ADDENDUM

NO. 4

Date: March 16, 2021

To: All Prime Bidders of Record and Plan Holders

Project: East Tennessee State University – Lamb Hall Renovation

Johnson City, TN

This addendum is hereby made a part of the contract documents and the Specifications of the above named project. All other requirements of the original Specifications shall remain in effect in their respective order. Acknowledge receipt of this Addendum by inserting its number and date in the Proposal Form.

This Addendum Number Four consists of _4_ typewritten pages, and _46_ attachments.

**General**

ITEM 1 State Fire Marshall Review of Plans #02 Comments

A. TFM # 07727 Project # 2021-02-01-01 Review of Plans, #2 dated March 11, 2021 have been addressed in revisions included in this Addendum. Revisions pertaining to the comments are enumerated in the attached response letter dated March 16, 2021.

B. A copy of the TFM Response letter has been included in this Addendum for clarity.

**Specifications**

Refer to Specifications. Specification section 00 01 10 Table of Contents has been revised.

Refer to Specifications. Specification section 00 01 15 List of Drawings has been revised.

Refer to Specifications. Specification section 02 35 53 Laboratory Casework: Paragraph 2.02. F. Basis of Design for “flip and fold shelves are Kewaunee Alpha Series.

Refer to Specifications. Specification section 04 01 21 Restoration and Cleaning has been added.

Refer to Specifications. Specification section 04 20 00 Unit Masonry has been revised.

Refer to Specifications. Specification section 08 71 00 Door Hardware has been revised to add the following:
Set No. 3A
Each to have:
2 Continuous Hinges  780-112-HD x EPT Prep  HAG  628/DK BZ
2 Power Transfers  EPT-10  VON  689/313
1 Exit Device  SD-QEL9847DT  VON  626/613
1 Exit Device  SD-QEL9847NL  VON  626/613
2 Cylinder  Corbin / Russwin as Required CT6  COR  626/613
2 Auto Operators  SW100- Continuous Cover Low E  BES  628/695
2 Touchless Actuators  MS11  BEA  -
1 Power Supply  PS902 – 900-2RS – 900-8F  VON  -
1 Card Reader  by access control integrator  -  -
-Card reader, card reader power supply, controller, logic, wire and wiring by others.
-Weatherstrip, thresholds, sweeps complete with aluminum doors.

Refer to Specifications. Delete specification section 08 74 13 Electronic Stand Alone Card Access Locking System.

Refer to Specifications. Specification section 08 80 00 Glazing: Paragraph 1.06 Quality Assurance.
Delete the following line: “and who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program”.

**Drawings**

Refer to Drawing Sheet G001. Replace existing G001 with revised G001 (attached). The Drawing Index has been updated through with revisions associated with Addenda 1-4. Code synopsis information has been modified to address TFM comments.

Refer to Drawing Sheet C1.0. Replace existing C1.0 with revised C1.0r4 (attached). Moved sewer line from existing Lamb Hall to match plumbing plans, removed manholes that connected service lines to new sewer line, we removed the gate valve on fire protection line. Contractor will be responsible to coordinate sewer line leaving the addition and existing Lamb Hall as identified on pumping plan sheets.

Refer to Drawing Sheet C1.1. Replace existing C1.1 with revised C1.1r4 (attached). Removed a manhole and updated the profile to reflect changes. Contractor will be responsible to coordinate sewer line leaving the addition and existing Lamb Hall as identified on pumping plan sheets.

Refer to Drawing Sheet C1.2. Replace existing C1.2 with revised C1.2r4 (attached). Removed gate valve on profile to reflect change.

Refer to Drawing Sheet EC1.0. Replace existing EC1.0 with revised EC1.0r4 (attached). We moved sewer line and removed manholes that connected service lines to new sewer line. Contractor will be responsible to provide inlet protection until the disturbed surfaces has been established and accepted.

Refer to Drawing Sheet AD111. Drawing Sheet AD111 Interior Demolition Notes has been revised to add the following:
Rooms 068 & 069 Existing toilet partitions, plumbing fixtures, mirrors, and toilet accessories to be demolished.

Refer to Drawing A300. Drawing Sheet A300 Building Sections, 2/A300 North – South Building Section, note “Limestone Rainscreen on Metal Channels” shall be deleted; add “Brick Veneer”.

*511 Tusculum Boulevard  Greeneville, Tennessee 37745  Tel 423.638.9900  Fax 423.638.9935*
Refer to Drawing Sheet A600. Replace existing A600 Door Schedule with sheets A600a Door Schedule – Part A and A600b Door Schedule – Part B (attached). Head, Jamb, and Sill information has been added, hardware callouts have been modified, door elevation callouts have been modified.

Refer to Drawing Sheet A601. Replace existing A601 with revised A601r4 (attached). Door Type elevations and details have been modified.

Refer to Drawing Sheet A706. Drawing Sheet A706 Detail 6/A706 Typical Enlarged Tiered Classroom. Existing tiers are constructed of poured in place concrete treads (3’-0”) and risers (7”) with concrete block supports.

Refer to Drawing Sheet A707. Replace existing A707 Fourth Floor Enlarged Plans & Elevations with revised A707r4 (attached). Additional interior elevations have been added.

Refer to Drawing Sheet M0.2. Replace existing M0.2 with revised M0.2r3 (attached).

Refer to Drawing Sheet M1.10. Replace existing M1.10 with revised M1.10r3 (attached).

Refer to Drawing Sheet M1.11. Replace existing M1.11 with revised M1.11r3 (attached).

Refer to Drawing Sheet M1.13. Replace existing M1.13 with revised M1.13r3 (attached).


Refer to Drawing Sheet M1.16. Replace existing M1.16 with revised M1.16r3 (attached).

Refer to Drawing Sheet M2.11. Replace existing M2.11 with revised M2.11r3 (attached).

Refer to Drawing Sheet M2.12. Replace existing M2.12 with revised M2.12r3 (attached).

Refer to Drawing Sheet M2.14. Replace existing M2.14 with revised M2.14r3 (attached).

Refer to Drawing Sheet P1.11. Replace existing P1.11 with revised P1.11r3 (attached).

Refer to Drawing Sheet P1.12. Replace existing P1.12 with revised P1.12r3 (attached).

Refer to Drawing Sheet P1.13. Replace existing P1.13 with revised P1.13r3 (attached).

Refer to Drawing Sheet P1.14. Replace existing P1.14 with revised P1.14r3 (attached).

Refer to Drawing Sheet P1.19. Replace existing P1.19 with revised P1.19r1 (attached).

Refer to Drawing Sheet P1.20. Replace existing P1.20 with revised P1.20r3 (attached).

Refer to Drawing Sheet P1.21. Replace existing P1.21 with revised P1.21r3 (attached).

Refer to Drawing Sheet P1.22. Replace existing P1.22 with revised P1.22r3 (attached).

Refer to Drawing Sheet P2.11. Replace existing P2.11 with revised P2.11r3 (attached).

Refer to Drawing Sheet P2.12. Replace existing P2.12 with revised P2.12r3 (attached).

Refer to Drawing Sheet P2.13. Replace existing P2.13 with revised P2.13r3 (attached).
Refer to Drawing Sheet P2.14. Replace existing P2.14 with revised P2.14r3 (attached).

Refer to Drawing Sheet P2.18. Replace existing P2.18 with revised P2.18r3 (attached).

Refer to Drawing Sheet P2.22. Replace existing P2.22 with revised P2.22r3 (attached).

Refer to Drawing Sheet FP110. Replace existing FP110 with revised FP110r3 (attached).

Refer to Drawing Sheet FP111. Replace existing FP111 with revised FP111r3 (attached).

Refer to Drawing Sheet E3.1. Replace existing E3.1 with revised E3.1r4 (attached).

Refer to Drawing Sheet E3.2. Replace existing E3.2 with revised E3.2r4 (attached).

Refer to Drawing Sheet E4.1. Replace existing E4.1 with revised E4.1r4 (attached).

Refer to Drawing Sheet T1.0. Replace existing T1.0 with revised T1.0r4 (attached).

Refer to Drawing Sheet T1.1. Replace existing T1.1 with revised T1.1r4 (attached).

Refer to Drawing Sheet T1.2. Replace existing T1.2 with revised T1.2r4 (attached).
March 16, 2021

Mr. Rickey Cottrell, Plans Examiner II
Department of Commerce and Insurance
Fire Prevention Division – TN State Fire Marshal’s Office
Codes Enforcement and Plans Review Section
Davy Crockett Tower, 10th Floor
500 James Robertson Parkway
Nashville, TN  37243-0565

Re:   Review of Plans, #02
ETSU Lamb Hall - Renovation
156 South Dossett Drive
Johnson City, TN  37614
TFM #  07727 Project # 2021-02-01-01
SBC # 166/005-09-2017CM

Dear Mr. Cottrell:

The following correspondence addresses the second set of review comments for the ETSU Lamb Hall - Renovation project. The comments are addressed in the order in which they were noted.

1.  Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official. IBC 107.2.1

   Review Note: The drawings contain layers which need to be flattened and 2266 AutoCAD SHX Text comment boxes which need to be addressed. Provide an updated full set of plans that do not contain layers or AutoCAD SHX text. The layers & text information cause delays & hinders the review process. (see attached information)

   Review Note: 10Mar2021 The drawings (addendum #01 package) contain layers which need to be flattened and hundreds of AutoCAD SHX Text comment boxes which need to be addressed. Addendum #02 package appears clean. Text & page numbers etc. missing from plans & some specification sheets in each package. Due to the high number of modified documents a complete up to date set of plans would greatly decrease the time to get the final approval issued.

   •  Response: A current complete set of documents will be uploaded to the TFM Portal separately.

3.  When revisions are made to sealed documents, the revisions are to be resealed and appropriately dated in accordance with A&E Rule 0120-02.

   •  Response: Duly noted.
7. Identify the sprinkler standard used and the hazard classification.

   **Review Note:** 10Mar2021 The information is to be listed as part of the code analysis. Currently the analysis lists “Sprinklered”.

   • **Response:** Refer to the attached revised sheet G001, the following information has been added to the code analysis; “Sprinklered – Light Hazard”.

9. Provide an updatable “Index of Drawings” which reflects the most current drawing revision and the date revised with each submission. IBC 107.2.1

   **Review Note:** See attached example of minimum requirements.

   **Review Note:** 10Mar2021 Provide a revised index which includes addendum #02 modifications.

   • **Response:** Refer to the attached revised sheet G001, the drawing index has been updated through Addendum No. 4.

12. For all fire rated assemblies, provide Gypsum Association or UL assembly listing (or other) details in their entirety including design illustrations and material specifications without modification or manipulation, IBC 107.2.1, 703.3.
   
   • Fire rated walls, columns, beams, floor/ceiling and roof/ceiling assemblies.
   • Fire rated joint systems for fire rated assembly connections such as wall-to-wall, floor-to-floor, floor-to-wall, head-of-wall, and bottom-of-wall joints where not inherently tight.
   • Curtain Wall Joint Systems for perimeter fire containment systems such as unrated curtain wall-to-rated floor assemblies where not inherently tight.

   **Review Note:** Engineering Judgments can only be used for the project it was issued for. (sheet LS402)

   **Review Note:** 10Mar2021 Engineering Judgment information on curtain wall joint system may be a stipulation on the plans upon initial approval of the project if it is not able to be secured in a timely manner.

   • **Response:** Duly noted. An Engineering Judgement will be submitted as part of the shop drawing process and will relate specifically to the window system being provided.

17. Communicating spaces (main & second level) shall comply with NFPA 101 8.6.6 (3) “The entire floor area of the communicating space open and unobstructed.”

   **Review Note:** 10Mar2021 Original request for equivalency was not approved. Revise and resubmit. Request should reference any related drawings that are part of the design approach of the equivalency. i.e., electrical smoke detection for early warning etc.

   • **Response:** A revised equivalency was uploaded to the TFM Portal on 3/12/21. The revised equivalency is attached for convenient reference. Please also refer to the attached sheets FP000-FP115 for automatic sprinkler system, sheets E3.0-E3.5 for fire alarm replacement and sheets E3.1 and E3.2 for smoke detection in the communicating space. Drawings E3.0 and E3.1 have been revised to add full smoke detection on the Main Floor and Second Floor in the communicating space areas of the vertical opening.
29. Provide design criteria for the delayed egress locks, access-controlled egress doors or electromagnetically locked egress doors. IBC 1008.1.9.2, 1008.1.9.3 and 1008.9.4 The design must show which system is used, a legend for access-control components, location of these devices, device mounting heights, system connections to electrical power, system connections to the fire alarm system, and system operation statement. Except as specifically permitted by this section, egress door shall be readily openable from the egress side without the use of a key or special knowledge or effort. IBC 1008.1.9

Review Note: 10Mar2021 Review response indicted locations are noted in specifications. Locations are to be noted on the plans along with any details required to determine code compliance.

Response: Refer to the attached revised hardware specifications and revised drawings. Notes regarding function have been added to the specifications. General notes have been added to Sheet A600a and A600b to clarify access control functions. Notes have been added to the door schedule indicating which door receive each type of access control. Sheets T1.0, T1.1, T1.2, and E4.1 have been revised to add details concerning operation of access-controlled doors.

42. Automatic sprinkler system shop drawings signed by the Responsible Managing Employee must be submitted for review after the design intent has been approved. They must also be reviewed and approved by the fire protection engineer of record (processed with the engineer’s shop drawing review stamp) prior to the submittal to the State Fire Marshal’s Office. Engineer of record for this purpose is the engineer that has sealed the approved design intent drawings. The Sprinkler Shop Drawings package is made up of three (3) distinct sections which are the drawings, calculations, and manufacture’s cut sheet package. First the drawings will either need a standard plan cover sheet containing the project information & the engineer of record’s review stamp or the stamp will need to appear on all the sheets provided for review. Provide review stamp on the cover sheet of each set of hydraulic calculations and the cover/index page of the manufacture’s information package or on each page of documentation being submitted. Shop drawing information will be a stipulation on the plans upon initial approval of the project and no response is required at this time for this item. Rule 0780-2-3-.03(2), IFC 105.4.2.1, & IBC 107.2.2

- Response: Duly noted. Shop drawings will be uploaded to the TFM Portal once reviewed and approved by the engineer of record.

51. Show location of the test connection(s). Test connections shall be provided at locations that will permit flow tests of water supplies and connections. NFPA 8.17.4.1.1.

Review Note: 10Mar2021 Provide an approximant location on the plans for the location of the remote test connection.

- Response: Refer to sheet FP110, the test connection has been added for the forward flow test.

54. Provide the following for fire pump room ventilation (NFPA 20, 4.12.6) and a floor drain in the (new) pump room (NFPA 20, 4.12.7).

Review Note: The fire pump is currently located in Mechanical 002e.
**Review Note:** 10Mar2021 Provide code compliant information on the plans for the new fire pump room.

- **Response:** Refer to sheet M110 for added exhaust fan #4 to Fire Pump Room. Refer to revised sheet P110 for added floor drains in Fire Pump Room.

65. Provide a material safety data sheets (MSDS) and the quantities for every chemical used in the building. This information must originate from owner(s) or Tenant(s).

**Review Note:** 10Mar2021 The revised documentation package as discussed still needs to be submitted.

- **Response:** Revised MSDS information was uploaded to the TFM Portal on 3/12/21.

### Additional comments based on revised documents:

66. All connections to private fire service mains for fire protection systems shall be arranged so that they can be isolated (NFPA 24 6.3.1). The sprinkler system isolation valve must be electronically supervised by a fire alarm system. IBC 903.4 Exception: Underground key or hub valves in roadway boxes provided by the municipality or public utility are not required to be monitored. IBC 903.4.1, Exception 1.

**Review Note:** 10Mar2021 the new gate valve that was added on sheet C1.0 in addendum #2 will require a tamper switch unless exception is met (owner of valve must be indicated on the plans).

- **Response:** Refer to sheet C1.0, the valve referenced in this comment will not be necessary and is being removed from the civil drawings. Therefore, there will be no tamper switch that needs to be connected and supervised by the fire alarm system.

**End of Review**
Date: March 11, 2021

To: John Fisher
Fisher + Associates
511 Tusculum Boulevard
Greenville, TN 37745

RE: Review of Plans #02
ETSU Lamb Hall - Renovation
156 South Dossett Drive
Johnson City, TN 37614

TFM # 07727
Project # 2021-02-01-01
County: Washington
SBC # 166/005-09-2017CM

Plans Examiner: Rickey Cottrell
Phone: 615.253.8803
Email: rickey.cottrell@tn.gov

Date plans received: 02Mar2021 Addendum_01 / 05Mar2021Addendum_02

Occupancy Classification: Existing Business

Scope of Work: 4 story addition to existing 5 story building. The existing building will be renovated & fully sprinklered under the scope of this project.

A review of your plans has been performed. Items listed in this review require amended construction documents such as revised sealed plans, supplemental instructions, addenda, field orders, or change orders. All numbered review items must be addressed before plans approval will be issued. Marked up plans may be included to assist the design professional in identifying specific areas referenced in the review comments.

This project has been reviewed under the Tennessee Public Buildings Accessibility Act. It is the responsibility of the owner and design professional to comply in full with accessibility codes and standards for the enforcement of the Tennessee Public Building Accessibility Act. TCA 68-120-204

In addition to the revised sealed plans, the designer may also provide a separate letter to explain the changes to the construction documents. All drawing revisions should be clouded with a corresponding revision number tag and be indicated on a drawing index.
State buildings, educational occupancies and any other occupancy requiring an inspection by the state fire marshal for initial licensure, must comply with the requirements of NFPA 101 Life Safety Code, 2012 edition. In the case of a conflict between the codes, the more stringent provision shall prevail with the exception of those items listed in Rule 0780-02-02-.04.

Starting construction before plans approval may be considered as a just cause, by the State, to issue a stop work order. It will also compromise, if not prevent, the issuance of a Certificate of Occupancy upon completion of the project. Rule 0780-2-3-.10

Please note the following: When submitting documents using the Portal application it is important to use correct document type(s) that best match the documents being submitted, e.g. Sprinkler Shop Drawings, Energy Certificates, etc. In order to ensure an accurate and timely response to your submittal:

- Provide the Tennessee Fire Marshal's TFM number and Project number on all plans and correspondence.
- Provide a corresponding letter which indicates, in the order of the review, where the revised items may be located on the drawings.
- Identify all corrections by means of a mark or cloud and provide only the sheets that require correction. If the number of corrections warrant complete revised sets of plans, revised sets are acceptable.
- Ensure that all revised documentation is sealed by the design professional of record. Please note that corrections in letter form, such as will comply, etc., are not acceptable as a review response.
- Document security settings must allow the application of markups and stamps, allow multiple PDF documents to be combined or merged into a single document, and allow the application of electronic signatures and certification. IBC 107.2.1, TSFMO Policy
- Use a standardized font recognized by Adobe Acrobat (such as Arial) to prevent loss of information during the conversion process from DWG to PDF.

All review items marked as stipulations must be satisfied by sealed construction documents before such work is performed.

New buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. Emergency responder radio coverage must be verified in the field. The test should be performed by the local fire department after interior and exterior walls and the roof are constructed.

A Certificate of Occupancy will not be issued if stipulations are not satisfied in accordance with Rule 0780-02-03-.10.

The items on the following pages require correction by revised plans, addenda, field orders, or change orders before plans can be approved for construction.
1. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official. IBC 107.2.1

*Review Note: The drawings contain layers which need to be flattened and 2266 AutoCAD SHX Text comment boxes which need to be addressed. Provide an updated full set of plans that do not contain layers or AutoCAD SHX text. The layers & text information cause delays & hinders the review process. (see attached information)*

*Review Note: 10Mar2021 The drawings (addendum #01 package) contain layers which need to be flattened and hundreds of AutoCAD SHX Text comment boxes which need to be addressed. Addendum #02 package appears clean. Text & page numbers etc. missing from plans & some specification sheets in each package. Due to the high number of modified documents a complete up to date set of plans would greatly decrease the time to get the final approval issued.*

3. When revisions are made to sealed documents, the revisions are to be resealed and appropriately dated in accordance with A&E Rule 0120-02.

7. Identify the sprinkler standard used and the hazard classification.

*Review Note: 10Mar2021 The information is to be listed as part of the code analysis. Currently the analysis lists “Sprinklered.”*

9. Provide an updatable “Index of Drawings” which reflects the most current drawing revision and the date revised with each submission. IBC 107.2.1

*Review Note: See attached example of minimum requirements*

*Review Note: 10Mar2021 Provide a revised index which includes addendum #02 modifications.*

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- Fire rated walls, columns, beams, floor/ceiling and roof/ceiling assemblies.
- Fire rated joint systems for fire rated assembly connections such as wall-to-wall, floor-to-floor, floor-to-wall, head-of-wall, and bottom-of-wall joints where not inherently tight.
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**Review Note:** 10Mar2021 Original request for equivalency was not approved. Revise and resubmit. Request should reference any related drawings that are part of the design approach of the equivalency. i.e. electrical smoke detection for early warning etc.

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**Review Note:** 10Mar2021 Review response indicated locations are noted in specifications. Locations are to be noted on the plans along with any details required to determine code compliance.

42. Automatic sprinkler system shop drawings signed by the Responsible Managing Employee must be submitted for review after the design intent has been approved. They must also be reviewed and approved by the fire protection engineer of record (processed with the engineer's shop drawing review stamp) prior to the submittal to the State Fire Marshal's Office. Engineer of record for this purpose is the engineer that has sealed the approved design intent drawings. The Sprinkler Shop Drawings package is made up of three (3) distinct sections which are the drawings, calculations, and manufacturer’s cut sheet package. First the drawings will either need a standard plan cover sheet containing the project information & the engineer of record’s review stamp or the stamp will need to appear on all the sheets provided for review. Provide review stamp on the cover sheet of each set of hydraulic calculations and the cover/index page of the manufacturer's information package or on each page of documentation being submitted. **Shop drawing information will be a stipulation on the plans upon initial approval of the project and no response is required at this time for this item.** Rule 0780-2-3-.03(2), IFC 105.4.2.1, & IBC 107.2.2

51. Show location of the test connection(s). Test connections shall be provided at locations that will permit flow tests of water supplies and connections. NFPA 8.17.4.1.1.

**Review Note:** 10Mar2021 Provide an approximant location on the plans for the location of the remote test connection.

54. Provide the following for fire pump room ventilation (NFPA 20, 4.12.6) and a floor drain in the (new) pump room (NFPA 20, 4.12.7).

**Review Note:** The fire pump is currently located in Mechanical 002e.

**Review Note:** 10Mar2021 Provide code compliant information on the plans for the new fire pump room.
65. Provide a material safety data sheets (MSDS) and the quantities for every chemical used in the building. This information must originate from owner(s) or Tenant(s)

   Review Note: 10Mar2021 The revised documentation package as discussed still needs to be submitted.

Additional comments based on revised documents:

66. All connections to private fire service mains for fire protection systems shall be arranged so that they can be isolated (NFPA 24 6.3.1). The sprinkler system isolation valve must be electronically supervised by a fire alarm system. IBC 903.4 Exception: Underground key or hub valves in roadway boxes provided by the municipality or public utility are not required to be monitored. IBC 903.4.1, Exception 1

   Review Note: 10Mar2021 The new gate valve that was added on sheet C1.0 in addendum #2 will require a tamper switch unless exception is met (owner of valve must be indicated on the plans).

End of Review
Request For Equivalency

The 2012 editions of the IBC, IFC, and NFPA 101 are currently adopted by this office. IBC Sections 104.10/104.11, IFC 104.8/104.9, and NFPA 101 Section 1.4, allow the Authority Having Jurisdiction (AHJ) to permit modifications to the code and/or alternative systems, methods, or devices that differ from those prescribed by the applicable Code. These systems, methods, or devices must be equivalent or superior to those required by code. This form must be completed by the building designer and approved by this office prior to plan approval. Please note that all approvals are specific to the project indicated below only and are not necessarily transferable to other projects.

Date: 03/12/2021
TFM#: 
Project#: 166/05-09-2017CM
County: Washington

Architect/Engineer: Fisher + Associates
Registration #: 21863
Address: 511 Tusculum Boulevard
City, State, Zip: Greeneville, TN 37745

Identify the Code(s) Section(s) that the equivalency is requested to replace:

Code deficiency: Enclosed restrooms with limited visibility within the two-story communicating space.
Violation of: NFPA 8.6.6 (3) Communicating Space. Unless prohibited by Chapters 11 through 43, unenclosed floor opening forming a communicating space between floor levels shall be permitted, provided that the following conditions are met: (3.) The entire floor area of the communicating space is open and unobstructed, such that a fire in any part of the space is readily obvious to the occupants of the space prior to the time it becomes an occupant hazard.

Explain how this alternative is equivalent or superior to that required by the Code:
The entire building has improved safety as a result of being protected throughout by an approved automatic sprinkler system as well as an all-new fire alarm system. Early detection in the communicating space will notify all building occupants of possible hazard rather than just visual observation by occupants of the space.

Identify the alternative system, method, or device (include attachment(s) of codes referenced, and/or cut sheets)
The entire building is protected throughout by an approved automatic sprinkler system in accordance with Section 9.7. (Refer to Sheets FP000-FP115) An all-new fire alarm system in accordance with Section 9.6, replaces the existing system. (Refer to Sheets E3.0 - E3.5) Smoke detection is provided within the Communicating Space. (Refer to Sheets E3.1 and E3.2)

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<tbody>
<tr>
<td>Approved</td>
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<tr>
<td>Plans Examiner Manager</td>
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END OF SECTION
SECTION 04 01 21
RESTORATION AND CLEANING

PART 1    GENERAL

1.01 WORK INCLUDED

A. Repoint existing building brick and limestone joints in areas indicated on the drawings and clean building as specified herein.

B. Work included
   1. Removal of existing loose, deteriorating and scaling mortar, surface preparation of joint and repointing.
   2. Cut out mortar joints on exposed side of wall.
   3. Cut out and (re)seal all stress cracks.
   4. Complete cleaning of brick and limestone on all elevations, including sills, columns, cornice, and entrance elements.
   5. In place samples for mortar, brick and limestone and sealant color harmony, soundness and workmanship comparisons with existing.
   6. Coordinate and sequence restoration work and cleaning work as required for project conditions.

1.02 RELATED SECTIONS

A. Unit Masonry: Section 04 20 00.

1.03 REFERENCE STANDARDS


1.04 SUBMITTALS

A. Product Data: Provide manufacturer's product data sheets on all products to be used for the work.

B. Applicator Qualifications: Submit qualifications of applicator as previously specified.

C. Environmental Regulations: Describe testing, handling, treatment, containment, collection, transport, disposal, and discharge of hazardous wastes and cleaning effluents. Describe any hazardous materials to be cleaned from substrates. Submit applicable local environmental regulations.

D. Protection: Describe methods for protecting surrounding areas, landscaping, building occupants, pedestrians, vehicles, and non-masonry surfaces during the work from contact with chemical restoration cleaners, residues, rinse water, fumes, wastes, and cleaning effluents.

E. Surface Preparation: Describe surface preparation to be completed before application of restoration cleaners.

F. Application: Describe application procedures of restoration cleaners.

G. Provide an analysis of the existing mortar to determine the original mortar mix. Provide testing agencies qualifications.

H. Pressure spray or rinse as referenced refers to the following:
   Provide a combination of rinsing pressure and water volume by masonry washing equipment generating 400-1000 psi with a water flow rate of 6-8 gallons per
minute delivered through a 15-45 degree fan spray tip. Equipment should be adjustable to reduce water flow rate and rinsing pressure as required for controlled cleaning of more sensitive surfaces. Refer to the Product Data Sheet for each cleaner for guidelines. Select areas where exterior materials are to be removed/repaired and use these materials for the testing of chemicals and pressures; prior to the cleaning of similar surfaces to remain.

1.05 QUALITY ASSURANCE

A. Certification of Experience
1. Work to be performed by experienced and skilled mechanics.
2. Submit evidence or certification that restoration personnel have a minimum of ten (10) consecutive years’ experience in this type of work.
3. Evidence or certification of experience shall be in letter form, in addition to statement of experience, and shall contain a list of at least five projects of comparable size and complexity which have been satisfactorily completed.
4. Provide a statement that the work will be under the direct supervision of skilled mechanics.

B. Intent of the work under this section is: repair deteriorated or damaged exterior surfaces and joints, repair cracks, seal around openings to produce as an end result, weather tight walls; clean all existing surfaces; to perform work in such a manner that the building appearance will not be marred by unsightly work; and that all necessary precautions are taken to protect exterior and interior of building and surrounding landscaping and traffic areas.

C. Owner reserves the right to perform quality tests on materials used or scheduled to be used in the project; cost of testing shall be borne by the Owner. If testing proves material in question is faulty, Contractor shall bear testing costs for that material.

D. Pre-Application Meeting: Convene a pre-application meeting 2 weeks before the start of exterior restoration cleaning. Require attendance of parties directly affecting work of this section, including the Contractor, Architect, applicator, and cleaning materials MFR’s representative. Review environmental regulations, test panel procedures, protection of surrounding areas and non-masonry surfaces, surface preparation, application, and coordination with other work.

E. Sample Area - Repointing
1. Perform repointing operations in a sample area approximately 4’ x 6’ where approved by Architect.
2. Sample area shall include materials, methods, and all other details of construction that will be used in the completed work.
3. Sample area will be an actual location of the work requiring repointing work and if acceptable to Architect, will remain in place.
4. Perform additional sample area work as required by Architect until a sample area is found to be acceptable.
5. Do not begin repointing operations until the sample area is approved by the Architect.
6. Acceptable sample area will be used as a reference standard for the remaining work.

F. Sample Area - Cleaning
1. Before full-scale application, review manufacturer’s product data sheets to determine the suitability of each product for the specific surfaces. Apply
Material Comply

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original unopened containers.

B. Store materials off the ground, under cover and protected from weather damage.

C. Stockpile/store aggregates (sand) to prevent contamination from foreign materials.

D. Locate storage areas where they will not be disturbed or damaged by construction operations.

E. Store cleaning material containers upright in a cool, dry, well-ventilated place, out of the sun. Store away from all other chemicals and potential sources of contamination. Keep lights, fire, sparks, and heat away from containers. Do not drop onto or slide across sharp objects. Keep containers tightly closed when not in use. Store and handle materials in accordance with manufacturer's instructions.

1.07 PROJECT CONDITIONS

A. Do not clean masonry surfaces when temperatures are below freezing or will be overnight, to avoid harm to masonry. Clean masonry surfaces only when air and masonry surface temperatures are 40°F and above. Allow adequate time for masonry to thaw if freezing conditions exist prior to application.

1.08 ENVIRONMENTAL REGULATIONS

A. Comply with applicable federal, state, and local environmental regulations regarding testing, handling, treatment, containment, collection, transport, disposal,
and discharge of hazardous wastes and cleaning effluents.

PART 2  PRODUCTS

2.01  MORTAR

A. General: Contractor shall engage a qualified testing agency. Mortar shall closely match existing surrounding mortar in texture, color and strength as determined by analysis of existing mortar and as approved by the Architect. Analysis shall include types and proportions of cements, limes, aggregates and admixtures used in existing samples. Color match may require adding lime proof mineral colors to give an aged appearance to mortar. Texture match may require the addition of an amount of small aggregates to the mortar mix. Provide non-staining type.

B. Materials
3. Hydrated Lime: ASTM C207, Type S.
4. Aggregate
   a. Mason's Sand (For other than pointing mortar): ASTM C144, clean masonry sand, not over 10% to pass No. 100 sieve for general use.
   b. Silica Sand (for pointing mortar): White or light color, fine pure silica.
5. Water: Clean, fresh and free of deleterious amounts of acids, alkalis and foreign organic matter.
6. Water Repellent Admixture: FORRER INDUSTRIES Dry-Block or Mortar Tite by ADDIMIENT. Manufacturer must submit certification that water repellent admixture meets or exceeds requirements specified herein.
   b. Type: Integral polymeric water-repellents (IPWR).

C. Mixes - Unit Masonry
1. Type N Mortar
   a. Proportions: ASTM C270 proportions by volume. Minimum average compressive strength at 28 days of 750 psi. One part Portland cement, one part hydrated lime and six times the sum of the volumes of cement and lime used of damp, loose sand.
   b. Aggregate shall be selected for color and size to closely match existing mortar.
2. Color may be added to the mix in quantities not to exceed 6% by weight of the cement in the mix.
3. Provide samples of aggregates to Architect for approval to incorporate into the mortar mix. Prepare sample mortar mixes using varying amounts of the approved aggregate for submission to and approval by the Architect for color and texture match with existing mortar.

D. Stone Mortar: Provide mix comprised of white and gray cement combined with lime and selected aggregates to produce color matching the color of existing stone mortar. Proportion mix based on analysis of existing mortar as required to match existing in color, texture, and strength.

E. Measure cementitious and aggregate material in a dry condition by volume or equivalent weight. Do not measure by shovel, use known measure. Mix materials in a clean mechanical batch mixer.
1. Pointing Mortar: Thoroughly mix cementitious and aggregate materials
together before adding water. Then mix again adding only enough water to produce a damp, unworkable mix which will retain its form when pressed into a ball. Maintain mortar in this dampened (prehydrated) condition for 1 to 2 hours. Add remaining water in small portions until desired mortar consistency is reached. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material.

2.02 CLEANING MATERIALS AND EQUIPMENT

A. Manufacturers: Specifications are based on materials manufactured by PROSOCO, INC. (800-255-4255). Equal or products of similar compounds manufactured by DIETRICH and ARCAL are acceptable.

B. Mild Cleaner: Manufacturer's standard cleaner and degreaser for light-to-heavy soiled concrete/precast surfaces.
   Basis of Design: "Enviro Klean 2010 All Surface Cleaner": PROSOCO, Inc..

C. Two-Part Cleaner: Manufacturer's standard two-part system consisting of an alkaline cleaner for prewash and an acid neutralizer for afterwash for dissolving heavy carbon soiling from concrete/precast surfaces.
   Basis of Design: "Sure Klean 766 Limestone & Masonry Pre-wash and Sure Klean Limestone & Masonry After-wash": PROSOCO, Inc.

D. Lime Run Remover: Manufacturer's standard concentrated acidic cleaner to remove atmospheric dirt, mildew, and other stains from unpolished limestone and other high calcium-based surfaces.
   Basis of Design: “Sure Klean Limestone Restorer”: PROSOCO, Inc.

E. Mold, Mildew, and Algae Remover: Manufacturer's standard two-component system and neutralizer to remove biological and atmospheric staining from concrete/precast.

F. Rust stains on masonry and lintels: Lintels should be wire brushed and sanded.
   If rust remains, remove tough atmospheric soiling and subsurface staining, while minimizing potential for damage to delicate masonry and adjacent substrates; in addition to removing difficult calcium (concrete) stains, white scum and other staining from most window glass. Test stability of surfaces before application.
   Basis of Design: Sure Klean® Light Duty Restoration Cleaner; PROSOCO, Inc.

G. Concentrated acidic cleaner for new masonry surfaces that are subject to vanadium, manganese and other metallic stains, and reduce potential for efflorescence and clean mortar smears
   Basis of Design: Sure Klean® Vana Trol® PROSOCO, Inc.,

H. Nonabrasive Brushes: Fiber bristles only.

I. Spray Equipment: Provide equipment for controlled spray application of water and chemical cleaners, if any, at rates indicated for pressure, measured at spray tip, and for volume. Adjust pressure and volume, as required, to ensure that damage to masonry does not result from cleaning methods. For chemical cleaner spray application, provide a low-pressure tank or chemical pump suitable for the chemical cleaner indicated, equipped with a cone-shaped spray tip.
J. Using the same panel selection format as indicated in 1.04.H, test panels to confirm results for all exterior surface types; for locations where sample panels are undamaged, require minor repair and are new replacements. The samples should reflect all of the conditions that could affect types of cleaners required for the condition, the dwell time and the concentration needed.

PART 3 EXECUTION

3.01 INSPECTION

A. Examine the substrates, structure, and installation conditions.

3.02 PREPARATION - GENERAL

A. Remove or loosen interferences such as cables, conduits, junction boxes, downspouts and railing on the surface of the building which would prevent the accomplishment or reduce the effectiveness of the work to be performed. Such items shall be reattached, unless the directed otherwise, as work is completed.

B. Adhere to manufacturer's printed instructions and restrictions for applying cleaners.

C. Cover or protect glass, window frames, landscaping and similar items that may be damaged as a result of the work of this section.

D. Protect passerby and vehicular traffic.

3.03 PREPARATION - JOINTS

A. Test rake all mortar joints. Cut out joints found to be defective to a depth of 1/2 inch or to firm mortar, whichever comes first.

1. Remove dust and loose mortar with compressed air or vacuum. Remove sealant and chemical compounds from joints as required with mechanical and chemical processes that will not abrade or attack the masonry surface.

2. Defective Joints: Consist of mortar joints in which mortar is soft, loose, missing, severely eroded, flaky, or powdered, broken, hollow or cracked.

3. It shall be the Contractor's responsibility to carefully examine all wall areas and to see that all defective joints are cut out. Any question as to whether a joint is defective or not shall be resolved to the satisfaction of the Architect.

B. Cut out forced cracks in masonry to a minimum depth of 1/2 inch. Fill void space in masonry larger than specified depth with a non-absorbent closed cell expandable foam back-up. Select a back-up size that will cause compression when in place.

3.04 REPOINTING EXISTING JOINTS

A. Joint Raking

1. Rake out mortar from joints to firm mortar or to a minimum depth of 1/2 inch, whichever comes first.

2. Remove mortar from masonry surfaces to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum and/or flush joints to remove dirt and loose debris.

3. Do not spall edges of masonry units or widen joints. Replace masonry units which become damaged.

a. Cut out mortar with chisel and mallet, unless otherwise indicated.
b. Power operated hand saws and grinders will be permitted only with specific written approval of the Architect based on submission of the Contractor of a satisfactory quality control program and demonstrated ability of operators to use tools without damage to masonry. Quality control program shall include provisions for supervising performance and preventing damage due to worker fatigue.

B. Joint Pointing
   1. Clean joint surfaces to remove dust and mortar particles. Schedule water rinsing operations so that, at time of pointing, excess water has evaporated or run off, and joint surfaces are damp but free of standing water.
   2. Apply first layer of pointing mortar to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8” until a uniform depth is formed. Compact each layer thoroughly and allow to become thumbprint-hard before applying next layer.
   3. After joints have been filled to a uniform depth, place remaining mortar in 3 layers with each of first and second layers filling approximately 2/5 of joint depth and third layer the remaining 1/5. Fully compact each layer and allow to become thumbprint hard before applying next layer. Slightly recess the final layer in from face of masonry. Take care not to spread mortar over edges onto exposed masonry surfaces; or to featheredge mortar.
   4. When final layer of mortar is thumbprint-hard, tool joints to match original appearance of joint or appearance of adjacent existing joint. Remove excess mortar from edge of joint by brushing.

3.05 REMOVAL AND REPLACEMENT

A. Replace missing, eroded, spalled, or cracked exterior units. Cut out deteriorated or damaged units, including entire mortar joint around the masonry unit. Install replacement joints solidly packed with mortar.
   1. Remove units by hand using care so as not to damage adjacent materials.
   2. Repoint new joints to comply with requirements for repointing existing.
   3. Place units in a full bed of mortar, bottom and sides, laid with a shove joint.

B. Clean excess mortar, splatter, and drippings from exterior and interior as work progresses.

3.06 CLEANING

A. Protection
   1. Protect surrounding areas, landscaping, building occupants, pedestrians, vehicles, and non-masonry surfaces during the work from contact with chemical restoration cleaners, residues, rinse water, fumes, wastes, and cleaning effluents in accordance with manufacturer's instructions.
   2. Clean exterior materials before installation of replacement windows.
   3. Test window glass not specified to be replaced for compatibility with chemical cleaning products to determine required protection.
   4. Divert and protect pedestrian and auto traffic.
   5. Avoid wind drifting of spray of chemical cleaning products, residues, and rinse water.

B. Surface Preparation: Apply all specified caulking and sealants and allow to cure before chemical cleaning begins.
C. Chemical Cleaners: When permitted for use, apply restoration cleaners to substrates in accordance with manufacturer's instructions, environmental regulations, and application procedures determined from test panel results approved by the Architect. Consult manufacturer's instructions for information on equipment to be used and precautions to be taken with the specified products.

END OF SECTION
SECTION 04 20 00
UNIT 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.

1.2 SUMMARY

A. Section Includes:
   1. Concrete masonry units.
   2. Face brick.
   3. Mortar and grout.
   4. Masonry joint reinforcement.
   5. Ties and anchors.
   6. Embedded flashing.
   7. Miscellaneous masonry accessories.
   8. Masonry Cleaners.

B. Related Sections:
   1. Section 07 27 26 “Fluid-Applied Membrane Air Barrier”
   2. Section 05 50 00 "Metal Fabrications" for furnishing steel lintels, shelf angles, and overflow scuppers (downspout nozzles) for unit masonry.
   3. Section 07 21 00 “Thermal Insulation” for cavity wall insulation.

1.3 PRE-INSTALLATION MEETINGS

A. Pre-Installation Conference: Conduct conference at Project site.

1.4 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.5 PERFORMANCE REQUIREMENTS

C. Provide unit masonry that develops indicated net-area compressive strengths at 28 days.
   1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

1.6 ACTION SUBMITTALS

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

B. Shop Drawings: For the following:
   1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
   2. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, “Details and Detailing of Concrete Reinforcement.” Show elevations of reinforced walls.
   3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Initial Selection:
   1. Colored mortar.
D. Samples for Verification: For each type and color of the following:
   1. Face brick, in the form of straps of five or more bricks.
   2. Special brick shapes.
   3. Pigmented mortar. Make Samples using same sand and mortar ingredients to be used on Project.
   4. Weep holes and vents.
   5. Accessories embedded in masonry.

1.7 INFORMATIONAL SUBMITTALS

A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers’ product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.
   1. Submittal is for information only. Neither receipt of list nor approval of mockup constitutes approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.

B. Qualification Data: For testing agency.

C. Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards.
   1. Masonry units.
      a. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
      b. For exposed brick, include test report for efflorescence according to ASTM C 67.
      c. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
   2. Cementitious materials. Include brand, type, and name of manufacturer.
   3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
   4. Grout mixes. Include description of type and proportions of ingredients.
   5. Reinforcing bars.
   7. Anchors, ties, and metal accessories.

D. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
   1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109 for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.
   2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

E. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

F. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

G. Meeting Records: Minutes of pre-installation conference.

1.8 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

D. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

E. 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 exterior wall and roof area as shown on Drawings and including, but not limited to, the following:
      a. Exterior Wall: Metal studs, exterior sheathing, fluid-applied membrane air barriers and transition strip at wall openings, through-wall flashing and drip-edge, cavity insulation, cavity drainage material, brick veneer including special shapes, colored mortar, masonry ties, weeps/vents, control joint, control joint filler, aluminum-clad wood window units and sealant.
      b. Roof: Partial metal roof framing, roof sheathing, shingles and underlayment, roof edge flashing and vents, gutters and downspouts.
   2. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.
   3. Protect accepted mockups from the elements with weather-resistant membrane.
   4. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
      a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
      b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained, and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.10 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
1. Extend cover a minimum of 24 inches down both sides of walls and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
   1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
   2. Protect sills, ledges, and projections from mortar droppings.
   3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
   4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
   1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.


PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

A. Regional Materials: CMUs shall be manufactured within 500 miles of Project site from aggregates and cement that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

B. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
   1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
   2. Provide square-edged units for outside corners unless otherwise indicated.

C. CMUs: ASTM C 90.
1. **Unit Compressive Strength:** Provide units with minimum average net-area compressive strength of 2000 psi.
2. **Density Classification:** Light weight.
3. **Size (Width):** Manufactured to dimensions 3/8 inch less than nominal dimensions.
4. **Exposed Faces:** Provide manufacturer’s standard color and texture, unless otherwise indicated.

### 2.3 MASONRY LINTELS

A. **Masonry Lintels:** Prefabricated or built-in-place masonry lintels made from bond beam CMUs with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

### 2.4 BRICK

A. **Regional Materials:** Brick shall be manufactured within 500 miles of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.

B. **General:** Provide shapes indicated on Drawings and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:

   1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
   2. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

C. **Face Brick:** Facing brick complying with ASTM C 216 or hollow brick complying with ASTM C 652, Class H40V (void areas between 25 and 40 percent of gross cross-sectional area).

   1. **Basis-of-Design:** To be determined, brick to match existing building.
   2. **Grade:** SW.
   3. **Type:** FBS.
   4. **Unit Compressive Strength:** Provide units with minimum average net-area compressive strength of 3350 psi.
   5. **Initial Rate of Absorption:** Less than 30 g/30 sq. in. per minute when tested per ASTM C 67.
   6. **Efflorescence:** Provide brick that has been tested according to ASTM C 67 and is rated “not effloresced.”
   7. **Size (Nominal Dimensions):** Modular 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.
   8. **Application:** Use where brick is exposed unless otherwise indicated.
   9. **Color and Texture:** As selected by Architect.

### 2.5 MORTAR AND GROUT MATERIALS

A. **Regional Materials:** Aggregate for mortar and grout, cement, and lime shall be extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site. Mortar to match color of existing building.

B. **Portland Cement:** ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

C. **Hydrated Lime:** ASTM C 207, Type S.

D. **Portland Cement-Lime Mix:** Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207, Type S.
E. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in masonry mortar.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Davis Colors; True Tone Mortar Colors.
      b. Lanxess Corporation; Bayferrox Iron Oxide Pigments.
      c. Solomon Colors, Inc.; SGS Mortar Colors.

F. 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.


H. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
   1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      a. Euclid Chemical Company (The); Accelguard 80.
      c. Sonneborn Products, BASF Aktiengesellschaft; Trimix-NCA.

I. Water: Potable.

2.6 REINFORCEMENT

A. Uncoated Steel Reinforcing Bars: ASTM A 615 or ASTM A 996, Grade 60.

B. Masonry Joint Reinforcement, General: ASTM A 951.
   1. Interior Walls: Hot dip galvanized, carbon steel.
   2. Exterior Walls: Hot dip galvanized, carbon steel.
   5. Wire Size for Veneer Ties: 0.187-inch diameter.
   6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
   7. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.

C. Masonry Joint Reinforcement for Single-Wythe Masonry: Either ladder or truss type with single pair of side rods.

D. Masonry Joint Reinforcement for Multiwythe Masonry:
   1. Adjustable (two-piece) type, either ladder or truss design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches. Size ties to extend at least halfway through facing wythe but with at least 5/8-inch cover on outside face. Ties shall have hooks or clips to engage a continuous horizontal wire in the facing wythe.

2.7 TIES AND ANCHORS

A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.
2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008, Commercial Steel, with ASTM A 153, Class B coating.

B. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch cover on outside face. Outer ends of wires shall be bent 90 degrees and extend 2 inches parallel to face of veneer.

C. Partition Top anchors: 0.105-inch thick metal plate with 5/8-inch diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot dip galvanized after fabrication.

D. Adjustable Masonry-Veneer Anchors:
   1. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:
      a. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.
   2. Screw-Attached, Masonry-Veneer Anchors: Units consisting of a wire tie and a metal anchor section. Unless otherwise indicated, provide the following types of anchors:
      a. Anchor Section: Gasketed sheet metal plate, 1-1/4 inches wide by 6 inches long, with screw holes top and bottom; top and bottom ends bent to form pronged legs of length to match thickness of insulation or sheathing; and raised rib-stiffened strap, 5/8 inch wide by 6 inches long, stamped into center to provide a slot between strap and plate for inserting wire tie. Provide anchor manufacturer's standard, self-adhering, polyethylene foam gaskets manufactured to fit behind anchor plate and extend beyond pronged legs.
         1) Fabricate sheet metal anchor sections and other sheet metal parts from 0.0781-inch thick, steel sheet, galvanized after fabrication.
         2) Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from 0.25-inch-diameter, hot-dip galvanized steel wire.
         3) Basis-of-Design: The design for Screw-Attached, Masonry-Veneer Anchor is based on the “X-Seal Anchor System” manufactured by Hohmann & Barnard, Inc. Subject to compliance with requirements, provide either the named product or a comparable product by another approved manufacturer.
   3. Polymer-Coated, Steel Drill Screws for Steel Studs: ASTM C 954 except manufactured with hex washer head and neoprene washer, No. 10 diameter by length required to penetrate steel stud flange with not less than 3 exposed threads, and with organic polymer coating with salt-spray resistance to red rust of more than 800 hours per ASTM B 117.
      a. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
         1) ITW Buildex; Teks Maxiseal with Climaseal finish.
         2) Textron Inc., Textron Fastening Systems; Elco Dril-Flex with Stalgard finish.

2.8 EMBEDDED FLASHING MATERIALS

A. Flexible Flashing: For flashing not exposed to the exterior, use the following, unless otherwise indicated:
   1. Asphalt-Coated Copper Flashing: 5-oz./sq. ft. copper sheet coated with flexible asphalt. Use only where flashing is fully concealed in masonry.
      a. Basis-of-Design: The design is based on “H & B C-Fab Flashing” manufactured by Hohmann & Barnard, Inc. Subject to compliance with requirements, provide either the named product or a comparable product by another approved manufacturer.
1. Adhesives, Primers, and Mastic for Flashings: Flashing manufacturer’s standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates, complying with ASTM D 4586, Type I, and containing no asbestos.
   a. Basis-of-Design: The design is based on "Asphalt Mastic" manufactured by Hohmann & Barnard, Inc. Subject to compliance with requirements, provide either the named product or a comparable product by another approved manufacturer.

2. Metal Termination Bars: Manufacturer’s standard, predrilled stainless-steel bars, approximately 1 by 1/8-inch-thick; with 1/4-inch holes, spaced at 8 inches on center.
   a. Basis-of-Design: The design is based on "T1 – Termination Bar with Foam-Tite Seal" manufactured by Hohmann & Barnard, Inc. Subject to compliance with requirements, provide either the named product or a comparable product by another approved manufacturer.

3. Corner and End Dams: Manufacturer’s standard, factory-formed copper end dam, inside corner and outside corner.
   a. Basis-of-Design: The design is based on "Copper Corner & End Dams" manufactured by Hohmann & Barnard, Inc. Subject to compliance with requirements, provide either the named product or a comparable product by another approved manufacturer.

   a. Basis-of-Design: The design is based on "Drip Plate with Foam-Tite Seam and Flashing-Adhere Adhesive Strip" manufactured by Hohmann & Barnard, Inc. Subject to compliance with requirements, provide either the named product or a comparable product by another approved manufacturer.
   b. Provide pre-formed inside and outside corners as required.

2.9 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Pre-molded closed cell neoprene sponge, filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated.
   1. Basis-of-Design: The design is based on "NS – Closed Cell Neoprene Sponge with Pressure-Sensitive Adhesive on One Side" manufactured by Hohmann & Barnard, Inc. Subject to compliance with requirements, provide either the named product or a comparable product by another approved manufacturer.

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
   1. Basis-of-Design: The design is based on "RS Series – Rubber Control Joint" manufactured by Hohmann & Barnard, Inc. Subject to compliance with requirements, provide either the named product or a comparable product by another approved manufacturer.

C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

D. Weep/Vent Products: Use the following unless otherwise indicated:
   1. Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full height, and width of head joint and depth 1/8 inch less than depth of outer wythe; in color selected from manufacturer’s standard.
      a. Basis-of-Design: The design is based on "WeepVent" manufactured by Mortar Net USA, Ltd. Subject to compliance with requirements, provide either the named product or a comparable product by another approved manufacturer.

E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
1. Basis-of-Design: The design is based on "Mortar Net" manufactured by Mortar Net USA, Ltd. Subject to compliance with requirements, provide either the named product or a comparable product by another approved manufacturer.

2. Provide the following configurations:
   a. Strips, full depth of cavity and 10 inches high, with dovetail shaped notches 7 inches deep that prevent clogging with mortar droppings.

F. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and hold reinforcing bars in center of cells. Units shall be formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

1. Basis-of-Design: The design is based on "RB - Rebar Positioner or RB – Twin Rebar Positioner" manufactured by Hohmann & Barnard, Inc. Subject to compliance with requirements, provide either the named product or a comparable product by another approved manufacturer.

2.10 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. Diedrich Technologies, Inc.
   b. EaCo Chem, Inc.
   c. ProSoCo, Inc.

2.11 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. For exterior masonry, use Portland cement-lime mortar.
3. For reinforced masonry, use Portland cement-lime mortar.
4. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.

C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.

1. For masonry below grade or in contact with earth, use Type M.
2. For reinforced masonry, use Type S or Type N.
3. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.

D. Pigmented Mortar: Use colored cement product or select and proportion pigments with other ingredients to produce color required. Do not add pigments to colored cement products.

1. Pigments shall not exceed 10 percent of portland cement by weight.
2. Color to be selected from manufacturer’s full range by Architect.
3. Application: Use pigmented mortar for exposed mortar joints with the following units:
a. Face brick.

E. Grout for Unit Masonry: Comply with ASTM C 476.
   1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
   2. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
   1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
   2. Verify that foundations are within tolerances specified.

B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.

D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Provide solid brick where vertical faces of brick wall are not aligned, and void might become visible above or below including corbels and similar conditions.

F. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
   1. Mix units from several pallets or cubes as they are placed.

G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:
   1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
   2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
   3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2-inch total.
B. Lines and Levels:
1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:
1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: To match existing building.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4-inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.

G. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
H. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
   1. Install compressible filler in joint between top of partition and underside of structure above.
   2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c. unless otherwise indicated.
   3. Wedge non-load-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
   4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 07 84 46 "Fire-Resistive Joint Systems."

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow brick and CMUs as follows:
   1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
   2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
   3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
   4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.

B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

3.6 CAVITY WALLS

A. Bond wythes of cavity walls together using adjustable (two-piece) type reinforcement with continuous horizontal wire in facing wythe attached to ties.

B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.

C. Apply air barrier to face of backup wythe to comply with Section 07 27 26 "Fluid-Applied Membrane Air Barriers."

D. Installing Cavity-Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
   1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.7 MASONRY JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
   1. Space reinforcement not more than 16 inches o.c.
   2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.

E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.8 ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to wall framing with masonry-veneer anchors to comply with the following requirements:
   1. Fasten screw-attached anchors through sheathing and insulation to wall framing with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
   2. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
   3. Space anchors as indicated, but not more than 18 inches o.c. vertically and 24 inches o.c. horizontally, with not less than 1 anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches, around perimeter.
   4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally with not less than 1 anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 36 inches, around perimeter.

3.9 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

B. Form control joints in concrete masonry. Install preformed control-joint gaskets designed to fit standard sash block.

C. Form expansion joints in brick. Build in compressible joint fillers where indicated.

D. Provide horizontal, pressure-relieving joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 07 92 00 “Joint Sealants,” but not less than 3/8 inch.
   1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

3.10 LINTELS

A. Install steel lintels where indicated.

B. Provide masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.

C. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

D. Provide adjustable concealed lintel system where indicated.

3.11 FLASHING, WEEP/VENTS, CAVITY DRAINAGE, AND VENTS
A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

B. Install flashing as follows unless otherwise indicated:
   1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer. Joints in flashing shall be made by lapping a minimum of 4 inches and coating both surface with mastic.
   2. At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of 8 inches, and through inner wythe to within 1/2 inch of the interior face of wall in exposed masonry.
   3. At masonry-veneer walls, extend flashing through veneer, across air space behind veneer, and up face of sheathing at least 8 inches; with upper edge secured by termination bar over air barrier, lapping at least 4 inches. Attach termination bar to substrate at 8 inches on center.
   4. Install factory-formed end dams, inside corners and outside corners under flashing.
   5. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
   6. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal drip edge.

C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

D. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
   1. Use open head joints to form weep holes.
   2. Fill open head joint with mesh weep/vent. Set mesh weep/vent flush with outside face of wall.
   3. Space weep holes 24 inches o.c. unless otherwise indicated.

3.12 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
   1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
   2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
   1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
   2. Limit height of vertical grout pours to not more than 60 inches.

3.13 FIELD QUALITY CONTROL
A. Testing and Inspecting: Owner may engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections.
   1. Payment for these services will be made by Owner.
   2. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

3.14 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
   1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
   2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
   3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
   4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
   6. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
   7. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

3.15 MASONRY WASTE DISPOSAL

A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

END OF SECTION
SECTION 08 80 00

GLAZING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Interior windows.
2. Exterior windows.
3. Exterior doors.

B. Related Sections include the following:

1. Division 8 Section "Mirrors."

1.03 DEFINITIONS

A. Manufacturers of Glass Products: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

C. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.

D. Deterioration of Insulating Glass: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1.04 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Glass Design: Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
   a. Specified Design Wind Loads: 70 MPH.

C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.05 SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.

B. Samples: For the following products, in the form of 12-inch- (300-mm-) square Samples for glass.
   1. Each type of patterned glass.
   2. Insulating glass for each designation indicated.

C. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.

D. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.

E. Warranties: Special warranties specified in this Section.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance.

B. Source Limitations for Glass: Obtain the following through one source from a single manufacturer for each glass type: clear float glass, insulating glass, and patterned glass.

C. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201 and, for wired glass, ANSI Z97.1.
   1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
   2. Where glazing units, including Kind FT glass, are specified in Part 2 articles for glazing lites 9 sq. ft. (0.84 sq. m) or less in exposed surface area of one side, provide glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction.

D. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
E. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following testing and inspecting agency:

1. Insulating Glass Certification Council.
2. Associated Laboratories, Inc.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.08 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40 deg F (4.4 deg C).

1.09 WARRANTY

A. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form, made out to Owner and signed by insulating-glass manufacturer agreeing to replace insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

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

2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

3. Basis-of-Design Product: The design for each glazing product is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.02 GLASS PRODUCTS

A. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; of class, kind, and condition indicated.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.
2. Provide Kind HS (heat-strengthened) float glass in place of annealed float glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" Article.

3. For uncoated glass, comply with requirements for Condition A.

4. Provide Kind FT (fully tempered) float glass in place Kind HS (heat-strengthened) float glass where safety glass is indicated.

B. Wired Glass: ASTM C 1036, Type II (patterned and wired flat glass), Class 1 (clear), Quality-Q-6; and of form and mesh pattern specified.

C. Insulating-Glass Units, General: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in Part 2 "Insulating-Glass Units" Article.

1. Provide Kind FT (fully tempered) glass lites at all insulating-glass units.

2. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated for insulating-glass units are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.

3. Sealing System: Dual seal, with primary and secondary sealants as follows:
   a. Manufacturer's standard sealants

4. Spacer Specifications: Manufacturer's standard spacer material and construction complying with the following requirements:
   a. Spacer Material: Aluminum with black, color anodic finish.
   b. Desiccant: Molecular sieve or silica gel, or blend of both.
   c. Corner Construction: Manufacturer's standard corner construction.

2.03 GLAZING SEALANTS

A. General: Complying with the following requirements:

1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

3. Glazing Sealants for Fire-Resistive Glazing Products: Identical to products used in test assemblies to obtain fire-protection rating.

2.04 MISCELLANEOUS GLAZING MATERIALS
A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions with a Shore, Type A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

G. Perimeter Insulation for Fire-Resistive Glazing: Identical to product used in test assembly to obtain fire-resistance rating.

2.05 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

2.06 MONOLITHIC FLOAT-GLASS UNITS

A. Uncoated Clear Float-Glass Units "C": Class 1 (clear) Kind HS (heat-strengthened) float glass.
   1. Thickness: 6.0 mm.
   2. All locations not requiring kind FT.

B. Uncoated Tinted Float-Glass Units "T": Class 1 (clear) Kind FT (fully tempered) float glass.
   1. Thickness: 6.0 mm.
   2. Locations: All interior doors and sidelites

2.07 MONOLITHIC WIRED-GLASS UNITS

A. Polished Wired-Glass Units "W": Form 1 (wired glass, polished both sides), Quality-Q6, Mesh 1 (M1) (Diamond), 6.0 mm thick.
   1. Available Manufacturers:
      a. Asahi/AMA Glass Corp.; affiliated with AFG Industries, Inc.
      b. Central Glass Co., Ltd.; distributed by Northwestern Industries Inc.
      c. Pilkington Sales (North America) Ltd.

2.08 MONOLITHIC PATTERNED-GLASS UNITS

A. Not required.

2.09 INSULATING-GLASS UNITS
A. Clear Low-E, Insulating Glass Units "I": Where Glass of this designation is indicated, provide low-emissivity insulating-glass units complying with the following.

1. Available Manufacturers:
   a. AFG Industries, Inc.
   b. PPG Industries, Inc.
   c. Pilkington Building Products
   d. Visteon

2. Overall Unit Thickness and Thickness of Each Lite: 6.0 mm each lite and 25 mm overall unit thickness.

3. Interspace Content: Argon

4. Outdoor Lite: Class 1 clear float glass.

5. Indoor Lite: Class 1 clear float glass.


B. Clear Low-E, Tempered Insulating-Glass Units "IT": Where Glass of this designation is indicated, provide low-emissivity insulating-glass units complying with the following:

1. Available Manufacturers:
   a. AFG Industries, Inc.
   b. PPG Industries, Inc.
   c. Pilkington Building Products
   d. Visteon

2. Overall Unit Thickness and Thickness of Each Lite: 6.0 mm each lite and 25 mm overall unit thickness.

3. Interspace Content: Argon.

4. Outdoor Lite: Class 1 (clear) float glass.
   a. Kind FT (fully tempered).

5. Indoor Lite: Class 1 (clear) float glass.
   a. Kind FT (fully tempered).

6. Low-Emissivity Coating: On second surface

**PART 3 - EXECUTION**
3.01 EXAMINATION
   A. Examine framing glazing, with Installer present, for compliance with the following:
      1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
      2. Minimum required face or edge clearances.
      3. Effective sealing between joints of glass-framing members.
   B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION
   A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.03 GLAZING, GENERAL
   A. Comply with combined written instructions of manufacturers of glass and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
   B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
   C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
   D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrated testing.
   E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
   F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
   G. Provide spacers for glass lites where length plus width is larger than 50 square inches (1270mm) as follows:
      1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
      2. Provide 1/8-inch (3mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
   H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
   I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer

3.04 CLEANING AND PROTECTION

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter or concrete stain. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION
RELOCATED SANITARY SEWER "LINE-A" PROFILE

STA. 0+00 - STA. 5+40-96

SCALE 1 inch = 20 feet Horiz.
1 inch = 2 feet Vert.
PROPOSED FIRE PROTECTION PROFILE

STA. 0+00 - STA. 2+56.74

SCALE 1 inch = 30 feet Horiz.
1 inch = 5 feet Vert.
### GENERAL DOOR NOTES

1. All doors are for interior use and should be fire rated.
2. Doors in doors shown are always treated as metal doors.
3. Doors to main and adjacent departments.
4. Doors to be installed as swing out style at walls, a door at the end of a corridor.
5. Laminated veneer doors to be used in fire rated walls.
6. Frost glass inserts in existing and new glass doors.
7. All doors are to be installed in existing and new existing construction. The installation is to be made with existing hardware.
8. All doors are to be installed with existing hardware.
9. All doors are to be installed with existing hardware.
10. All doors are to be installed with existing hardware.
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20. All doors are to be installed with existing hardware.
21. All doors are to be installed with existing hardware.
### NOISE CRITERIA HOT WATER

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### ACCESSORIES AND FEATURES:

- **Contractor SHALL PROVIDE TRANSFORMER FOR CONTROL S OF UNITS, SEE ALSO ELECTRICAL DRAWINGS.**
EXISTING NON
NEW NON
EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)

ALL WALLS TAGGED "X1" OR "X2" ARE 1 HR SMOKE BARRIERS

NEW 1 HR FLOOR/CEILING HORIZONTAL ASSEMBLY

1ADDENDUM NO.1 2/23/2021

KEY NOTES:
1. EXISTING VENTILATION AIR SUPPLY TO REMAIN. 300, 48x14, 2, 650 CFM. PROVIDE COMBO FIRE/SMOKE DAMPER BEHIND GRILLE.
2. 14 DUCT MOUNTED SMOKE DETECTOR AND FIRE/SMOKE DAMPER close in layers 3 and 4.

MECHANICAL

ELEV.

ELEV. EQUIP.

KEY NOTES:

1. NEW HEAT EXCHANGER
2. NEW PRV STATION.
3. NEW STEAM CONDENSATE RETURN PUMP (CRP -1).
4. CONNECT NEW CHILLED WATER AND HOT WATER MAINS TO EXISTING HYDRAULIC RUNOUTS.
5. CONNECT NEW 6" CHWS/CHWR TO EXISTING CHWS/CHWR AT THIS LOCATION. CONNECT AT THE VERTICAL DROP.
6. CONNECT NEW 6" CHWS/CHWR TO EXISTING CHWS/CHWR RISER IN THIS LOCATION.
7. CONNECT EXISTING 3" CHWR AND 2" HWR TO NEW 6" CHWS/CHWR RISER IN THIS LOCATION.
8. ROUTE NEW 4" STEAM PIPING UP HIGH.
9. REMOVE EXISTING EXPANSION TANKS AND STEEL SUPPORTS
10. REMOVE EXISTING HEAT EXCHANGER
11. REMOVE ALL EXISTING CHILLED AND HOT WATER PIPING MAINS IN MECHANICAL ROOM
12. WATER FILTRATION TO REMAIN
13. 4" STEAM PIPING TO REMAIN
14. CHILLED WATER AND HOT WATER PIPING RUNOUTS TO REMAIN
15. EXISTING AIR HANDLER TO REMAIN
16. EXISTING AIR HANDLER TO REMAIN

EXISTING NON-RATED (ASSEMBLY VARIES)
EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)
EXISTING 2 HR FIRE BARRIER (ASSEMBLY VARIES)
NEW NON-RATED (ASSEMBLY VARIES)
NEW 2 HR FIRE BARRIER (ASSEMBLY VARIES)
NEW 1 HR FIRE BARRIER (ASSEMBLY VARIES)
NEW 1 HR FLOOR/CEILING HORIZONTAL ASSEMBLY ABOVE - ASSEMBLY VARIES (SEE UL DESIGN No. J994)
NEW 2 HR FLOOR CEILING HORIZONTAL ASSEMBLY ABOVE - ASSEMBLY VARIES (SEE UL DESIGN No. D902)
ALL WALLS TAGGED "X1" OR "X2" ARE 1 HR SMOKE BARRIERS

Sheet Title:
EAST TENNESSEE STATE UNIVERSITY
LAMB HALL RENOVATION
ASSOCIATES
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511 TUSCULUM BOULEVARD
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Sheet Date: 1/29/2021

Sheet No.: M116

1/4" = 1'-0"

Ground Level Enlarged Mechanical Floor Plan - New Work

Ground Level Enlarged Mechanical Floor Plan - Demolition
ASSEMBLY VARIES (SEE UL DESIGN No. J994)

4" HHWS AND HHWR UP TO FLOOR ABOVE.

CONNECT NEW 1 1/2" CHWS/CHWR TO EXISTING 2" CHWS/CHWR IN THIS LOCATION.

CONNECT NEW 3/4" CHWS/CHWR AND 3/4" HHWS/HWR AND 3/4" HHWR TO EXISTING SUSPENDED FAN COIL UNIT TO REMAIN. EXISTING HYDRONIC PIPING IS FED FROM BELOW.

CONNECT NEW 5" HWS/HWR TO EXISTING 6" HWS/HWR RISER IN THIS LOCATION.

2 1/2" CHWS/CHWR DOWN FROM ABOVE.

MAIN LEVEL HYDRONIC FLOOR PLAN

WALL & FLOOR/CEILING RATING LEGEND

EXISTING NON-RATED (ASSEMBLY VARIES)

NEW NON-RATED (ASSEMBLY VARIES)

NEW 1 HR FIRE BARRIER (ASSEMBLY VARIES)

ALL WALLS TAGGED "X1" OR "X2" ARE 1 HR SMOKE BARRIERS

NEW 1 HR FLOOR/CEILING HORIZONTAL ASSEMBLY ABOVE

1ADDENDUM NO.1 2/23/2021
2ADDENDUM NO.4 3/16/2021

LAMB HALL RENOVATION
JOHNSON CITY, TENNESSEE

SBC NO.: 166/005-09-2017CM

Fisher + Associates
Architectural/Engineers

Sheet Title: MAIN LEVEL HYDRONIC FLOOR PLAN

01/29/2021

01/29/2021

Sheet Date

Job No.: 166006-40/27CA

File No.

Facility Est. Consultants, LLC
CONNECT NEW 1" CHWS/CHWR AND 3/4" HWS/HWR PIPING TO NEW FAN COIL IN THIS LOCATION.

CONNECT NEW 3/4" HWS/HWR AND NEW 3/4" CHWS/CHWR PIPING TO NEW FAN COIL IN THIS LOCATION.

EXISTING FLOOR MOUNTED FAN COIL AND ASSOCIATED HYDRONIC PIPING TO REMAIN.

NEW 2 1/2" CHWS/CHWR DOWN TO FLOOR BELOW.

CONNECT NEW 1 1/2" CHWS/CHWR AND 1" HWS/HWR TO NEW FAN COIL.

EXISTING NON-RATED (ASSEMBLY VARIES)

EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)

NEW 1 HR FIRE BARRIER (ASSEMBLY VARIES)

NEW 2 HR FIRE BARRIER (ASSEMBLY VARIES)

HR SMOKE BARRIERS

NEW 2 HR FLOOR CEILING HORIZONTAL ASSEMBLY ABOVE
4" CHWS/CHWR DOWN FROM PENTHOUSE. 2 1/2" CHWS/CHWR DOWN TO FLOOR BELOW.

ASSEMBLY VARIES (SEE UL DESIGN NO. J994)

CONNECT NEW 3/4" CHWS/CHWR AND 3/4" HWS/HWR TO NEW FAN COIL.

INSTALL NEW ISOLATION VALVES AT EACH FLOOR TO ALLOW ISOLATION OF HYDRONIC EXISTING FAN COIL TO REMAIN.

CONNECT NEW 1" CHWS/CHWR AND 3/4" HWS/HWR TO NEW FAN COIL.

EXISTING NON-RATED (ASSEMBLY VARIES)

NEW NON-RATED (ASSEMBLY VARIES)

EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)

ALL WALLS TAGGED "X1" OR "X2" ARE 1-1/2 HR SMOKE BARRIERS

NEW 2 HR FLOOR CEILING HORIZONTAL ASSEMBLY ABOVE

BREAK WORK

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GREENEVILLE, TENNESSEE 37745
EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)
EXISTING 2 HR FIRE BARRIER (ASSEMBLY VARIES)
HR SMOKE BARRIERS
NEW 2 HR FLOOR CEILING HORIZONTAL ASSEMBLY
ABOVE
ADDITIONAL LOAD OF 1,340 MBTU,
TOTAL CONNECTED LOAD OF 3,167 MBTU,
REFER TO CIVIL FOR CONTINUATION.
LONGEST RUN OF 200'.
GAS REGULATOR 2PSI TO 10" W.G.
COORDINATE WITH OWNER
EMAIL JOHN@JOHNFISHERARCHITECT.COM
EXISTING SERVICES IN THIS AREA TO REMAIN UNLESS OTHERWISE NOTED
EAST TENNESSEE STATE UNIVERSITY
LAMB HALL RENOVATION
SBC NO.: 166/005-09-2017CM
SHEET TITLE: PLAN
MAIN FLOOR DOMESTIC WATER PLAN
ADDENDUM #2
RECESSED OUTLET BOXES ON OPPOSITE SIDES OF FIRE RATED PARTITIONS

ADDENDUM #1
ADDENDUM #4
FIRE ALARM AND HVAC WIRING

CONTRACTOR SHALL REMOVE ALL EXISTING FIRE ALARM WIRING, DEVICES,
SECOND FLOOR

2/23/2021
3/4/2021

HYDE CLASSROOM 75cd
88db
75cd
88db

NOTE#4

88db
120/1
FCU

206e
205e

30A
AC
STAIR

269e
268e

2. CONNECTING CONDUIT. ENGINEER PRIOR TO PROCEEDING WITH WORK.

DISCREPANCIES BETWEEN ELECTRICAL DRAWINGS AND VOLTAGE INFORMATION
SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF AT LEAST 24 INCHES.

VEI Job No. 17408
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ALUMNI AFFAIRS

PANEL "S2"