Division 26 contractor.

1.2 RELATED DOCUMENTS

A Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.3 SUMMARY

A Section Includes:
1. Installers Qualifications
2. Communications equipment coordination and installation.
3. Sleeves for pathways and cables.
4. Common communications installation requirements.

1.4 SUBMITTALS

A General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Provide evidence of applicable registration or certification.

C At the completion of the project, the contractor shall submit as-built drawings in AutoCad 2007 format that incorporates all changes made during construction.

1.5 QUALITY ASSURANCE

A Installer Qualifications: Engage an experienced Installer who has a registered communications distribution designer (RCDD) as permanent staff, certified by the Building Industry Consulting Service International (BICSI). At least 50% of the employees installing the low voltage structured cabling system must have current BICSI certification. This includes terminating the components as well.

B Winning contractor will be required to submit references from other completed work similar in size and scope.

C Manufacturer Qualifications: Engage firms experienced in manufacturing components listed and labeled under EIA/TIA-568B.1, B.2 and B.3and who comply with these Specifications.
1. Comply with NFPA 70.
2. Comply with ANSI American National Standards Institute
3. Comply with BICSI Building Industry Consulting Service International
4. Comply with Telecommunications Distribution Methods Manual (current edition)
5. Comply with Building Officials and Code BOCA Administrators (Standard Building Code)
6. Comply with EIA Electronic Industries Association
7. Comply with FCC Federal Communications Commission
8. Comply with International Conference of ICBO Building Officials (Uniform Building Code)
9. Comply with IEEE Institute of Electrical and Electronic Engineers, Inc.
10. Comply with NBC National Building Code
11. Comply with NFPA National Fire Protection Association
12. Comply with TIA Telecommunications Industry Association
13. Comply with University of Kentucky CNS Standards

D Work Coordination: Coordinate Work of this Section with the University’s Communications & Network Systems (UK CNS) department. Coordinate the service entrance arrangement with the Owner or it’s designee.

E Meet jointly with representatives of the above organizations and Owner's representatives to exchange information and agree on details of equipment arrangements and installation interfaces.

F Record agreements reached in meetings and distribute record to other participants.

G Adjust the arrangements and locations of distribution frames, patch panels, and cross connects in equipment rooms and wiring closets to accommodate and optimize the arrangement and space requirements of the telephone, and data equipment.

H The contractor providing work in this Division is to provide and install network cabling for Div 28 networked devices, including cameras, security, door hardware devices, etc.).

1.6 COORDINATION

A Coordinate arrangement, mounting, and support of communications equipment:
1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for piping and conduit installed at required slope.
4. So connecting pathways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

B Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

C Coordinate sleeve selection and application with selection and application of firestopping.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A Manufacturers for communications products shall be limited to those indicated in the Apendix. The manufacturers listed shall override any manufacturer listings in other Div. 27 specification sections.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR COMMUNICATIONS INSTALLATION

A Comply with NECA 1.

B Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both communications equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
1. Right of Way: Give to piping systems installed at a required slope.

APPENDIX

PARTS LISTING

Horizontal Cabling

Cat 6A Unshielded, Blue, Riser	Commscope SYSTIMAX X10D 1091SD	109SD BLU C6A 4/23 U/UTP
Cat 6A Unshielded, Blue, Plenum	Commscope SYSTIMAX X10D 2091SDB	2091SDB BLU C6A 4/23 U/UTP

Horizontal Termination Hardware

6 Port Faceplate	Commscope	FP-LBL-6P-XXX
4 Port Faceplate	Commscope	FP-LBL-4P-XXX
2 Port Faceplate	Commscope	FP-LBL-2P-XXX
Cat 6 ModularJack, Unshielded, Blue (Faceplate and Patch Panel)	Commscope	USL10G-BL
Blank Inserts	Commscope	1116412-X
48 Port Unshielded Angled Patch Panel	Commscope	CPPA-UDDM-SL-2U-48
Cat 6A U/UTP Reduced Diameter Patch Cable	Commscope	CO199K2-XXFXXX
Horizontal Cable Mgmt Panel 2U	Ortronics	60400057
Rack Mount 100 Pr 110 Block	Commscope	558635-1

X = Coordinate color of faceplates and blanks (both same color) with the end user and eletrical faceplates (if not stainless steel).

Copper Backbone Cabling

100 pr UTP Riser Cable	General Cable	2133144
25 pr UTP Riser Cable	General Cable	2133033
900 pr OSP Armored 24 AWG	General Cable	7525876
600 pr OSP Armored 24 AWG	General Cable	7525868
300 pr OSP Armored 24 AWG	General Cable	7525843
25 pr OSP Armored 24 AWG	General Cable	7525785

Opitcal Fiber Cabling and Termination Hardware

24 Strand OFNR Fiber Cable SM	Corning Cable Systems	024E81-33131-24
24 Strand OFNR Fiber Cable 62.5 MM	Corning Cable Systems	024K81-33130-24
24 Strand OFNR Fiber Cable OM4 MM	Corning Cable Systems	024T81-33190-24
12 Strand OFNR Fiber Cable SM	Corning Cable Systems	012E81-33131-24
12 Strand OFNR Fiber Cable 62.5 MM	Corning Cable Systems	012K81-33130-24
12 Strand OFNR Fiber Cable OM3 MM	Corning Cable Systems	012T81-33190-24

6 Strand OFNR Cable MM	Corning Cable Systems	006K81-31130-24
Outdoor Hybrid Fiber 48MM/48SM	Corning Cable Systems	096XU4-XXXXXD20
Outdoor Hybrid Fiber 24MM/24SM	Corning Cable Systems	048XU4-XXXXXD20
Outdoor Hybrid Fiber 12MM/12SM	Corning Cable Systems	024XU4-XXXXXD20
Outdoor Hybrid Fiber 6MM/6SM	Corning Cable Systems	012XU4-XXXXXD20
1" Innerduct (orange) - not required if armored fiber is installed		
Fiber Connector Housing	Corning Cable Systems	CCH-04U
Fiber Connector Housing	Corning Cable Systems	CCH-02U
Pigtailed Splice Cassette SM LC	Corning Cable Systems	CCH-CSXX-A9-P00RE
Pigtailed Splice Cassette OM1 LC	Corning Cable Systems	CCH-CSXX-A8-P00KE
Pigtailed Splice Cassette OM4 LC	Corning Cable Systems	CCH-CSXX-E4-P00QE
Telecommunications Room Racks		
7' floor rack	Legrand	OR-MM20716-B
Vertical Wire Manager 6.5"	Legrand	OR-MM20VMD706-B
Vertical Wire Manager 10.5"	Legrand	OR-MM20VMD710-B
Telecommunications Room Ladder Runway		
Black 12"	CPI	10250-712
Black 18"	CPI	10250-718
Cable Tray		
4" Deep Aluminum Ladder Style Cable Tray (6" rung spacing)		
Horizontal Elbows, Vertical Risers, Tees		
Radius Drop Out		
Connection Components		
Surface Raceway - Metal Only		
Minimum 2" Depth		
Protection		
Terminal Protection Block	CircaMax	1880ECA1-XX
Solid State Protector Modules	CircaMax	4B1S-300
Copper Infrastructure Splice Components		
Splice Closure 9.5" x 38"	Preformed	8000635
Splice Closure 6.5" x 28"	Preformed	8000626
Splice Closure 9.5" End Plate Kits	Preformed	800081098
Splice Closure 6.5" End Plate Kits	Preformed	8000361

MS ^{2} Splicing Module (Dry)	3M	4000-D/TR
MS ^{2} Splicing Module (Filled)	3M	4000-D
PICABOND Connectors (Dry)	Commscope	406587-1
PICABOND Connectors (Filled)	Commscope	406585-1
Coaxial Cable		
Horizontal RG-6	Belden	1189A
F Connector	Belden	FSNS6U
Riser 540	Commscope	QR 540 JCAR
Outside 540 Aerial	Commscope	QR 540 JCA
Outside 540 Buried	Commscope	QR 540 JCASS

END OF SECTION 270500

SECTION 271000 - STRUCTURED CABLING

PART 1 GENERAL

1.1 SECTION INCLUDES

A Communications system design requirements.

B Communications pathways.

C Copper cable and terminations.

D Fiber optic cable and interconnecting devices.

E Communications equipment room fittings.

F Communications outlets.

G Communications grounding and bonding.

H Communications identification.

1.2 RELATED REQUIREMENTS

A Section 078400 - Firestopping.

B Section 260526 - Grounding and Bonding for Electrical Systems.

C Section 260536 - Cable Trays for Electrical Systems.

D Section 260533.16 - Boxes for Electrical Systems.

E Section 260553 - Identification for Electrical Systems: Identification products.

F Section 262726 - Wiring Devices.

G Section 270533.13 - Conduit for Communications Systems.

1.3 REFERENCE STANDARDS

A BICSI N1 - Installation Practices for Telecommunications and ICT Cabling and Related Cabling Infrastructure, 1st Edition; 2019.

B EIA/ECA-310 - Cabinets, Racks, Panels, and Associated Equipment; 2005e.

C ICEA S-83-596 - Indoor Optical Fiber Cable; 2021.

D NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

E TIA-455-21 - FOTP-21 - Mating Durability of Fiber Optic Interconnecting Devices; 1988a (Reaffirmed 2012).

F TIA-492CAAB - Detail Specification for Class IVa Dispersion-Unshifted Single-Mode Optical Fibers with Low Water Peak; 2000 (Reaffirmed 2005).

G TIA-526-7 - Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant, Adoption of IEC 61280-4-2 Edition 2: Fibre-Optic Communications Subsystem Test Procedures – Part 4-2: Installed Cable Plant – Single-Mode Attenuation and Optical Return Loss Measurement; 2015a (Reaffirmed 2022).

H TIA-526-14 - Optical Power Loss Measurement of Installed Multimode Fiber Cable Plant; IEC 61280-4.1 Edition 3.1, Fiber Optic Communications Subsystem Test Procedures- Part 4-1: Installed Cable Plant- Multimode Attenuation Measurement; 2023d.

I TIA-568 (SET) - Commercial Building Telecommunications Cabling Standard Set; 2020.

J TIA-568.2 - Balanced Twisted-Pair Telecommunications Cabling and Components Standards; 2018d, with Addenda (2020).

K TIA-568.3 - Optical Fiber Cabling and Components Standard; 2022e.

L TIA-569 - Telecommunications Pathways and Spaces; 2019e.

M TIA-598 - Optical Fiber Cable Color Coding; 2014d, with Addendum (2018).

N TIA-606 - Administration Standard for Telecommunications Infrastructure; 2021d.

O TIA-607 - Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises; 2019d.

P UL 444 - Communications Cables; Current Edition, Including All Revisions.

Q UL 514C - Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers; Current Edition, Including All Revisions.

R UL 1651 - Fiber Optic Cable; Current Edition, Including All Revisions.

S UL 1863 - Communications-Circuit Accessories; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A Coordination:
1. Coordinate requirements for service entrance and entrance facilities with Communications Service Provider.

2. Coordinate the work with other trades to avoid placement of other utilities or obstructions within the spaces dedicated for communications equipment.
3. Coordinate arrangement of communications equipment with the dimensions and clearance requirements of the actual equipment to be installed.
4. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.5 SUBMITTALS

A See Section 013000 - Administrative Requirements, for submittal procedures.

B Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.

C Documentation for Installer qualifications.

D Field Test Reports.

E Project Record Documents: Prepared and approved by BICSI Registered Communications Distribution Designer (RCDD).
1. Record actual locations of outlet boxes and distribution frames.
2. Show as-installed color coding, pair assignment, polarization, and cross-connect layout.
3. Identify distribution frames and equipment rooms by room number on drawings.

1.6 QUALITY ASSURANCE

A Installer Qualifications: Engage an experienced Installer who has a registered communications distribution designer (RCDD) as permanent staff, certified by the Building Industry Consulting Service International (BICSI). At least 50% of the employees installing the low voltage structured cabling system must have current BICSI certification. This includes terminating the components as well.

1.7 DELIVERY, STORAGE, AND HANDLING

A Store products in manufacturer's unopened packaging until ready for installation.

B Keep stored products clean and dry.

1.8 WARRANTY

A See Section 017800 - Closeout Submittals, for additional warranty requirements.

B Correct defective Work within a 2 year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.1 SYSTEM DESIGN

A Provide a complete permanent system of cabling and pathways for voice and data communications, including cables, conduits and wireways, pull wires, support structures, enclosures and cabinets, and outlets.
1. Comply with TIA-568 (SET) (cabling) and TIA-569 (pathways) (commercial standards).
2. Provide fixed cables and pathways that comply with NFPA 70 and TIA-607 and are UL listed or third party independent testing laboratory certified.
3. Provide connection devices that are rated for operation under conditions of 32 to 140 degrees F (0 to 60 degrees C) at relative humidity of 0 to 95 percent, noncondensing.
4. In this project, the term plenum is defined as return air spaces above ceilings, inside ducts, under raised floors, and other air-handling spaces.

B System Description:
1. Building Entrance Cable: as indicated on drawings.
2. Backbones - Within Building: As indicated on the drawings.
3. Offices and Work Areas: Provide 4 Data outlets in each work area (minimum) unless indicated otherwise.

C Main Distribution Frame (MDF): Centrally located support structure for terminating horizontal cables that extend to telecommunications outlets, functioning as point of presence to external service provider.
1. Locate main distribution frame as indicated on the drawings.

D Intermediate Distribution Frames (IDF): Support structures for terminating horizontal cables that extend to telecommunications outlets.
1. Locate intermediate distribution frames as indicated on the drawings.

E Backbone Cabling: Cabling, pathways, and terminal hardware connecting intermediate distribution frames (IDF's) with main distribution frame (MDF), wired in star topology with main distribution frame at center hub of star.

F Cabling to Outlets: Specified horizontal cabling, wired in star topology to distribution frame located at center hub of star; also referred to as "links".

2.2 PATHWAYS

A Conduit: See section 260533.13.

B Cable Trays: See Section 260536.

C Firestop Sleeves: Listed; provide as required to preserve fire resistance rating of building elements.

2.3 COPPER CABLE AND TERMINATIONS

A Manufacturers: See section 270500
1. CommScope; _____: www.commscope.com/#sle.

B Copper Horizontal Cable:
1. Description: 100 ohm, balanced twisted pair cable complying with TIA-568.2 and listed and labeled as complying with UL 444.
2. Cable Type - Voice and Data:
   a. Non-data Systems:
      1) U/UTP 4/23 Category 6 PVC Cable (Blue); Commscope Systimax
   b. Data Systems:
      1) U/UTP 4/23 Category 6A PVC Cable (Blue): Commscope Systimax
3. Cable Capacity: 4-pair.
4. Cable Applications: Use listed NFPA 70 Type CMP plenum cable unless otherwise indicated.
5. Cable Jacket Color - Voice and Data Cable: Blue.

C Copper Cable Terminations: Insulation displacement connection (IDC) type using appropriate tool; use screw connections only where specifically indicated.

D Jacks and Connectors: Modular RJ-45, non-keyed, terminated with 110-style insulation displacement connectors (IDC); high impact thermoplastic housing; suitable for and complying with same standard as specified horizontal cable; UL 1863 listed.
1. Performance: 500 mating cycles.
2. Voice and Data Jacks: 8-position modular jack, color-coded for both T568A and T568B wiring configurations.
3. Product(s):
   a. CommScope; SYSTIMAX RJ45 Jacks; USL10G-BL: www.commscope.com/#sle.

E Copper Patch Cords:
1. Description: Factory-fabricated 4-pair cable assemblies with 8-position modular connectors terminated at each end.
2. Patch Cords for Patch Panels:
   a. Quantity: One for each pair of patch panel ports.
   b. Length: 3 feet (_____ mm).
3. Patch Cords for Work Areas:
   a. Quantity: One for each work area outlet port.
   b. Length: 3 feet (_____ mm).
4. Product(s):
   a. CommScope; SYSTIMAX Category 6A U/UTP Patch Cords, reduced diameter

2.4 FIBER OPTIC CABLE AND INTERCONNECTING DEVICES

A Manufacturers:
1. Corning Cable Systems.

B Fiber Optic Backbone Cable:
1. Description: Tight buffered, non-conductive fiber optic cable complying with TIA-568.3, TIA-598, ICEA S-83-596 and listed as complying with UL 444 and UL 1651.
2. Cable Type: Single-mode, 8.3/125 um (OS2) complying with TIA-492CAAB.
3. Cable Capacity: Quantity of fibers as indicated on drawings.
4. Cable Applications:
   a. Riser Applications: Use listed NFPA 70 Type OFNR riser cable or Type OFNP plenum cable.
5. Cable Jacket Color:
   a. Single-Mode Fiber (OS1/OS2): Yellow.

C Fiber Optic Interconnecting Devices:
1. Connector Type: Type LC.
2. Connector Performance: 500 mating cycles, when tested in accordance with TIA-455-21.
3. Maximum Attenuation/Insertion Loss: 0.3 dB.
4. Product(s):
   a. Corning Cable Systems.

2.5 COMMUNICATIONS EQUIPMENT ROOM FITTINGS

A Copper Cross-Connection Equipment:
1. Connector Blocks for Category 5e and Up Cabling: Type 110 insulation displacement connectors; capacity sufficient for cables to be terminated plus 25 percent spare.
2. Patch Panels for Copper Cabling: Angled, sized to fit EIA/ECA-310 standard 19 inch (482.6 mm) wide equipment racks; 0.09 inch (2.2 mm) thick aluminum; cabling terminated on Type 110 insulation displacement connectors; printed circuit board interface.
   a. Jacks: Non-keyed RJ-45, suitable for and complying with same standard as cable to be terminated; maximum 48 ports per standard width panel.
   b. Capacity: Provide ports sufficient for cables to be terminated plus 25 percent spare.
   c. Labels: Factory installed laminated plastic nameplates above each port, numbered consecutively; comply with TIA-606.
   d. Provide incoming cable strain relief and routing guides on back of panel.
3. Product(s):
   a. CommScope; SYSTIMAX Copper Panels; CPPA-UDDM-SL-2U-48: www.commscope.com/#sle.

B Fiber Optic Cross-Connection Equipment:
1. Manufacturers:
   a. Corning Cable Systems.
2. Patch Panels for Fiber Optic Cabling: Sized to fit EIA/ECA-310 standard 19 inch (482.6 mm) wide equipment racks; 0.09 inch (2.2 mm) thick aluminum.
   a. Adapters: As specified above under FIBER OPTIC CABLE AND INTERCONNECTING DEVICES; maximum of 24 duplex adaptors per standard panel width.
   b. Labels: Factory installed laminated plastic nameplates above each port, numbered consecutively; comply with TIA-606.
   c. Provide incoming cable strain relief and routing guides on back of panel.

d. Provide rear cable management tray at least 8 inches (203 mm) deep with removable cover.
e. Provide dust covers for unused adapters.

3. Product(s):
a. Corning Cable Systems: CCH-04U or CCH-02U.

C Backboards: Interior grade plywood without voids, 3/4 inch (19 mm) thick; UL-labeled fire-retardant.
1. Do not paint over UL label.

D Equipment Frames, Racks and Cabinets:
1. Manufacturers:
a. Ortronics: Mighty Mo series.
2. Component Racks: EIA/ECA-310 standard 19 inch (482.6 mm) wide.
3. Floor Mounted Racks: Aluminum or steel construction with corrosion resistant finish; vertical and horizontal cable management channels, top and bottom cable troughs, and grounding lug.

E Cable Management:
1. Manufacturers:
a. Ortronics.

2.6 COMMUNICATIONS OUTLETS

A Outlet Boxes: Comply with Section 260533.16.
1. Provide depth as required to accommodate cable manufacturer's recommended minimum conductor bend radius.

B Wall Plates:
1. Comply with system design standards and UL 514C.
2. Accepts modular jacks/inserts.
3. Capacity:
a. Data or Combination Voice/Data Outlets: _____ ports.
4. Wall Plate Material/Finish - Flush-Mounted Outlets: Match wiring device and wall plate finishes specified in Section 262726.

2.7 GROUNDING AND BONDING COMPONENTS

A Comply with TIA-607.

B Comply with Section 260526.

2.8 IDENTIFICATION PRODUCTS

A Comply with TIA-606.

PART 3 EXECUTION

3.1 INSTALLATION - GENERAL

A Comply with latest editions and addenda of TIA-568 (SET) (cabling), TIA-569 (pathways), TIA-607 (grounding and bonding), BICSI N1, NFPA 70, and SYSTEM DESIGN as specified in PART 2.

B Comply with Communication Service Provider requirements.

C Grounding and Bonding: Perform in accordance with TIA-607 and NFPA 70.

D Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

3.2 INSTALLATION OF PATHWAYS

A Install pathways with the following minimum clearances:
1. 48 inches (1220 mm) from motors, generators, frequency converters, transformers, x-ray equipment, and uninterruptible power systems.
2. 12 inches (300 mm) from power conduits and cables and panelboards.
3. 5 inches (125 mm) from fluorescent and high frequency lighting fixtures.
4. 6 inches (150 mm) from flues, hot water pipes, and steam pipes.

B Outlet Boxes:
1. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of telecommunications outlets provided under this section.

3.3 INSTALLATION OF EQUIPMENT AND CABLING

A Cabling:
1. Do not bend cable at radius less than manufacturer's recommended bend radius; for unshielded twisted pair use bend radius of not less than 4 times cable diameter.
2. Do not over-cinch or crush cables.
3. Do not exceed manufacturer's recommended cable pull tension.
4. When installing in conduit, use only lubricants approved by cable manufacturer and do not chafe or damage outer jacket.

B Service Loops (Slack or Excess Length): Provide the following minimum extra length of cable, looped neatly:
1. At Distribution Frames: 120 inches (3000 mm).
2. At Outlets - Copper: 12 inches (305 mm).
3. At Outlets - Optical Fiber: 39 inches (1000 mm).

C Copper Cabling:

1. Category 5e and Above: Maintain cable geometry; do not untwist more than 1/2 inch (12 mm) from point of termination.
2. For 4-pair cables in conduit, do not exceed 25 pounds (110 N) pull tension.
3. Use T568B wiring configuration.

D Fiber Optic Cabling:
1. Prepare for pulling by cutting outer jacket for 10 inches (250 mm) from end, leaving strength members exposed. Twist strength members together and attach to pulling eye.
2. Support vertical cable at intervals as recommended by manufacturer.

E Floor-Mounted Racks and Enclosures: Permanently anchor to floor in accordance with manufacturer's recommendations.

F Identification:
1. Use wire and cable markers to identify cables at each end.
2. Use manufacturer-furnished label inserts, identification labels, or engraved wallplate to identify each jack at communications outlets with unique identifier.
3. Use identification nameplate to identify cross-connection equipment, equipment racks, and cabinets.

3.4 FIELD QUALITY CONTROL

A See Section 014000 - Quality Requirements, for additional requirements.

B Comply with inspection and testing requirements of specified installation standards.

C Visual Inspection:
1. Inspect cable jackets for certification markings.
2. Inspect cable terminations for color coded labels of proper type.
3. Inspect outlet plates and patch panels for complete labels.

D Testing - Fiber Optic Cabling:
1. Backbone: Perform optical fiber end-to-end attenuation test using an optical time domain reflectometer (OTDR) and manufacturer's recommended test procedures; perform verification acceptance tests and factory reel tests.
2. Multimode Backbone: Perform tests in accordance with TIA-526-14.
3. Single Mode Backbone: Perform tests in accordance with TIA-526-7.
4. Links: Perform optical fiber end-to-end attenuation tests and field reel tests.

E Final Testing: After all work is complete, including installation of telecommunications outlets, and telephone dial tone service is active, test each voice jack for dial tone.

END OF SECTION 271000