



ADDENDUM NUMBER: 1
PROJECT NAME: CCU Kimbel Library Renovation
PROJECT NUMBER: H17-9616-MJ
PREPARED BY: Liollo Architecture
1640 Meeting Street Road, Suite 202
Charleston, SC 29409
elissa@liollo.com
DATE OF ISSUE: April 18, 2024

TO ALL BIDDERS OF RECORD: This Addendum modifies the Contract Documents only in the manner and to the extent stated herein and shown on any accompanying drawings and will become a part of the Contract Documents. Except as specified or otherwise indicated by this Addendum, all work shall be in accordance with the basic requirements of the Contract Documents.

**BIDDERS SHALL ACKNOWLEDGE RECEIPT OF ADDENDUM WHEN SUBMITTING BID.
THIS ADDENDUM CONSIST OF 7 PAGE(S) AND THE FOLLOWING ENCLOSURES:**

I. ENCLOSURES:

1. SE-310 Invitation for Design-Bid-Build Construction Services (1 page)
2. Specification Section 047200 – Cast Stone Masonry (6 pages)
3. Specification Section 221316 – Sanitary Waste and Vent Piping (9 pages)
4. Tier 1 Seismic Evaluation, Dated March 24, April 8, and April 12, 2021 (11 pages)

II. GENERAL INFORMATION / CLARIFICATIONS:

1. The bid opening date has been moved to May 9th. Refer to the attached revised SE-310.
2. Deadline for questions is 5pm on April 29th. Questions must be submitted in writing to Elissa Morrison at elissa@liollo.com.
3. Deadline for substitution requests is 5pm on April 29th. All requests must be submitted in writing to Elissa Morrison at elissa@liollo.com per specification requirements with the substitution request form in the project manual.
4. The final addenda will be issued no later than May 2nd.
5. CCU intends to sign the contract quickly after the bid opening; however, GC will not have access to the site / Kimbel Library until CCU is moved out of Kimbel into Thompson which is currently targeting early August.

6. If a contractor would like to schedule a time to walk through the existing building during the bidding period, please reach out to Mark Avant at CCU to schedule a time.

III. CHANGES TO SPECIFICATIONS:

1. Replace SE-310 Invitation for Design-Bid-Build Construction Services with the attached.
2. Section 078413 – Penetration Firestopping, Insert “Section 1.7 Quality Assurance: 1. A Installer Qualifications: A firm that has been approved by FM Approvals according to FM Approvals 4991, “Approval of Firestop Contractors,” or been evaluated by UL and found to comply with UL’s “Qualified Firestop Contractor Program Requirements.” . “
3. Insert new specification Section 04700 Cast Stone Masonry.
4. Modifications to Specification Section 221316 Sanitary Waste and Vent Piping, Section 3.9.

IV. CHANGES TO DRAWINGS - Replace the drawing sheets previously issued with the sheets of the same name attached to this addendum.

Civil Drawings:

None

Landscape Architecture Drawings

None

Structural Drawings:

None

Architectural Drawings:

1. D101 – First Floor Demolition Plan
2. D102 - Second Floor Demolition Plan
3. D300 - Demolition Elevations
4. D301 – Existing Wall Sections (1975 Drawings Reference)
5. A101 – Floor Plan
6. A201 – Enlarged Plans – Restrooms
7. A502 – Wall Sections
8. A510 – Section Details
9. A511 – Section Details

Fire Protection Drawings:

None

Plumbing Drawings:

10. P063 – First Floor Sanitary & Vent Demolition Plan

Mechanical Drawings:

- 11. M003 – HVAC Details
- 12. M007 – HVAC Details

Electrical Drawings:

- 13. E002 – Electrical Schedules + Details
- 14. E301 – First Floor Systems Plan

V. QUESTIONS / ANSWERS:

1. **Question:** Section on the top right of sheet A511 indicates closed cell foam on the underside of steel decking below the second floor. What thickness or r-value is required here, and what is the extent of the coverage of the second floor steel decking? Is this another egress alcove with minimal square footage?
Response: R-38 is required per energy code. This detail has been revised to address the question on sheet A511, see attached.
2. **Question:** 7/A510 curb detail doesn't show any closed cell foam against the cementitious flat roof deck but the building sections on A400 appear to show the closed cell foam extending coverage across the flat. Can you please clarify if the coverage is the whole roof deck or just the 5:12 slopes?
Response: 100% of the roof deck to receive insulation.
3. **Question:** In specification section 078443 Joint Firestopping it requires the installer to have a FM Approvals 4991 certificate. However, that requirement is not listed in specification section 078413 Penetration Firestopping. Is the FM Approval 4991 also a requirement for specification section 078413?
Response: Section 078413 has been modified to clarify the requirements per notes above in Changes to Specification section.
4. **Question:** Are all penetration firestopping and joint firestopping required to be completed by the same subcontractor?
Response: The design team has no objection as long as the project specifications, including UL listings requirements are met. The GC is responsible for coordinating and ensuring all assemblies comply with specification / drawing requirements.
5. **Question:** Missing mirror call out in women's Restroom (Room 112)?
Response: See attached revised sheet A201 Enlarged Plans – Restrooms.
6. **Question:** No callout for paper towel dispenser beside hand dryer?
Response: See attached revised sheet A201 Enlarged Plans – Restrooms.
7. **Question:** Is there to be sanitary napkin dispenser in Men's Restroom (Room 245)?
Response: None required.
8. **Question:** Grab Bars are not called out?

- Response:** See attached revised sheet A201 Enlarged Plans – Restrooms.
9. **Question:** Does GC need to pick up 3rd party testing/SWPPP Inspections as shown on C100?
Response: The contractor is responsible for SWPPP inspections. The owner will be responsible for any 3rd party geotechnical testing.
10. **Question:** Does the steel fabricator need to be AISC Certified?
Response: **Specification** Section 051200,1.5.B indicates that the steel fabricator is to be AISC certified.
11. **Question:** Note 22 on D102 should be Note 23, please advise?
Response: See attached revised sheet D102 Second Floor Demolition Plan.
12. **Question:** D102 2nd FI Demolition Plan has note 22 at the HVAC chase location. Should be note 23. I did not find note 22 anywhere else?
Response: See attached revised sheet D102 Second Floor Demolition Plan.
13. **Question:** Plumbing drawing P063 note 1 says to Abandon Storm Pipe, Cap, and Fill the Pipe with Concrete. Would you please clarify if this note requires all Abandon Storm and DWV piping to be completely filled with concrete? What trade is responsible for filling the abandoned piping with concrete?
Response: Any piping under slab that is not being removed shall be filled with concrete. G.C. to determine responsible trade.
14. **Question:** Spec section 221316 SANITARY WASTE AND VENT PIPING Paragraph 3.9 Piping Schedule does not list an approved underground piping type. Will you please clarify whether the underground piping type is to be SCH 40 PVC or Service Weight Cast Iron?
Response: The Specification Section 221316 Sanitary waste and vent piping has been updated.
15. **Question:** Plumbing drawing P063 note 3 SAW CUT THE AREA SHADED IN GREY. Many areas seem to ask for more saw-cutting than necessary. Example Colum line F/4 shows saw-cutting an approximately 3'x7' area to be able to cap (1) 4" storm drainpipe. Can these saw-cut areas be reduced? Also, who is responsible for providing the saw cutting for the project (Plumbing or Demo Contractor)?
Response: The Saw cutting shown on the plan is merely diagrammatic. The saw-cut areas can be reduced if the G.C. believes they can reduce the scope. G.C. to determine responsible trade for providing saw cutting.
16. **Question:** What is the model number of the existing Firelite fire alarm control panel?
Response: Fire Lite 9200UDLS
17. **Question:** Does the existing fire alarm control panel have the capacity needed to add all the planned new fire alarm equipment?
Response: The Fire Lite 9200UDLS is used in several of the larger residence halls on campus, however we would like to confirm this with the vendor based on the number of new devices in this renovation. Additional information will be issued in forthcoming addendum.
18. **Question:** Where is the existing Firelite fire alarm control panel located in the Bryan Information Commons building?

- Response:** The existing fire alarm control panel is located in the interior electrical room southeast corner of Bryan Information Commons building.
19. **Question:** Are you interested in seeing a separate quote where we add an additional fire alarm control panel in the library instead of running cable back to the existing panel? We would instead tie the two panels together.
- Response:** Team is reviewing and answer in the next addendum.
20. **Question:** Is there an existing pathway to run cable back to the existing fire alarm control panel?
- Response:** There is presumed to be an existing pathway back to the existing fire alarm control panel, however the common area between Kimbel Library and the Bryan Information Commons building may present some challenges. Fire marshal has offered to meet on site to discuss possibilities if needed. Reach out to Mark Avant at CCU to schedule on site meeting.
21. **Question:** Structural plans do not appear to address elevator hoist beam and its support.
- Response:** Hoist beam and details are shown on sheet S602.
22. **Question:** Work hour restrictions?
- Response:** Refer to specification Section 011000 Summary. In addition, limits to work both inside and outside will occur during exam weeks; the academic calendar is available on CCU's website.
23. **Question:** Is it the intent of the demolition plans to remove all existing column cover finishes and framing?
- Response:** Yes, see revised demolition plans for clarification.
24. **Question:** Can contractor use existing elevator during construction?
- Response:** The elevator will not be re-used for the project, the GC can utilize during construction as they see fit. We have attached the Tier 1 Seismic Evaluation completed in 2021 that provides a summary of the existing elevator for reference.
25. **Question:** Is air spading required only in the pathway of new utilities?
- Response:** Air spading is only required for new utilities below the existing tree canopy drip line.
26. **Question:** At what point does the building have to be under conditioned space before that element of construction can begin?
- a. **Question:** Hang and finish drywall? **Answer:** As recommended in writing by manufacturer.
- b. **Question:** Ceilings? **Response:** As recommended in writing by manufacturer.
- c. **Question:** Millwork and doors? **Response:** As recommended in writing by manufacturer.
- d. **Question:** Wood ceilings? **Response:** As recommended in writing by manufacturer.
- f. **Question:** CCU will furnish a temporary unit. Need electrical data so we can prepare for it. **Response:** CCU will not furnish a temporary unit for Kimbel Library Renovation project or the selected GC for the project.

27. **Question:** Will CCU furnish water and power?
Response: Refer to specification Section 015000 Temporary Facilities and Controls 3.3 C and 3.3 F.
28. **Question:** For all special systems, i.e. data, communications security, etc. Contractor installs box, conduit and pull string. All wiring and devices are by others?
Response: Correct. The sound masking system is entirely in the GC's scope.
29. **Question:** The doors in the Bryan Information Commons connector are not required fire egress and will be blocked off?
Response: The doors into Bryan Information Commons are not required for egress and can be locked / secured during construction.
30. **Question:** Can we assume no electrical or data services are located in or pass through the new curtain wall areas?
Response: There are some areas that will be required for the infrastructure shown in the drawings, like card readers.
31. **Question:** Cast Stone belt at window sill height.
a. Detail 8/A610 calls for precast to be secured to sheathing with strap anchors?
b. Not sure what this looks like?
c. Often anchored precast with stainless steel pin connections. As I remember these connections usually fell to the precast supplier to design.
d. Unsure how to fasten a strap anchor to the precast.
e. Maybe you can install pin through 3/8" cont plate?
f. Checked structural detail and this connection is not addressed.
Response: See attached specification Section 047200 Cast Stone Masonry. GC to provide shop drawings with attachment requirements from cast stone manufacturer. We anticipate a combination of dovetail anchors and strap anchors, but ultimately cast stone manufacturer will determine attachments based on size, length, and weight of the cast stone units.
32. **Question:** Can vertical joint spacing in GFRC cornice on canopy be changed to meet manufacturers recommending spacing? i.e. shorter spacing?
Response: Yes, we will work with manufacturer to meet their spacing requirements to achieve alignments with adjacent elements on the canopy and existing building.
33. **Question:** Would the owner be willing to consider shifting the bid date back to the next week?
Response: See revised bid date per attachment.
34. **Question:** From Demo Elevation sheet D300, would indicate veneer to be removed down to soldier course. From Section 4/D301, indicates existing precast belt at soffit opening. 1/A300 shows a belt below the composite panel. 1/A502 Section seems to indicate new belt lower in elevation and different shape than old belt. But it has to sit on existing steel lintel plate, correct? Structural plans do not show any change in this location. Is this a new precast piece in a different location or the same existing belt left / re-installed in the same location? This condition is typical of the three recessed entrance locations.
Response: See revised drawings and additional photo for clarification on existing condition.

Remove all cement board paneling as shown in demo elevations. Refer to photo on attached sheet D300 for the existing soffit condition over recessed doors. It appears the existing precast belt at these locations have been removed in prior renovations. Revised detail 6/A511 shows the new ACM panel extending down to the existing steel plate.

VI. SUBSTITUTION REQUESTS:

1. Section 034900 Glass Fiber Reinforced Concrete: Wilson Composites is an acceptable manufacturer provided that they meet the requirements identified in the specification.
2. Section 074213.23 – Metal Composite Material Wall Panels: Elval Colour, Etalbond 4mm RF Composite Material is an acceptable manufacturer and product provided that they meet the requirements identified in the specification including the finish requirements.
3. Section 102800 – Toilet, Bath, and Laundry Accessories: Saniflow Speedflow Plus is an acceptable manufacturer and product for Section 2.3 B High-Speed Air Hand Dryer.

END OF ADDENDUM

SE-310 INVITATION FOR DESIGN-BID-BUILD CONSTRUCTION SERVICES

AGENCY: Coastal Carolina University

PROJECT NAME: Kimbel Library Renovation

PROJECT NUMBER: H17-9616-MJ CONSTRUCTION COST RANGE: \$12,000,000 to \$12,200,000

PROJECT LOCATION: Coastal Carolina University, Kimbel Library, 376 University Blvd, Conway, SC 29526

DESCRIPTION OF PROJECT/SERVICES: *(450 character limit)*

(REVISED BID DATE) Renovation of existing library to include new study spaces, meeting rooms, curriculum center, reading room, special collections space, admin support spaces, new monumental stair, new elevator, entry canopy, additional ext. glazing and other associated work as shown in the bid documents.

BID/SUBMITTAL DUE DATE: 05/09/2024 TIME: 02:00 PM NUMBER OF COPIES: 1

PROJECT DELIVERY METHOD: Design-Bid-Build

AGENCY PROJECT COORDINATOR: Mark Avant

EMAIL: avant@coastal.edu TELEPHONE: (843) 349-2515

DOCUMENTS OBTAINED FROM: https://www.coastal.edu/facilities/projects/

BID SECURITY IS REQUIRED IN AN AMOUNT NOT LESS THAN 5% OF THE BASE BID.

PERFORMANCE AND LABOR & MATERIAL PAYMENT BONDS: The successful Contractor will be required to provide Performance and Labor and Material Payment Bonds, each in the amount of 100% of the Contract Price.

DOCUMENT DEPOSIT AMOUNT: \$0.00 IS DEPOSIT REFUNDABLE: Yes No N/A

Bidders must obtain Bidding Documents/Plans from the above listed source(s) to be listed as an official plan holder. Bidders that rely on copies obtained from any other source do so at their own risk. All written communications with official plan holders & bidders will be via email or website posting.

Agency **WILL NOT** accept Bids sent via email.

All questions & correspondence concerning this Invitation shall be addressed to the A/E.

A/E NAME: Liollio Architecture A/E CONTACT: Elissa Bostain Morrison

EMAIL: elissa@liollio.com TELEPHONE: (843) 762-2222

PRE-BID CONFERENCE: Yes No MANDATORY ATTENDANCE: Yes No

PRE-BID DATE: 04/10/2024 TIME: 01:30 PM

PRE-BID PLACE: CCU Lackey Chapel, 105 University Blvd., Conway, SC 29526

BID OPENING PLACE: Facilities 1 Conference Room, 755 Hwy 544 (corner of Founders Dr. & Hwy 544), Conway, SC

BID DELIVERY ADDRESSES:

HAND-DELIVERY:

Attn: Mark Avant

Facilities 1, 755 Hwy 544

Conway, SC 29526

MAIL SERVICE:

Attn: Mark Avant

Facilities 1, PO Box 261954

Conway, SC 29528

IS PROJECT WITHIN AGENCY CONSTRUCTION CERTIFICATION? Yes No

APPROVED BY:



DATE: 04/15/2024

(OSE PROJECT MANAGER)

SECTION 047200 - CAST STONE MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Cast Stone Institute
- C. Standards for Architectural Cast Stone

1.2 SUMMARY

- A. Section Includes:

- 1. Cast-stone trim.
 - a. Window sills.
 - b. Water tables.
 - c. Trim.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- 1. For cast-stone units, include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- 2. Waterproofing at conditions
- 3. Fasteners and anchors

- B. Shop Drawings: Show fabrication and installation details for cast-stone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.

- 1. Include building elevations showing layout of units and locations of joints and anchors.
- 2. Include details and engineered attachment requirements for re-installation of existing units. Details to show adjacent materials and connections.
- 3. Engineering fasteners, attachments, locations and quantities for re-installation of existing units. Details to show adjacent materials and connections.

- C. Samples for Verification:

- 1. For each color and texture of cast stone required, 10 inches square in size.
- 2. For each trim shape required, 10 inches in length.
- 3. For colored mortar, make Samples using same sand and mortar ingredients to be used on Project. Label Samples to indicate types and amounts of pigments used.
- 4. GC to match cast stone, precast architectural concrete, and stucco colors. GC to submit all 3 material samples for architect review.

- D. Full-Size Samples: For each color and texture of cast-stone unit required.

1. Make available for Architect's review at Project site.
2. Contractor to provide existing cast stone piece from building to match existing color and texture.
3. Make Samples from materials to be used for units used on Project immediately before beginning production of units for Project.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
 1. Include copies of material test reports for completed projects, indicating compliance of cast stone with ASTM C 1364.
- B. Material Test Reports: For each mix required to produce cast stone, based on testing according to ASTM C 1364, including test for resistance to freezing and thawing.
 1. Provide test reports based on testing within previous two years.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer of cast-stone units similar to those indicated for this Project, that has sufficient production capacity to manufacture required units, and is a plant certified by the Cast Stone Institute .
- B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 1. Build mockup of typical wall area as shown on Drawings as part of a multi-product large mock up assembly.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Coordinate delivery of cast stone to avoid delaying the Work and to minimize the need for on-site storage.
- B. Pack, handle, and ship cast-stone units in suitable packs or pallets.
 1. Lift with wide-belt slings; do not use wire rope or ropes that might cause staining. Move cast-stone units if required, using dollies with wood supports.
 2. Store cast-stone units on wood skids or pallets with nonstaining, waterproof covers, securely tied. Arrange to distribute weight evenly and to prevent damage to units. Ventilate under covers to prevent condensation.
- C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- D. Protect cast-stone units during shipping, delivery, storage, installation and after installation.

1.7 PROJECT CONDITIONS

- A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice

or frost. Do not build on frozen substrates. Comply with cold-weather construction requirements in TMS 602/ACI 530.1/ASCE 6.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until cast stone has dried, but no fewer than seven days after completing cleaning.
- B. Hot-Weather Requirements: Comply with hot-weather construction requirements in TMS 602/ACI 530.1/ASCE 6.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Contractor to salvage, protect and store all existing cast stone for re-use, including cast stone in walls to be demolished and cast stone to be re-installed.
- B. If care is not taken during demolition / removal, GC is responsible for providing new cast stone pieces to match the existing cast stone in color, texture, shape, size and profile.

2.2 MANUFACTURERS

- A. Source Limitations for Cast Stone: Obtain cast-stone units from single source from single manufacturer.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

2.3 CAST-STONE UNITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Advanced Architectural Stone.
 2. Reading Rock
 3. Stromber.
- B. Cast-Stone Units: Comply with ASTM C 1364.
 1. Units shall be manufactured using the vibrant dry tamp method.
- C. Sizes, Texture and Shapes
 1. Existing shapes, sizes and texture to match existing.
- D. Fabricate units with sharp arris and accurately reproduced details, with indicated texture on all exposed surfaces unless otherwise indicated.
 1. Slope exposed horizontal surfaces 1:12 to drain unless otherwise indicated.
 2. Provide raised fillets at backs of sills and at ends indicated to be built into jambs.
 3. Provide drips on projecting elements as indicated.

E. Fabrication Tolerances:

1. Variation in Cross Section: Do not vary from indicated dimensions by more than 1/8 inch.
2. Variation in Length: Do not vary from indicated dimensions by more than 1/360 of the length of unit or 1/8 inch, whichever is greater, but in no case by more than 1/4 inch.
3. Warp, Bow, and Twist: Not to exceed 1/360 of the length of unit or 1/8 inch, whichever is greater.
4. Location of Grooves, False Joints, Holes, Anchorages, and Similar Features: Do not vary from indicated position by more than 1/8 inch on formed surfaces of units and 3/8 inch on unformed surfaces.

F. Acid etch units after curing to remove cement film from surfaces to be exposed to view.

G. Colors and Textures: Match Existing.

2.4 MORTAR MATERIALS

A. Aggregate for Mortar: ASTM C 144.

1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.

B. Water: Potable.

2.5 ACCESSORIES

A. Anchors: Type and size indicated, fabricated from Type 316 stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666.

B. Dowels: 1/2-inch- diameter round bars, fabricated from Type 316 stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666.

2.6 MORTAR MIXES

A. As recommended by The Cast Stone Institute.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SETTING ANCHORED CAST STONE WITH SEALANT-FILLED JOINTS

- A. Set cast stone as indicated on Drawings. Set units accurately in locations indicated, with edges and faces aligned according to established relationships and indicated tolerances.
 - 1. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.
 - 2. Shim and adjust anchors, supports, and accessories to set cast stone in locations indicated with uniform joints.
- B. Keep cavities open where unfilled space is indicated between back of cast-stone units and backup wall; do not fill cavities with mortar or grout.
- C. Fill anchor holes with sealant.
- D. Set cast stone supported on clip or continuous angles on resilient setting shims. Use material of thickness required to maintain uniform joint widths. Hold shims back from face of cast stone a distance at least equal to width of joint.
- E. Keep joints free of mortar and other rigid materials at head joints. Remove temporary shims and spacers from joints after anchors and supports are secured in place and cast-stone units are anchored. Do not begin sealant installation until temporary shims and spacers are removed.
 - 1. Form open joint of width indicated, but not less than 3/8 inch.
- F. Prime cast-stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant unless otherwise indicated.
- G. Prepare and apply sealant of type and at locations indicated to comply with applicable requirements in Section 079200 "Joint Sealants."
- H. No patching is allowed. Damaged units will be replaced in entirety. In-field patching is not allowed.

3.3 INSTALLATION TOLERANCES

- A. Variation from Plumb: Do not exceed 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
- B. Variation from Level: Do not exceed 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
- C. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches or one-fourth of nominal joint width, whichever is less.
- D. Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch, except where variation is due to warpage of units within tolerances specified.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace stained and otherwise damaged units and units not matching approved Samples. Cast stone may be repaired if methods and results are approved by Architect.

- B. Protect in place cast stone with protective plastic coating. Protect cast stone from effects of surrounding work. Maintain protection throughout construction as required.
- C. Replace units in a manner that results in cast stone matching existing, complying with other requirements, and showing no evidence of replacement.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed cast stone as follows:
 - 1. Test cleaning methods on sample; leave one sample uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of cast stone.
 - 2. Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 - 3. Wet surfaces with water before applying cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
 - 4. Clean cast stone by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.

END OF SECTION 047200

SECTION 221316 - SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Pipe, tube, and fittings.
 - 2. Specialty pipe fittings.

1.3 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:
 - 1. Soil, Waste, and Vent Piping: 10-foot head of water.
- B. Seismic Performance: Soil, waste, and vent piping and support and installation shall withstand the effects of earthquake motions determined according to ASCE 7-16.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For coordination. Include plans, elevations, sections, and details.

1.5 INFORMATIONAL SUBMITTALS

- A. Seismic Qualification Certificates: For waste and vent piping, accessories, and components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Detailed description of piping anchorage devices on which the certification is based and their installation requirements.
- B. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

1.7 PROJECT CONDITIONS

- A. Interruption of Existing Sanitary Waste Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
 - 1. Notify Architect/Owner no fewer than five days in advance of proposed interruption of sanitary waste service.
 - 2. Do not proceed with interruption of sanitary waste service without Architect's/Owner's written permission.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.2 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. Heavy-Duty, Hubless-Piping Couplings:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ANACO-Husky.
 - b. Charlotte Pipe & Foundry.
 - c. MIFAB, Inc.
 - d. Mission Rubber Company; a division of MCP Industries, Inc.
 - e. Tyler Pipe.
 - f. Or approved equal.
 - 2. Standards: ASTM C 1540.
 - 3. Description: Stainless-steel shield, 0.015 inch minimum thickness, with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.

2.3 COPPER TUBE AND FITTINGS

- A. Copper DWV Tube: ASTM B 306, drainage tube, drawn temper.

- B. Copper Drainage Fittings: ASME B16.23, cast copper or ASME B16.29, wrought copper, solder-joint fittings.
- C. Hard Copper Tube: ASTM B 88, Type L, water tube, drawn temper.
- D. Copper Flanges: ASME B16.24, Class 150, cast copper with solder-joint end.
 - 1. Flange Gasket Materials: ASME B16.21, full-face, flat, nonmetallic, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
 - 2. Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
- E. Solder: ASTM B 32, lead free with ASTM B 813, water-flushable flux.

2.4 SPECIALTY PIPE FITTINGS

- A. Transition Couplings:
 - 1. General Requirements: Fitting or device for joining piping with small differences in OD's or of different materials. Include end connections same size as and compatible with pipes to be joined.
 - 2. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
 - 3. Shielded, Nonpressure Transition Couplings:
 - a. Standard: ASTM C 1460.
 - b. Description: Elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.
- B. Dielectric Fittings:
 - 1. General Requirements: Assembly of copper alloy and ferrous materials with separating nonconductive insulating material. Include end connections compatible with pipes to be joined.
 - 2. Dielectric Unions:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Capitol Manufacturing Company.
 - 2) Central Plastics Company.
 - 3) Hart Industries International, Inc.
 - 4) Jomar International Ltd.
 - 5) Matco-Norca, Inc.
 - 6) McDonald, A. Y. Mfg. Co.
 - 7) Watts Regulator Co.; a division of Watts Water Technologies, Inc.
 - 8) Wilkins; a Zurn company.
 - 9) Or approved equal.
 - b. Description:

- 1) Standard: ASSE 1079.
- 2) Pressure Rating: 125 psig minimum at 180 deg F.
- 3) End Connections: Solder-joint copper alloy and threaded ferrous.

3. Dielectric-Flange Insulating Kits:

- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1) Advance Products & Systems, Inc.
- 2) Calpico, Inc.
- 3) Central Plastics Company.
- 4) Pipeline Seal and Insulator, Inc.
- 5) Or approved equal.

- b. Description:

- 1) Nonconducting materials for field assembly of companion flanges.
- 2) Pressure Rating: 150 psig .
- 3) Gasket: Neoprene or phenolic.
- 4) Bolt Sleeves: Phenolic or polyethylene.
- 5) Washers: Phenolic with steel backing washers.

4. Dielectric Nipples:

- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- 1) Elster Perfection.
- 2) Grinnell Mechanical Products.
- 3) Matco-Norca, Inc.
- 4) Precision Plumbing Products, Inc.
- 5) Victaulic Company.
- 6) Or approved equal.

- b. Description:

- 1) Standard: IAPMO PS 66
- 2) Electroplated steel nipple.
- 3) Pressure Rating: 300 psig at 225 deg F .
- 4) End Connections: Male threaded or grooved.
- 5) Lining: Inert and noncorrosive, propylene.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on coordination drawings.

- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Install seismic restraints on piping. Comply with requirements for seismic-restraint devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- K. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if two fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- L. Install soil and waste drainage and vent piping at the following minimum slopes unless otherwise indicated:
 - 1. Sanitary Drainage Piping: 1/4" per foot downward in direction of flow for piping NPS 2 and smaller; 1/8" per foot downward in direction of flow for piping NPS 3 and larger.
 - 2. Vent Piping: 1/8" per foot down toward vertical fixture vent or toward vent stack.
- M. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
- N. Install aboveground copper tubing according to CDA's "Copper Tube Handbook."
- O. Install engineered soil and waste drainage and vent piping systems as follows:
 - 1. Combination Waste and Vent: Comply with standards of authorities having jurisdiction.
- P. Plumbing Specialties:
 - 1. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers in sanitary drainage gravity-flow piping. Comply with requirements for cleanouts specified in Section 221319 "Sanitary Waste Piping Specialties."

2. Install drains in sanitary drainage gravity-flow piping. Comply with requirements for drains specified in Section 221319 "Sanitary Waste Piping Specialties."

Q. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

R. Install sleeves for piping penetrations of walls, ceilings, and floors.

S. Install sleeve seals for piping penetrations of exterior concrete walls and slabs.

T. Install escutcheons for piping penetrations of walls, ceilings, and floors.

3.2 JOINT CONSTRUCTION

A. Join hubless, cast-iron soil piping according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.

B. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.

2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

C. Join copper tube and fittings with soldered joints according to ASTM B 828. Use ASTM B 813, water-flushable, lead-free flux and ASTM B 32, lead-free-alloy solder.

3.3 SPECIALTY PIPE FITTING INSTALLATION

A. Transition Couplings:

1. Install transition couplings at joints of piping with small differences in OD's.

2. In Drainage Piping: Shielded, nonpressure transition couplings.

B. Dielectric Fittings:

1. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.

2. Dielectric Fittings for NPS 2 and Smaller: Use dielectric nipples or unions.

3.4 HANGER AND SUPPORT INSTALLATION

A. Comply with requirements for seismic-restraint devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."

B. Comply with requirements for pipe hanger and support devices and installation specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."

1. Install stainless-steel pipe hangers for horizontal piping.

2. Install stainless-steel pipe support clamps for vertical piping.
 3. Vertical Piping: MSS Type 8 or Type 42, clamps.
 4. Install individual, straight, horizontal piping runs: MSS Type 1, adjustable, clevis hangers
- C. Support horizontal piping and tubing within 12 inches of each fitting and coupling.
- D. Support vertical piping and tubing at base and at each floor.
- E. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.
- F. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
 2. NPS 3: 60 inches with 1/2-inch rod.
 3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
 4. NPS 6 and NPS 8: 60 inches with 3/4-inch rod.
 5. NPS 10 and NPS 12: 60 inches with 7/8-inch rod.
 6. Spacing for 10-foot lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches.
- G. Install supports for vertical cast-iron soil piping every 15 feet.
- H. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/4: 72 inches with 3/8-inch rod.
 2. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
 3. NPS 2-1/2: 108 inches with 1/2-inch rod.
 4. NPS 3 and NPS 5: 10 feet with 1/2-inch rod.
 5. NPS 6: 10 feet with 5/8-inch rod.
 6. NPS 8: 10 feet with 3/4-inch rod.
- I. Install supports for vertical copper tubing every 10 feet.
- J. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.
- 3.5 CONNECTIONS
- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- C. Connect drainage and vent piping to the following:
1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.

3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
 4. Install test tees (wall cleanouts) in conductors near floor and floor cleanouts with cover flush with floor.
 5. Comply with requirements for cleanouts and drains specified in Section 221319 "Sanitary Waste Piping Specialties."
 6. Equipment: Connect drainage piping as indicated. Provide shutoff valve if indicated and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.
- D. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.
- E. Make connections according to the following unless otherwise indicated:
1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.

3.6 IDENTIFICATION

- A. Identify exposed sanitary waste and vent piping. Comply with requirements for identification specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.7 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 3. Roughing-in Plumbing Test Procedure: Test drainage and vent piping except outside leaders on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water. From 15 minutes before

inspection starts to completion of inspection, water level must not drop. Inspect joints for leaks.

4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

3.8 CLEANING AND PROTECTION

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.9 PIPING SCHEDULE

- A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.
- B. Aboveground, soil, waste, and vent piping shall be any of the following:
 1. Service class, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings; heavy-duty hubless-piping couplings; and coupled joints.
 3. For stubouts through walls to fixture trap arm: Copper DWV tube, copper drainage fittings, and soldered joints.
- C. Underground, soil, waste, and vent piping except for Grease/Kitchen piping shall be the following:
 1. Solid wall PVC pipe, PVC socket fittings, and solvent-cemented joints.
 2. Dissimilar Pipe-Material Couplings: Shielded, nonpressure transition couplings.

END OF SECTION 221316



MARTINEZ & ASSOCIATES

STRUCTURAL ENGINEERS, PA

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Tier I Seismic Evaluation: American Society of Civil Engineers 41-13

Inspection Dates: March 24, April 8, and April 12, 2021

Project: Kimbel Library Coastal Carolina University

Location: 376 University Boulevard
Conway, SC 29526

Current Owner: Coastal Carolina University
Facility Director: Mark Avant
100 Chanticleer Drive
Conway, SC 29526

Consultant: Martinez & Associates Structural Engineers, PA
1107 48th Ave North 310C
Myrtle Beach, SC 29577
Phone: (843)839.1620
marteng1@sccoast.net

Project Number: 21-254

Present: Saul J. Martinez, PE and Mark Avant

Building Description

Constructed in the mid 1970s, the current library facility is a two-story conventional steel framed building with infill unreinforced masonry shearwalls. Elevator shearwalls along with steel building columns are supported by individual pilecaps supported by a minimum of four timber piles. Intermediate lengths of grade beams are supported by single 20-ton timber piles.

Existing drawings provided by James, DuRant, James and Matthews Architects depict three stairwells with one immediately south of the original entry, the second at the northeast building corner and the third, at the southwest building corner. While all three possess a brick veneer cladding, only a portion of the stairwell perimeters are constructed of block masonry presumed to comprise the lateral restraint system. These components will be evaluated for their ability to resist lateral load generated from seismic activity. The block portions of the stairwells are supported at the corners by quad pile caps and intermediately by concrete grade beams.

The elevator core located within the west quadrant of the rectangular building is comprised completely of concrete block along its perimeter and is supported at the corners by single timber capped piles. A concrete grade beam connects the single pile caps at the corners (ref. Page 2 Existing Drawings).

The floor system is comprised of repetitive steel bars joists below corrugated metal decking which forms an approximate 3" concrete deck. Steel beam girders support the bar joist system throughout.

The roof system is conventionally steel framed at the corner hips and with the hips being supported by steel beams at the apex or, intermediately, by steel W sections and pipe columns.

The steel connections observed within the existing drawings (not visible during field inspection) were of gusset angle type with no moment connections apparent. Perimeter walls are comprised of non-live load bearing metal studs and brick veneer.

Scope & Intent

It is the intent of this exercise to perform a Tier 1 Screening of the building in accordance with ASCE Standard 41-13. A Tier 1 screening is intended to identify the building type, potential deficiencies, and its potential behavior during a seismic event. Reference materials utilized during this Tier 1 Screening are as follows:

- Existing building drawings by James, DuRant, James and Matthews Architects dated April 1975.
- Existing geotechnical report by S&ME dated November 5, 2009. Project No. 1633-09-251.
- USGS 2018 Seismic Hazard Long-term Model
- ASCE 41-13

The Performance Level to serve as the guideline and checklist criteria for this report was determined to be Life Safety based on the High Seismicity category under which the building falls (ref. Figure 4-1 ASCE 41-13). The Risk Category III will be used for Kimbel Library (school classification) under the Tier 1 Existing Building Hazard for BSE-1E or Basic Safety Earthquake-1 for use with the Basic Performance Objective for Existing Buildings, taken as a seismic hazard with a 20% probability of exceedance in 50 years.

For Risk Category III, the Tier 1 screening checklists shall be based on the Life Safety Performance Level (S-3), except that checklist statements using the Quick Check procedures of Section 4.5.3 of ASCE 41-13 shall be based on MS-factors and other limits that are an average of the values for Life Safety and Immediate Occupancy. Non-structural components will be graded based on Position Retention (N-B).

On-site evaluations were performed on March 24, April 8 and April 12 of 2021.

Engineering Parameters

The seismic hazard as a result of ground movement shall be based on the location of the building relative to causative faults, the site-specific geotechnical characteristics, and the specified Seismic Hazard Levels. Per S&ME Report No. 1633-09-251 page 9, Site Class E would be applicable to determine spectral values for design. Utilizing earthquake design factors from Section 1613 of the 2006 International Building Code and based upon the code design earthquake with a 2 percent probability of return in 50 years, the following spectral design values were determined:

- $S_s = 0.66g$ (spectral acceleration for short periods)
- $S_1 = 0.18g$ (spectral acceleration for a 1-second period)
- $F_A = 1.39$
- $F_V = 3.25$
- $S_{MS} = 0.91g$
- $S_{M1} = 0.59g$
- $S_{DS} = 0.61g$ (prompts "**High**" Level of Seismicity > 0.50g)
- $S_{D1} = 0.40g$ (prompts "**High**" Level of Seismicity > 0.20g)
- $PGA = 0.24g$

A level 3-C Life Safety parameter has been chosen by which to evaluate the **building's** required performance. This parameter states that the structure will remain stable following a seismic event and that the building has significant reserve capacity to prevent partial or total collapse; hazardous nonstructural damage is controlled. This parameter is less stringent than either Immediate Occupancy (1-B) or Operational (1-A) requirements.

Per ASCE 41-13 Commentary: While some structural elements and components are severely damaged, this damage has not resulted in large falling debris hazards, either inside or outside the building. Injuries might occur during the earthquake, however, the overall risk of life-threatening injury as a result of structural damage is expected to be low. It should be possible to repair the structure, however for economic reasons, this repair might not be practical. Although the damaged structure is not an imminent collapse risk, it would be prudent to implement structural repairs or install temporary bracing before reoccupancy.

Lateral Restraint System and Field Observations

The **building's** predominant ability to resist lateral shear occurs at the connection between the building elevated corrugated metal deck slab and the elevator block wall core where the deck pours into an 8" wide x 16" deep perimeter beam (ref. Section 3/12 on Page 12 of the Existing Drawings). Beams supporting the repetitive bar joists at either side of the elevator do not appear to be connected directly to the elevator core rendering the slab pour and thickness of the slab at the interface the predominant resistive component. Connection in the form of vertical reinforcement of the block wall to the surrounding elevator pit concrete wall was not apparent within the existing drawings (ref. Section 5/12 or Page 12). Per the provided building sections, horizontal reinforcement is only present at the slab level beams described above or at closed-bottom bond beams at the mechanical room ceiling slab level.

Concrete block stair shafts occur at the rear left and front right building corners. While concrete block at the corners offers moderate opportunity for lateral restraint, the complete vertical block sections occur in "L" configuration to the exterior. The longer wall section is not directly connected to the main floor diaphragm (separated by open riser/tread area) and the shorter wall section can only be utilized for lateral restraint along the longitudinal axis or in torsional restraint through the transverse building axis.

Because existing building drawings do not show sections depicting vertical rebar within the block wall cells, it is assumed that the masonry is unreinforced. This factor is considered to be a deficiency per ASCE 41-13 and is depicted within the Basic and Life Safety Checklists attached in Appendix C.

Summary and Recommendations

Buildings comprised of unreinforced masonry walls are inherently brittle systemically and exhibit limited ductility capacity in variable modes of lateral movement. These building types rely on friction and, sometimes, overburden from supported loads to resist over-turning or horizontal drift. Strengths and stiffnesses degrade with each additional cycle of response to ground motions and are thus susceptible to incremental damage, particularly in larger magnitude, longer duration earthquakes and multiple aftershocks compared with damage from shorter duration, isolated events.

Structural Performance Level S-3, Life Safety, correlates to a post-earthquake damage state in which significant damage to the structure has occurred but some margin against either partial or total structural collapse remains. More brittle connections such as the interface of second level concrete deck to elevator core is expected to sustain damage, but it is not likely that the damage has resulted in large falling debris hazards, either inside or outside the building. Injuries may occur during the earthquake, however, the overall risk of life-threatening injury as a result of structural damage is expected to be low.

With reference to ASCE 41-13 Table C2-5, Non-structural Performance levels for Life Safety (N-C) as related to cladding may result in extensive distortion in connections and damage to cladding components, including loss of weather-tight seals. Partitions including brick veneer at stairs or at the perimeter are likely to sustain distributed damage, some severe cracking, crushing and dislodging. Doors may also sustain damage such as racking or jamming following a seismic event.

Mechanical, electrical and plumbing systems are also expected to be affected. Elevators are likely to become out of service with counter-weights shifting slightly. HVAC equipment connections may show signs of shifting and units may not continue operation. Some lines are expected to rupture throughout the plumbing system along with failure of hangers or supports. Similar damage may appear within the fire suppression system piping (ASCE 41-13 Table C2-6 and C2-7).

The intent of the Tier 1 seismic evaluation is to evaluate the building in order to reduce seismic risk by using simplified procedures for specific building types. The Tier 1 procedure is less complex than a complete analytical evaluation common in Tier 3 systematic procedures. Geologic information acquired from the borings and test results in 2009 provided the actual soil properties near the building along with seismic coefficients necessary for completing this Tier 1 evaluation.

While the building is in good condition and a defined load path exists for the 45 year-old building, a number of items comprising the lateral restraint system were found to be either non-compliant or unknown including:

- Shear Stress Check
- Wall Anchorage
- Openings at Exterior Masonry Shear Walls

Deficiencies in the existing lateral restraint system warrant the execution of a Tier 2 deficiency-based Seismic Procedure. Chapter 5 of ASCE 41-13 requires that the analysis only determine demands, capacities and acceptance criteria for those elements determined to be evaluated based on findings of the Tier 1 study. Deficiencies identified in the Tier 1 evaluation may be mitigated through Tier 2 deficiency-based retrofit measures. The resulting building, including fortification measures, shall comply with the Tier 1 evaluation and Tier 2 deficiency-based evaluation for all potential deficiencies identified.

The design professional must perform Tier 2 analysis and evaluation as necessary to demonstrate the adequacy of the new structural elements, connections and details added along with all elements, connections and details modified as part of the rehabilitation.

This report is a general summary report, is not exhaustive in detail and does not change the contractual responsibilities between parties for correction of deficiencies or non-complying items, whether or not all were discovered and noted in this report. Please direct all questions or concerns to the above listed contact information provided.

Sincerely,
Saul J. Martinez, PE



Appendix A
Kimbel Library - CCU
Photo Documentation



Photo #1: Southeast Corner/Prev Front Entr



Photo #5: East Side



Photo #2: Southwest Corner



Photo #6: Existing to Newer Bldg Interface



Photo #3: West Side

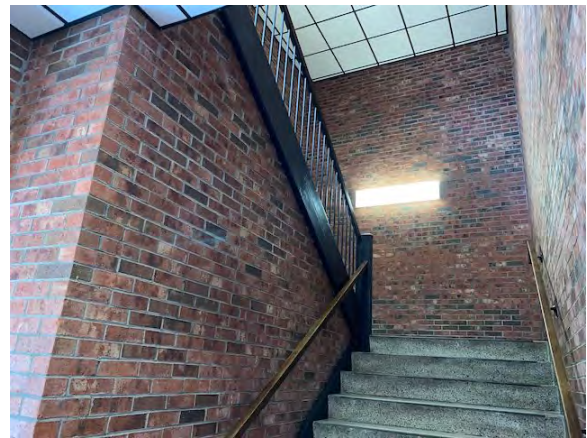


Photo #7: Southeast stairwell



Photo #4: Northwest Corner



Photo #8 - Northwest stairwell



Photo #9: Roof structural steel from catwalk



Photo #10: Roof bar joists above mech room



Photo #11: Roof bars and mechanical hangers



Photo #12: Structural column and beams at Flat roof corner

Appendix B
Kimbel Library - CCU
Seismic Calculations

COASTAL CAROLINA UNIVERSITY - KIMBELL LIBRARY

SEISMIC ANALYSIS

| LEVEL | DEAD LOAD (PSF) | AREA (FT ²) | PERIMETER VENEER LOAD KIPS | CONCRETE BEAM KIPS | 8" CMU WALL (PLF) | WALL LENGTH (FT) | COLUMN LOAD (PSF) | COL AREA (FT ²) | PARTITION WALL (PSF) | AREA (FT ²) | WEIGHT (KIPS) | HEIGHT (FT) | W _i *h _i ^k (FT-K) | F _x (KIPS) Factored EQ 16-41 | SHEAR, V (KIPS) Factored |
|------------|-----------------|-------------------------|----------------------------|--------------------|-------------------|------------------|-------------------|-----------------------------|----------------------|-------------------------|---------------|-------------|--|---|-----------------------------|
| Mech Roof | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | 35.67 | 0.00 | 0.00 | 0.00 |
| Mech | 60 | 1152 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1152 | 69.12 | 27.40 | 1,893.89 | 199.04 | 199.04 |
| Roof | 25 | 22759 | 0 | 0 | 111 | 141 | 0 | 0 | 0 | 22759 | 584.56 | 24.00 | 14,029.33 | 1474.39 | 1673.43 |
| 2nd | 60 | 22759 | 0 | 18.7 | 748 | 141 | 75 | 35 | 10 | 22759 | 1719.85 | 14.00 | 24,077.94 | 2530.43 | 4203.86 |
| 1st | 60 | 22759 | 0 | 0 | 455 | 141 | 75 | 35 | 10 | 22759 | 1659.91 | 1.00 | 1,659.91 | 174.45 | 4378.30 |
| GRND | | | | | | | | | | | | 0.00 | | 0.00 | 4378.30 |
| Total, W = | | | | | | | | | | | | 4,033.44 | 41,661.07 | 4378.30 | |

Determination of V (ASCE 7-10)

| | | | | | |
|----------------------------------|--------|--|---|---------|--------------|
| Site Classification: | E/F | GEOTECH | S ₁ | 0.18 | Figure 22-2 |
| I _E | 1 | Table 1604.5 | F _V | 3.25 | Table 11.4-2 |
| S _S | 0.66 | Figure 22-1 | S _{M1} | 0.585 | EQ 11.4-2 |
| F _A | 1.39 | Table 11.4-1 | S _{D1} | 0.39 | EQ 11.4-4 |
| S _{MS} | 0.9174 | EQ 11.4-1 | C _T | 0.02 | Table 12.8-2 |
| S _{DS} | 0.612 | EQ 11.4-3 | T _a | 0.23952 | EQ 12.8-7 |
| R | 1.5 | Table 12.2-1 Unreinforced Masonry Shear Walls | | | |
| C _S | 0.408 | EQ 16-35 | | | |
| (C _s) _{min} | 0.027 | EQ 12.8-5 | S _{D1} = (2/3)*S _{M1} | | EQ 11.4-4 |
| (C _s) _{max} | 1.086 | EQ 12.8-3 | S _{M1} = F _V S ₁ | | EQ 11.4-2 |
| k | 1 | Section 12.8.3 GEOTECH | | | |
| V = C _s W | 4378.3 | kips EQ 12.8-1 | | | |

Appendix C
Kimbel Library - CCU
Tier 1 Seismic Study
ASCE 41-13 Checklists