UNIVERSITY OF KENTUCKY
Purchasing Division

INVITATION FOR BIDS

CCK-2644-23
ADDENDUM # 2
8/30/2022
New Due Date – 9/22/2022

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

IMPORTANT: BID AND ADDENDUM MUST BE RECEIVED BY 9/22/2022 @ 3:00 P.M. LEXINGTON, KY TIME

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

This addendum is to inform potential bidders of the new schedule for this bid, as well as release the change in the Specifications with Drawings and Special Conditions, all are attached.

New Schedule:

Pre-Bid Meeting – September 8th at 10am - Nursing Bldg., NW Corner. 751 Rose Street, Lexington

Written Questions Due – September 13 by 4pm

Final Addendum posting - September 15

Bids Due by – September 22nd, no later than 3pm in a sealed envelope delivered to the Purchasing Bid Desk
322 Peterson Service Building
411 S. Limestone
Lexington, KY 40506

OFFICIAL APPROVAL
UNIVERSITY OF KENTUCKY

David D. Stefanic / Category Specialist / 859-257-5792

University of Kentucky
Purchasing Division
322 Peterson Service Building
Lexington, KY 40506-0005

010000S01- Special Conditions - General Contractor

UNIVERSITY OF KENTUCKY
SPECIAL CONDITIONS OF THE CONTRACT
FOR CONSTRUCTION BY A GENERAL CONTRACTOR
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010000S01- Special Conditions - General Contractor

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 FIELD CONDITIONS

2.1 General Contractor 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 their bid. No allowance shall be made for failure of the General Contractor to obtain such site information prior to submitting their proposal, and no adjustment to the General Contractor's Contract amount or stipulated time for completion shall be allowed when due to failure by the General Contractor to do so.

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 Brown & Kubican 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 thirty (30) consecutive calendar days from the date of commencement as specified in the Work Order letter, and Final Completion shall be thirty (30) days thereafter.

ARTICLE 07 LIQUIDATED DAMAGES

7.1 Should the General Contractor 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 Hundred Fifty Dollars ($250.00) for each consecutive calendar day that Substantial Completion has not been met. See Article 3 of the Agreement.

7.2 Should the General Contractor 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 Hundred Dollars ($100.00) for each consecutive calendar day until Final Completion is reached. See Article 3 of the Agreement.

ARTICLE 08 SUBMITTALS AND SHOP DRAWINGS

8.1 SUBMISSIONS - GENERAL

8.1.1 The General Contractor shall submit each set of Shop Drawings, product data, samples, and test and/or certification reports 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 General Contractor for compliance with the Contract Documents before submission for approval. All submittals are to be initiated by the General Contractor. 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 General Contractor shall be made to any changes other than those 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. General Contractor 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 General Contractor shall be deemed to be making the following representations:

8.3.1.1 The General Contractor understands and agrees that he shall bear full responsibility for the products furnished. The General Contractor 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 General Contractor 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 General Contractor acknowledges that the Owner will rely on the skill, judgment, and integrity of the General Contractor as to conformance requirements and subsequent usability.

8.4 SHOP DRAWING AND PROCUREMENT SUBMITTAL LOG

8.4.1 The General Contractor, 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 General Contractor shall review, approve, and submit Shop Drawings to 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 General Contractor 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 General Contractor 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 General Contractor 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 General Contractor 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 General Contractor's stamp of approval on any shop drawing or sample shall constitute a representation to Owner and Design Consultant that the General Contractor 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 General Contractor 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 General Contractor from his responsibility for any deviations from the requirements of the Contract Documents unless the General Contractor 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 General Contractor 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 (NOT USED)

8.7 SUBMISSIONS - OPERATION AND MAINTENANCE MANUALS (NOT USED)

8.8 SUBMISSIONS – AS - BUILT SET OF DRAWINGS

8.8.1 The General Contractor shall submit one (1) electronic copy of As - Built set of drawings in .pdf format indicating all deviations of construction as originally specified in the Contract Documents. These As-Built Drawings will compile information from the General Contractor as well as all Sub-contractors. The General Contractor 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 General Contractor shall provide and utilize a camera to photograph the installation of buried utilities and concealed items. The General Contractor 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 General Contractor'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 (NOT USED)

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 General Contractor.

ARTICLE 09 PLANS, DRAWINGS, AND SPECIFICATIONS

9.1 The successful General Contractor 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 General Contractor will be required to pay Lynn Imaging for the cost of duplication for all sets required.

9.2 The University will provide two (2) sets of the 'Official Contract Documents' book to the successful General Contractor. One (1) 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, General Contractor'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 General Contractor 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) General Contractor.
(4) Sub-contractors.
(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 CONSTRUCTION SCHEDULE – BAR CHART

11.1 The General Contractor shall prepare construction schedules as a bar chart, with separate divisions for each major portion of the work, and in sufficient detail to identify the plan and sequence of construction to be followed in meeting the requirements of the Contract. Schedules shall include divisions for Work to be accomplished remote from the central construction site, e.g. utilities from outside the construction site to the site for chilled water, steam, electrical, communications, and/or fire service. Such Work shall be scheduled so that disruption resulting from construction will be minimized. Start dates and completion dates for such Work must be maintained and completed in the shortest reasonable time. The sequence of listings shall follow the Table of Contents of the Specifications. Maximum sheet size shall be 30" x 42". The schedule shall show the complete sequence of construction, by activity, with dates for beginning and completion of each element of the Work.

11.1.1 For projects requiring a bar chart schedule instead of a Critical Path Method (CPM) schedule, the following Articles of the General Conditions are amended as follows:

11.1.2 Article 21.4.2 of the General Conditions to the Contract is amended to read as follows:

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 sensitive 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) that 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 that were 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 the Project contractually required completion dates will be considered in evaluating the merit of a delay request and in adjusting the schedule. Time extensions will not be considered for concurrent delays not caused by the Owner. Requests for an extension of time which are not supported by this information shall not be considered for approval by the Owner.

11.1.3 Article 21.4.3 of the General Conditions to the Contract is amended to read as follows:

21.4.3 In anticipation of the possibility of delay due to unusual bad weather, the General Contractor shall identify those activities in the schedules, and those activities subsequently added to updated schedules, that might reasonably be expected to be delayed by bad weather.

11.1.4 Article 21.7 of the General Conditions to the Contract is amended to read as follows:

21.7 The Contract Time will only be adjusted for causes specified above. Extensions of time will only be approved if the General Contractor can provide justification supported by the Project schedule or other acceptable data that such changes extend the contractually required date of Substantial Completion, and that the General Contractor 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.

11.1.5 Article 21.8 of the General Conditions to the Contract is amended to read as follows:

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 General Contractor shall submit to the Consultant and the Owner 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 the sequence of new or revised activities and/or durations that are proposed to be added to the existing schedule including related logic. This impact analysis 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 contractually required completion dates. The General Contractor 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 General Contractor and/or the General Contractor's contractors, subcontractors, suppliers, or their respective employees and agents. Time extensions will not be considered 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.

11.1.6 Article 32.1 of the General Conditions to the Contract is amended to read as follows:

32.1 The General Contractor shall prepare and submit to the Owner and the Consultant a bar-chart type construction schedule for the Work. The schedules shall include all activities necessary for performance of the work showing the duration and the planned start and finish dates for each activity. The schedules shall include, but not be limited to, submittal processing, fabrication and delivery of materials, construction, testing, clean-up, work and/or materials to be

provided by the Owner, dates and durations for major utility outages requiring coordination with the Owner and the Owner's operations, and significant milestones related to the completion of the Project.

11.2 The schedule shall be submitted to the Consultant and to the Owner for review within thirty (30) calendar days after the date established for the start of Work on the Project as stated in the official Work Order and Notice to Proceed. Review will be only for general conformance to the requirements of the contract. Review comments and/or acceptance of the Contractor's schedule shall not relieve the Contractor of any obligation for compliance with all requirements of the Contract Documents. Such review and comments shall not constitute interference with the Contractor's means and methods of construction, which shall remain solely the responsibility of the Contractor.

11.3 Schedules shall be revised no less frequently than monthly to coincide with regular monthly Project progress meetings and submission of Applications for Payment and shall be updated to indicate progress of each activity to the date of submittal, the projected completion of each activity, any activities modified since previous submittal, any major changes in scope, and all other identifiable changes, and further shall be accompanied by a narrative report to define problem areas, anticipated delays, impact on the progress of the Work, and to report corrective action taken or proposed.

11.4 Initial schedules shall be submitted within thirty (30) calendar days after the date established in Notice to Proceed. After review, required revisions to the schedule shall be completed and incorporated in the schedule within ten (10) calendar days. Up-dated Progress Schedules shall be submitted with each Application for Payment. Submissions must include one (1) opaque reproduction and one (1) electronic copy (disk or CD) along with a transmittal letter.

11.5 Copies of reviewed Schedules are to be provided to the job site file and, as appropriate, to sub-contractors, suppliers, and other concerned entities, including separate contractors. Recipients are to be instructed to promptly report, in writing, problems anticipated by projections shown in schedules.

11.6 The processing of all progress payments is contingent upon the submission of updated schedules.

11.7 The processing of all Change Orders requesting a time extension to the contract are contingent upon the submission and approval of a revised schedule demonstrating that the change order does impact the date of completion for the entire project. Time extension requests associated with Change Orders that do not impact the date of completion for the entire project will be rejected.

ARTICLE 12 WALK-THROUGH

12.1 After the "Work Order" is issued but before Work by the General Contractor 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 General Contractor to schedule the walk-through with the Owner's Project Manager, the Consultant, and other interested parties.

12.2 During the walk-through, General Contractor 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 General Contractor 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 General Contractor 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 (NOT USED)

ARTICLE 14 FIELD OFFICE

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

14.2 A field office shall not be required for this Project.

ARTICLE 15 TELEPHONE SERVICE (NOT USED)

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. General Contractor 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 General Contractor'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 General Contractor'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 six (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 (1) section of fencing where blind corners occur or at pedestrian/vehicle intersections.

16.1.5 The General Contractor shall be responsible for removing and replacing any fence sections and/or posts necessary for access to the site on a daily basis. The General Contractor 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 General Contractor fails to comply with the requirements of this Article 16, the Owner may proceed to have the work done and the General Contractor 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 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 General Contractor 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 General Contractor to be used by the Contractor and/or the Contractor'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 Contractor and subcontractors in the K lots at Commonwealth Stadium or elsewhere on Campus. The Contractor 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 Restroom facilities in one of the surrounding buildings will be designated at the Pre-Construction Meeting for use by the General Contractor's workforce during construction. The designated restroom(s) and areas accessible to General Contractor must be kept clean and neat during construction. Failure to keep them clean will result in the General Contractor being required to provide portable toilets at his cost at the site. Drinking water shall be provided from an approved safe source so 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 General Contractor and be adjusted as before mentioned.

20.2 The General Contractor 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 (NOT USED)

ARTICLE 22 SEQUENCE OF CONSTRUCTION

22.1 NOT USED.

22.2 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.

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

22.3 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 General Contractor 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 General Contractor is to insure that all exits provide for free and unobstructed egress. If exits must be blocked, prior arrangements must be made with the Owner's Project Manager.

22.4 The General Contractor shall cooperate with the Owner to minimize inconvenience to, or interference with normal use of existing buildings and grounds by staff, students, other Contractors, or the public. General Contractor 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.

ARTICLE 23 CRANE & MATERIAL HOIST OPERATIONS

23.1 General Contractor 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 General Contractor shall be utilized to prevent pedestrian and vehicular traffic from crossing the pathway of crane lift. General Contractor's flag men shall coordinate these activities with the appropriate security personnel.

23.2 Cranes and material hoists shall be safely secured and inaccessible during non-operating hours. General Contractor 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).

23.3 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 24 UTILITIES

24.1 This Article modifies Article 8 of the General Conditions. The Owner will provide water and electricity for this Project. The General Contractor shall provide for all temporary taps, hoses, lines, boxes, lighting and installation of the same for construction operations. Electricity shall not be used for heating purposes. In the event that the General Contractor is wasteful with these utilities, the Owner shall charge the General Contractor accordingly.

24.2 UTILITY OUTAGES

24.2.1 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.

24.2.1.1 ENTIRE BUILDING OUTAGE

The Owner's Project Manager is the General Contractor'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 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.

24.2.1.2 SECTION OF A BUILDING OUTAGE

The Owner's Project Manager is the General Contractor'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 25 CLEANING AND TRASH REMOVAL

25.1 The General Contractor 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.

25.2 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.

25.3 Upon completion of the Work, General Contractor shall thoroughly clean and re-sod grass areas damaged to match existing areas.

25.4 The General Contractor 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.

25.5 Dumpsters will be provided and maintained by the General Contractor.

25.6 During Work at the Project site, the General Contractor shall clean and protect Work in progress and adjoining Work on a continuing basis. General Contractor shall apply suitable protective covering on newly installed Work where needed to prevent damage or deterioration until the time of Substantial Completion. General Contractor shall clean and perform maintenance on newly installed Work as frequently as necessary through remainder of construction period.

25.7 The General Contractor shall be responsible for daily cleaning of spillage's and debris resulting from his and his Sub-contractor'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 General Contractor 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 hospital waste and trash receptacles is strictly prohibited, except as otherwise provided by the project specifications.

25.8 Failure to comply with the above requirements shall be cause for stopping work until the condition is corrected.

ARTICLE 26 BLASTING

26.1 There shall be no blasting under any conditions on University of Kentucky property unless specified in these Special Conditions.

ARTICLE 27 CUTTING AND PATCHING - NEW AND EXISTING WORK

27.1 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.

27.2 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 done. 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 General Contractor's expense.

ARTICLE 28 UNRELATED PROJECTS

28.1 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 General Contractor for this Project must coordinate with any other contractors regarding overlapping areas. See Article 42 - Separate Contracts of the General Conditions.

ARTICLE 29 OWNER SUPPLIED MATERIALS (NOT USED)

ARTICLE 30 REMOVED ITEMS (NOT USED)

ARTICLE 31 INTERIOR ENCLOSURE AND DUST ENCAPSULATION (NOT USED)

ARTICLE 32 UKIT COMMUNICATIONS AND NETWORK SYSTEMS (NOT USED)

ARTICLE 33 EMERGENCY VEHICLE ACCESS

33.1 Emergency Vehicle Access must be maintained during construction. The General Contractor 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 34 SMOKE DETECTORS / FIRE ALARM SYSTEMS- EXISTING AND/OR NEW FACILITIES (NOT USED)

ARTICLE 35 SURVEYS, RECORDS, and REPORTS

35.1 General: Working from lines and levels established by property survey, and as shown in relation to the Work, the General Contractor 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 General Contractor 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. General Contractor shall advise Sub-contractors performing Work of marked lines and levels provided for their use in layout of Work.

35.2 Survey Procedures: The General Contractor 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 General Contractor or Design Consultant's reference at reasonable times. Surveyor shall record deviations from required lines and levels, and advise Design Consultant or General Contractor promptly upon detection of deviations exceeding indicated or recognized tolerances. The General Contractor shall record deviations which are accepted (not corrected) on Record Drawings.

ARTICLE 36 TOBACCO PRODUCTS PROHIBITED

36.1 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.

36.2 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.

36.3 General Contractor employees violating this prohibition will be subject to dismissal from the Project.

36.4 For the full Administrative Regulation see University AR 6:5.
http://www.uky.edu/Regs/files/ar/ar6-5.pdf
.

ARTICLE 37 ALTERNATES (NOT USED)

ARTICLE 38 FIELD CONSTRUCTED MOCKUPS (NOT USED)

ARTICLE 39 PROJECT COORDINATION VIA COMPUTER

39.1 The General Contractor and subcontractors are required to have an active email account to facilitate coordination of the project during construction and warranty.

39.2 To facilitate project construction coordination between the Consultant, the General Contractor, 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.

39.2.1 Owner shall provide the General Contractor and subcontractors with user accounts and appropriate training for the web-based project management tool.

39.2.2 Utilization of, and training in the use of, the WPMS will be arranged for and supervised by Owner.

39.2.3 Participation of General Contractor is mandatory; others as determined by Owner. Participation of Subcontractors is not mandatory but will be offered at their discretion.

39.2.4 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.

39.2.5 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.

39.2.6 Site camera monitors may be included at Owner's discretion.

39.2.7 Utilization of the WPMS shall be implemented by the Owner's representative.

39.2.8 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.

ARTICLE 40 HOT WORK PERMITS

40.1 All work involving open flames or producing heat and/or sparks in occupied buildings on the University of Kentucky campus will require the General Contractor 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 Cadwelding. A copy of the Hot Work Permit and the Hot Work Permit Procedure will be passed out at the Preconstruction Conference for the General Contractor's use.

ARTICLE 41 INSURANCE

41.1 Employers' Liability Insurance. The General Contractor shall acquire and maintain Employers' Liability insurance with at least $500,000/$500,000/$500,000 limits of liability for all employees who will be working at the Project site.

41.2.1 Commercial General Liability Insurance. If the work involved requires the use of helicopters, a separate aviation liability policy with limits of liability of $1,000,000 will be required. If cranes and rigging are involved, a separate inland marine policy with liability limits of $100,000,000 will be required.

41.2.1.1 The limits of liability shall not be less than $500,000 each occurrence combined single limits for bodily injury and property damage. If split limits are used, they shall not be less than $500,000 for each person and each occurrence and $500,000 for property damage.

41.2.2 Comprehensive Automobile Liability Insurance. Policy limits shall not be less than $1,000,000 for combined single limits for bodily injury and property damage for each occurrence. As an alternative, split limits of not less than $1,000,000 for bodily injury and $500,000 for property damage for each occurrence shall be maintained.

41.2.3 Excess or Umbrella Liability Insurance. This policy shall have a minimum of $1,000,000 combined single limits for bodily injury and property damage for each occurrence in excess of the applicable limits in the primary policies.

41.2.4 Workers' Compensation - Statutory Requirements (Kentucky)

ARTICLE 42 KEY ACCESS (NOT USED)

ARTICLE 43 CEILING CLEARANCE (NOT USED)

ARTICLE 44 METAL ANCHORS

44.1 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 45 CONTRACTOR/SUPERINTENDENT EXPERIENCE (NOT USED)

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
Contractor will adhere to all provisions outlined in 010000S02 Tree Protection Standards.

KFI
ENGINEERS
3264 Loch Ness Drive
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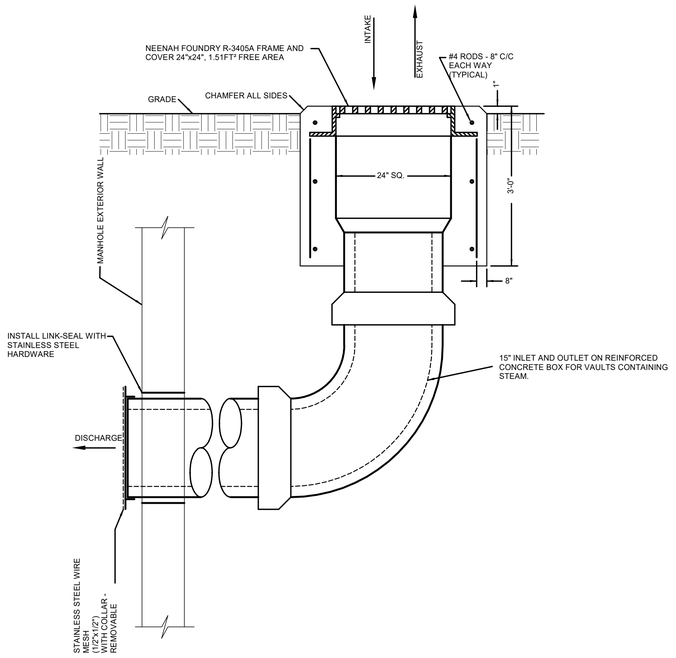
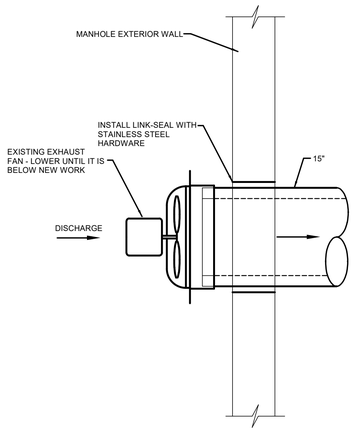
Email: kfi@kfi-eng.com

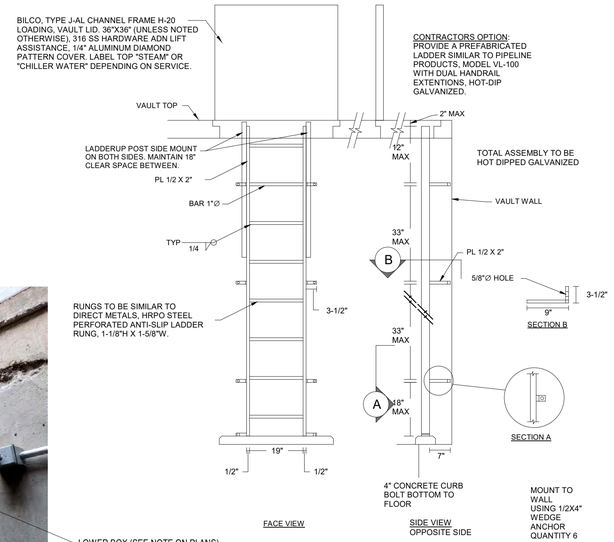


INTAKE



EXHAUST

POWER BOX TO BE LOWERED



TYPICAL LADDER FOR VAULT
SCALE: NONE

VENTILATION INLET/EXHAUST DETAIL
SCALE: NONE

GENERAL MEP SPECIFICATIONS

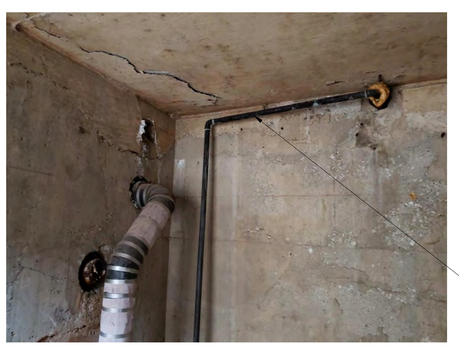
DISCONNECT, DEMOLISH, AND REMOVE ALL PIPING NOTED AND REMOVE FROM THE SITE. PATCH BACK AND INSULATION DAMAGED WITH LIKE KIND.

ALL OTHER EXISTING WORK TO REMAIN (SUCH AS PIPING, VALVES, ETC.) SHALL BE PROTECTED FROM DAMAGE DURING DEMOLITION. CONSTRUCT PROTECTIVE BARRIERS AS NEEDED. ANY DAMAGED MATERIAL WILL BE REPLACED.

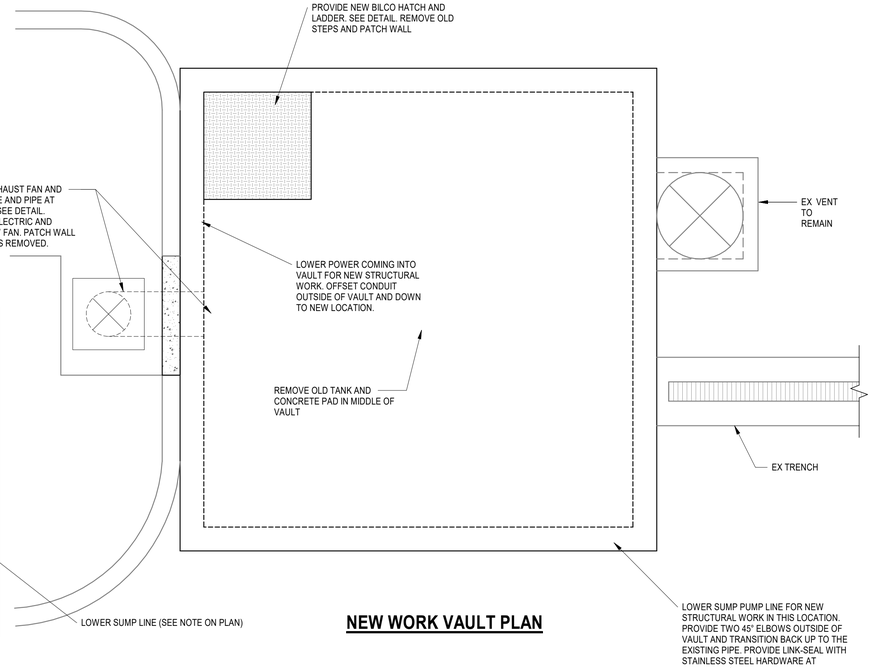
IF PIPE, INSULATION, OR EQUIPMENT TO REMAIN IS DAMAGED IN APPEARANCE OR IS UNSERVICEABLE, REMOVE DAMAGED OR UNSERVICEABLE PORTIONS AND REPLACE WITH NEW PRODUCTS OF EQUAL CAPACITY AND QUALITY.

COPPER PIPE FOR THE PUMP DISCHARGE SHALL BE TYPE K.

ALL CONDUIT SHALL BE RIGID TO MATCH EXISTING.



SUMP LINE TO BE LOWERED



NEW WORK VAULT PLAN

A/U1.1 UTILITY PLAN AND DETAILS
1/2" = 1'-0"

BROWN KUBICAN
STRUCTURAL ENGINEERS
2224 Young Drive | Lexington, KY 40505
859-543-0933 | www.brownkubican.net

STATE OF KENTUCKY
DANIEL H. BRANSOM
14375
LICENSED
PROFESSIONAL ENGINEER

UTILITY PLAN AND DETAILS

Vault HPS 049 Top Slab Replacement
University of Kentucky
Lexington, Kentucky

DRAWN BY: DHB
CHECKED BY: DHB
DATE: 08/18/2022

PROJECT NUMBER
22272

REVISIONS

NO.	DATE	DESCRIPTION

SHEET
U1.1

8/29/2022 8:26:10 AM

GENERAL NOTES

DESIGN STRESS LIVE LOADS

AASHTO H20-44 DESIGN TRUCK LOAD

ROAD SURCHARGE ..... 120 PSF
EARTH EQUIVALENT FLUID PRESSURE (ASSUMED)..... 60 PCF

DESIGN STRESSES

CONCRETE (STRENGTH DESIGN) MINIMUM COMPRESSIVE STRENGTH IN 28 DAYS:
VAULT WALL, TOP SLAB, AND CURB ..... f'c = 5,000 PSI
REINFORCING BARS (ASTM A615 GRADE 60)..... fy = 60,000 PSI

GENERAL

1. THE REQUIREMENTS OF THESE GENERAL NOTES APPLY UNLESS OTHERWISE NOTED ON PLANS OR IN SPECIFICATIONS.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO COMMENCING WORK. THE ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCIES THAT MAY EXIST.
3. ANY DISCREPANCIES BETWEEN STRUCTURAL AND MECHANICAL DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL AND STRUCTURAL ENGINEER.
4. DO NOT SCALE DRAWINGS.
5. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY BRACING REQUIRED TO PROPERLY CONSTRUCT THE STRUCTURE 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, NEW OR EXISTING, 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. ELEVATIONS SHOWN ON STRUCTURAL DRAWINGS ARE IDEALIZED ELEVATIONS BASED ON CONCRETE THICKNESS SHOWN ON DRAWINGS AND DO NOT ACCOUNT FOR SLOPECAMBER. IT IS THE RESPONSIBILITY OF THE CONTRACTORS TO COORDINATE ANY SLOPE WITH EXISTING PAVEMENT AND TRENCH AROUND AND ADJUST ELEVATIONS AS NECESSARY TO DRAIN WATER OFF THE NEW TOP SLAB.
9. 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 MECHANICAL DRAWINGS. IF THE MECHANICAL DRAWINGS DO NOT INCLUDE DETAILS FOR ANY OF THESE CONDITIONS, CONSULT WITH MECHANICAL ENGINEER FOR DIRECTION.
10. EXISTING CONSTRUCTION SHOWN IS BASED ON EXISTING CONSTRUCTION DOCUMENTS AND/OR GENERAL CONSTRUCTION PRACTICE AND IS NOT GUARANTEED TO BE TRUE OR EXACT. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS RELEVANT TO THEIR WORK PRIOR TO CONSTRUCTION.
11. DETAILS NOT SPECIFICALLY INDICATED 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 301-10, ACI 318-11 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 IN CONCRETE WORK WHERE REQUIRED. SEE MECHANICAL DRAWINGS.
5. WELDING OF REINFORCING BARS (INCLUDING TACK WELDING) IS NOT PERMITTED.
6. ALL EXPOSED CORNERS OF CONCRETE SHALL BE CHAMFERED 45 DEGREES. MINIMUM CHAMFER TO BE 1/2".
7. BEND ALL HORIZONTAL WALL AND FOOTING BARS 1'-0" AROUND CORNERS OR PROVIDE CORNER BARS WITH 2'-0" LAP.
8. USE AIR-ENTRAINED ADMIXTURE IN ALL CONCRETE.
9. USE CORROSION-INHIBITING ADMIXTURE IN ALL CONCRETE, SEE SPECIFICATION.
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	1. INCREASE SPLICE LENGTH BY THE FOLLOWING: 2. NOTE: INCREASED LENGTHS ARE ACCUMULATIVE
#3	21"	19"	17"	
#4	29"	25"	22"	
#5	36"	31"	28"	1. HORIZONTAL TOP BARS WITH GREATER THAN 12" OF CONCRETE BELOW +30 %
#6	43"	37"	33"	2. BAR SPACING LESS THAN 2 BAR DIAMETERS +50 %
#7	62"	54"	48"	
#8	71"	62"	55"	

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 SLABS AND WALLS
       NO. 11 BAR AND SMALLER ..... ¾"

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.

INSPECTION

AN APPROVED INDEPENDENT TESTING LABORATORY SHALL PROVIDE INSPECTION AND TESTING SERVICES PER ASTM E329. REPORTS OF INSPECTION AND TESTING SHALL BE SENT TO THE ARCHITECT. SUCH INSPECTION AND TESTING SHALL INCLUDE:

1. CONCRETE: MIX DATA, DAILY POUR REPORTS, CYLINDER TESTS, SLUMP, ENTRAINED AIR TESTS, AND TEMPERATURE.
2. REINFORCEMENT: PLACEMENT, TYPE, AND SIZE.

NOTE:
THE GENERAL CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR DESIGNING, SUPPLYING, AND INSTALLING ALL TEMPORARY SHORING NECESSARY TO INSTALL NEW STRUCTURAL ELEMENTS. THE DESIGN OF THE SHORING MUST BE DONE BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF KENTUCKY. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEERS (FOR THEIR RECORDS) TEMPORARY SHORING DRAWINGS (PLANS AND ANY NECESSARY DETAILS). SEALED, SIGNED AND DATED BY THE PROFESSIONAL ENGINEER RESPONSIBLE FOR THEIR PREPARATION.

STRUCTURAL ABBREVIATIONS

ARCH	ARCHITECTURAL
BOT	BOTTOM
BTWN	BETWEEN
CLR	CLEAR
C.I.P.	CAST-IN-PLACE
CJP	COMPLETE JOINT PENETRATION
CONC	CONCRETE
CONT	CONTINUOUS
D	DEEP
DET	DETAIL
DWGS	DRAWINGS
EA	EACH
E.F.	EACH FACE
ELEV	ELEVATION
EMBED	MINIMUM EMBEDMENT DEPTH INTO SUBSTRATE
E.W.	EACH WAY
EX	EXISTING
EXP	EXPANSION
F.F.E.	FINISHED FLOOR ELEVATION
F.S.	FAR SIDE
FTG	FOOTING
F.V.	FIELD VERIFY
GALV	GALVANIZED
GA	GAUGE
HORIZ	HORIZONTAL
HSS	HOLLOW STRUCTURAL SECTION
LBS	POUNDS
L.D.H.	LONG DIMENSION HORIZONTAL
L.D.V.	LONG DIMENSION VERTICAL
MANUF.	MANUFACTURER
MAX	MAXIMUM
MECH	MECHANICAL
M.E.P.	MECHANICAL/ELECTRICAL/PLUMBING
MIN	MINIMUM
N.S.	NEAR SIDE
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.P.H.	OPPOSITE HAND
P.A.F.	POWDER ACTUATED FASTENER
PJP	PARTIAL JOINT PENETRATION
PL	PLATE
R	RADIUS
REINF	REINFORCEMENT
S.C.	SLIP CRITICAL
SIM	SIMILAR
S.O.G.	SLAB ON GRADE
S.S.	STAINLESS STEEL
TYP	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W	WIDE
W.W.F.	WELDED WIRE FABRIC

MATERIAL LEGEND

BEDROCK

CRUSHED STONE

NATIVE EARTH / ENGINEERED FILL

CONCRETE

MANHOLE HATCH

VIEW OF TOP SLAB OF EXISTING VAULT

CRACKS AND STANDING WATER WERE OBSERVED AT THE TOP OF THE EXISTING VAULT.

INTERIOR VIEW OF DELAMINATED EXISTING TOP SLAB

CRACKS, SPALLING CONCRETE, AND EXPOSED CORRODED BARS WERE OBSERVED AT THE BOTTOM SURFACE OF THE EXISTING VAULT TOP SLAB.

VIEW OF EXISTING EXHAUST FAN AND VENT

A EXISTING EXHAUST FAN WAS OBSERVED NEXT TO THE MANHOLE OPENING OF THE EXISTING VAULT. REMOVING EXISTING TOP SLAB AND INSTALLING NEW SLAB REQUIRES MODIFICATION OF THE EXISTING OPENING AND LOWER THE EXISTING FAN (SEE MECH DWGS).

VIEW OF MANHOLE ACCESS OF EXISTING VAULT

CRACKS AND SPALLING CONCRETE,WERE OBSERVED AT THE WALL SURFACE OF THE EXISTING VAULT AT MANHOLE ACCESS.

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859-543-0933 | www.brownkubican.net

STATE OF KENTUCKY
ZHENG WANG
25595
PROFESSIONAL ENGINEER

FAILURE TO ABIDE BY DESIGN DOCUMENTS OR TO OBTAIN GUIDANCE

THE DESIGN PROFESSIONAL WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/ OR FOLLOW THE DESIGN PROFESSIONAL'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES, AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

GENERAL NOTES

Vault HPS 049 Top Slab Replacement
University of Kentucky
Lexington, Kentucky

DRAWN BY: ZJW
CHECKED BY: ZJW
DATE: 08/18/2022

PROJECT NUMBER
22272

REVISIONS

NO.	DATE	DESCRIPTION

SHEET

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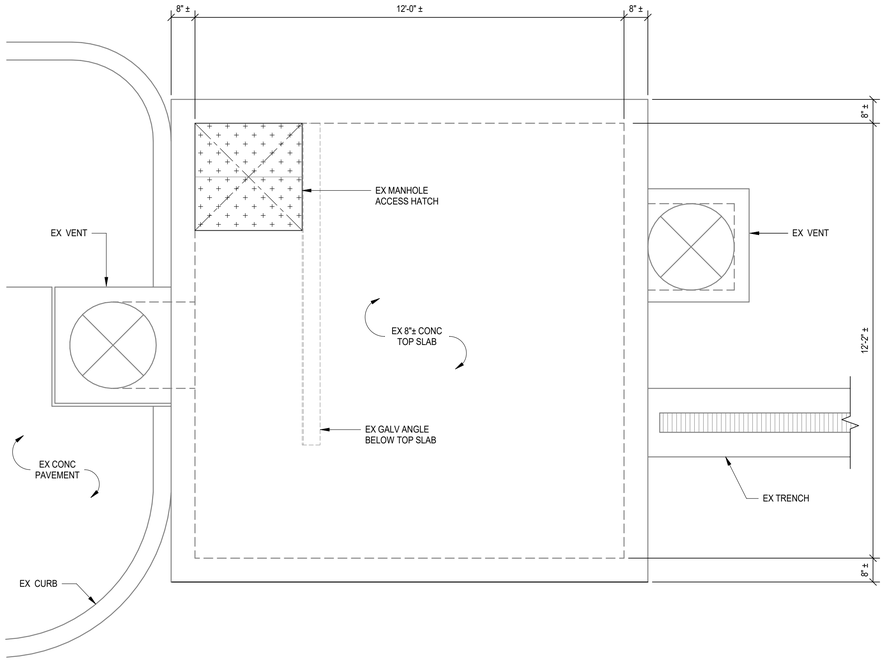
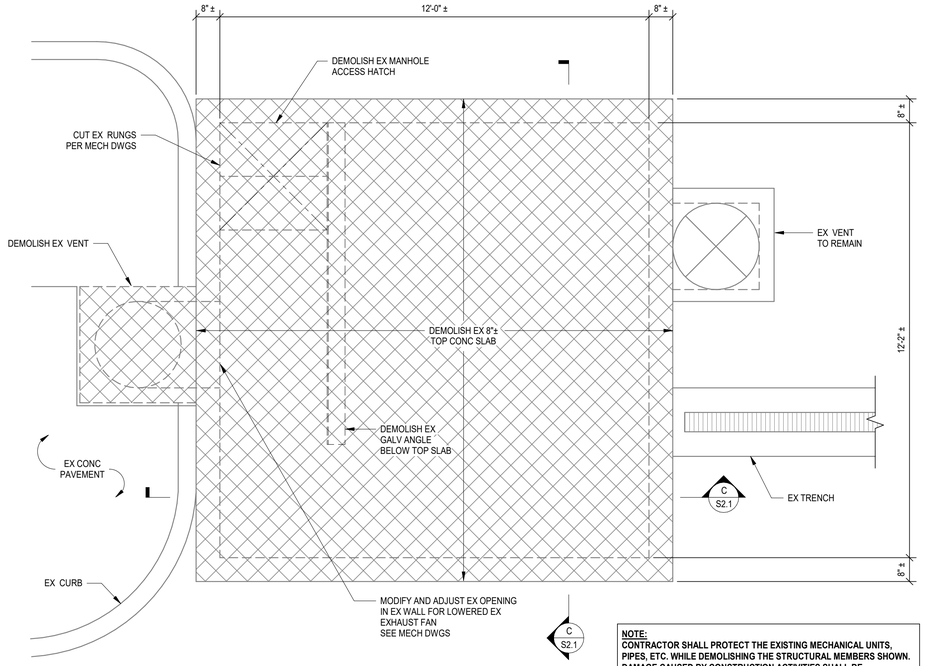
8/25/2022 3:54:26 PM



A S2.1 EXISTING CONCRETE VAULT PLAN

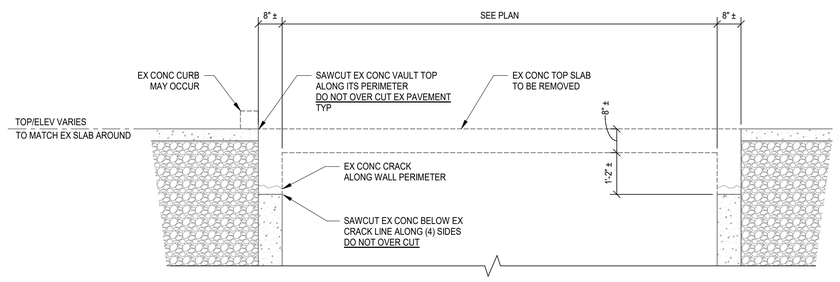
1/2" = 1'-0"



NOTE:
CONTRACTOR SHALL PROTECT THE EXISTING MECHANICAL UNITS, PIPES, ETC. WHILE DEMOLISHING THE STRUCTURAL MEMBERS SHOWN. DAMAGE CAUSED BY CONSTRUCTION ACTIVITIES SHALL BE CORRECTED BY THE RESPONSIBLE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

B S2.1 DEMOLISH PLAN

1/2" = 1'-0"



C S2.1 DEMOLISH DETAILS

1/2" = 1'-0"

BROWN + KUBICAN
STRUCTURAL ENGINEERS
2224 Young Drive | Lexington, KY 40505
859-543-0933 | www.brownkubican.net

STATE OF KENTUCKY
ZHENG WANG
25595
PROFESSIONAL ENGINEER

EXISTING, DEMOLISH PLANS AND DETAILS

Vault HPS 049 Top Slab Replacement
University of Kentucky
Lexington, Kentucky

DRAWN BY: ZJW
CHECKED BY: ZJW
DATE: 08/18/2022

PROJECT NUMBER
22272

REVISIONS

NO.	DATE	DESCRIPTION

SHEET

S2.1

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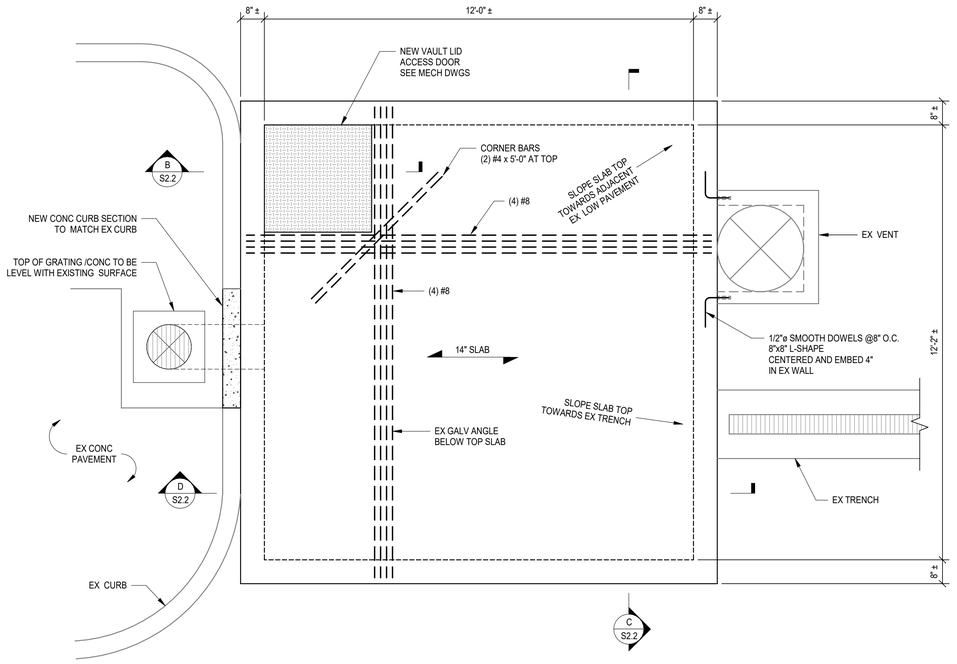
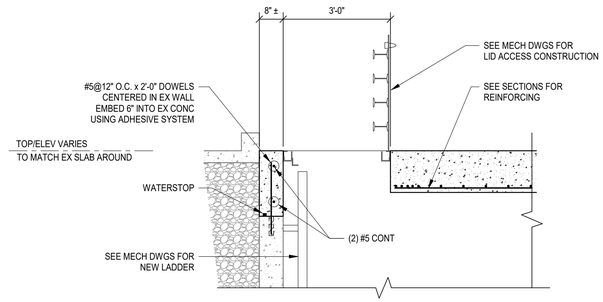


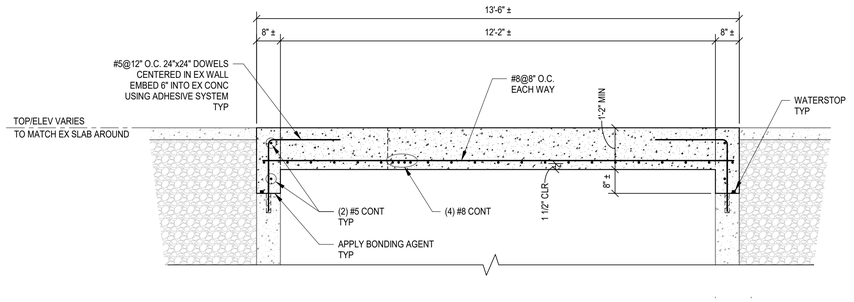
NOTES

1. NEW VAULT TOP SLAB SHALL NOT BE LOADED UNTIL CONCRETE HAS CURED TO ITSMINIMUM 28-DAY COMPRESSIVE STRENGTH. SEE SPECIFICATIONS FOR ALL CONCRETE MINIMUM COMPRESSIVE STRENGTH REQUIREMENTS.
2. TOP ELEVATION OF NEW TOP SLAB VARIES TO MATCH THE EXISTNG PAVEMENT AROUND ALONG ITS PERIMETER. SLOPE CONCRETE SLAB TOP TO DRAIN WATER TOWARDS EXISTING TRENCH OR OTHER LOWER SLABS AROUND. KEEP THE MINIMUM SLAB THICKNESS TO BE 14", INCREASE AS NEEDED FOR THE SLOPE.
3. APPLY TRAFFIC COATING ON SURFACE OF THE NEW TOP SLAB. SEE SPECIFICATION.
4. OPENINGS AND PENETRATIONS ARE NOT SHOWN FOR CLARITY. SEE MECHANICAL DRAWINGS FOR OPENING AND PENETRATION LOCATIONS AND DETAILS. SLEEVE ALL PENETRATIONS THROUGH WALLS OR SLABS LARGER THAN 10"ø.



A S2.2 NEW CONCRETE VAULT TOP PLAN

1/2" = 1'-0"

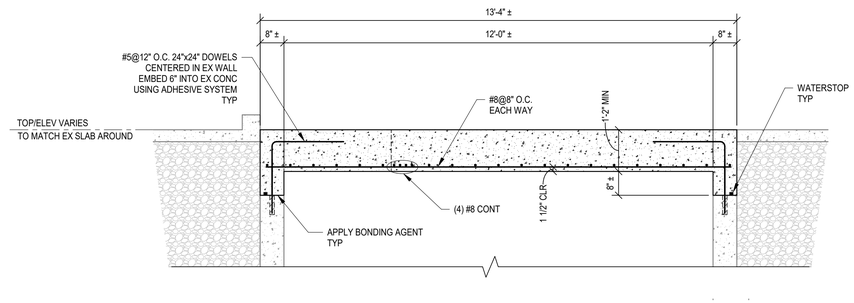


C S2.2 SECTION

1/2" = 1'-0"

B S2.2 SECTION @ VAULT TOP ACCESS DOOR

1/2" = 1'-0"



D S2.2 SECTION

1/2" = 1'-0"

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STATE OF KENTUCKY
ZHENG WANG
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PROFESSIONAL ENGINEER

FAILURE TO ABIDE BY DESIGN DOCUMENTS OR TO OBTAIN GUIDANCE

THE DESIGN PROFESSIONAL WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/ OR FOLLOW THE DESIGN PROFESSIONAL'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES, AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

NEW VAULT TOP PLAN AND DETAILS

Vault HPS 049 Top Slab Replacement
University of Kentucky
Lexington, Kentucky

DRAWN BY: ZJW
CHECKED BY: ZJW
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SPECIFICATIONS

SECTION 014120– STRUCTURAL INSPECTION

PART 1 – GENERAL
1.1 SUMMARY
A. Structural Inspections are additional to testing and inspection requirements which may be shown elsewhere in the specifications and on the drawings.
B. The Inspection Agency shall conduct inspections under the supervision of a qualified professional engineer licensed in the State of Kentucky (Inspector).
C. The Inspection Agency shall be subject to approval by the Structural Engineer of Record.
D. The Inspection Agency shall be retained by the General Contractor. Costs for reinspection and retesting, should discrepancies be found, shall be provided at no extra cost to Owner.
1.2 QUALITY ASSURANCE
A. Certification Authorities: Certification Authorities providing certification which may be applicable to Project include:
1. American Concrete Institute (ACI).
2. National Institute of Certified Engineering Technology (NICET).
B. Inspection Agency Qualifications: To qualify for acceptance, an independent testing agency must demonstrate to Structural Engineer of Record's satisfaction, based on evaluation of agency-submitted criteria conforming to ASTM E 699, that it has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.
1. Each inspector performing work on the Project shall be qualified to perform inspections for the particular type of construction or operation requiring inspection. Certification Authorities providing certification applicable to Project include, but are not limited to, the following:
a. Concrete Construction
1) Use of design mix – ACI Level 2, NICET Level 1, or ICC Reinforced Concrete Special Inspector (RCSI).
2) Material verifications, sampling of fresh concrete – ACI Level 2, NICET Level 1 (concrete), or ICC Reinforced Concrete Special Inspector (RCSI).
3) Reinforcing inspection – NICET Level 2 (concrete) or ICC Reinforced Concrete Special Inspector (RCSI).
2. Available Inspection Agency: Subject to compliance with requirements, Inspection Agencies that may perform Inspection Work include, but are not limited to, the following:
a. CSI of Kentucky, 858 Contract Street, Lexington, KY 40505 (859) 309-6021
b. S&ME, Inc. 2020 Liberty Road, Suite 105, Lexington, KY 40505 (859) 293-5518
c. L.E.Gregg Associates, 2456 Fortune Drive, Suite 155, Lexington, KY 40509 (859) 252-7558
3. For Inspection Agencies not listed herein, submit qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified. Engineer reserves the right to accept or reject Inspection Agency candidates based on the past experience, knowledge, and capacity of the proposed candidate. Inspection Agency shall be approved by Engineer prior to hiring by General Contractor.
C. Inspector Qualifications: A professional engineer who is legally authorized to practice in the State of Kentucky and who is experienced in providing testing and inspection services of structure system types similar to this Project in material, design, and extent.
PART 2 – EXECUTION
2.1 INSPECTION OF CONCRETE CONSTRUCTION
A. Periodically verify the use of the proper design mix.
B. Verify use of proper grade and ASTM designation of reinforcing steel.
C. Perform periodic inspection on placement, spacing, clear cover, number, and splice lap lengths of reinforcing steel.
D. Monitor concrete quality by means of site and laboratory tests. The Inspection Agency is authorized to reject plastic concrete not conforming to specifications. Immediately inform the Contractor, the Structural Engineer of inadequacies in concrete quality. Sampling and testing for quality control during concrete placement shall include the following:
1. Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
a. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
b. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
c. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture..
d. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each set of composite sample.
e. Compression Test Specimen: ASTM C 31; one set of four standard 6" diameter by 12" or five standard 4" diameter by 8"cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
f. Compressive-Strength Tests: ASTM C 39; test one specimen at 7 days, two 6"x12" or three 4"x8" specimens tested at 28 days, and one specimen retained in reserve for later testing if required. Additional cylinder tests (such as at 14 days) for contractor convenience and scheduling shall be paid for by the Contractor. A compressive-strength test shall be the average compressive strength from a set of specified number specimens obtained from same composite sample and tested at age indicated.
g. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
h. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing the in-place concrete.
i. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
2. Test results shall be reported in writing to Structural Engineer, ready-mix producer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
F. 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 Structural Engineers. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.
2.2 REPORT REQUIREMENTS
A. Inspector shall keep records of all inspections.
B. The Inspector shall furnish inspection reports to the Structural Engineer, and General Contractor weekly as construction progresses.
C. Inform General Contractor and / or Fabricator of all discrepancies immediately for correction.
1. Document in writing correction of discrepancies.
2. 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.
D. Submit a final report of inspections documenting completion of **all** required Structural Inspections and correction of any discrepancies noted in inspections to the Structural Engineer. Final report shall be prepared by, sealed, and signed by the Inspector and shall include a complete list of materials and work inspected during the course of the project.

END OF SECTION 014120

SECTION 033000 – CAST-IN-PLACE CONCRETE

PART 1 – GENERAL
1.1 SUMMARY
A. This Section specifies cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes. This section applies to concrete work shown on the structural drawings.
B. Cast-in-place concrete includes the following:
1. New top slab and walls of the existing vault.
2. New Concrete curbs.
C. Coordination: Unless other satisfactory agreements are specifically entered into by contractors concerned, all miscellaneous iron and steel, sleeves, anchors, etc., required by work of other contractors, will be furnished and installed by such other contractors with the cooperation of this contractor.
1.2 DEFINITIONS
A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
B. W/C Ratio: The ratio by weight of water to cementitious materials.
1.3 ACTION SUBMITTALS
A. Design Mixtures: For each concrete mixture with laboratory test reports for the following data. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
1. Method used to determine the proposed mix design (per ACI 301, Section 4).
2. Gradation and quantity of fine and coarse aggregates.
3. Proportions of all ingredients including all admixtures added either at the time of batching or at the job site. Indicate amounts of mixing water to be withheld for later addition at Project site.
4. Water/cement ratio and water/cementitious ratio.
5. Slump – ASTM C143.
6. Certification and test results of the total water-soluble chloride ion content of the design mix – FHWA RD-77 or AASHTO T 260-84.
7. Air content of freshly mixed concrete by the pressure method, ASTM C231, or the volumetric method, ASTM C173.
8. Unit weight of concrete – ASTM C138.
9. Strength at 7- and 28-days for structural concrete– ASTM C39. Document strength on basis of previous field experience or trial mixtures, per ACI 301 Section 4. Submit strength test records, mix design materials, conditions, and proportions for concrete used for record of tests, standard calculation, and determination of required average compressive strength.
10. Strength at 7- and 28-days for polished concrete surfaces– ASTM C39. Document strength on basis of trial mixture (mandatory), per ACI 301 Section 4. Submit strength test records, mix design materials, conditions, and proportions for concrete used for record of tests, standard calculation, and determination of required average compressive strength.
11. Complete and include Structural Engineer's standard mix design submittal form for each mix. A blank copy is included at the end of this section.
B. Product Data: For proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, and traffic coating, and others if requested by the Structural Engineer.
1.4 INFORMATIONAL SUBMITTALS
A. Laboratory test reports for concrete materials or material certificates in lieu of material laboratory test reports. Material certificates shall be signed by Manufacturer and Contractor, certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.
1.5 QUALITY ASSURANCE
A. Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Each contractor having reference to ACI Documents shall maintain copies of same on project site.
AMERICAN CONCRETE INSTITUTE
1. ACI 117-10 – Specifications for Tolerances for Concrete Construction and Materials.
2. ACI 211.1-91 – Standard Practice for Selecting Proportions Normal, Heavyweight and Mass Concrete (Reapproved 2009).
3. ACI 301-10 – Specification for Structural Concrete.
4. ACI 302.1R-04 – Guide for Concrete Floor and Slab Construction.
5. ACI 304.2R-96 – Placing Concrete by Pumping Methods (Reapproved 2008).
6. ACI 305R-10 – Guide to Hot Weather Concreting.
7. ACI 306R-10 – Guide to Cold Weather Concreting.
8. ACI 308R-01 – Guide to Curing Concrete (Reapproved 2008).
9. ACI 309R-05 – Guide for Consolidation of Concrete.
10. ACI 311.1R-07 – ACI Manual of Concrete Inspection.
11. ACI 318-14 – Building Code Requirements for Structural Concrete and Commentary.
12. ACI 347-04 – Guide to Formwork for Concrete.
13. SP-66 – ACI Detailing Manual.
<u>CONCRETE REINFORCING STEEL INSTITUTE (CRSI):</u>
1. CRSI – Manual of Standard Practice.
2. CRSI RB4.1 – Supports for Reinforcement Used in Concrete (2014a)
3. CRSI – Placing Reinforcing Bars (2011)
B. Qualifications of Workers: Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper execution of the work required by this Division.
C. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94 requirements for production facilities and equipment.
1.6 DELIVERY, STORAGE, AND HANDLING
A. Deliver steel reinforcement and concrete 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 reinforcement off ground by using pallets, platforms, dunnage, or other supports and spacers.
C. 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.
D. Store waterstops and packaged materials in sealed containers with manufacturer's labels intact. Place under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.
PART 2 - PRODUCTS
2.1 FORM MATERIALS
A. Forms for Exposed (Smooth) Finish Concrete: Exterior-grade high-density overlay (Class 1 or better), medium-density overlay (Class 1 or better with mill-release agent treated and edge sealed), or Structural1 or Class 1 (B-B or better, mill oiled and edge sealed) plywood panels complying with DOC PS1; or new metal-framed and metal faced panels; or other acceptable panel-type materials to provide continuous, straight, and smooth exposed surfaces. Furnish in largest practicable sizes to minimize number of joints.
B. Forms for Unexposed, Rough-Formed Finish Concrete: Plywood, lumber, metal or another acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.
C. Chamfer Strips: Non-staining dressed wood, metal, PVC, or rubber strips; ¾ by ¾ inch, minimum, and as shown on Drawings; in longest practical lengths.
D. Form-Release Agent: Commercially formulated form-release agent with maximum volatile organic compounds (VOCs) not to exceed those allowable by jurisdictional regulations that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
E. Form Ties (Standard): Factory-fabricated, adjustable-length, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of plastic concrete on forms, prevent form deflection, and to prevent spalling of concrete upon removal.
1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of the exposed concrete surface.
2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.
F. Form Joint Tape: Compressible foam tape; pressure sensitive; AAMA800, "Specification 810.1, Expanded Cellular Glazing Tape"; minimum ¼ inch thick.
G. Form Joint Sealant: Elastomeric sealant complying with ASTM C920, Type M or S, Grade NS, that adheres to form joint substrates.
H. Sealer: Penetrating, clear, polyurethane wood form sealer formulated to reduce absorption of bleed water and prevent migration of set-retarding chemicals from wood.
2.2 REINFORCING MATERIALS
A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
2.3 CONCRETE MATERIALS
A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
B. Cementitious Materials:
1. Portland Cement: ASTM C 150, Type I. High early strength (when specified), ASTM C150, Type III. One brand of cement shall be used throughout Project duration unless otherwise acceptable to Engineer.
2. Fly Ash: ASTM C 618, Class F or C, except maximum loss on ignition: 3%.
3. Slag Cement: ASTM C 989, Grade 100 or 120.
4. Blended Hydraulic Cement: ASTM C 595, Type IS, portland blast-furnace slag, Type IP, portland-pozzolan, Type IL, portland-limestone, or Type IT, ternary blended cement.
5. Silica Fume: ASTM C 1240, amorphous silica.
C. Normal-Weight Aggregates: ASTM C 33 Class 3S coarse aggregate or better, graded, and as specified. Provide aggregates from a single source for exposed concrete.
1. For exposed exterior surfaces, do not use fine or coarse aggregates that contain substances considered deleterious or that cause spalling or surface discoloration due to oxidation.
2. Fine Aggregate to be free of materials with deleterious reactivity to alkali in cement.
D. Water: ASTM C 1602 and potable.
E. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Water-Reducing Admixture: ASTM C 494, Type A.
2. Retarding Admixture: ASTM C 494, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
5. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
6. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.
7. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.
8. Air-Entraining Admixture: ASTM C 260.
F. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494, Type C.
1. Manufacturers: Subject to compliance with requirements manufacturers offering products that may be incorporated into the work include, but are not limited to the following:
a. BASF Corporation; Construction Systems.
b. Euclid Chemical Company; an RPM company.
c. GCP Applied Technologies, Inc.
d. RussTech Admixtures, Inc.
e. Sika Corporation.
G. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
1. Manufacturers: Subject to compliance with requirements manufacturers offering products that may be incorporated into the work include, but are not limited to the following:
a. BASF Corporation; Construction Systems.
b. GCP Applied Technologies Inc.
c. RussTech Admixtures, Inc.
d. Sika Corporation.
2.4 RELATED MATERIALS
A. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer-modified chloroprene rubber, for adhesive bonding to concrete, 3/8 by 3/4 inch.
1. Manufacturers: Subject to compliance with requirements manufacturers offering products that may be incorporated into the work include, but are not limited to the following:
a. GCP Applied Technologies Inc.
b. Sika Greenstreak.
B. Bonding Agent: ASTM C 1059, Type II, nonredispersible, acrylic emulsion or styrene butadiene.
C. Cartridge Injection Acrylic Adhesive (for reinforcing dowels): two-component material for use in concrete. Anchor to be approved for use with cracked concrete per AC308.
1. Acrylic resin adhesive, suitable for use on dry or damp surfaces. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
a. HIT HY 200 V3 System, Hilti.
b. AC 200+, DeWalt/ Powers.
c. AT-XP System, Simpson/Strong-Tie.
2. Epoxy adhesive, suitable for use on oversized, cored, and wet holes and in submerged applications. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
a. EPCON G5 System, ITW Red Head.
b. HIT RE500 V3 System, Hilti.
c. PE 1000+, DeWalt/Powers.
d. SET-XP Epoxy System, Simpson/Strong-Tie.
2.5 LIQUID FLOOR TREATMENTS
A. Penetrating Concrete Sealer: Water-repellent penetrating sealer that complies with the highest requirements of EN 1504-2. (applied to the surface of all exposed new concrete)
1. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, the following:
a. Sikagard – 705L
2.6 CURING MATERIALS
A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

SPECIFICATIONS

C. Water: Potable.
2.7 PROPORTIONING AND DESIGNING MIXES
A. Prepare design mixes for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field data methods, or both, according to ACI 301. Mix proportions shall be established so that the concrete can be placed readily without segregation into forms and around reinforcement under anticipated placement conditions. Use an independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures. Trial batch and field experience tests shall have been performed within 24 months of submittal date. Use mix design submittal form included at the end of this section.
B. Submit written reports to Engineer of each proposed concrete mix type at least 15 days prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed by Engineer. The approved mix designs shall be used throughout this project unless changes are approved by the Engineer prior to use.
C. Cementitious Materials: Supplier shall coordinate surface treatment compatibility with cementitious materials. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Fly Ash: 20 percent for Type F or 25% for Type C.
2. Combined Fly Ash and Pozzolan: 25 percent.
3. Slag Cement: 50 percent.
4. Combined Fly Ash or Pozzolan and Slag Cement: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
5. Silica Fume: 10 percent.
6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
7. Combined Fly Ash or Pozzolans, Slag Cement, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
D. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete as required for placement and workability and in all pumped concrete, and concrete required to be watertight.
2. Use accelerating and retarding admixtures at Contractor's discretion to control set time when required by extreme temperatures or humidity, or other adverse placement conditions. Use accelerating admixture in concrete slabs placed at ambient temperatures below 35 deg F.
3. <u>Use corrosion-inhibiting admixture in concrete mixtures where indicated.</u>
E. The minimum compressive strength measured 28 days after placement (f'_c), minimum cementitious content, slump, maximum water/cementitious content ratio (W/C), and air content of the concrete for each portion of the structure shall be as follows:
1. Exterior structural concrete exposed to weather or deicer chemicals. Normal-weight concrete.
a. Minimum Compressive Strength: 5,000 psi.
b. Minimum Cementitious Material: 564 lbs/cy.
c. Maximum W/C Ratio: 0.40.
d. Water Reducing Admixture: Optional.
e. Slump Limit: 4 inches or not more than 8 inches after adding admixture to 2-to-3-inch slump concrete, plus or minus 1 inch.
f. Corrosion-inhibiting admixture.
g. Air Content: 5.5 percent for 1½-inch maximum aggregate.
6.0 percent for 1-inch maximum aggregate.
6.0 percent for ¾-inch maximum aggregate.
7.0 percent for ½-inch maximum aggregate
F. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Engineer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Engineer before using in Work.
2.8 FABRICATING REINFORCEMENT
A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."
2.9 CONCRETE MIXING
A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and furnish batch ticket information.
1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.
PART 3 - EXECUTION
3.1 GENERAL
A. Coordinate the installation of joint materials, and other related materials with placement of forms and reinforcing steel.
3.2 FORMWORK INSTALLATION
A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied until concrete structure can support such loads.
B. Construct formwork so concrete members and structures are of correct size, shape, lines, alignment, elevation, position, level, plumb, and dimension and indicated. Maintain formwork construction tolerances and surface irregularities within limits of ACI 117.
C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
1. Class A, 1/8-inch tolerances for smooth-formed concrete surfaces exposed to view.
2. Class C, ½-inch tolerances for other concrete surfaces.
D. Solidly butt joints and provide backup at joints to prevent cement paste from leaking.
E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like for easy removal.
F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.
G. Provide temporary openings for cleanouts and inspections where interior area of formwork is inaccessible before and during concrete placement. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
H. Form openings, chases, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, and other features required in the Work. Chamfer exposed corners and edges at exterior corners and edges of permanently exposed concrete and as indicated, to produce uniform smooth, straight lines and tight edge joints.
I. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
J. Use selected materials to obtain required finishes.
K. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.
1. Do not allow excess form-coating material to accumulate in forms or come into contact with in-place concrete surfaces against which fresh concrete will be placed.
2. Do not spray reinforcing with form oil.
3. Coat steel forms with a nonstaining, rust-preventative material. Do not use rust-stained steel form-facing material.
3.3 INSTALLING EMBEDDED ITEMS
A. Place and secure anchorage devices, and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, templates, instructions, and directions furnished with items to be embedded. Aluminum conduit shall not be installed in concrete.
3.4 REMOVING FORMS
A. Formwork supporting weight of concrete, such as new vault top slab, and other structural elements, may not be removed in less than 14 days and until concrete has attained at least 75 percent of its 28-day design compressive strength. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.
3.5 SHORING INSTALLATION
A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring.
1. Do not remove shoring until measurement of slab tolerances is complete.
B. Remove shores in a planned sequence to avoid damage to partially cured concrete. Locate and provide adequate reshoring to support work without excessive stress or deflection.
3.6 STEEL REINFORCEMENT INSTALLATION
A. General: Comply with Concrete Reinforcing Steel Institute's (CRSI) "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
B. Deliver reinforcement to job site bundled, tagged and marked. Use waterproof tags indicating bar size, length, and mark corresponding to placing drawings.
C. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
D. When permitted, field bend bars cold, except during cold weather when moderate heating is necessary to avoid brittle failures.
E. Accurately position, support, and secure all bar reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum coverages as indicated for concrete protection.
1. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations.
2. Walls with reinforcing mats on each face shall have bent U-bar spacers tied to each mat to hold spacing between mats. U-bar spacers shall be minimum #3 bars spaced a maximum of 6 feet on center horizontally and vertically with a row of bars placed at the top of any wall over 4 feet tall.
3. All walls shall have chairs or bolsters placed between reinforcing mat(s) and both form faces spaced a maximum of 6 feet on center to maintain clear cover.
F. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
G. Construction tolerances shall be in accordance with ACI 117 and the following:
1. For member depths 12" and smaller, tolerance on concrete cover shall be the smaller of -3/8" and -(1/3)*[specified cover].
2. For member depths larger than 12", tolerance on concrete cover shall be the smaller of -1/2" and -(1/3)*[specified cover].
3. At formed soffits, tolerance on concrete cover shall be -1/4".
4. Tolerance for longitudinal location of bends and ends of reinforcement:
a. At discontinuous ends of brackets and corbels, ±1/2".
b. At discontinuous ends of other members, ±1".
c. At other locations, ±2".
3.7 PLACING ADHESIVE SYSTEM
A. General: Clean all holes per manufacturer instructions to remove loose material and drilling dust prior to installation of adhesive. Holes may be dry, damp or wet. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive. Follow manufacturer recommendations to ensure proper mixing of adhesive components. Sufficient adhesive shall be injected in the hole to ensure that the annular gap is filled to the surface. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole. Do not disturb or load anchors before manufacturer specified cure time has elapsed.
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.
2. Cored Holes: Where anchors are to be installed in cored holes, use core bits with matched tolerances as specified by the manufacturer. Acrylic Adhesive Anchors shall not be installed in core drilled holes.
3. Embedded Items: Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. 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.
4. Observe manufacturer recommendations with respect to installation temperatures for cartridge injection adhesive anchors and capsule anchors.
5. Perform anchor installation in accordance with manufacturer instructions.
3.8 JOINTS
A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
B. Construction Joints in Reinforced Structure: Locate and install construction joints so they do not impair strength or appearance of the structure, at locations indicated or otherwise as acceptable to Engineer.
1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
2. Form continuous keyways as indicated. Embed keys at least 1-1/2 inches into concrete. Provide keyways 1/3 the member thickness, or 3 ½" minimum, in walls, footings, and between walls and footings centered in the member thickness unless shown otherwise. Provide keyways ½ member width by ½ member depth in grade beams, beams, and columns and between grade beams / beams and supporting members centered in the member unless shown otherwise.
3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
3.9 WATERSTOP INSTALLATION
A. Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Protect exposed waterstops during progress of the Work.
1. Locate waterstop within joint relative to face and reinforcing as per manufacturer's printed instructions. Location varies with manufacturer. Location shown on drawings is diagrammatic only. Do not locate waterstop within shear key.
2. Support and protect exposed waterstops during progress of Work.
3. Cut ends square, using a razor knife or circular saw equipped with a carbide tipped blade. Weld splices per manufacturer's recommendations.
4. Field-fabricate joints in waterstops according to manufacturer's printed instructions.
B. Concrete surfaces to receive bonded waterstop shall be reasonably smooth with either a formed or float finish. Where such a concrete surface is scheduled to be rough to facilitate interlocking with the adjacent concrete placement, a 2" wide ribbon of flat surface shall be tooled into the concrete surface to facilitate the proper installation of waterstop. Any irregularities in the concrete surface that would interfere with the waterstop being placed in intimate contact with the concrete surface shall be ground smooth prior to installation.
C. Install waterstop per manufacturer's recommended installation instructions with primer or adhesive as required.
3.10 CONCRETE PLACEMENT
A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.
B. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," and as specified. Concrete delivery tickets shall show:
1. Batch number.
2. Mix by number with cement content in pounds and maximum size aggregate.
3. Admixtures.
4. Air content.
5. Slump.
6. Time dispatched and discharged.
7. Date.
8. Contractor.
9. Ready Mix Supplier.
10. Project Name and Address.
11. Volume of Concrete.
C. Do not add water to the concrete mix during delivery, at Project site, or during placement unless approved by the General Contractor's representative, noted on the delivery ticket with the amount of water, and signed by the General Contractor'srepresentative. The maximum water/cement ratio of an approved mix design shall not be exceeded.
1. When the ambient air temperature is between 80 and 90 degrees Fahrenheit, one (1) gallon of water per cubic yard of concrete may be added at the job site to compensate for water evaporation during transit.
2. When the ambient air temperature exceeds 90 degrees Fahrenheit, two (2) gallons of water per cubic yard of concrete may be added at the job site to compensate for water evaporation during transit.
3. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
D. Discharge concrete within 1 ½ hours after water has been added to the cement, unless a longer time has been authorized by the Engineer. During hot weather or other conditions contributing to a quick stiffening of the concrete, the Engineer may require discharge in less than 1 ½ hours.
E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation. Do not allow concrete to drop more than 5 feet or from a height which allows concrete to fall against reinforcing.
1. Deposit concrete in forms in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints. Do not subject concrete to any procedure that will cause segregation. Deposit concrete as near as possible to the final position to avoid segregation.
2. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix to segregate.
F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in proper position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
G. Cold-Weather Placement: When air temperature is expected to fall below 40 degrees Fahrenheit (4 deg C) within the first 72 hours after concrete placement, comply with provisions of ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When mean daily air temperature is expected to fall below 40 deg F (4 deg C) for more than three successive days after concrete placement, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature at point of placement as follows:
a. Not less than 55 deg F (13 deg C) or more than 75 deg F (24 deg C) for concrete sections less than 12 inches in the least dimension (width or thickness).
b. Not less than 50 deg F (10 deg C) or more than 70 deg F (21 deg C) for concrete sections 12 inches or greater in the least dimension (width or thickness).
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
H. Hot-Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305.1 and as specified.
1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90 deg F (32 deg C). Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to Engineer.
I. Pumping Concrete: Grout used to prime a pump shall not be placed in the forms of any concrete exposed to view in the final structure. Concrete shall not be pumped through pipe made of aluminum or aluminum alloys.

3.11 FINISHING FORMED SURFACES
A. Rough-Formed Finish: Provide a rough-formed finish on formed concrete surfaces not exposed to view in the finished Work or concealed by other construction. This is an as-cast concrete surface having texture imparted by form-facing material used. Repair and patch tie holes, honeycombing over ½ inch in depth, and other defective areas. Remove fins and other projections exceeding ¼ inch in height by rubbing down, chipping, or grinding off.
B. Smooth-Formed Finish: Provide a smooth-formed finish on formed concrete surfaces exposed to view in non-public rooms (storage, mechanical rooms, etc.) or to be covered with a coating or covering material applied directly to concrete. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes, honeycombing over ¼" in depth, and other defective areas. Remove fins and other projections exceeding 1/8" in height by rubbing down or grinding off until completely removed and smoothed.

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PROFESSIONAL ENGINEER

SPECIFICATIONS
Vault HPS 049 Top Slab Replacement
University of Kentucky
Lexington, Kentucky

DRAWN BY: ZJW
CHECKED BY: ZJW
DATE: 08/18/2022

<u>PROJECT NUMBER</u>
22272

REVISIONS

NO.	DATE	DESCRIPTION

SHEET
S3.1

SPECIFICATIONS

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.12 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as specified; slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo; and where indicated.

1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

C. Trowel Finish: Apply a trowel finish to monolithic slab surfaces exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or another thin film-finish coating system.

1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units.
2. Allow moisture film or sheen to disappear from the floated surface and allow the concrete to harden enough to prevent fine material and water from being worked into the concrete surface. Then begin first trowel-finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks and uniform in texture and appearance.

D. Nonslip Broom Finish: Apply a nonslip broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.

E. Surface Cleaning: Where concrete surface is to be left exposed or sealed with thin film or penetrating coating, burnish or burn to remove all protruding synthetic fiber reinforcing.

F. Exposed Concrete Slabs: Slabs exposed to view in the public spaces shall be free of trowel marks and uniform in texture and appearance. Sharply defined low and high spots are prohibited and cause for rejection by Engineer. Grinding and patching to correct discrepancies will be prohibited unless acceptable to Engineer. Use new, clean blankets and other protections that will not discolor or dull the finish.

3.13 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Cleanliness for Architecturally Exposed Concrete Slabs: Slabs to be left exposed in public places and to be sealed with densifier/sealers, hardeners, or similar shall remain clean from dirt and other agents which might discolor the finish. Install new, clean polyethylene film over slabs and below curing blankets and other protection which might discolor or stain the raw concrete.

C. For cold-weather protection during curing, comply with ACI 306.1 and the following:

1. All freshly placed concrete shall be kept from freezing for the following periods:
   a. 3 days for all concrete with an air entraining admixture.
   b. 4 days for all concrete without an air entraining admixture.
2. A cumulative curing time of seven days at a minimum surface temperature of 50 degrees F (10 degrees C) shall be provided or until concrete has attained 75% of its design strength. This shall be followed by cooling of concrete in a gradual transition to surrounding conditions. The temperature drop during this period shall not be at a rate exceeding 2 degrees F per hour until the outside or surrounding temperature is reached.
3. When concrete is placed under conditions of cold weather concreting (defined as a period when the mean daily temperature drops below 40 degrees F for more than three successive days), take additional precautions as specified in "Cold Weather Concreting" by the American Concrete Institute (ACI Report 306) when placing, curing, monitoring and protecting the fresh concrete.

D. For hot-weather protection during curing, comply with ACI 301 and the following:

1. When concrete is placed under conditions of hot weather concreting, provide extra protection of the concrete against excessive placement temperatures and excessive drying throughout the placing and curing operations. Hot weather is defined as air temperature which exceeds 80 degrees F or any combination of high temperature, low humidity and/or high wind velocity that causes a rate of evaporation in excess of 0.2 pounds per square foot per hour as determined by Figure 2.1.5 of ACI Report 305. Hot weather curing is required if these conditions occur within a 24-hour period after completion of concrete placement.
2. Forms, reinforcing and the air shall be cooled by water fog spraying immediately before placing concrete.
3. Immediately following screeding, protect concrete by applying the specified evaporation retarder in accordance with the recommendations of the manufacturer.

E. Formed Surfaces: Cure formed concrete surfaces, including walls, columns, sides and underside of beams, supported slabs, and other similar surfaces, by moisture curing with forms in place for 7 days or until forms are removed. If forms are removed within the first 7 days, continue moisture curing without forms for the balance of the 7-day curing period.

1. For vertical surfaces, after the concrete has hardened and while the forms are still in place, the form ties shall be loosened and water shall be applied to run down the inside of the form to keep the concrete wet.
2. After formwork has been removed from vertical surfaces, keep surface continuously wet by water spray or water-saturated absorptive cover.

F. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

1. Cure exterior slab surfaces exposed to deicing salts and slabs is not compatible with curing compounds by Moisture Curing.

G. Cure concrete according to ACI 308.1 by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
   a. Water.
   b. Continuous water-fog spray.
   c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
   a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

3.14 LIQUID FLOOR TREATMENT APPLICATION

A. General: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.

1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
2. Do not apply to concrete that is less than seven days old.
3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

B. Penetrating Concrete Sealer

1. Apply penetrating concrete sealer to all concrete floor surfaces exposed to view in the finished structure.
2. Coverage rate shall be 300 square feet (maximum) per gallon.

3.15 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1-part portland cement to 2-1/2 parts fine aggregate passing a No. 16 sieve, and a 50:50 mixture of acrylic or styrene butadiene-based bonding admixture and water. Use only enough liquid as required for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar matches surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Engineer.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
3. Repair random cracks in exposed concrete slab on grade by fully removing and replacing slab between existing control or construction joints. Drill and install dowel bars between new and existing slab as directed by Engineer.
4. Repair random cracks in exposed suspended concrete slab by fully removing and replacing slab as directed by Engineer. Slab replacement shall extend to third point of framing infill bay and girder span at composite beam systems.

E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.

F. Repair methods not specified above may be used, subject to acceptance of Engineer.

3.16 QUALITY CONTROL

A. General Contractor shall 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 Engineer or Owner for final acceptance.

1. See Section 014120 – Structural Special Inspections and Contract Drawings for testing and inspection to be performed.
2. Test results will be reported in writing to the Engineer, ready-mix producer and General Contractor within 24 hours 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 Engineer.

3.17 PROTECTION

A. The General Contractor shall provide for protection of exposed slab surfaces both before and after treatment by liquid floor treatments or polishing. General Contractor shall coordinate all other construction activities to ensure slab surfaces are not damaged or stained.

B. Use protective methods and materials, including temporary covering, recommended in writing by installer's manufacturer.

C. Do not allow contaminants including acids, oils, resins, etc. to contact surface. Provide continuous scuff-preventing pads covered in lapped and sealed water and oil resistant film.

D. Do not place any material onto surface that may cause etching, scuffing, chips, or scratches. Provide protection boards below scaffolding legs. Do not allow tracked vehicles on surface.

END OF SECTION 033000

SECTION 075700 – TRAFFIC COATINGS

PART 1 – GENERAL

1.2 SUBMITTALS

A. Manufacturer's Data: Submit specifications, installation instructions and general recommendations by the manufacturer of fluid applied waterproofing materials. Include manufacturer's certified test data showing compliance with the requirements. Provide copy of license agreement between manufacturer and installer indicating division of warranty responsibility.

B. Manufacturer's standard color samples for color selection by Owner.

C. Warranty, per requirements herein.

1.3 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. See Section 033000 for ACI Documents that apply to this Section.

AMERICAN SOCIETY FOR TESTING AND MATERIAL (ASTM)

1. ASTM C882 – Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear
2. ASTM C884 – Standard Test Method for Thermal Compatibility Between Concrete and an Epoxy-Resin Overlay
3. ASTM D570 – Standard Test Method for Water Absorption of Plastics
4. ASTM D638 – Standard Test Method for Tensile Properties of Plastics
5. ASTM D695 – Test Method for Compressive Properties of Rigid Plastics
6. ASTM D4060 – Test Method for Abrasion Resistance of Organic Coatings

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

4. AASHTO T277 – Standard Method of Test for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration

B. The contractor shall be experienced in traffic coatings. This shall be demonstrated by providing five successful project references.

C. The manufacturer shall be experienced in concrete repair and protection. This shall be demonstrated by providing proof of producing concrete repair and protection products for a minimum of ten years. Manufacturers to be ISO 9000/9001 certified.

D. The installer shall demonstrate qualifications to perform the work of this Section by submitting following documentation:

1. Licensing or Certification by the waterproofing manufacturer as an applicator of the product to be used.
2. List of at least five projects (with reference names and phone numbers) satisfactorily completed under the current company name, of similar scope and complexity of this project.

E. Deliver products in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Store and condition the product in full compliance with the manufacturer's recommendations.

F. The contractor shall supply a complete warranty for workmanship for one year commencing with the date of acceptance of work. The manufacturer shall supply a complete warranty for materials for one year commencing with the date of acceptance of work.

G. Qualifications of Workers: Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper execution of the work required by this Division.

H. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.

I. Delivery and Storage:

1. Deliver materials to project site in sealed, original packages or containers bearing name and brand of manufacturer. Each container shall have manufacturer's printed label.
2. Upon delivery, notify the Engineer. Only materials brought to area and approved may be used.
3. Store materials in single place and manner designated by General and Special Conditions.
4. Empty containers used on project shall have labels canceled and shall be marked as reuse.

1.5 JOB CONDITIONS

A. A specified coating shall not be applied if weather is outside limitations stated by manufacturer's recommendations and requirements. Protection required for proper installation and curing shall be the responsibility of the Contractor and shall be reflected in his pricing in the Bid.

B. Protect adjacent surfaces and materials (including those below area of Work) with covering, duct tape and/or drop cloths as required to keep free of coating. Upon completion, remove protection and clean as necessary. Surfaces soiled or damaged by special coating shall be cleaned or replaced at no extra cost to Owner.

C. Proceed with the installation of waterproofing only after the substrate construction and/or preparation has been properly completed and cured and after penetrating components have been installed, so that membrane will not be penetrated or damaged by subsequent work.

D. When payment for elastomeric deck coating is based on area of application, the area used in calculations shall be horizontal surfaces only.

E. Examine the substrate and the conditions under which the elastomeric waterproofing work is to be applied. Do not proceed with the work until unsatisfactory conditions have been corrected and approved by the manufacturer's representative. Installation of products constitutes Contractor's and Manufacturer's acceptance of conditions.

1.6 WARRANTY

A. Manufacturer and Contractor shall be jointly and severally responsible and shall submit an affidavit signed by both parties warranting the installed system for a minimum period of five (5) years from date of final completion. The Installer shall repair or replace membrane which leaks water, deteriorates excessively, wars prematurely or otherwise fails to perform as required within the guarantee period, due to failure of materials or workmanship. The guarantee shall include an agreement to remove and replace other work which has been superimposed on elastomeric waterproofing work as required to repair or replace the waterproofing system.

B. Warranty information shall be submitted with Bid documentation, and shall separately list conditions or actions by the Owner during the Warranty period which may wholly or partially invalidate the Warranty.

PART 2 - PRODUCTS

2.1 TRAFFIC COATINGS: Elastomeric polyurethane waterproofing traffic-bearing membrane system

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

1. Neogard Auto-Gard Vehicular Traffic Coatings

The system consists of an epoxy primer applied to the cleaned concrete surface at a minimum rate of 300 square feet per gallon no more than 24 hours prior to base coat applications; the base coat will be a polyurethane applied to an average thickness of 20 mils dry (26 mils wet). The wearing coat is a polyurethane, applied at an average thickness of 20 mils dry (26 mils wet) with aggregate broadcast at the rate of 10-15 pounds per 100 square feet and backrolled. For heavy traffic areas such as drive aisles, steep or spiraling ramps, ticket booths and turning areas, a second wear coat is applied at 12 mils dry (16 mils wet) with aggregate broadcast at the rate of 10 to 15 pounds per 100 square feet.

2. Leveling of the concrete surface prior to membrane system application in order to achieve a suitable substrate shall be performed using a Neogard 70708/70709 epoxy and sand mixture or FC base coat, depending on the profile of concrete.

2.2 AGGREGATES: Supply clean, rounded, oven-dried quartz sand with a minimum size gradation of 16-30 mesh, and a minimum hardness of 6.5 per the Moh's scale, supplied in pre-packaged bags and free of metallic or other impurities. Seeding of aggregate means an even, light broadcast short of to refusal.

2.3 PERFORMANCE REQUIREMENTS

A. It is required that, for the period of Warranty, the completed system be watertight and not deteriorate excessively under normal weather exposure, normal traffic conditions, and/or manufacturer-recommended cleaning procedures.

B. It is required that traffic topping work not deteriorate under spillage of motor oil, transmission fluids, and other motor vehicle operating compounds, nor for exposure to normal ice/snow melting substances not specifically excluded by manufacturer's product information.

C. Base coat shall have a minimum tensile strength per ASTM D412 of 1,000 pounds per square inch.

D. Top coat shall have a minimum tensile strength per ASTM D412 of 2,000 pounds per square inch.

E. Base coat shall be capable of 350% elongation minimum, per ASTM D412.

F. Minimum adhesion shall be one of the following:

1. Base Coat – 20 pounds per square inch per ASTM D903.
2. Base Coat – 25 pounds per square inch per ASTM C794.
3. Base Coat – 250 pounds per square inch per ASTM D4541.
4. Failure in Concrete when f'c is less than 6,000 pounds per square inch.

G. Total System Requirements

1. Minimum dry film thickness of the system without aggregate in parking areas is 40 mils.
2. Minimum dry film thickness of the system without aggregate in heavy wear areas is 50 mils.
3. All systems shall be wear balanced for parking stall and drive aisle applications according to the manufacturer's recommendations.

PART 3 - EXECUTION

3.1 PREPARATION

A. Bond Test: Prior to membrane application, perform a direct tensile pull test per ASTM C1583 "Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method)" as follows, unless more are required by product manufacturer:

1. One (1) test per each 7,500 square feet of existing coat to be recoated.
   a. One (1) additional test shall be performed for each failure in same area tested.
2. One (1) test for every four (4) areas requiring removal of existing membrane base coat and/or installation of joint sealants. Each joint and each patch consists of one "area."
   a. One (1) additional test shall be performed for each failure in same area.

B. Install cant strips and similar accessories as recommended by the waterproofing manufacturer, in the manner recommended by the manufacturer.

C. Verify substrate has properly cured. If efflorescence is present, mechanically remove it before proceeding.

1. Concrete should have a minimum compressive strength of 3,000 psi and be cured for a minimum of 28 days or 80 percent of design strength.

D. Repair voids, delaminated areas, split or damaged joints and nosings with cementitious and epoxy patching material.

E. At locations of possible movement in the substrate construction, including cracks which have developed and construction joints, prepare the substrate to increase the fluid applied waterproofing capability for bridging the movement without failure. Use only products which have been determined to be compatible with the elastomeric waterproofing.

F. Pitted surfaces can be leveled by mixing binder resin with up to 5 parts of aggregate to create a trowelable mortar.

G. Areas where damaged to existing membrane has occurred due to concrete substrate height shall be ground even with surrounding areas, and will receive full coating system.

H. Comply with the manufacturer's instruction, except where more stringent requirements are shown or specified, and except where project conditions require extra precautions or provisions to ensure satisfactory performance of the work.

I. Mix separately packaged components in accordance with manufacturer's instructions.

J. Apply coatings to substrate and/or previous coatings within the time frame specified by the manufacturer.

K. Block off traffic and protect membrane from physical damage.

3.2 APPLICATION

A. Start the installation of elastomeric waterproofing membrane only in the presence and with the advice of the manufacturer's technical representative. A series of four (4) wet mil gauge tests shall be conducted for every 100 square feet on the first day of installation in the presence of the representative to ensure proper coverage rate.

B. Apply a uniform coating of cold applied elastomeric waterproofing to the substrate and adjoining surfaces indicated to receive the membrane. Apply coating by hand, complying with manufacturer's recommendations regarding horizontal and vertical surfaces.

C. A light application of primer compatible with the elastomeric seal coat shall be applied to clean, dry concrete surface. The elastomeric coating shall be applied uniformly to the primed surface at a minimum dry film thickness of 20 mils.

D. The elastomeric base coat shall be applied in strict accordance with manufacturer's requirements for the system and verified by wet mill thickness testing (minimum of one test per 100 square feet).

E. A compatible wearing course shall be applied over the base coat in accordance with the manufacturer's instructions. A selected aggregate shall be broadcast evenly over the surface and fall on the surface in vertical direction so as not to displace uncovered coating.

1. Aggregates should be spread to an excess thickness until surface appears dry. After the coating has sufficiently cured, the excess aggregates shall be removed and the tie coat shall be applied to the surface.
2. Apply top coat in one or two applications to achieve the specified dry film thicknesses.

F. Where required, a compatible leveling course shall be applied directly onto the concrete surface after cleaning and prior to application of the primer and base course. The leveling course is intended to fill and smooth pop-outs, scaling, depressions and pitting in the concrete surface due to abrasion, finishing problems or other existing conditions.

G. Adhere to all procedures, limitations and cautions for the product in the manufacturer's current printed literature. Start the installation of membrane only in the presence and with the advice of the manufacturer's technical representative.

H. Coatings shall be allowed to cure adequately prior to subsequent coating and traffic loading.

I. Special treatment shall be provided at all construction joints, cove joints and at all cracks over 1/16" in width. This special treatment shall be included in the bid price for the waterproofing membrane installation.

J. The coating shall be applied at base of curbs to produce a 6" minimum high base.

K. Upon completion of work, carefully examine entire installation. Correct all defective or damaged work.

3.3 CLEANING

A. Upon completion of work, or at such other times as directed, remove all surplus materials, cartons, rubbish and debris resulting from these operations and dispose of per the General/Special Conditions.

B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

END OF SECTION 075700

SPECIFICATIONS

BROWN + KUBICAN
STRUCTURAL ENGINEERS
2224 Young Drive | Lexington, KY 40505
859-543-0933 | www.brownkubican.net

STATE OF KENTUCKY
ZHENG WANG
25595
PROFESSIONAL ENGINEER

FAILURE TO ABIDE BY DESIGN DOCUMENTS OR TO OBTAIN GUIDANCE

THE DESIGN PROFESSIONAL WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/ OR FOLLOW THE DESIGN PROFESSIONAL'S GUIDANCE WITH RESPECT TO ANY ERRORS, OMISSIONS, INCONSISTENCIES, AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

SPECIFICATIONS

Vault HPS 049 Top Slab Replacement
University of Kentucky
Lexington, Kentucky

DRAWN BY: ZJW
CHECKED BY: ZJW
DATE: 08/18/2022

PROJECT NUMBER
22272

REVISIONS

NO.	DATE	DESCRIPTION

SHEET

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