ADDENDUM

NO. 1

Date: February 23, 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 One consists of 5 typewritten pages, and 134 attachments.

General

TFM # 07727 Project # 2021-02-01-01 Review of Plans, #1 dated February 23, 2021 have been addressed in revisions included in this Addendum. Revisions pertaining to the comments are enumerated in the attached response letter dated February 23, 2021.

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

Specifications

Refer to Specifications. Delete specification section 00 61 13 Contract Bond.

Refer to Specifications. Specification section 01 11 00 Summary of Work has been updated.

Refer to Specifications. Specification section 08 71 00 Door Hardware has been revised and reissued to address Access Control Hardware and adding Exit Devices to doors serving occupant loads of more than 50.

Refer to Specifications. Specification section 12 35 53.19 Wood Laboratory Casework has been updated.

Drawings

Refer to Drawing Sheet G001. Replace existing G001 with revised G001r1 (attached). Drawing list, notes, and code information updated.
Refer to Drawing Sheet G003. Replace existing G003r1 (attached). IBC nomenclature added to partition types.

Refer to Drawing Sheet GN1.0. Replace existing GN1.0 with revised GN1.0 (attached). Sheet was reprinted to resolve text and layering issues.

Refer to Drawing Sheet V2.0. Replace existing V2.0 with revised V2.0 (attached). Sheet was reprinted to resolve text and layering issues.

Refer to Drawing Sheet C1.0. Replace existing C1.0 with revised C1.0 (attached). Sheet was reprinted to resolve text and layering issues.

Refer to Drawing Sheet C1.0C. Sheet is newly issued. Added to address required egress for the Dental Hygiene department during construction.

Refer to Drawing Sheet C1.3. Replace existing C1.3 with revised C1.3 (attached). Sheet was reprinted to resolve text and layering issues.

Refer to Drawing Sheet C3.3. Replace existing C3.3 with revised C3.3r1 (attached).

Refer to Drawing Sheet CD1.0. Replace existing CD1.0 with revised CD1.0 (attached). Sheet was reprinted to resolve text and layering issues.

Refer to Drawing Sheet EC1.0. Replace existing EC1.0 with revised EC1.0 (attached). Sheet was reprinted to resolve text and layering issues.

Refer to Drawing Sheet L1.00. Replace existing L1.00 with revised L1.00r1 (attached). Additional notes have been added to indicate addition of curb and tactile warning mat at location of new ramp. A detail call-out has also been added for detail 3/L4.00. Sheet was reprinted to resolve text and layering issues.

Refer to Drawing Sheet L3.00. Replace existing L3.00 with revised L3.00r1 (attached). Additional contours are shown to reflect the grading changes caused by the added concrete walks and steps. Additional contours are shown around location of utility equipment and around the elliptical walk. Sheet was reprinted to resolve text and layering issues.

Refer to Drawing Sheet L4.00. Replace existing L4.00 with revised L4.00r1 (attached). The detail numbering has been adjusted to accommodate the addition of detail 3 Concrete Curb Detail. The notes indicating material and finish color for the handrail have also been updated. Sheet was reprinted to resolve text and layering issues.

Refer to Drawing Sheet LS1.10. Replace existing LS1.10 with revised LS110r1 (attached). Addition of phrases to Life Safety and Wall Rating Legends as well as Laboratory Classifications.

Refer to Drawing Sheet LS1.11. Replace existing LS1.11 with revised LS1.11r1 (attached). Addition of phrases to Life Safety and Wall Rating Legends as well as Laboratory Classifications.

Refer to Drawing Sheet LS1.12. Replace existing LS1.12 with revised LS1.12r1 (attached). Addition of phrases to Life Safety and Wall Rating Legends as well as Laboratory Classifications.

Refer to Drawing Sheet LS1.13. Replace existing LS1.13 with revised LS1.13r1 (attached). Addition of phrases to Life Safety and Wall Rating Legends as well as Laboratory Classifications.

Refer to Drawing Sheet LS1.16 (attached). Sheet is newly issued. Added to address required egress for the Dental Hygiene department during construction.

Refer to Drawing Sheet LS4.02. Replace existing LS4.02 with revised LS4.02r1 (attached). Information for Engineering Judgement has been modified. Details are noted for reference only. The curtainwall provide will be required to submit and Engineering Judgement appropriate for the installed system.

Refer to Drawing Sheet A1.10. Replace existing A1.10 with revised A1.10r1 (attached). Wall rating legend changes and vertical shafts in classroom/lab addition changed to 2-hr.

Refer to Drawing Sheet A1.11. Replace existing A1.11 with revised A1.11r1 (attached). Wall rating legend changes and vertical shafts in classroom/lab addition changed to 2-hr. Doors removed and adjusted.


Refer to Drawing Sheet A1.13. Replace existing A1.13 with revised A1.13r1 (attached). Wall rating legend changes and vertical shafts in classroom/lab addition changed to 2-hr. Tiered classroom enlarged plan callout added.


Refer to Drawing Sheet A130. Replace existing A130 with revised A130r1 (attached). Penthouse Level room names have been modified.

Refer to Drawing Sheet A140. Replace existing A140 with revised A140r1 (attached). Various updates to core plan & elevations.

Refer to Drawing Sheet A141. Replace existing A141 with revised A141r1 (attached). Various updates to core plan & elevations.

Refer to Drawing Sheet A142. Replace existing A142 with revised A142r1 (attached). Various updates to core plan & elevations.

Refer to Drawing Sheet A143. Replace existing A143 with revised A143r1 (attached). Various updates to core plan & elevations.

Refer to Drawing Sheet A146. Replace existing A146 with revised A146r1 (attached). Added plan and section details for wall added within stair 249e.

Refer to Drawing Sheet A300. Replace existing A300 with revised A300r1 (attached). Revised information on floor ceiling assemblies, Fire Barriers, and Smoke Barriers.

Refer to Drawing Sheet A302. Replace existing A302 with revised A302r1 (attached). Revised information on floor ceiling assemblies, Fire Barriers, and Smoke Barriers.

Refer to Drawing Sheet A303. Replace existing A303 with revised A303r1 (attached). Revised information on floor ceiling assemblies, Fire Barriers, and Smoke Barriers. Detail 2/A303 was revised to coordinate with A300.
Refer to Drawing Sheet A600. Replace existing A600 with revised A600r1 (attached). Revised hardware callouts to incorporate exit devices on doors serving occupant loads over 50.

Refer to Drawing Sheet A703. Replace existing A703 with revised A703r1 (attached). Adjusted clearance to stage and dimensions for back Lecture Hall walls. Dimensions between fixed seating, handrails at aisle accessways, and egress components.

Refer to Drawing Sheet A705. Replace existing A705 with revised A705r1 (attached). Various updates to lab plan & elevations.

Refer to Drawing Sheet A706. Replace existing A706 with revised A706r1 (attached). Adjusted clearance to stage and dimensions for back Lecture Hall walls. Dimensions between fixed seating, handrails at aisle accessways, and egress components.

Refer to Drawing Sheet A707. Replace existing A707 with revised A707r1 (attached). Various updates to lab plan & elevations.

Refer to Drawing Sheet S1.1. Replace existing S1.1 with revised S1.1r1 (attached). Added a new wall legend and shifted stairs.

Refer to Drawing Sheet S1.2. Replace existing S1.2 with revised S1.2r1 (attached). Added a new wall legend.

Refer to Drawing Sheet S1.3. Replace existing S1.3 with revised S1.3r1 (attached). Added a new wall legend and inserted and identified Section 2/S2.7.

Refer to Drawing Sheet S1.4. Replace existing S1.4 with revised S1.4r1 (attached). Added a new wall legend.

Refer to Drawing Sheet S1.5. Replace existing S1.5 with revised S1.5r1 (attached). Added a new wall legend. Revised RTU support stands.

Refer to Drawing Sheet S2.5. Replace existing S2.5 with revised S2.5r1 (attached). Revised Section 10/S2.5.

Refer to Drawing Sheet S2.7. Replace existing S2.7 with revised S2.7r1 (attached). Revised Detail 6/S2.7 and added Detail 2/S2.7.

Refer to Drawing Sheet E1.0. Replace existing E1.0 with revised E1.0r1 (attached).

Refer to Drawing Sheet E1.1. Replace existing E1.1 with revised E1.1r1 (attached).

Refer to Drawing Sheet E1.2. Replace existing E1.2 with revised E1.2r1 (attached).

Refer to Drawing Sheet E1.3. Replace existing E1.3 with revised E1.3r1 (attached).

Refer to Drawing Sheet E1.4. Replace existing E1.4 with revised E1.4r1 (attached).

Refer to Drawing Sheet E2.0. Replace existing E2.0 with revised E2.0r1 (attached).

Refer to Drawing Sheet E2.1. Replace existing E2.1 with revised E2.1r1 (attached).
Refer to Drawing Sheet E2.2. Replace existing E2.2 with revised E2.2r1 (attached).

Refer to Drawing Sheet E2.3. Replace existing E2.3 with revised E2.3r1 (attached).

Refer to Drawing Sheet E2.4. Replace existing E2.4 with revised E2.4r1 (attached).

Refer to Drawing Sheet E3.0. Replace existing E3.0 with revised E3.0r1 (attached).

Refer to Drawing Sheet E3.1. Replace existing E3.1 with revised E3.1r1 (attached).

Refer to Drawing Sheet E3.2. Replace existing E3.2 with revised E3.2r1 (attached).

Refer to Drawing Sheet E3.3. Replace existing E3.3 with revised E3.3r1 (attached).

Refer to Drawing Sheet E3.4. Replace existing E3.4 with revised E3.4r1 (attached).

Refer to Drawing Sheet E3.5. Replace existing E3.5 with revised E3.5r1 (attached).

Refer to Drawing Sheet E4.5. Replace existing E4.5 with revised E4.5r1 (attached).

Refer to Drawing Sheet T1.0. Replace existing T1.0 with revised T1.0r1 (attached).

Refer to Drawing Sheet T1.1. Replace existing T1.1 with revised T1.1r1 (attached).

Refer to Drawing Sheet T1.2. Replace existing T1.2 with revised T1.2r1 (attached).

Refer to Drawing Sheet T1.3. Replace existing T1.3 with revised T1.3r1 (attached).

Refer to Drawing Sheet T1.4. Replace existing T1.4 with revised T1.4r1 (attached).

Refer to Drawing Sheet T2.3. Replace existing T2.3 with revised T2.3r1 (attached).

Refer to Addendum No. 1 Mechanical Items – See Attachment
February 23, 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, #01  
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 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)

   - **Response:** Refer to revised sheets GN1.0, V1.0, V2.0, C1.0, C1.1, C1.2, C1.3, C1.4, CD1.1, EC1.0, EC1.1, L0.00, L1.00, L2.00, L2.10, L3.00, L4.00, L5.00, L5.10 layers and text information have been cleared from the prints.

2. Provide COMcheck Compliance Certificates for energy code compliance with signature and date by a Tennessee registrant. Software & Web Tools are available at http://www.energycodes.gov/software-and-web-tools Include all categories for the project scope of work: i.e. exterior envelope, interior lighting, exterior lighting, and mechanical. If the scope of work in an existing building does not require an upgrade to current IECC requirements, include a letter identifying the exception(s) used. Combine all individual energy documents into one pdf and submit through TN SFMO Portal under “Energy Certificates”.

   - **Response:** COMcheck documentation was uploaded to the TFM Portal on 2/4/2021.
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.

4. Provide the building name, 911 street address city and county.

  **Review Note:** Provide county on at least on the cover or as part of the code analysis.

- **Response:** Refer to revised sheet G001. Information has been added to the Code Synopsis.

5. Provide the responding fire department’s information: Include the Fire Chief/Fire Marshal’s name, mailing address, phone, and email.

- **Response:** Refer to revised sheet G001. Information has been added to the Code Synopsis.

6. Identify the number of stories and height of the building. Show the allowable number of stories and height and modification calculations used. Penthouses not in compliance with Sections 1509.2.1 through 1509.2.5 shall be considered as an additional story of the building. Use limitations: Penthouses shall not be used for purposes other than shelter of mechanical or electrical equipment, tanks, or vertical shafts openings in the roof assembly. IBC 1509.2.3

  **Review Note:** Plans indicate janitor’s closet & a number of storage rooms.

- **Response:** Refer to revised sheet A130. The Penthouse spaces are to be unoccupied and room names have been edited as such.

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

- **Response:** This information is provided in the Design Intent See FP000.
8. Provide a complete Life Safety Plan: (6' high construction fence with privacy screen shown on C1.0)

**Review Note:** Provide information on building use during construction, existing buildings being affected by construction shall have a clear code compliant access to the public way at all times. If access is not supplied at all times, an evacuation plan may include the modified use of the existing building(s) to accommodate the closing of required exits from said building & how fire department access will be affected by construction.

- **Response:** The Dental Hygiene department on the Main Level will remain in use during construction. Egress Stairs 109e and 116e and Stair/Corridor 000e and 013e as well as doors 000e and 013Ae will remain operational providing clear passage while Dental Hygiene is in use. Refer to attached sheet C1.0C which shows modifications to the construction fence to allow egress from the building. Also refer to revised sheet LS116 showing required egress for the Dental Hygiene area during construction.

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

- **Response:** Duly noted, refer to revised sheet G001.

10. The following drawings were submitted but not shown in the “Index of Drawings” IBC 107.2.1

**Review Note:** Sheet(s) L115

- **Response:** Duly noted, refer to revised sheet G001.

11. The following Provide a wall type legend that identifies fire walls, fire barriers, fire partitions, smoke barriers and/or smoke partitions and their rating in hours. Use the International Building Code terms for fire-resistance assemblies:

- FIRE WALL, IBC Section 202 & 706.
- FIRE BARRIER, IBC Section 202 & 707
- FIRE PARTITION, IBC Section 202
- SMOKE BARRIER, IBC Section 202
- SMOKE PARTITION, NFPA 101, 3.3.254
- HORIZONTAL ASSEMBLIES, IBC Section 202


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.
(1) Fire rated walls, columns, beams, floor/ceiling and roof/ceiling assemblies.
(2) 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.
(3) 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)

- **Response:** Refer to revised sheet LS402, the firestop detail has been revised to be a generic representation to indicate the type of document to be provided by the Curtain Wall provider. Specification Section 08 44 13 Glazed Aluminum Curtain Walls has been modified to include a requirement for the manufacturer to provide a fire rating detail or engineering judgement.

13. Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:

- Be located in accessible concealed floor, floor-ceiling or attic spaces;
- Be located within 15 feet (4572 mm) of the end of each wall and at intervals not exceeding 30 feet (9144 mm) measured horizontally along the wall or partition; and
- Include lettering not less than 3 inches (76 mm) in height with a minimum 3/8 inch stroke in a contrasting color incorporating the suggested wording. “FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS” or other wording.

- **Response:** Refer to revised sheet G001 which adds a “Rated Construction Note” requiring the information noted.

14. Provide the following flow test data on the plans for existing fire hydrants (IBC 107.2.1, IFC 507.4). Show flow test data on the plans next to the hydrant tested. Hydrant flow test must have been conducted within the last six months during peak demand hours.

- Static pressure (psi), residual pressure 20 psi min., and flow 500 gpm min. Department of Environment & Conservation Rules and Regulations 0400-45-01-.17(18).
- Name and address of party responsible for performing test, date test taken (within the last 6-months), time test taken (a.m./p.m.), and elevation of test hydrant.

- **Response:** This information is provided in the Design Intent on Sheet FP000 but has also been added to the Code Synopsis. Refer to revised sheet G001.
15. Fire hydrants must be provided so that any portion of the building’s exterior is within 600 ft. (for sprinkled buildings) hose lay of a fire hydrant measured along vehicle access route. (IFC 507.5.1)

- **Response:** See new fire hydrant added to provide coverage on sheet C1.0.

16. For new buildings or existing buildings with new or relocated fire department connections, the location of fire department connections shall be approved by the fire chief. IBC 912.2

- **Response:** Architect and CMGC met on site with local Fire Chief and located PIV, FDC and new FDC. See sheet C1.0 for dimensional locations.

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”

- **Response:** Refer to Request For Equivalency uploaded to the TFM Portal on 2/4/2021

18. The minimum width of each egress door opening shall be sufficient for the occupant load served and shall provide a minimum clear width of 32 inches (see exceptions), a minimum height of 80 in., and the width of any single door must not exceed 48 in. IBC 1008.1.1

- **Response:** To be addressed in Addendum No. 2.

19. Doors serving 50 or more people and stairway doors must swing in the direction of exit travel. IBC 1008.1.2

   **Review Note:** Provide for all required areas up to and including door(s) 230, 232, 400 A, 400B

- **Response:** Refer to revised sheets A112 and A114. Doors 230A, 232A, 400A and 400B have been revised to swing in the direction of egress.

20. Doors serving rooms or spaces with an occupant load of 50 or more in a Group A or E occupancy shall not be provided with a latch or lock unless it is panic hardware or fire exit hardware. IBC 1008.1.10 (see exceptions)


- **Response:** Refer to revised sheets LS112, LS113, LS114, A112, A113, A114, A600, and revised specification Section 08 71 00 Door Hardware for revised door swings and adjusted hardware to comply with the noted code requirement.

21. Provide dimensions of the width of the aisle accessways, aisles, and other means of egress for assembly areas in accordance with IBC 1028.6, 1028.9, 1028.10

- **Response:** Refer to revised sheets A703 and A706, which add dimensions showing clearances of egress components.
22. Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and aisle stairs shall be provided with handrails in compliance with Section 1012 located either at one or both sides of the aisle or within the aisle width. IBC 1028.13

Exceptions:

(1) Handrails are not required for ramped aisles having a gradient no greater than one unit vertical in eight units horizontal (12.5-percent slope) and seating on both sides.
(2) Handrails are not required if, at the side of the aisle, there is a guard that complies with the graspability requirements of handrails.
(3) Handrail extensions are not required at the top and bottom of aisle stair and aisle ramp runs to permit crossovers within the aisles.

• Response: Refer to revised sheets A703 and A706 which add information on ramp slopes and handrail detailing.

23. Where seating rows have 14 or fewer seats, the minimum clear aisle accessway width shall not be less than 12 inches measured as the clear horizontal distance from the back of the row ahead and the nearest projection of the row behind. Where chairs have automatic or self-rising seats, the measurement shall be made with seats in the raised position. Where any chair in the row does not have an automatic or self-rising seat, the measurements shall be made with the seat in the down position. For seats with folding tablet arms, row spacing shall be determined with the tablet arm in the used position. IBC 1028.10.2

• Response: Refer to revised sheets A703 and A706, which add dimensions showing clearances of egress components.

24. For rows of seating served by an aisle or doorway at only one end of the row, the minimum clear width of 12 inches (305 mm) between rows shall be increased by 0.6 inch for every additional seat beyond seven seats, but the minimum clear width is not required to exceed 22 inches. IBC 1028.10.2.2

• Response: Refer to revised sheets A703 and A706, which add dimensions showing clearances of egress components.

25. Aisle stairs and ramps must meet IBC 1028.13

• Response: Refer to revised sheets A703 and A706 which add information on ramp slopes and handrail detailing.

26. Every assembly area shall have the occupant load posted in a conspicuous place near the main exit of the room. IBC 1004.3

Response: Refer to revised sheets LS110, LS111, LS112, LS113 and LS114 Life Safety Note 14 stating “ALL ASSEMBLY AREAS SHALL HAVE A MAXIMUM OCCUPANCY LOAD LISTED IN A CONSPICUOUS AREA NEAR MAIN EXIT OF ROOM PER IBC 1004.3.” Specification 10 14 00 GRAPHICS, SIGNAGE, & METAL LETTERS has been revised to state the same information.
27. The minimum width of each egress door opening shall be sufficient for the occupant load served and shall provide a minimum clear width of 32 inches (see exceptions), a minimum height of 80 in., and the width of any single door must not exceed 48 in. IBC 1008.1.1

- **Response:** To be addressed in Addendum No. 2.

28. Openings in exit enclosures shall be limited to those necessary for exit access to the enclosure from normally occupied spaces and for egress from the enclosure. IBC 713.7.1 Penetrations other than those necessary for the purpose of a shaft are prohibited in shaft enclosures. IBC 713.8.1

*Review Note:* Issue is door 002Be into mechanical room. The plans indicate space 000e as a corridor while it is currently part of the stair enclosure.

- **Response:** To be addressed in Addendum No. 2.

Next issue is Jan 156e inside of stair enclosure 155e. Next issue door 169Ae form mech. 169e into stair 170e.

- **Response:** Refer to revised sheet A111 the existing Janitor’s Closet has been eliminated. Door 155e will be demolished and infilled and the space will not be unoccupied. Door 169Ae has been demolished and infilled at Mech 169e.

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

- **Response:** Doors 001e, 100B, and 170Ae will incorporate Access Control ADA automated opener hardware. Other access control locations are noted in Section 3.3 hardware Sets of Section 08 71 00. Refer to re-issued specification Section 08 71 00 Door Hardware: the door hardware schedule lists access control components and system operation statements for each access-controlled hardware set.

30. Penetrations of exit stairways with steam lines, gas lines, roof drain piping, water lines, electrical conduit, and HVAC duct are prohibited. Only sprinkler piping, standpipes, and electrical conduit serving the stairway, or duct systems/other equipment necessary for stair pressurization, are permitted. IBC 1022.5

*Review Note:* Existing services in corner of stair 360e require further details to address current issues.

- **Response:** Refer to revised sheets LS111, LS112, LS113, and LS114 which indicate the chases for existing to remain hydronic piping in stair 360e to be replaces with newly constructed chases utilizing UL #U415-B shaft wall assemblies.
31. Shaft enclosures that are permitted to be penetrated by ducts and transfer openings must be protected with combination fire/smoke dampers (see exceptions). IBC 717.5.3

*Review Note:* Provide damper where RTU 1,2,3,4 ducts enter the 2 hour shaft (M114), on second floor where the two supply ducts exit the shaft space 231. Provide protection for the 2 return air duct/openings being placed in the shafts at space 231. Provide protection for bottom of shafts terminating in floor/ceiling of space 131.

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

32. Fire dampers are required where duct systems penetrate a one hour or more fire-resistance rated fire partition, fire barrier, and fire wall. (IBC 716.5) Fire dampers may be omitted in fire partitions where the duct penetrating the wall meets minimum exceptions. IBC 717.5.4

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

33. Fire dampers may be used instead of a fire rated shaft when duct systems penetrate a fire-resistance-rated floor/ceiling assembly that connects no more than two stories. IBC 717.6.1

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

34. Duct systems penetrating non-fire rated floor/ceiling horizontal assemblies must be protected by a shaft enclosure under IBC Section 713 or equipped with a fire damper at each floor line where the duct connects no more than 3-stories (see Exception No. 2 for duct penetrating one floor). IBC 717.6.3

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

35. Smoke dampers must be installed in duct system penetrations at smoke barriers unless the duct is a part of a smoke removal system. IBC 717.5.5

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

36. Ceiling dampers or other methods of protecting openings in rated floor/ceiling or roof/ceiling assemblies must comply with the construction details of the tested floor/roof/ceiling assemblies with listed ceiling air diffusers or listed ceiling dampers. IBC 716.6, 716.6.2

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

37. For new buildings, guards shall be provided where appliances, equipment, fans or other components that require service and roof hatch openings are located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. IMC 304.11

*Review Note:* Provide for any new units meeting the 10’ requirement up and including: RTU 1, 2, 7 and 8.

- **Response:** Refer to attached response from Facility Systems Consultants, LLC
38. (Mechanical) Provide UL (or other) fire-stop details in their entirety including design illustrations and material specifications without modification or manipulation for penetrations through rated assemblies (IBC 107.2.1 and Section 714). The details must be the latest version.

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

39. The means of egress, including the exit discharge, shall be illuminated at all times the building space served by the means of egress is occupied. IBC 1006.1 In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas: Exterior landings as required by Section 1008.1.6 for exit discharge doorways.

  **Review Note:** Provide for all required areas up to and including: Stair(s) 000e, 013e, 155e, 170e Vestibule(s) 260e

- **Response:** Drawings E1.0, E1.1, and E1.2 have been revised as part of Revision # 1 work to add exterior emergency egress lighting as noted.

40. Provide a minimum 3 ft. horizontal, the greater of 6½ ft. vertical or the height of the equipment, and the greater of 30 in. wide or the width of the equipment working space in front of electrical equipment. (IFC 605.3 and 2017 NFPA 70 110.26(A) (1-3), Table 110.26(A)(1)) Working spaces may not be used for storage and may not contain ductwork, piping, etc.

  **Review Note:** Provide for all required areas up to and including: Panels located in Storage 435, 336

- **Response:** Drawings E2.3 and E2.4 have been revised as part of Revision # 1 work to show NEC required working spaces in front of panels in Rooms 336 and 445 as noted.

41. A fire alarm zone indicator panel shall be located at grade level at the normal point of fire department access or at a constantly attended building security control center. IBC 907.6.3.1

  **Review Note:** Lobby 135 or as directed by local fire.

- **Response:** Drawing E3.0 has been revised as part of Revision # 1 work to show fire alarm zone indicator at the location of fire department access to the building in Corridor 001 on Ground Floor.

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 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 submitted for review.

43. Sprinkler systems and sprinkler system components are reviewed for compliance with the following State of Tennessee adopted codes:

- National Fire Protection Association (NFPA) 13, 2010 edition
- National Fire Protection Association (NFPA) 24, 2010 edition
- International Building Code (IBC), 2012 edition

**Review Note:** Sheet FP000 currently lists a code edition not adopted by the State of Tennessee.

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

44. On the cover sheet of the plans, identify the specific sprinkler standard to be used in the design drawings and scope of building protection: e.g., *Equipped Throughout, Partial, Incidental Area*. IBC 107.2.1, IBC 903.3.1

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

45. Civil Drawings shall include the following items that pertain to the design of the private fire service main (IFC 507.2.1 and NFPA 24 4.1.3):

1. The following items that pertain to **private fire service mains**:
   - (a) Size, length, location, material

2. The following items that pertain to **hydrants**:
   - (a) Size, location, number of outlets, and whether outlets are to be equipped with independent gate valves.
   - (b) Static and residual hydrants used in flow
   - (c) Method of restraint

3. Size, location, and piping arrangement of **fire department connections**

**Response:** Refer to Revised Civil C1.0

1. a. Fire Hydrant lead is 6” diameter, 88’ feet long and is Restained Joint Ductile Iron Pipe (PC350)

2. a. 6” Hydrant (City of Johnson City Standard with 2 outlets and a pumper nozzle with 6” isolation gate valve
   b. Static and residual hydrants have been identified on C1.0
   c. Using restrained joint pipe i.e. megalug type glands
46. All connections to private fire service mains for fire protection systems shall be arranged in accordance with one of the following so that they can be isolated (IFC 507.2.1 and NFPA 24 6.2.11):

   (1) A post indicator valve installed not less than 40 ft. from the building. For buildings less than 40 ft. in height, a post indicator valve shall be permitted to be installed closer than 40 ft. but at least as far from the building as the height of the wall facing the post indicator valve.

- **Response:** Refer to Revised Civil C1.0
  - (1) PIV is shown per the field verified location with City of Johnson City Fire Department

47. Provide the following information on the Automatic Sprinkler System Design Intent site plan:

   • Show the location of the point of service for the underground sprinkler piping on the site plan. and provide a note stating “Installation of all sprinkler system piping from the point of service must be performed by a Tennessee registered sprinkler contractor.” Rule 0780-2-7-.08

- **Response:** Refer to Revised Civil C1.0.
  - (1) Point of service is shown on Site Utilities Plan.

  • Provide details of the underground piping from the point of service to the building. Identify: the NFPA 24 6.2.11 system isolation valve location & type, underground piping material type and size, depth of bury, valve pit, trench detail, and thrust block size and location. IFC 507.2.1, NFPA 24 Chapter 4, 5, 10, and NFPA 13 Chapter 10

- **Response:** To be addressed in Addendum No. 2.

48. Provide a lead-in detail where the underground piping passes through or under the foundation and passes through the floor slab. Provide clearance to prevent breakage of the piping due to building settlement. NFPA 13.9.3.4.1, NFPA 24 10.6, and NFPA 13 10.6.2, IPC 305.2

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

49. Sprinkler systems shall be designed and installed in accordance with Section 903.3.1.1 (NFPA 13) unless otherwise permitted by Sections 903.3.1.2, or other chapters of this code, as applicable (IBC 903.3.1). Identify the standard used in the design and the specific type of system used (Wet, Dry, Preaction or Deluge, etc.). NFPA Chapter 13

- **Response:** Refer to attached response from Facility Systems Consultants, LLC
50. All sprinkler pipe and fittings shall be so installed that the system can be drained. NFPA 13 8.16.2. Provide a method for drainage where the lead-in terminates at a point lower than grade.

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

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.

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

52. Except as permitted by IBC 903.3.1.1.1, all areas must be protected, including: Provide sprinklers under combustible exterior roofs or canopies exceeding 4 ft. in width (see reference for exceptions). NFPA 13 8.14.7

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

53. The fire pump room must be separated from all other spaces of the building by 2-hour fire rated construction. The rating may be reduced to 1-hour if the building is fully sprinklered with a NFPA 13 system. NFPA 20, 4.12.1.1

  **Review Note:** The fire pump is currently located in Mechanical 002e which is not shown to be rated.

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

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

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

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

55. Provide a plan and a cross section of the fire pump room. Identify any equipment that is not fire pump related (plumbing, mechanical, electrical, etc.). 2012 IFC Section 913 and NFPA 20, 4.2.3

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

56. Identify the manufacturer of the controller and transfer switches. NFPA 20, 4 All controllers and transfer switches shall be specifically listed for electric-motor driven fire pump service. NFPA 20, 10.1.2.1

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

57. Show the fire department connection. It must be on the discharge side of the fire pump. NFPA 13, 6.8

- **Response:** Refer to attached response from Facility Systems Consultants, LLC

58. Identify on plans the class and type of the proposed standpipe system (Class I, II, or III; automatic, semiautomatic, manual, wet, dry). NFPA 14, 5.3
• **Response:** Refer to attached response from Facility Systems Consultants, LLC

59. Provide earthquake protection (fire pump) based on seismic design requirements. NFPA 20, 4.13.5

• **Response:** Refer to attached response from Facility Systems Consultants, LLC

60. Check valves and backflow prevention devices must be listed for fire protection service and when located upstream of the pump shall be located a minimum of ten pipe diameters from the pump suction flange. NFPA 20, 4.27, and 4.14.3

• **Response:** Refer to attached response from Facility Systems Consultants, LLC

61. All pump room wiring must be in rigid, intermediate, or liquid tight flexible metal conduit, LFNC-B, listed Type MC cable, Type MI cable, or other approved means. NFPA 20, 9.1.3 and 2011 NFPA 70, Article 695.6(E)

• **Response:** Drawing E3.0 has been revised as part of Revision #1 work to show that all wiring in the Fire Pump Room is to be installed using intermediate metal conduit (IMC).

62. The required construction of laboratory units shall be in accordance with Table 5.1.1. [NFPA 45 5.1.1]

• **Response:** Refer to revised sheet G003 and Life Safety Sheets LS110, LS111, LS112, LS113, and LS114 as well as sheets A300, A301, A302, and A303 indicating rated construction providing occupancy separation at laboratory units.

63. Laboratory units shall be classified as Class A (High Fire Hazard), Class B (Moderate Fire Hazard), Class C (Low Fire Hazard), or Class D (Minimal Fire Hazard), according to the quantities of flammable and combustible liquids specified in Table 10.1.1(a) or Table 10.1.1(b). [NFPA 45 4.2.1.1]

• **Response:** Refer to revised Life Safety Sheets LS110, LS111, LS112, LS113, and LS114 which classify the laboratory units on Level 2 as Class D and units on Level 4 as Class C.

64. Instructional laboratory units shall be classified as Class C or Class D laboratory units. NFPA 45 4.2.2.1

• **Response:** Refer to revised Life Safety Sheets LS110, LS111, LS112, LS113, and LS114 which classify the laboratory units on Level 2 as Class D and units on Level 4 as Class C.

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)

• **Response:** MSDS documentation was uploaded to the TFM Portal on 2/5/2021.

_End of Review_
RESPONSES TO COMMENT(S):

31. Explanation: Combination fire/smoke dampers have been added for RTU-1,2,3,4. Refer to revised sheets M112, M114.

32. Explanation: Fire dampers are shown in all rated walls as required. Dampers have been added to sheets M111, M112, M113, M114.

33. Explanation: The drawings have been coordinated with the updated architectural walls and ratings.

34. Explanation: The drawings have been coordinated with the updated architectural walls and ratings.

35. Explanation: The drawings have been coordinated with the updated architectural walls and ratings.

36. Explanation: The drawings have been coordinated with the updated architectural walls and ratings.

37: Explanation: The rooftop unit locations have been adjusted to provide the 10 foot clearance requirements. Refer to revised sheet M115.

38: Explanation: Fire stop details are shown on sheet M003.

43: Explanation: Corrected the current code adoption listed on sheet FP000

44. Explanation: Refer to Fire Sprinkler Systems Notes, located on sheet FP000. Notes also added to plans cover sheet.

48. Explanation: Not applicable. Fire water service does not enter at foundations/footings. The entrance is through existing wall.

49. Explanation: Refer to Fire Sprinkler System Notes, note 5, on sheet M003.

51. Explanation: Inspectors test connection added to riser detail and inspectors test detail added to sheet FP000

52. Explanation: Sprinkler Coverage provided via sidewall heads for 4th floor balcony.

53. Explanation: A separate fire pump room has been added to 002E Mechanical Room. Refer to revised sheet FP110.

54. Explanation: Mechanical Solution (venting pump room).
FIRE MARSHAL REVIEW
RESPONSES TO COMMENTS

55. Explanation: Added Plan & Cross Section of pump room to sheet FP110

56. Explanation: Identified Pump controllers in Fire Pump detail on sheet FP001

57. Explanation: Routed FDC from pump discharge piping, shown in detail on sheet FP000 & on plan sheet FP110

58. Explanation: Identified Standpipe Class 1 in STANDPIPE NOTES on sheet FP000

59. Explanation: Provided note for seismic bracing on sheets FP000 & FP110

60. Explanation: Relocated Fire Riser to beside Fire Pump on sheet FP110

Date: 02/23/2021
ADDENDUM NUMBER 1
Mechanical Items

Lamb Hall Renovation
East Tennessee State University
Johnson City, Tennessee
February 24, 2021
SBC Project No. 166/005-09-2017 CM

SECTION 23 05 48 Vibration Isolation for HVAC

1. Rooftop mounted equipment shall have isolation rails.

DRAWINGS

The following drawings have been modified by this Addendum:

FP000 FIRE PROTECTION NOTES & LEGENDS
FP001 FIRE PROTECTION DETAILS & STANDPIPE SECTIONS
FP110 GROUND FLOOR FIRE PROTECTION PLAN
FP111 MAIN LEVEL FIRE PROTECTION PLAN
FP112 SECOND LEVEL FIRE PROTECTION PLAN
FP113 THIRD LEVEL FIRE PROTECTION PLAN
FP114 FOURTH LEVEL FIRE PROTECTION PLAN
M000 MECHANICAL NOTES, LEGENDS, AND SCHEDULES
M001 MECHANICAL SCHEDULES
M002 MECHANICAL SCHEDULES
M003 MECHANICAL DETAILS
M004 MECHANICAL DETAILS
M005 MECHANICAL DETAILS
M006 MECHANICAL DETAILS
M007 MECHANICAL DETAILS
M008 MECHANICAL DETAILS
M009 MECHANICAL DETAILS
M010 GROUND FLOOR MECHANICAL PLAN – DEMOLITION
M011 MAIN LEVEL MECHANICAL PLAN – DEMOLITION
M012 SECOND FLOOR MECHANICAL PLAN – DEMOLITION
M013 THIRD FLOOR MECHANICAL PLAN – DEMOLITION
M014 FOURTH FLOOR MECHANICAL PLAN – DEMOLITION
M015 PENTHOUSE MECHANICAL PLAN – DEMOLITION
M110 GROUND LEVEL MECHANICAL FLOOR PLAN
M111 MAIN LEVEL MECHANICAL FLOOR PLAN
M112 SECOND LEVEL MECHANICAL FLOOR PLAN
M113 THIRD LEVEL MECHANICAL FLOOR PLAN
M114 FOURTH LEVEL MECHANICAL FLOOR PLAN
M115 PENTHOUSE MECHANICAL FLOOR PLAN
M116 ENLARGED MECHANICAL PLANS
M117 MECHANICAL SECTIONS
M210 GROUND LEVEL HYDRONIC FLOOR PLAN
M211  MAIN LEVEL HYDRONIC PLAN
M212  SECOND LEVEL HYDRONIC PLAN
M213  THIRD LEVEL HYDRONIC PLAN
M214  FOURTH LEVEL HYDRONIC PLAN
M215  PENTHOUSE HYDRONIC FLOOR PLAN

P001  PLUMBING SCHEDULES & DETAILS
P110  GROUND FLOOR SANITARY SEWER PLAN
P111  MAIN FLOOR SANITARY SEWER PLAN
P112  SECOND FLOOR SANITARY SEWER PLAN
P113  THIRD FLOOR SANITARY SEWER PLAN
P114  FOURTH FLOOR SANITARY SEWER PLAN
P115  ROOF SANITARY SEWER PLAN
P116  ENLARGED SANITARY VIEW – MECHANICAL ROOM
P117  ENLARGED SANITARY VIEWS – LABS
P118  ENLARGED SANITARY VIEWS – LABS
P119  ENLARGED SANITARY VIEWS – CORE RESTROOMS
P120  ENLARGED SANITARY VIEWS – RESTROOMS
P210  GROUND FLOOR DOMESTIC WATER & GAS PLAN
P211  MAIN FLOOR DOMESTIC WATER & NATURAL GAS PLAN
P212  SECOND FLOOR DOMESTIC WATER & NATURAL GAS PLAN
P213  THIRD FLOOR DOMESTIC WATER & NATURAL GAS PLAN
P214  FOURTH FLOOR DOMESTIC WATER & NATURAL GAS PLAN
P215  ROOF / PENTHOUSE DOMESTIC WATER & NATURAL GAS PLAN
P216  ENLARGED DOMESTIC WATER & GAS VIEW – MECHANICAL ROOM
P217  ENLARGED DOMESTIC WATER & GAS VIEWS – LABS
P218  ENLARGED DOMESTIC WATER & GAS VIEWS – LABS
P219  ENLARGED DOMESTIC WATER VIEWS – CORE RESTROOMS
P220  ENLARGED DOMESTIC WATER VIEWS – RESTROOMS

THIS ADDENDUM SHALL BECOME A PART OF THE PROJECT MANUAL AND HAVE FULL EFFECT AS IF SUBMITTED WITH THE ORIGINAL DOCUMENTS.

2/23/2021
Date

By: Facility Systems Consultants, LLC

[Signature]

[Stamp]  4/25/2021
SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: The work of this Contract includes but is not limited to:

1. Lamb Hall Renovation is a 90,000 SF 5 story building which is composed of the original 1959 structure and an addition in 1970. Work will consist of the selective interior demolition of the existing 5 story building as well as the renovation of the structure including a new sprinkler system and other life safety improvements. The project includes the construction of two new additions. The 2,800 SF 4 story courtyard entrance addition is a structural steel frame with curtain wall glass enclosure with an open roof covered balcony on the 4th floor. The second addition is a 16,000 SF academic addition with steel frame and precast concrete floor system and curtain wall glass facade. The addition provides programmatic space for a large-tiered classroom, classrooms and labs. The mechanical work is a combination of existing and new systems tied to the central energy plant and the electrical is a combination of new and existing systems.

2. The existing building roofing system shall remain with minimum work while maintaining the existing warranty. The new additions will have new 30 year EPDM roofing systems.

3. The brick and limestone exterior façade of the existing building shall be cleaned along with the existing windows which will remain. The facades of the new additions are curtainwall glass systems with a new one-story brick base on the academic addition.

4. Associated site work shall consist of minor grading, new utilities with existing utility relocations as well as new concrete walks with exterior lighting.

B. Related Work Described Elsewhere:

1. Requirement for Progress Schedule: General Conditions.

2. Construction Period: Agreement

3. Submittals: Section 01 33 00.

1.02 CONTRACTS

A. Construct the work under a single fixed-price contract.

1.03 WORK SEQUENCE

A. Contractor shall coordinate all utilities shutdowns with Architect and Owner.

B. Contractor may use laydown space adjacent to the site upon coordination with the Architect and Owner.
C. Concrete lots, or asphalt if authorized, used for laydown shall be protected from damage.

D. Site work at the project will require coordination with adjacent functions. Roads and other access points are to be kept open during the entire work or alternate routes be provided.

1.04 CONTRACTOR'S USE OF THE PREMISES

A. Coordinate use of premises under direction of Architect.

B. Contractor shall limit his use of the premises for work and for storage, to allow for:

1. Work performed by other Contractors under other Contracts.

C. Move any stored Products, under Contractor's control, which interfere with operations of separate Contractor.

D. Obtain and pay for the use of additional storage or work areas needed for operations.

E. Assume full responsibility for the protection and safekeeping of products under this Contract, stored on or off the site.

F. Assume full responsibility for protection of occupants in regard to erecting proper barriers to prohibit entrance by occupants into a construction area not yet ready for use.

G. Smoking or open fires will not be permitted within the building enclosure or on premises.

H. Contractor shall assume all responsibility for safety during the course of the entire work. Safety conformance shall include Local, State and Federal Requirements and OSHA (Occupational Safety and Health Administration, United States Department of Labor) Regulations.
SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Installation of all electrified and mechanical door hardware items is described and required to be provided in other related Sections of these Specifications. Door hardware items specified to be furnished by the contract door hardware supplier, under this section. Door hardware items specified for installation on aluminum door openings shall be shipped from the contract door hardware supplier directly to the manufacturer / supplier of the aluminum door openings for hardware preparations and installation. Shipment(s) shall take place in a manner to avoid any delays in the work.

Hardware supplier must be an authorized, direct factory distributor of all door hardware and access control products specified herein to insure compliance and service of these products.

C. Unless otherwise approved by the Architect / Engineer, furnish all door hardware items as described in the door hardware schedule.

1.2 SUMMARY

A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

B. This Section includes the following:

- Butt Hinges
- Continuous Geared Hinges
- Cylinders and Keys
- Cylindrical Latchsets and Locksets
- Mortise Latchsets and Locksets
- Deadbolts with Accessories
- Exit Devices
- Door Closers
- Overhead Door Stops / Holders
- Wall and Floor Stops
- Electromagnetic Door Holders
- Push and Pull Bars
- Mop and Kick Plates
- Lock Guards
- Thresholds
- Door Sweeps
- Self-Adhesive Gasketing
- Perimeter Gasketing
- Drip Strips
- Door Silencers
- Security Equipment

C. Related Sections: The following Sections contain requirements that relate to this Section:
1. Section 05 50 00 - Metal Fabrications
2. Section 06 20 00 - Finish Carpentry
3. Section 07 92 00 - Joint Sealants
4. Section 08 11 00 - Metal Doors and Frames
5. Section 08 14 16 - Flush Wood Doors
6. Section 08 34 73 - Sound Control Door Assemblies
7. Section 08 41 13 - Aluminum Entrances and Storefronts
8. Section 08 33 23 - Overhead Coiling Doors
9. Division 26 - Electrical
10. Division 27 - Communications
11. Division 28 - Electronic Safety And Security
12. Hardware specified under other Sections is excluded from this Section.

1.3 REFERENCES

A. Standards of the following as referenced:

1. 2010 ADA Standards for Accessible Design
2. American National Standards Institute, Inc. (ANSI)
3. Door and Hardware Institute (DHI)
5. Intertek Testing Services - Warnock Hersey (ITS-WH)
10. Underwriter’s Laboratories, Inc. (UL)

B. Regulatory standards of the following as referenced:

1. Department of Justice, Office of the Attorney General, Americans with Disabilities Act, Public Law 101-336 (ADA)

1.4 SYSTEM DESCRIPTION

A. Refer to applicable headings for system description for electric hardware products.

1.5 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification, Section 01 33 00 - Submittal Procedures; for submittal procedures.

B. Product data including manufacturers’ technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements. Clearly highlight each submitted item and data applicable to this project on manufacturer’s cut sheets. Arrange cut sheets in an order in which each item appears in the hardware sets.

C. Final hardware / access control systems schedule coordinated with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into vertical format “hardware sets” indicating complete designations of every item required for each door or opening. Use specification Set Numbers with any variations suffixed with A, B, etc. Include the following information:

   a. Type, style, function, size, and finish of each hardware item.
   b. Name and manufacturer of each item.
c. Fastenings and other pertinent information.
d. Location of each hardware set cross referenced to indications on drawings both on floor plans and in door and frame schedule.
e. Explanation of all abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for hardware.
g. Door and frame sizes and materials.
h. Keying information.
i. Provide a complete and detailed system of operating and elevation diagrams specifically developed for each opening requiring electrified hardware, except openings where only electromagnetic door holders and/or door position switches are specified. Provide these diagrams with the hardware schedule submittals, for approval. The following shall be included:

1. Point-To-Point wiring diagram.
2. Elevation of each door.
3. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.

j. Cross reference numbers used within schedule deviating from those specified.

1. Column 1: State specified item and manufacturer.
2. Column 2: State prior approved substituted item and its manufacturer.

2. Submittal Sequence: Submit schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work (e.g.: hollow metal frames) which is critical in the Project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of hardware schedule.

3. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner’s final instructions on keying of locks has been fulfilled.

D. Samples of each type of exposed hardware unit in finish indicated and tagged with full description for coordination with schedule. Submit samples prior to submission of final hardware schedule.

1. Samples will be returned to the supplier. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated in the work, within limitations of keying coordination requirements.

E. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

This is a requirement of the door hardware supplier to furnish all templates of each required door hardware item to the suppliers of the hollow metal doors and frames. No templates shall be sent until all door hardware items have been approved.

F. Electronic Hardware Systems:

1. Wiring Diagrams: Coordinate the installation of all required electronic hardware items with the Project Electrical Engineer and provide all necessary installation and technical data, including wiring diagram drawings, to the Project Electrical Engineer and Electrical Sub-Contractor. Provide a copy of all wiring diagram drawings with each door hardware schedule submitted after approval.
2. Provide complete operational descriptions of electronic components listed by each door opening in the door hardware submittals. Operational descriptions are to detail how each electrical component functions within the door opening, incorporating all conditions of ingress and egress.
Provide this information with each door hardware schedule submitted for approval.

3. Provide elevation drawings of electronic hardware items and systems identifying locations of the system’s components with respect to their placement in the door opening. Provide a copy of all elevation drawings with each door hardware schedule submitted for approval.

4. The electrical products contained within this specification represents a complete engineered system. If alternate electrical products are submitted, it is the responsibility of the distributor to bear any and all costs of providing a complete and operational system including re-engineering of electrical diagrams and system layout, as well as power supplies, power transfers, and all other required electrical components. Coordinate with the Project Electrical Engineer and Electrical Sub-Contractor to ensure that line voltage and low voltage wiring requirements are coordinated to provide a complete and operational system.

5. Upon completion of the electrical hardware installation, the door hardware supplier shall verify that all electrical components are functioning properly and state in the required guarantee that this inspection has been performed.

G. Contract closeout submittals: At the completion of this Project, furnish to the Owner two (2) copies of an Owner’s Operation and Maintenance Manual. This manual shall consist of a labeled, hardcover, three-ring binder with the following technical information.

1. Maintenance instructions for each door hardware item.

2. Manufacturers’ catalog cut-sheets for each of their respective products.

3. Parts list for each of the manufacturers’ respective products.

4. Final “Approved” Door Hardware Schedule.

5. Final “Approved” Keying Schedule.

6. Warranty: Completed and executed warranty forms.

1.6 QUALITY ASSURANCE

A. General Contractor’s Investigation: Prior to Contract Execution, the General Contractor shall have thoroughly investigated the entities such as employees, consultants, sub-contractors, manufacturers, suppliers, etc., and other entities that will be performing work or supplying materials, products, equipment, or systems for this project, to ensure that they comply with all of the qualifications and requirements mentioned or implied in the Contract Documents. If it is later determined that any of the previously mentioned entities do not comply with the qualifications and requirements specified in the Contract Documents, the General Contractor will be required to replace that entity with a qualified entity at no increase in Contract Sum or Contract Time.

B. Single Source Responsibility: Obtain each type of hardware (latch and lock sets, hinges, closers, security equipment, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.

C. Qualifications of Supplier: A recognized architectural door hardware supplier, with warehousing facilities, who has been furnishing hardware and installation in the Project’s vicinity for a period of not less than 5 years. The supplier shall be, or shall employ, a certified Architectural Hardware Consultant (AHC) and Security Consultant who is available, at reasonable times during the course of the work, for consultation about the Project’s hardware requirements, to the Owner, Architect, and Contractor.

A certified Architectural Hardware Consultant (AHC) and Security Consultant shall prepare all hardware and access control schedules. Supplier shall be responsible for proper coordination of all door hardware items and access control items with related sections, to insure compatibility of products.
1. Hardware supplier must be an authorized, direct factory distributor of all door hardware and access control products specified herein to insure compliance and service of these products.

2. Require supplier to meet with Owner to finalize keying requirements and to obtain final instructions in writing.

D. Qualifications of Installer: The hardware installer shall have no less than five (5) years of documented experience in the installation of hardware of similar quantities and types as required for this project. The installer’s qualifications shall be submitted to the architect, in writing, for approval by the architect before any work shall commence.

E. Fire-Rated Openings: Furnish door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of the Authorities Having Jurisdiction. Furnish only items, of door hardware, that are listed and are identical to products tested by UL, ITS-WH, FM, or other testing and inspecting organization acceptable to the Authorities Having Jurisdiction, for use on types and sizes of doors indicated, in compliance with the requirements of fire-rated door and door frame labels.

Project requires door assemblies and components that are compliant with positive pressure and S Label requirements. Specifications must be cross-referenced and coordinated with door and frame manufacturers to ensure that total door opening engineering is compatible with UL10C Standard for Positive Pressure Fire Tests of Door Assemblies.

F. Product Qualifications: Manufacturers names and numbers are used to indicate the standards of design and quality. Submittals should include a sheet listing grade of item, duty rating (if applicable) and finish.

G. Substitutions: All substitution requests are required to be submitted prior to the bid date and complying with the procedures and time frame as outlined in Section 00 21 13 - Instructions To Bidders. Approval of submitted products is at the discretion of the Architect and his Hardware Consultant.

H. General Contractor, hardware distributor, access control supplier, and installers shall count, coordinate, and store all door hardware and access control items herein, verifying complete counts of all items scheduled and furnished. The manufacturers’ and Owner’s representatives will inspect the installation of the door hardware and access control items during that phase of construction. Any deficiencies in installation of all materials included herein shall be corrected before installation continues.

I. At the Project’s Completion, the Owner’s Representative shall accompany the Architect and General Contractor during the door hardware and Access Control items punch list phase of the project close-out, insuring the Owner’s Representative is familiar with all applications and systems, as installed. Refer to additional requirements under 3. - EXECUTION.

J. Pre-Installation Meeting: Prior to door hardware installation, the General Contractor / Construction Manager shall request a hardware installation meeting to be held at the project’s location. This meeting shall convene no later than one month prior to the hardware’s installation. The types of hardware this meeting shall include are: locksets, exit devices, and door closers. The manufacturer’s representatives of the above listed products, in conjunction with the hardware supplier for this project, shall conduct the installation training. All hardware installers shall be required to attend this meeting to receive certificate of authorized training. This meeting shall serve as door openings coordination and review of all shop drawings from related trades prior to the hardware installation.

The hardware supplier shall include any related meeting costs in their proposal.

K. Electrified Hardware And Security Hardware Systems: Prior to ordering the electrified hardware, the General Contractor shall request a coordination meeting. This meeting shall convene prior to or after the Door Hardware Schedule and the wiring diagrams have been submitted to the General Contractor. All related trades shall be represented at this meeting, which shall also include the architect, the Owner’s representative, and the hardware supplier. This meeting shall serve as a review and coordination of all electrified hardware, wiring, connections, location for power supplies, and remote switches, and door functions. All related trades shall make any required changes, and resubmit schedules, diagrams, and any
other required data, no later than one (1) week following this meeting.

1.7 PRODUCT HANDLING

A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.

B. Packaging of door hardware is the responsibility of the supplier. As material is received by the hardware supplier from various manufacturers, sort and repack in containers clearly marked with appropriate hardware set numbers to match the set numbers of the approved hardware schedule. Two or more identical sets may be packed in the same container.

C. Door hardware supplier shall deliver all individually packaged hardware items promptly to the place of installation (Shop or Project Site); direct factory shipments are not acceptable unless agreed upon beforehand. Hardware supplier shall coordinate delivery times and schedules with the Contractor.

D. Inventory door hardware jointly with the General Contractor, representatives of the hardware supplier, and the hardware installer, until each is satisfied that the count is correct.

E. At the time of the hardware delivery, the door hardware supplier in conjunction with the Contractor shall verify and check in all hardware items. The Contractor must report all shortages (discrepancies with shipping documents) within five (5) working days.

F. General Contractor shall provide a secure lock-up for the door hardware and security equipment delivered to the Project, but not yet installed. Control handling and installation of the hardware items that are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

1.8 WARRANTY

A. All materials must be warranted against defects in workmanship and materials for a period of one (1) year from date of acceptance of this project, unless otherwise noted. Any evidence of misuse or abuse voids all warranties. These warranties shall be each manufacturer’s standard written warranty.

B. Special Warranties:

   . Continuous Geared Hinges: Limited Lifetime.
   . Cylindrical Latchesets and Locksets: Seven (7) Year Period.
   . Mortise Latchesets and Locksets: Ten (10) Year Period.
   . Exit Devices: Five (5) Year Period.
   . Door Closers: Twenty-Five (25) Year Period.
   . Electromagnetic Door Holders: Two (2) Year Period.
   . Thresholds, Door Sweeps, Self-Adhesive Gasketing, Perimeter Gasketing, and Drip Strips: Three (1) Year Period.

C. Any manufacturer whose standard written warranty does not equal or exceed the requirements listed above must provide a letter stating that they will extend their warranty to comply with the requirements of this specification.

D. Refer to Section 01 77 70 - Contract Closeout; for additional warranty requirements.

1.9 MAINTENANCE

A. Maintenance Tools and Instructions: The General Contractor shall furnish a complete set of specialized tools and maintenance instructions as needed for the Owner’s continued adjustment, maintenance, and removal and replacement of door hardware.

B. Parts Kits: Furnish manufacturers’ standard parts kits for locksets, exit devices, and door closers.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

Substitutions: Where specific manufacturers and their products are listed as “acceptable manufacturers”, provide those products from specified manufacturers; subject to compliance with specified requirements stated herein.

Any request for substitutions shall be submitted prior to the bid date and complying with the procedures and time frame as outlined in Section 00 21 13 - Instructions To Bidders. Approved substitutions will be provided by addendum only.

Substitutions will not be allowed where only one manufacturer and their products are listed.

2.2 BUTT HINGES

1. Acceptable Manufacturers:
   b. IVES; Division of Allegion, PLC (IVE) - 5BB1 / 5BB1HW (IVE).
   c. Stanley Hardware; A Division of Stanley Security Solutions, Inc. - FBB168 / FBB179 / FBB191 / FBB199 (STA).

2. Characteristics:
   a. Tested to be in accordance with ANSI / BHMA A156.1.
   b. Type: Five (5) knuckle, full mortise, ball bearing.
   c. Templates: Furnish only template-produced units.
   d. Fasteners: Furnish Phillips flat-head screws complying with the following requirements.
      (1) For metal doors and frames, install machine screws into drilled and tapped holes.
      (2) For wood doors and frames, install threaded-to-the-head wood screws.
      (3) For fire-rated wood doors, install #12 x 1-1/4 inch, threaded-to-the-head steel wood screws.
      (4) Finish screw heads to match surface of hinges or pivots.
   e. Hinge Pins: Except as otherwise indicated, furnish hinge pins as follows:
      (1) Out-Swing Exterior Doors: Non-removable pins.
      (2) Out-Swing Interior Doors: Non-rising pins and Non-removable pins; as indicated in Door Hardware Sets.
      (3) In-Swing Exterior / Interior Doors: Non-rising pins.
      (4) Tips: Flat button and matching plug. Finished to match leaves.
   f. Size: Provide hinges 4.5” x 4.5” for doors up to 36” in width. Provide hinges 5” x 4.5” for doors over 36” in width. Hinge width shall be sufficient to allow door to swing to its maximum degree of opening.
   g. Quantity: Furnish one pair of hinges for all doors up to 5’-0” high. Furnish one additional hinge for each additional 2 feet or fraction thereof.

2.3 CONTINUOUS GEARED HINGES

1. Acceptable Manufacturers:
   a. Hager Hinge Co. – 780-112-HD (HAG)
   b. Select Products Limited - SL24 HD (SEL).
   c. IVES; Division of Allegion, PLC (IVE) - 224HD.

2. Characteristics:
   a. Tested to be in accordance with ANSI / BHMA A156.26, Grade 1.
   b. Templates: Furnish only template-produced units.
c. All hinges are to be “Full Mortise”.
d. Hinges to be manufactured of extruded 6063-T6 aluminum alloy with an anodized finish.
e. All hinge profiles to be manufactured to template bearing locations at 2 9/16” spacing.
f. All hinges are to be furnished factory cut for each door size.
g. Vertical door loads shall be carried on chemically lubricated polyacetal thrust bearings.
h. The door and frame leaves shall be continuously geared together for the entire hinge length and this relationship secured with a full-length cover channel so that the hinge will operate through a full swing of 180 degrees.
i. All rotating areas of the gear cap and geared leaves shall have a permanent lubricant which is factory applied along the full length of the hinge, and the lubricant shall last the life of the hinge without any additional maintenance required.
j. Fasteners: Furnish manufacturer’s standard fasteners based upon recommendations for each installation.

2.4 CYLINDERS AND KEYS

1. Acceptable Manufacturers:
a. Corbin Russwin, Inc.; An ASSA ABLOY Group company (COR).

2. Characteristics:
a. Tested to be in accordance with ANSI / BHMA A156.28.
b. Existing Key System: Furnish all cylinders keyed into East Tennessee State University’s existing “Corbin Russwin” interchangeable core key system, for this project.
c. Equip all cylinders and locksets with the manufacturer’s standard 6-pin interchangeable core tumbler cylinders, 8000 Series.
d. Furnish cylinders and locksets with temporary, brass / keyed, “Construction” interchangeable cores for the duration of the time of construction. Construction cores, master keys, and control keys shall not be part of the Owner’s permanent key system or furnished on the same keyway (or key section) as the Owner’s permanent key system. Construction cores, master keys, and control keys are the property of the manufacturer and shall be returned when the permanent cores and keys are installed. Remove these “Construction” interchangeable cores Only when directed by the Architect and / or Owner.

e. Furnish final “Permanent” interchangeable cores and keys, for installation by the Owner.
f. Metals: Construct lock cylinder parts from brass or bronze, stainless steel, or nickel silver.
g. Comply with the Owner’s instructions for keying requirements and, except as otherwise indicated, furnish individual change keys for each lock that is not designated to be keyed alike with a group of related locks.

(1) Permanently inscribe each key with number of lock that identifies the cylinder manufacturer’s key symbol, and notation, “DO NOT DUPLICATE”.

h. A keying meeting between the Owner and a representative of the successful door hardware distributor shall be arranged subsequent to the return of the approved Door Hardware Schedule. A keying schedule will be established by the door hardware distributor’s representative and submitted to the Owner, for approval. After the Owner’s review, the keying schedule shall be returned to the distributor’s representative such that the permanent cores and keys can be prepared on a timely basis.
i. Permanent cores and keys will be transmitted directly to the Owner by the Door Hardware Distributor. The Owner shall be responsible for the installation of the permanent cores and the return of the construction cores and keys.
j. Key Material: Furnish keys of nickel silver only.
k. Key Quantities: Furnish the following quantities of keys for the entire project.

(1) Ten (10) Each - Construction Master Keys
(2) Two (2) Each - Construction Control Keys
(3) Five (5) Each - Permanent Master Keys
(4) Two (2) Each - Permanent Control Keys
(5) Four (4) Each - Permanent Change Keys
(For Each Keyed Door Opening)

Deliver all construction interchangeable cores and keys to the General Contractor. Deliver all permanent interchangeable cores and keys to the Owner, via Registered Mail.

2.5 CYLINDRICAL LATCHSETS AND LOCKSETS

1. Acceptable Manufacturers:
   a. Corbin Russwin, Inc.; An ASSA ABLOY Group company (COR) - CL3300 Series x “Newport (NZD)” Trim Design.

2. Characteristics:
   a. Tested to be in accordance with or exceed ANSI / BHMA A156.2, Series 4000, Grade 1 Strength and Operational requirements.
   b. U.L. Listed for 3-hour doors.
   c. Locksets shall be non-handed.
   d. Chassis: Cylindrical housing design, heavy gauge, cold rolled steel mechanisms, corrosion treated for normal atmosphere conditions.
   e. Locksets shall have separate anti-rotational through-bolts for positive mounting/interlocking to the door, without any exposed mounting screws.
   f. Locksets shall have solid cast levers, plated to match the specified finish symbols. Levers shall operate independently, and shall have separate, heavy duty, lever return springs or spring cages, allowing for a smooth operation of the lockset, for effective lever support, which shall prevent lever sag. Outside lever handles shall be a minimum of 4-5/8” in length and shall provide a minimum of 2” clearance from the surface of the door to the inside of the lever, at the midpoint. Outside lever handles shall return to within, a maximum, of 1/2” of the door surface.
   g. Outside lever handles, on keyed locksets, shall be removable only when the designated key is in the cylinder.
   h. When the outside lever handle is locked, the lever shall rotate freely and shall return to its horizontal position when released. The locked outside lever handle shall freely rotate up and down while remaining securely locked.
   i. Roses: Wrought brass, bronze or stainless steel, plated to match the specified finish symbols. Roses shall be a minimum 3-7/16” in diameter, for coverage of the ANSI / DHI A115.18 - 1994 door preparation.
   j. All locksets shall be furnished with a 1/2” throw latchbolt and shall be listed by Underwriter’s Laboratories, Inc. for A label and lesser class 4'-0” x 10'-0” single doors.
   k. Backsets: 2-3/4”.
   l. Strike: Brass, bronze or stainless steel, plated to match the specified finish symbols. Conform to ANSI A115.2 (4-7/8” x 1-1/4”), with lips of a sufficient length to clear trim and protect clothing.

2.6 MORTISE LATCHSETS AND LOCKSETS

1. Acceptable Manufacturers:
   a. Corbin Russwin, Inc.; An ASSA ABLOY Group company (COR) - ML2000 Series x “Newport (NSR)” Trim Design or “110 Salvador” as scheduled.

2. Characteristics:
   a. Conforms to and/or exceeds all ANSI / BHMA A156.13, Series 1000, Grade 1 Operational, Grade 2 Security. ANSI / ASTM F476-84 Grade 30, U.L. Listed. Conform to and/or exceed 800,000 cycle ANSI Grade 1 requirements.
   b. Latchsets and locksets shall have all functions available in a one size case, fabricated from heavy wrought steel, zinc dichromate plated for corrosion resistance and lubricity of internal parts. Cases shall be closed on all sides to protect internal parts.
   c. The handing of all latchsets and locksets shall be reversible without the disassembly of the lockcase.
   d. Latchsets and locksets shall have adjustable, beveled and armored fronts, with standard 2-
3/4” (70mm) backsets, with full 3/4” (19mm) throw two or three-piece mechanical stainless steel anti-friction latchbolts, one-piece stainless steel 1” throw deadbolts, and stainless steel auxiliary bolts.

e. All latchsets and locksets with latchbolts, regardless of trim design, shall be listed by Underwriters Laboratories for 3-hour fire rated and lesser classified doors.

f. Lock trim (knobs, levers, sectional or escutcheon) shall be throughbolted through the lockcase to assure correct alignment and proper operation.

g. Latchsets and locksets shall be furnished with replaceable breakaway spindles, designed to resist excessive force from vandalism, preventing damage to lever trim and internal lock case components.

h. Where indicated in Door Hardware Sets, when the outside lever handle is locked, the lever shall rotate freely and shall return to its horizontal position when released. The locked outside lever handle shall freely rotate up and down while remaining securely locked.

i. Lever handles shall be one-piece, solid, brass, bronze, or stainless steel.

j. Armor fronts, escutcheons, and roses shall be fabricated from brass, bronze, or stainless steel.

k. Strikes shall be 16 gauge, curved, brass, bronze or stainless steel, with 1” deep strike boxes, and furnished with lips of sufficient lengths to clear trim and protect clothing.

l. Furnish “Knurled” outside levers; as indicated in Door Hardware Sets.

“For Abrasive” outside levers shall not be acceptable.

2.7 EXIT DEVICES

1. Acceptable Manufacturers:

2. Characteristics:
   a. Tested to be in accordance with ANSI A156.3, 1994, Grade 1. All exit devices to be heavy duty, with one-piece removable covers. The housing shall be manufactured from extruded aluminum without exposed screws or rivets.

b. Exit devices shall be “UL” listed for Life Safety. All exit devices for fire-rated door openings shall have “UL” labels for “Fire Exit Hardware”. All exit devices shall conform to NFPA 80 and NFPA 101 requirements.

c. All series exit devices shall be “touchpad” (modern) types, incorporating a hydraulic fluid damper, which decelerates the touchpad on its return stroke and eliminates noise associated with the exit device operation. All exit devices shall be non-handed. The touchpad shall extend a minimum of 1/2 of the door width and shall be a minimum of 2-3/16” in height.

d. Exit devices shall incorporate a deadlatching feature for security and / or for future addition of alarm kits and / or other electrical requirements.

e. All latchbolts to be the deadlocking type. Latchbolts shall have a self-lubricating coating to reduce wear.

f. Flush metal end caps shall be standard with all exit devices.

g. Exit device strikes, where surface applied, shall be a roller type and have an anti-slip mounting plate.

h. All outside exit device trim shall be forged brass, full escutcheon. The lever trim shall be a “breakaway type” with substantial resistance to rotation when locked but allowing the vandalized lever to drop to a vertical, 90 degrees, position when more than 35 pounds of torque is applied.

i. The exit device end caps shall be secured with three (3) screws to a truss bracket.

j. The “touchpad” exit devices shall be patterned punched to designate code requirements; where required.

k. Where detailed, provide electric latch retraction. Retraction shall be provided by motor driven retraction of latch. Where scheduled, provide coordinated power supplies, Von Duprin Series 900 with proper modules as listed.

l. All exit devices shall be fabricated of aluminum material, anodized to the standard
architectural finishes to match the balance of the door hardware.

m. Provide standard “06” lever trim at all openings except where special “M52” trim is noted in the schedule of hardware.

2.8 DOOR CLOSERS

1. Acceptable Manufacturers:
   a. Corbin Russwin, Inc.; An ASSA ABLOY Group company (COR) - DC6000 Series.

2. Characteristics:
   a. Door closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder; which have been tested and certified under ANSI Standard A156.4, Grade 1.
   b. Hydraulic fluid shall be of an all weather type, requiring no seasonal closer adjustment.
   c. Spring power shall be continuously adjustable over the full range of closer sizes, and allowing for reduced opening force for the physically handicapped. Hydraulic regulations shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed and back check.
   d. All closers shall have solid forged steel main arms (and forearms for parallel arm closers) and where specified shall have a spring loaded stop in the soffit shoe; as indicated in Door Hardware Sets. Where door travel on out-swing doors must be limited, use spring loaded stop in the soffit shoe type closers. Auxiliary stops are not required when spring loaded stop in the soffit shoe type closers are used.
   e. Closers shall have non-metallic full, plastic, covers, which provides complete enclosure.
   f. All closers shall be of one manufacturer and shall maintain the manufacturer’s thirty (30) year warranty.
   g. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying with ADA and ANSI A117.1 provisions for door opening force.
   h. Closers shall be attached utilizing through bolts with wood and machine screws.
   i. Closers to be installed to allow door swing as shown on plans. Doors swinging into exit corridors shall provide for corridor clear width as required by code. Where possible, mount closers inside rooms.
   j. Powder coating finish to be certified to exceed 100 hours salt spray testing by ETL, an independent testing laboratory used by BHMA for ANSI certification.

Lacquer or painted finish on metal components shall not be acceptable.

2.9 AUTOMATIC OPERATORS

1. Acceptable Manufacturers:
   a. Besam Operators.
   b. Horton Automatics.
   c. Other Equivalent manufacture.

2. Characteristics:
   a. Provide automatic operators as scheduled that comply with BHMA A156.19; Power Assist and Lowe Energy Power Operators as manufactured by Besam.
   b. Where scheduled, provide operators that respond to signal from “wave to open” actuators inside and outside the building. Units shall have an “ON/OFF” switch located on the exterior of unit housing.
   c. Provide operators mounted on the push side of openings.
   d. Finish: To match aluminum storefront finish.
   e. Provide “wave to open” actuators manufactured by BEA where indicated in hardware sets.

2.10 OVERHEAD DOOR STOPS / HOLDERS
1. Acceptable Manufacturers:
   a. Glynn-Johnson Door Controls; Division of Allegion, PLC - 90 / 100 / 450 Series (GJ).
   b. Rixson Specialty Door Controls; An ASSA ABLOY Group company - 1 / 9 / 10 Series (RIX).
   c. Sargent Manufacturing Company; An ASSA ABLOY Group company - 590 / 690 / 1540 Series (SAR).

2. Characteristics:
   a. Tested to be in accordance with ANSI / BHMA A156.8, Grade 1.
   b. Furnish medium / heavy duty door stops, non-handed / reversible, of a, where detailed, carbon steel base substrate material or 300 Series stainless steel substrate material.
   c. Furnish units with a shock absorbing mechanism for added durability.
   d. All units are to be installed with the jamb bracket mounted on the stop, unless as indicated in the Door Hardware Sets, “Angle Jamb Brackets” are specified to be utilized. Overhead door stops specified with “Angle Jamb Brackets” are used to convert the installation of the units to hinge side mounting.

2.11 WALL AND FLOOR STOPS

1. Acceptable Manufacturers:
   b. IVES; Division of Allegion, PLC - WS401CCV / FS439 (IVS).

2. Characteristics:
   a. Tested to be in accordance with ANSI / BHMA A156.16, Grade 1.
   b. Wall stops shall have a solid forged brass housing with a concealed, in the concave bumper, attachment. Furnish with wood screw and plastic anchors.
   c. Floor stops shall be fabricated from solid cast brass or bronze. Furnish with wood screws and plastic anchors / machine screws and lead expansion shield anchors.
   d. Install floor stops in such a position that they permit maximum door swing, but do not present a hazard or obstruction.

2.12 ELECTROMAGNETIC DOOR HOLDERS

1. Acceptable Manufacturers:
   a. Rixson Specialty Door Controls; An ASSA ABLOY Group company - Model 998.
   b. LCN; Division of Allegion, PLC (LCN) - SEM7850 Series.

2. Characteristics:
   a. Tested to be in accordance with ANSI / BHMA A156.15, Grade 1.
   b. Furnish electromagnetic door holders designed to hold designated doors in an open position when energized by an electrical current. Electromagnetic door holders shall be designed to operate in conjunction with U.L. Listed fire detectors and manual door closers. When electrical current is interrupted, holder shall become de-energized, releasing door and allowing manual door closer to perform its closing function.
   c. Door holders shall be a low profile, recessed, wall mount, for concealed wiring, and designed to be installed in a single outlet box. The outlet box shall be reinforced to withstand the shock of a door opening, preventing the box anchors from working loose. Electrical Sub-Contractor shall be responsible for furnishing outlet boxes, electrical wiring, conduit, and all other related components.
   d. Furnish door holders which can also be released by a simple manual pull on the door.
   e. Door holders shall be furnished with a Fail-Safe operation. When electrical power failure occurs, doors shall release to close automatically.
   f. Door holders shall be U.L. Listed for installation on smoke barrier 3-hour doors.
   g. Magnets shall be protected against transients and surges up to 600 volts.
   h. Voltage and Current: 120V AC, 50-60 Hz., @ .020 amp. maximum.
i. Door armature assembly shall be through bolt mounted and furnished with a door reinforcing plate.

j. For installations where 120V AC input voltage is required, 120V / 24V transformers are required to be furnished to reduce line voltage for 24V holding solenoids.

k. Electrical wiring of these units shall be in accordance with the National Electrical Code (ANSI / NFPA 70) for the appropriate class of circuit.

l. Final installation of these units shall be handled by and coordinated with General Contractor’s Electrical Sub-Contractor.

2.13 PUSH AND PULL BARS

1. Acceptable Manufacturers:
   b. Rockwood Manufacturing An ASSA ABLOY Group company – RM4110 Hickory; RM2110-8” (ROC).
   c. H. B. Ives, Division of Allegion PLC – 9190 Series at aluminum entrances (IVE).

2. Characteristics:
   a. Tested to be in accordance with ANSI / BHMA A156.6, Grade 1.
   b. Push and pull bars shall be fabricated of 1” diameter solid bar stock. Push bars shall have 2-1/2” projection with a 1-1/2” clearance. Pull bars shall have a minimum, 10” center-to-center length, 2-3/4” projection, 1-3/4” clearance, and shall comply with the recommendations of the Americans with Disabilities Act (A.D.A.).
   c. Fasteners: Furnish with one (1) 3/8-16 x 3” steel cone head machine screw with two (2) set screws, and (1) zinc plated, steel screw sleeve, for concealed, thru-bolt, back-to-back, mounting of the Common Ends. Furnish with two (2) 3/8-16 x 2-1/4” machine screws with blind thru-bolts, for mounting of the Free Ends.

2.14 KICK PLATES

1. Acceptable Manufacturers:
   a. Hager Hinge Co. – 193S Series
   b. IVE; Division of Allegion, PLC (IVE) - 8400 Series.

2. Characteristics:
   a. Tested to be in accordance with ANSI / BHMA A156.6, Grade 1.
   b. All mop and kick plates shall be US18 gauge (.050”) thick of stainless steel material.
   c. Fabricate mop plates not more than 1 inch less than door widths, on the “Pull” sides, and kick plates not more than 1 inch or 1-1/2 inches less than door widths, on the “Push” sides; or as indicated in Door Hardware Sets.
   d. Heights:
      (1) Kick Plates shall be 8 inches in height.
   e. Bevel three (3) edges.
   f. Fabricate kick plates with countersunk screw holes.
   g. Furnish kick plates with #6 x 5/8” truss head, stainless steel, sheet metal screws.

2.15 THRESHOLDS

1. Acceptable Manufacturers:
   a. National Guard Products, Inc. (NGP)
   b. Reese Enterprises, Inc. (RES)
   c. Zero International, Inc.; Division of Allegion, PLC (ZER).

2. Characteristics:
   a. Thresholds shall be certified by an independent testing laboratory to meet the requirements of ANSI / BHMA A156.21 and in accordance with the requirements of A.D.A.A.G. and ICC / ANSI A117.1.
b. Thresholds shall be no less than a total thickness of .187” and furnished in an aluminum extrusion that is of alloy 6063 hardness T-5.

c. Furnish thresholds with a rugged abrasive “non-skid” finish of a nickel-aluminum composite, which is bonded by a heat-fusion process to the metal surface, by an exothermic reaction, at high temperatures.

d. Thresholds shall be furnished with 1/4”-20 x 3” stainless steel sleeve anchors.

2.16 DOOR SWEEPS

1. Acceptable Manufacturers:
   a. National Guard Products, Inc. (NGP).
   b. Reese Enterprises, Inc. (RES).
   c. Zero International, Inc.; Division of Allegion, PLC (ZER).

2. Characteristics:
   a. Tested to be in accordance with ANSI / BHMA A156.22.
   b. Door sweeps shall be furnished encased in a high quality aluminum extrusion that is of alloy 6063 hardness T-5.
   c. Furnish door sweeps with neoprene seals, rain drip strips, and #6 x 1/2” stainless steel, truss head, sheet metal screw fasteners.

2.17 SELF-ADHESIVE GASKETING

1. Acceptable Manufacturers:
   a. National Guard Products, Inc. (NGP).
   b. Reese Enterprises, Inc. (RES).
   c. Zero International, Inc.; Division of Allegion, PLC (ZER).

2. Characteristics:
   b. Gasketing shall be furnished extruded from high grade silicone, with pressure sensitive, double backed, self-adhesive.
   c. Gasketing shall be classified by UL.

2.18 PERIMETER GASKETING

1. Acceptable Manufacturers:
   a. National Guard Products, Inc. (NGP).
   b. Reese Enterprises, Inc. (RES).
   c. Zero International, Inc.; Division of Allegion, PLC (ZER).

2. Characteristics:
   a. Tested to be in accordance with ANSI / BHMA A156.22.
   b. Gasketing shall be furnished encased in a high quality aluminum extrusion that is of alloy 6063 hardness T-5.
   c. Furnish gasketing with solid neoprene seals and #6 x 3/4” stainless steel, truss head, sheet metal screw fasteners.

2.19 DRIP STRIPS

1. Acceptable Manufacturers:
   a. National Guard Products, Inc. (NGP).
   b. Reese Enterprises, Inc. (RES).
   c. Zero International, Inc.; Division of Allegion, PLC (ZER).

2. Characteristics:
   a. Drip strips shall be furnished in an aluminum extrusion that is of alloy 6063 hardness T-5.
b. Furnish all drip strips #6 x 1/2” stainless steel, truss head, sheet metal screw fasteners.

2.20 HARDWARE AT SOUND SEAL EQUIPPED DOORS

1. Acceptable Manufacturers:
   b. Reese Enterprises, Inc. (RES)
   c. Pemko; An ASSA ABLOY Group company (PEM)

2. Adjustable Head and Jamb Seals:
   a. Head and jamb seal housing shall have extruded metal housings with a minimum overall thickness of 0.93 inches.
   b. Head and jamb housing shall allow for a minimum of 0.31 inches of adjustability after installation.
   c. Seals shall be continuous closed cell sponge neoprene with a minimum width of 0.75 inches.
   d. Zero Model 770.

3. Automatic Door Bottoms:
   a. Door bottom housing shall have extruded metal housings with a minimum overall thickness of 0.83 inches.
   b. Door bottom shall have a minimum vertical travel of 1 inch.
   c. Seal shall be continuous closed cell sponge neoprene with a minimum width of 0.75 inches.
   d. Zero Model 369 (Mortised).

4. Astragals:
   a. Astragals shall have a minimum depth of 0.50 inches.
   b. Astragals shall allow for a minimum of 0.188 inches of adjustability after installation.
   c. Zero Model 55 & 155 (Surface Mounted)

5. Thresholds:
   a. Thresholds shall be extruded solid metal, ¼” minimum thickness.
   b. Threshold shall be flat without grooves.
   c. Zero Model 164A.

6. Door Closer, Door Holder, and Exit Device Strike Brackets:
   a. Door closer / holder brackets shall be solid steel with a minimum thickness of 0.157 inches.
   b. Door closer height shall be coordinated with the specified perimeter gasketing to allow for complete adjustability of the seals after installation.
   c. Provide brackets as required where top strikes of exit devices would be required to be mounted through the perimeter gasketing.
   d. All brackets used on fire doors must be listed by a recognized testing laboratory for that use.

2.21 DOOR SILENCERS

1. Acceptable Manufacturers:
   a. IVES; Division of Allegion, PLC (IVE) – SR64.
   c. Triangle Brass Manufacturing Company, Inc. (TRI) - 1229A.

2. Characteristics:
   a. Tested to be in accordance with ANSI / BHMA A156.16, Grade 1.
   b. Silencers shall be fabricated from a gray, opaque, rubber material, and featuring a pneumatic design that, once installed, forms an air pocket to absorb shock, reduce noise of door closing, eliminate door rattle, and provide constant tension for door latches or
locks.

c. Silencers shall be installed into pre-drilled hollow metal door frames, which if installed properly, shall become Tamper-Proof.

d. Silencers shall be installed into pre-drilled wood door frames. To prevent removal, a small brad shall be driven into the stop strips of the wood frames and through the stems of the silencers.

e. Furnish three (3) for each single door, four (4) for each single “Dutch” door, and two (2) for each pair of doors.

2.22 SECURITY EQUIPMENT

1. Acceptable Manufacturers:

   a. Electric Latch Retraction:
      1. Von Duprin; Division of Allegion, PLC – QEL Series (VON)

   b. Power Supplies:
      1. Schlage Lock Company, LLC; Division of Allegion, PLC - PS900 Series (SCH).
      2. Von Duprin, Inc.; Division of Allegion, PLC - PS900 Series (VON).

   c. Key Switches:
      1. Schlage Lock Company, LLC; Division of Allegion, PLC – 653-04-L2 (SCH). Characteristics:
         a. Furnish all items as indicated in Door Hardware Sets.

      2. Coordinate all required security equipment items with Division 26 - Electrical, Division 27 - Communications, Division 28 - Electronic Safety and Security, Project Electrical Engineer, Electrical Sub-Contractor, Alarm System’s Engineers, and Access Control System’s Integrators.

CREMONE BOLTS

1. Acceptable Manufacturers:

   a. Richards Wilcox:
      1. Heavy Duty Cremone Bolt 1028.00310 Series (RW)
      2. Finish – Zinc Plated Steel

2.23 MATERIALS AND FABRICATION

A. Manufacturer’s Name Plate: Do not use manufacturers’ products that have manufacturer’s name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise acceptable to Architect.

   1. Manufacturer’s identification will be permitted on rim of lock cylinders only.

B. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer’s standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI / BHMA A156 series standards for each type of hardware item and with ANSI / BHMA A156.18 for finish designations indicated. Do not furnish “optional” materials or forming methods for those indicated, except as otherwise specified.

C. Fasteners: Furnish hardware manufactured to conform to published templates, generally prepared for machine screw installation.

   1. Do not furnish hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.

   2. Furnish screws for installation with each hardware item. Furnish Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware
finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible, including “prepared for paint” surfaces to receive painted finish.

3. Furnish concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of adequately fastening the hardware. Coordinate with wood doors and metal doors and frames where thru-bolts are used as a means of reinforcing the work, furnish sleeves for each thru-bolt or use sex screw fasteners.

2.24 HARDWARE FINISHES

D. Match items to the manufacturer’s standard color and texture finish for the latch and lock sets (or push-pull units if no latch of lock sets).

E. Furnish finishes that match those established by ANSI or, if none established, match the Architect’s sample.

F. Furnish quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with the manufacturer’s standards, but in no case less than specified by the referenced standards, for the applicable units of hardware.

G. The designations used to indicate hardware finishes are those listed in ANSI / BHMA A156.18, “Materials and Finishes”, including coordination with the traditional U.S. finishes, shown by certain manufacturers for their products.

- Butt Hinges
  - US26D (626) Satin Chromium
  - US32D (630) Satin Stainless Steel

- Continuous Geared Hinges
  - US28 (628) Satin Aluminum, Clear Anodized

- Mortise Cylinders and Mortise Thumbturn Cylinders
  - US26D (626) Satin Chromium

- “Construction” Interchangeable Cores
  - US19 (622) Flat Black Coated

- “Permanent” Interchangeable Cores
  - US26D (626) Satin Chromium

- Cylindrical Latchsets and Locksets
  - US26D (626) Satin Chromium

- Mortise Latchsets and Locksets
  - US26D (626) Satin Chromium

- Exit Devices
  - US26D (626) Satin Chromium

- Door Closers and Mounting Plates
  - US28 (689) Silver Aluminum Painted

- Overhead Door Stops / Holders
  - 652 Chrome-Like Coating on Steel
  - US32D (630) Satin Stainless Steel

- Wall and Floor Stops
  - US26D (626) Satin Chromium

- Electromagnetic Door Holders
  - AL (689) Powder Coated Aluminum

- Push / Pull Bars
  - US32D (630) Satin Stainless Steel

- Kick Plates
  - US32D (630) Satin Stainless Steel

- Lock Guards
  - US32D (630) Satin Stainless Steel
. Thresholds 719 (US27) Mill Finish Aluminum, Uncoated
. Sound Seal Threshold 719 (US27) Mill Finish Aluminum, Uncoated
. Door Sweeps 628 (US28) Satin Aluminum, Clear Anodized
. Self-Adhesive Gasketing BLACK (Silicone)
. Perimeter Gasketing 628 (US28) Satin Aluminum, Clear Anodized
. Drip Strips 628 (US28) Satin Aluminum, Clear Anodized
. Door Silencers GREY (Rubber)
. Rapid Entry Key Boxes BLACK
. Power Supplies LGR Baked On Light Grey Enamel

PART 3 - EXECUTION

3.1 INSTALLATION

A. Mount hardware units at heights indicated in the following applicable publications, except as specifically indicated or required to comply with governing regulations and, except as otherwise indicated, by the Architect.

   1. “Recommended Locations for Builders Hardware for Standard Steel Doors and Frames” by the Door and Hardware Institute.

B. Install each hardware item in compliance with the manufacturer’s instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 9 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.

C. Sets units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Where scheduled, Door Pulls shall be through-bolted with bolt heads concealed behind Push Plates.

E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

F. Set thresholds, for exterior and interior doors, in a full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements specified in Division 7, Section 07 92 00 - Joint Sealants.

G. Sound Seals: Comply with manufacturer’s instructions and recommendations to the extent installation requirements are not otherwise indicated.

   1. Silencers shall not be installed on doors equipped with sound seals.
   2. Sound seals shall be installed in coordination with all other scheduled hardware.
   3. Contractor shall adjust all sound seals to provide a light tight seal at the entire perimeter of the door leaf.
   4. All door closers shall operate silently under normal operation.
   5. Apply a continuous bead of non-hardening, paintable sealant between the seal housing and door frame. Do not paint acoustical seals.
   6. Acoustical seals shall be continuous when installed. Do not cut or otherwise modify seals or seal housings for any reason.

H. The hardware installer shall be responsible for installation of all mechanical and electromechanical
hardware items contained within this specification, in accordance with the manufacturer’s technical installation guidance, and in addition to all applicable code requirements.

I. The Electrical Sub-Contractor, under Division 26 - Electrical, shall be responsible for providing and installing all (120 VAC) power source wiring as required for the electrified locking and access control hardware, equipment, accessories, and power supplies. This includes quad outlets as required on a dedicated circuit in designated IT / Telecommunication Room(s) and the related conduit, stud-ins, junction boxes, and connectors required for the power source delivery and connections. Provide cabling, conduit, stub-ins, patch cords, fire stop systems, data connectors, junction boxes, and back boxes for both the electrified locking hardware and access control equipment at each of the access controlled or monitored openings per plan drawings and specifications. Provide and install conduit between each of the aforementioned devices and between junction boxes, power supplies, and access control equipment located on or above each door opening.

Installation of power supplies and interfacing of security system with fire alarm system as required, and coordination of complete security system shall be provided by the Electrical Sub-Contractor, under Division 26 - Electrical. Electrical Sub-Contractor shall be responsible for providing and installing all 120 VAC cabling connections and terminations from the electrical junction boxes to these electrical devices.

J. The Access Control System’s supplier shall be responsible for providing all low-voltage (12 / 24 VDC) wiring and communication cabling (RS-232 / RS-485) installation from network control processors to reader controllers, I/O monitor / control interface panels, electrified and integrated locking hardware, remote card readers, keypads, or display terminals, monitoring and signaling switches, and power supplies, identification, and termination in accordance with the manufacturer’s technical installation guidance, in addition to all applicable code requirements. Installation of all card readers, controllers, software packages, door position switches, and run low voltage wiring from the power supplies / controllers to the electrified hardware items at each opening where specified. The Access Control System’s installer shall also be responsible for connectors, final wire terminations, final hook-ups, testing, system set-up, warranty, and Owner Turnover. Owner Training shall be provided under this Section.

K. Upon completion of the final installation of the Door Hardware and Access Control System, and burn in of the Security System, the Contract Hardware Distributor and the Access Control System’s Supplier shall jointly make final adjustments to the electrified hardware and Access Control System’s openings to insure proper adjustment and function of the opening is in compliance with the system’s functionality requirements.

3.2 ADJUSTING, CLEANING, AND DEMONSTRATING

A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly or as intended for the application made.

1. Where door hardware is installed more than one month prior to acceptance or occupancy of a space or area, the hardware installers shall return to the installation during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

B. Clean adjacent surfaces soiled by hardware installation.

C. Door Hardware Supplier’s Field Service:

1. Instruct Owner’s Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

D. Architect’s Hardware Consultant’s Field Service:

1. Inspect door hardware items for correct installation and adjustment after complete installation of the
door hardware.

2. File a written report of this inspection directly to the Architect.

E. Continued Maintenance Service: Approximately six (6) months after the acceptance of hardware in each area, the Installer shall return to the project and re-adjust every item of hardware to restore proper function of doors and hardware.
Consult with and instruct Owner’s personnel in recommended additions to the maintenance procedures.
Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of any current or predictable problems (of substantial nature) in the performance of the hardware and furnish copy to the Owner’s Agent / Representative.

3.3 HARDWARE SETS.

A. The hardware sets represent the design intent and direction of the Owner and Architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the Architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

B. The supplier is responsible for handing and sizing all products listed in the door hardware sets. Quantities listed are for each pair of doors, or for each single door.

Set No. 1
Each to have:
1 Exit Device CD9827DT-LBR VON 626
1 Exit Device CD9827NL-LBR VON 626
3 Cylinders Corbin / Russwin as Required CT6 COR 626
2 Mag Locks by access control integrator - - - -
1 Card Reader by access control integrator - - - -
2 Door Closers DC6210-A11 x Drop Plate as Required COR 689
-Card reader, card reader power supply, controller, logic, mag locks wire and wiring by others.
-Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied.
Modify as required.
- Hinges, weatherstrip, thresholds, sweeps existing to remain.

Set No. 2
Each to have:
1 Exit Device CD9827DT-LBR VON 626
1 Exit Device CD9827NL-LBR VON 626
3 Cylinders Corbin / Russwin as Required CT6 COR 626
2 Mag Locks by access control integrator - - - -
1 Card Reader by access control integrator - - - -
1 Door Closer DC6210-A11 x Drop Plate as Required COR 689
2 Auto Operators SW100- Continuous Cover Low E BES 628
2 Touchless Actuators MS11 BEA - -
-Card reader, card reader power supply, controller, logic, mag locks wire and wiring by others.
-Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied.
Modify as required.
- Hinges, weatherstrip, thresholds, sweeps existing to remain.
Set No. 3
Each to have:
2 Continuous Hinges 780-112-HD x EPT Prep HAG 628
2 Power Transfers EPT-10 VON 689
1 Exit Device SD-QEL9847DT VON 626
1 Exit Device SD-QEL9847NL VON 626
2 Cylinder Corbin / Russwin as Required CT6 COR 626
2 Auto Operators SW100- Continuous Cover Low E BES 628
2 Touchless Actuators MS11 BEA - -
1 Power Transfer 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.

Set No. 4
Each to have:
1 Continuous Hinge 780-112-HD HAG 628
1 Continuous Hinge 780-112-HD w/EPT Prep HAG 628
1 Power Transfer EPT-10 VON 689
1 Exit Device CD9847DT VON 626
1 Exit Device SD-QEL 9847NL VON 626
3 Cylinders Corbin / Russwin as Required CT6 COR 626
2 Door Closers DC6210-A11 x Drop Plate as Required COR 689
1 Power Supply PS902 – 900-2RS – 900-8F VON - -
1 Card Reader By Owner
Weatherstrip, thresholds, sweeps complete with aluminum doors.
Card reader, card reader power supply, controller, logic, wire and wiring by others.

Set No. 5
Each to have:
2 Continuous Hinges 780-112-HD HAG 628
2 Sets Push / Pull Bars 159V – BTB Mounted HAG 630
2 Door Closers DC6210-A11 x Drop Plate as Required COR 689

Set No. 6
Each to have:
3 Ea. Butts BB1191 – NRP HAG 626
1 Exit Device 9875NL VON 626
1 Cylinder Corbin / Russwin as Required CT6 COR 626
1 Door Closer DC6210 – A12 COR 689
1 Kick Plate 193S HAG 630
1 Threshold 425 NGP 719
1 Door Sweep 200SA NGP 628
1 Set Weatherstrip 700SA – Head & Jambs NGP 628
1 Drip Cap 16A x M. O. Width NGP 628
### Set No. 7
Each to have:

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Quantity</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Ea. Butts</td>
<td>BB1191 – NRP</td>
<td></td>
<td>HAG 626</td>
</tr>
<tr>
<td>1 Electric Onity Lock</td>
<td>by Security Integrator</td>
<td></td>
<td>- - 626</td>
</tr>
<tr>
<td>1 Door Closer</td>
<td>DC6210 – A12</td>
<td></td>
<td>COR 689</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td>193S</td>
<td></td>
<td>HAG 630</td>
</tr>
<tr>
<td>1 Threshold</td>
<td>425</td>
<td></td>
<td>NGP 719</td>
</tr>
<tr>
<td>1 Door Sweep</td>
<td>200SA</td>
<td></td>
<td>NGP 628</td>
</tr>
<tr>
<td>1 Set Weatherstrip</td>
<td>700SA – Head &amp; Jambs</td>
<td></td>
<td>NGP 628</td>
</tr>
<tr>
<td>1 Drip Cap</td>
<td>16A x M. O. Width</td>
<td></td>
<td>NGP 628</td>
</tr>
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</table>

- Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify as required.

### Set No. 8
Each to have:

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<th>Manufacturer</th>
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<td>3 Ea. Butts</td>
<td>BB1191 – NRP</td>
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<td>HAG 626</td>
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<td>1 Lever Entrance</td>
<td>ML2065 – NSA – CT6</td>
<td></td>
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<tr>
<td>1 Door Closer</td>
<td>DC6210 – A12</td>
<td></td>
<td>COR 689</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td>193S</td>
<td></td>
<td>HAG 630</td>
</tr>
<tr>
<td>1 Threshold</td>
<td>425</td>
<td></td>
<td>NGP 719</td>
</tr>
<tr>
<td>1 Door Sweep</td>
<td>200SA</td>
<td></td>
<td>NGP 628</td>
</tr>
<tr>
<td>1 Set Weatherstrip</td>
<td>700SA – Head &amp; Jambs</td>
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<td>NGP 628</td>
</tr>
<tr>
<td>1 Drip Cap</td>
<td>16A x M. O. Width</td>
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<td>NGP 628</td>
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- Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify as required.

### Set No. 9
Each to have:

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<th>Quantity</th>
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<tr>
<td>6 Ea. Butts</td>
<td>BB1279</td>
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<td>HAG 652</td>
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<tr>
<td>1 Flush Bolt Set</td>
<td>296W</td>
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<td>HAG 626</td>
</tr>
<tr>
<td>1 Dust Proof Strike</td>
<td>280X</td>
<td></td>
<td>HAG 626</td>
</tr>
<tr>
<td>1 Lever Office</td>
<td>CL3351 – NZD – CT6</td>
<td></td>
<td>COR 626</td>
</tr>
<tr>
<td>2 Door Closers</td>
<td>DC6200/DC6210</td>
<td></td>
<td>COR 689</td>
</tr>
<tr>
<td>1 Coordinator</td>
<td>297D x 297F x MTG Brkts as required</td>
<td>HAG 689</td>
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<td>2 Kick Plates</td>
<td>193S</td>
<td></td>
<td>HAG 630</td>
</tr>
<tr>
<td>2 Door Stops</td>
<td>236W</td>
<td></td>
<td>HAG 626</td>
</tr>
<tr>
<td>2 Silencers</td>
<td>SR64</td>
<td></td>
<td>IVE - -</td>
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- Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify as required.

### Set No. 10
Each to have:

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<th>Manufacturer</th>
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<tr>
<td>3 Ea. Butts</td>
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<td>HAG 652</td>
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<tr>
<td>1 Lever Storeroom</td>
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<tr>
<td>1 Door Closer</td>
<td>DC6200</td>
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<td>1 Kick Plate</td>
<td>193S</td>
<td></td>
<td>HAG 630</td>
</tr>
<tr>
<td>1 Door Stop</td>
<td>236W</td>
<td></td>
<td>HAG 626</td>
</tr>
<tr>
<td>3 Silencers</td>
<td>SR64</td>
<td></td>
<td>IVE - -</td>
</tr>
</tbody>
</table>

- Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify as required.
### Set No. 11
Each to have:

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<th>Item</th>
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<th>Price</th>
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<tr>
<td>3 Ea. Butts</td>
<td>BB1279 (5” high @ &gt; 36” wide doors)</td>
<td>HAG</td>
<td>652</td>
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<tr>
<td>1 Lever Classroom</td>
<td>CL3355 – NZD – CT6</td>
<td>COR</td>
<td>626</td>
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<tr>
<td>1 Door Closers</td>
<td>DC6210 /DC6200</td>
<td>COR</td>
<td>689</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td>193S</td>
<td>HAG</td>
<td>630</td>
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<tr>
<td>1 Door Stop</td>
<td>236W</td>
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<td>626</td>
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<tr>
<td>3 Silencers</td>
<td>SR64</td>
<td>IVE</td>
<td>-</td>
</tr>
</tbody>
</table>

Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify size and quantity as required.

-Use 4ea. Butt hinges where doors are more than 90” in height.

### Set No. 12
Each to have:

<table>
<thead>
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<th>Specification</th>
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<tr>
<td>6 Ea. Butts</td>
<td>BB1168</td>
<td>HAG</td>
<td>652</td>
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<td>2 Exit Devices</td>
<td>9827L-F-LBR</td>
<td>VON</td>
<td>626</td>
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<td>2 Cylinders</td>
<td>Corbin / Russwin as Required CT6</td>
<td>COR</td>
<td>626</td>
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<td>2 Door Closers</td>
<td>DC6200/DC6210</td>
<td>COR</td>
<td>689</td>
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<tr>
<td>2 Kick Plates</td>
<td>193S</td>
<td>HAG</td>
<td>630</td>
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<tr>
<td>2 Magnetic Holders</td>
<td>FM998</td>
<td>RIX</td>
<td>689</td>
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<tr>
<td>2 Silencers</td>
<td>SR64</td>
<td>IVE</td>
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Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify size and quantity as required.

### Set No. 13
Each to have:

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<th>Item</th>
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<tr>
<td>6 Ea. Butts</td>
<td>BB1168</td>
<td>HAG</td>
<td>652</td>
</tr>
<tr>
<td>2 Exit Devices</td>
<td>9827L-F-LBR</td>
<td>VON</td>
<td>626</td>
</tr>
<tr>
<td>2 Cylinders</td>
<td>Corbin / Russwin as Required CT6</td>
<td>COR</td>
<td>626</td>
</tr>
<tr>
<td>2 Door Closers</td>
<td>DC6210</td>
<td>COR</td>
<td>689</td>
</tr>
<tr>
<td>2 Kick Plates</td>
<td>193S</td>
<td>HAG</td>
<td>630</td>
</tr>
<tr>
<td>2 Magnetic Holders</td>
<td>FM998</td>
<td>RIX</td>
<td>689</td>
</tr>
<tr>
<td>2 Silencers</td>
<td>SR64</td>
<td>IVE</td>
<td>-</td>
</tr>
</tbody>
</table>

- Fire alarm power, relays, wire and wiring by others.
-Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify size and quantity as required.

### Set No. 14
Each to have:

<table>
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<th>Item</th>
<th>Specification</th>
<th>Brand</th>
<th>Price</th>
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<tbody>
<tr>
<td>3 Ea. Butts</td>
<td>BB1279</td>
<td>HAG</td>
<td>652</td>
</tr>
<tr>
<td>1 Lever Office</td>
<td>CL3351 – NZD – CT6</td>
<td>COR</td>
<td>626</td>
</tr>
<tr>
<td>1 Door Closers</td>
<td>DC6200/DC6210</td>
<td>COR</td>
<td>689</td>
</tr>
<tr>
<td>1 Kick Plate</td>
<td>193S</td>
<td>HAG</td>
<td>630</td>
</tr>
<tr>
<td>1 Door Stop</td>
<td>236W/241F</td>
<td>HAG</td>
<td>626</td>
</tr>
<tr>
<td>3 Silencers</td>
<td>SR64</td>
<td>IVE</td>
<td>-</td>
</tr>
</tbody>
</table>

-Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify size and quantity as required.
Set No. 15
Each to have:
Hardware complete by glass door supplier.

Set No. 16
Each to have:
<table>
<thead>
<tr>
<th>Set No.</th>
<th>Item Description</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Exit Devices</td>
<td>VON</td>
<td>9827L-EO-F -LBR</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Door Closers</td>
<td>COR</td>
<td>DC6210</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Kick Plates</td>
<td>HAG</td>
<td>193S</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Magnetic Holders</td>
<td>RIX</td>
<td>FM998</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Silencers</td>
<td>IVE</td>
<td>SR64</td>
<td>2</td>
</tr>
</tbody>
</table>

Fire alarm power, relays, wire and wiring by others.

Set No. 17
Each to have:
<table>
<thead>
<tr>
<th>Set No.</th>
<th>Item Description</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Exit Device</td>
<td>VON</td>
<td>9875L-BE-F</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Door Closer</td>
<td>COR</td>
<td>DC6210</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Kick Plate</td>
<td>HAG</td>
<td>193S</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Door Stop</td>
<td>HAG</td>
<td>236W</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Silencers</td>
<td>IVE</td>
<td>SR64</td>
<td>1</td>
</tr>
</tbody>
</table>

Set No. 17A
Each to have:
<table>
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<th>Set No.</th>
<th>Item Description</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Exit Device</td>
<td>VON</td>
<td>9875L-F</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Cylinder</td>
<td>COR</td>
<td>Corbin / Russwin as Required CT6</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Door Closer</td>
<td>COR</td>
<td>DC6210 – A12</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Kick Plate</td>
<td>HAG</td>
<td>193S</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Door Stop</td>
<td>HAG</td>
<td>236W</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Silencers</td>
<td>IVE</td>
<td>SR64</td>
<td>1</td>
</tr>
</tbody>
</table>

Set No. 18
Each to have:
<table>
<thead>
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<th>Set No.</th>
<th>Item Description</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Exit Devices</td>
<td>HAG</td>
<td>BB1168</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>Door Stop</td>
<td>HAG</td>
<td>236W</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>Dust Proof Strike</td>
<td>HAG</td>
<td>280X</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>Lever Office</td>
<td>COR</td>
<td>CL3351 – NZD – CT6</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Kick Plates</td>
<td>HAG</td>
<td>193S</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Door Stops</td>
<td>HAG</td>
<td>236W</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Silencers</td>
<td>IVE</td>
<td>SR64</td>
<td>2</td>
</tr>
</tbody>
</table>

-Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify size and quantity as required.

Set No. 19
Each to have:
<table>
<thead>
<tr>
<th>Set No.</th>
<th>Item Description</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Exit Devices</td>
<td>HAG</td>
<td>BB1168</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>Door Privacy</td>
<td>COR</td>
<td>CL3320 – NZD</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Door Closer</td>
<td>COR</td>
<td>DC6200</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Kick Plate</td>
<td>HAG</td>
<td>193S</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>Door Stop</td>
<td>HAG</td>
<td>236W</td>
<td>1</td>
</tr>
<tr>
<td>Set No.</td>
<td>Each to have:</td>
<td>3 Ea. Butts</td>
<td>BB1279</td>
<td>HAG 652</td>
</tr>
<tr>
<td>--------</td>
<td>---------------</td>
<td>-------------</td>
<td>--------</td>
<td>---------</td>
</tr>
<tr>
<td>20</td>
<td>1 Push Plate</td>
<td>30S - 8&quot; x 16&quot;</td>
<td>HAG 630</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Pull Plate</td>
<td>H33G - 4&quot; x 16&quot;</td>
<td>HAG 630</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Door Closer</td>
<td>DC6210</td>
<td>COR 689</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Kick Plate</td>
<td>193S</td>
<td>HAG 630</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Door Stop</td>
<td>236W</td>
<td>HAG 626</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Set Sound Seal</td>
<td>770SP – Head &amp; Jambs</td>
<td>ZER 628</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Auto Door Bottom</td>
<td>369 w/ End Caps</td>
<td>ZER 628</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Threshold</td>
<td>164A</td>
<td>ZER 719</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Set No.</th>
<th>Each to have:</th>
<th>3 Ea. Butts</th>
<th>BB1279</th>
<th>HAG 652</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>1 Lever Office</td>
<td>CL3351 – NZD – CT6</td>
<td>COR 626</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Door Closer</td>
<td>DC6200</td>
<td>COR 626</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Kick Plate</td>
<td>193S</td>
<td>HAG 630</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Door Stop</td>
<td>236W</td>
<td>HAG 626</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Set Sound Seal</td>
<td>770SP – Head &amp; Jambs</td>
<td>ZER 628</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Auto Door Bottom</td>
<td>369 w/ End Caps</td>
<td>ZER 628</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Threshold</td>
<td>164A</td>
<td>ZER 719</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Set No.</th>
<th>Each to have:</th>
<th>3 Ea. Butts</th>
<th>BB1279</th>
<th>HAG 652</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>1 Lever Classroom</td>
<td>CL3355 – NZD – CT6</td>
<td>COR 626</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Door Closer</td>
<td>DC6200</td>
<td>COR 626</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Kick Plate</td>
<td>193S</td>
<td>HAG 630</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Door Stop</td>
<td>236W</td>
<td>HAG 626</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Set Sound Seal</td>
<td>770SP – Head &amp; Jambs</td>
<td>ZER 628</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Auto Door Bottom</td>
<td>369 w/ End Caps</td>
<td>ZER 628</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Threshold</td>
<td>164A</td>
<td>ZER 719</td>
<td></td>
</tr>
</tbody>
</table>
### Set No. 24
Each to have:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Item</th>
<th>Model</th>
<th>Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Ea. Butts</td>
<td>BB1279</td>
<td>HAG</td>
</tr>
<tr>
<td>1</td>
<td>Lever Passage</td>
<td>CL3310-NZD</td>
<td>COR</td>
</tr>
<tr>
<td>1</td>
<td>Door Closer</td>
<td>DC6210</td>
<td>COR</td>
</tr>
<tr>
<td>1</td>
<td>Overhead Stop</td>
<td>GJ90S series @ 164e only</td>
<td>GJ</td>
</tr>
<tr>
<td>1</td>
<td>Kick Plate</td>
<td>193S</td>
<td>HAG</td>
</tr>
<tr>
<td>1</td>
<td>Door Stop</td>
<td>236W</td>
<td>HAG</td>
</tr>
<tr>
<td>3</td>
<td>Silencers</td>
<td>SR64</td>
<td>-</td>
</tr>
</tbody>
</table>

- Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify size and quantity as required.

### Set No. 25
Each to have:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Item</th>
<th>Model</th>
<th>Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Ea. Butts</td>
<td>BB1168</td>
<td>HAG</td>
</tr>
<tr>
<td>2</td>
<td>Exit Devices</td>
<td>9827L x M52 Trim x LBR</td>
<td>VON</td>
</tr>
<tr>
<td>2</td>
<td>Cylinders</td>
<td>Corbin / Russwin as Required CT6</td>
<td>COR</td>
</tr>
<tr>
<td>2</td>
<td>Door Closer</td>
<td>DC6210</td>
<td>COR</td>
</tr>
<tr>
<td>2</td>
<td>Kick Plates</td>
<td>193S</td>
<td>HAG</td>
</tr>
<tr>
<td>2</td>
<td>Door Stops</td>
<td>236W</td>
<td>HAG</td>
</tr>
<tr>
<td>2</td>
<td>Silencers</td>
<td>SR64</td>
<td>-</td>
</tr>
</tbody>
</table>

- Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify size and quantity as required.

### Set No. 26
Each to have:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Item</th>
<th>Model</th>
<th>Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pivot Set</td>
<td>L147</td>
<td>RIX</td>
</tr>
<tr>
<td>1</td>
<td>Intermediate Pivot</td>
<td>ML19</td>
<td>RIX</td>
</tr>
<tr>
<td>1</td>
<td>Lever Office</td>
<td>CL3351-NZD – CT6 x (M28-lead lined rose)</td>
<td>COR</td>
</tr>
<tr>
<td>1</td>
<td>Door Closer</td>
<td>DC6210</td>
<td>COR</td>
</tr>
<tr>
<td>1</td>
<td>Kick Plates</td>
<td>193S</td>
<td>HAG</td>
</tr>
<tr>
<td>3</td>
<td>Silencers</td>
<td>SR64</td>
<td>IVE</td>
</tr>
</tbody>
</table>

- Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify size and quantity as required.

### Set No. 27
Each to have:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Item</th>
<th>Model</th>
<th>Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Ea. Butts</td>
<td>BB1168</td>
<td>HAG</td>
</tr>
<tr>
<td>1</td>
<td>Exit Device</td>
<td>9875L</td>
<td>VON</td>
</tr>
<tr>
<td>1</td>
<td>Cylinder</td>
<td>Corbin / Russwin as Required CT6</td>
<td>COR</td>
</tr>
<tr>
<td>1</td>
<td>Door Closer</td>
<td>DC6210</td>
<td>COR</td>
</tr>
<tr>
<td>1</td>
<td>Kick Plate</td>
<td>193S</td>
<td>HAG</td>
</tr>
<tr>
<td>1</td>
<td>Door Stop</td>
<td>236W</td>
<td>HAG</td>
</tr>
<tr>
<td>3</td>
<td>Silencers</td>
<td>SR64</td>
<td>IVE</td>
</tr>
</tbody>
</table>

### Set No. 28
Each to have:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Item</th>
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<th>Brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Ea. Butts</td>
<td>BB1279</td>
<td>HAG</td>
</tr>
<tr>
<td>1</td>
<td>Electric Onity Lock</td>
<td>by Security Integrator</td>
<td>-</td>
</tr>
<tr>
<td>1</td>
<td>Door Closer</td>
<td>DC6200/DC6210</td>
<td>COR</td>
</tr>
<tr>
<td>1</td>
<td>Kick Plate</td>
<td>193S</td>
<td>HAG</td>
</tr>
<tr>
<td>3</td>
<td>Silencers</td>
<td>SR64</td>
<td>IVE</td>
</tr>
</tbody>
</table>

- Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied.
Modify size and quantity as required.

Set No. 29
Each to have:
1  Ea. Butts  BB1279 (Top)  HAG  652
2  Ea. Spring Hinge  1250 (Middle and Bottom)  HAG  626
1  Lever Privacy  CL3320 – NZD  COR  626
1  Kick Plate  193S  HAG  630
1  Mop Plate  193S  HAG  630
1  Door Stop  236W / 241F  HAG  626
3  Silencers  SR64  IVE  - -

Set No. 30
Each to have:
1  Ea. Butts  BB1279 (Top)  HAG  652
2  Ea. Spring Hinge  1250 (Middle and Bottom)  HAG  626
1  Lever Privacy  CL3320 – NZD  COR  626
1  Overhead Stop  GJ90S series  GJ  630
1  Kick Plate  193S  HAG  630
1  Mop Plate  193S  HAG  630
3  Silencers  SR64  IVE  - -

Set No. 31
Each to have:
3  Ea. Butts  BB1279  HAG  652
1  Push Plate  30S – 8” x 16”  HAG  630
1  Pull Plate  H33G – 4” x 16”  HAG  630
1  Door Closer  DC6210/DC6200  COR  689
1  Kick Plate  193S  HAG  630
1  Mop Plate  193S  HAG  630
1  Door Stop  236W  HAG  626
3  Silencers  SR64  IVE  - -

-Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify size and quantity as required.

Set No. 32
Each to have:
3  Ea. Butts  BB1279  HAG  652
1  Lever Office  CL3351 – NZD – CT6  COR  626
1  Overhead Stop  GJ90S series  GJ  630
1  Kick Plate  193S  HAG  630
3  Silencers  SR64  IVE  - -

Set No. 33
Each to have:
3  Ea. Butts  BB1279  HAG  652
1  Lever Storeroom  CL3357 – NZD – CT6  COR  626
1  Door Stop  236W / 241F  HAG  626
3  Silencers  SR64  IVE  - -
-Where noted on door schedule (*) Existing frame, field verify templating for new hardware to be applied. Modify size and quantity as required.

<table>
<thead>
<tr>
<th>Set No. 34</th>
<th>Each to have:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Continuous Hinges 780-112-HD HAG 628</td>
</tr>
<tr>
<td>1</td>
<td>Sets Push / Pull Bars 159V – BTB Mounted HAG 630</td>
</tr>
<tr>
<td>1</td>
<td>Door Closers DC6210/DC6200 x Drop plate as required COR 689</td>
</tr>
<tr>
<td>1</td>
<td>Door Stop 236W/241F as required HAG 626</td>
</tr>
</tbody>
</table>

Weatherstrip, thresholds, sweeps complete with aluminum doors where required.

<table>
<thead>
<tr>
<th>Set No. 35</th>
<th>Each to have:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Ea. Butts BB1191 – NRP HAG 626</td>
</tr>
<tr>
<td>1</td>
<td>Lever Classroom ML2065 – NSA – CT6 COR 626</td>
</tr>
<tr>
<td>1</td>
<td>Door Closer DC6210 – A12 COR 689</td>
</tr>
<tr>
<td>1</td>
<td>Kick Plate 193S HAG 630</td>
</tr>
<tr>
<td>1</td>
<td>Threshold 425 NGP 719</td>
</tr>
<tr>
<td>1</td>
<td>Door Sweep 200SA NGP 628</td>
</tr>
<tr>
<td>1</td>
<td>Set Weatherstrip 700SA – Head &amp; Jambs NGP 628</td>
</tr>
</tbody>
</table>

END OF SECTION 08 71 00
SECTION 12 35 53.19
WOOD LABORATORY CASEWORK AND RELATED PRODUCTS

PART 1: DESCRIPTION OF WORK

1.00 SUMMARY AND SCOPE

A. Section Includes:
   1. The basis of design is Kewaunee Scientific Corporation, SIGNATURE SERIES – CONTEMPORARY FULL OVERLAY – STYLE 5 Laboratory Furniture as a wood casework specification standard, furnish all cabinets and casework, including tops, ledges, supporting structures, and miscellaneous items of equipment as listed in these specifications, or equipment schedules including delivery to the building, setting in place, and leveling. Furnishing and installing all filler panels, knee space panels and scribes as shown on drawings.

   2. Furnishing and delivering all utility service outlet accessory fittings, electrical receptacles and switches, as listed in these specifications, equipment schedules or as shown on drawings as mounted on the laboratory furniture. The above-defined items shall be furnished with supply tank nipples and lock nuts, loose in boxes and properly marked. All plumbing and electrical fittings will be packaged separately and properly marked for delivery to the appropriate contractor.

   3. Furnishing and delivering, packed in boxes for installation by the mechanical contractor, all laboratory sinks, cup sinks or drains, drain troughs, overflows and sink outlets which occur above the floor, and where these items are part of the equipment or listed in the specifications, equipment schedules or shown on the drawings.

   4. Furnishing service strip supports and setting in place service tunnels, service turrets, supporting structures and reagent racks of the type shown on the details.

   5. Removal of all debris, dirt and rubbish accumulated as a result of the installation of the laboratory furniture to an onsite container provided by others, leaving the premises clean and orderly.

B. Related Divisions:
   1. Divisions 5 & 6 : Behind-the-Wall Blocking and Studs
   2. Division 9 : Base Molding
   3. Division 11 : Chemical Fume Hoods
   4. Division 15 : Plumbing
   5. Division 16 : Electrical Fittings and Connections

C. Related Publications:
   1. SEFA 3 – Scientific Equipment and Furniture Association
   2. SEFA 8 – Scientific Equipment and Furniture Association
   3. NFPA 30 – National Fire Protection Association
   4. NFPA-45 - National Fire Protection Association
   5. UL - Underwriters Laboratory
   6. ASTM D552 - Bending Test
   7. ANSI/HPVA HP-1 1994 – Hardwood Plywood
   8. ANSI A208.1-1999 – Particleboard Plywood
   9. ANSI A208.2-1994 – MDF Plywood

1.01 BASIS OF WORK
A. It is the intent of this specification to use Kewaunee Scientific Corporation, SIGNATURE SERIES – CONTEMPORARY FULL OVERLAY – STYLE 5 Laboratory Furniture as the standard of construction for laboratory furniture. The construction standards of this product line shall provide the basis for quality and functional installation.

B. Supply all equipment in accordance with this specification. The offering of a product differing in materials and construction from this specification requires written approval from the owner/architect. This approval must be obtained seven (7) days before the quotation deadline. Procedures for obtaining approval for an alternate manufacturer are defined in section 2.00.C in this specification.

C. General Contractors should secure a list of approved wood laboratory furniture manufacturers from the architect as a protection against non-conformance to these specifications.

D. Participants in the quotation process have the option of clarifying deviations to the specified design, construction, or materials. Without such clarifications, sealed quotations to the owner or owner representative will be construed as being in total conformance to the requirements of the specification.

E. The owner / owner representative reserves the right to reject qualified or alternate proposals and to award based on product value where such action assures the owner greater integrity of product.

1.02 QUALITY ASSURANCE

A. The wood laboratory furniture contractor shall also provide work tops and fume hoods all manufactured or shipped from the same geographic location to assure proper staging, shipment and single source responsibility.

B. General Performance: Provide certification that furniture shall meet the performance requirements described in SEFA 8.

C. Finish Performance: Provide independent test lab certification that the furniture finish shall meet the performance requirements described in section 2.03 of these specifications.

1.03 SUBMITTALS

A. Manufacturer’s Data: Submit manufacturer’s data and installation instructions for each type of casework. Provide data indicating compliance with SEFA 8 Standard.

B. Shop Drawings:
   Submit shop drawings for furniture assemblies showing plans, elevations, ends, cross-sections, service run spaces, location and type of service fittings.
   1. Coordinate shop drawings with other work involved.
   2. Provide roughing-in drawings for mechanical and electrical services when required.

PART 2 – PRODUCTS

2.00 MANUFACTURERS

A. The basis of this specification is wood casework manufactured according to the standards used by Kewaunee Scientific Corporation. The specified design is Signature Series – CONTEMPORARY FULL OVERLAY – STYLE 5. Mott Manufacturing, Steve Ward, and
Scott Lab are also approved manufacturers. All laboratory equipment covered by the specification shall be the product of one manufacturer and be fabricated at one geographic location to assure shipping continuity and single-source responsibility. All quotations from a manufacturer other than Kewaunee Scientific Corporation shall contain a review of the following capabilities:
1. List of shop facilities
2. List of engineering and manufacturing personnel
3. Proof of financial ability to fulfill the contract
4. List of a minimum of ten (10) installations over the last five (5) years of comparable scope
5. Proof of project management and installation capabilities
6. SEFA member in Good Standing

B. The selected manufacturer must warrant for a period of one-year, starting on the date of acceptance or occupancy, whichever comes first, that all products sold under the contract referenced above shall be free from defects in material and workmanship. Purchaser shall notify the manufacturer’s representative immediately of any defective product. The manufacturer shall have a reasonable opportunity to inspect the goods. The purchaser shall return no product until receipt by purchaser of written shipping instructions from the manufacturer.

C. Samples:
Samples from non-specified manufacturers will be required and reviewed per specification. Samples shall be delivered, at no cost to the architect or owner to a destination set forth by the architect or owner. This must be done seven (7) days before quotation deadline as a condition of approval of each bidder. Samples shall be full size, production type samples. Miniature, or "Show Room" type samples are not acceptable. Furnish the following:
1. One combination drawer and cupboard base unit showing complete construction details, including one shelf.
2. One acid storage base cabinet typical of specified elevations.
3. One sample of all top materials shown or called for, of sufficient size to perform finish requirement tests.
4. Sample of all mechanical service fittings, locks, door pulls, hinges, and interior hardware.

D. The above samples of the successful manufacturer will be impounded by the architect or owner to ensure that material delivered to the jobsite conforms in every respect to the samples submitted.

E. Manufacturer to provide local, off-site factory storage, for up to 30 days, at no charge to General Contractor or Owner, for rolling just-in-time deliveries.

2.01 MATERIALS

Material shall be selected so that the finished installation shall provide an attractive and harmonious appearance. All exterior casework surfaces exposed to view after installation, and cabinet interior surfaces, shall be White Maple. Solid woods and veneers exposed to view after completion of installation shall be of color and graining in conformance with the normally accepted standards required of the scientific laboratory equipment industry.

A. Solid Woods:
All solid woods shall be carefully and thoroughly air-dried, then kiln dried in humidity controlled kilns to a moisture content of 4-1/2%. All kiln dried lumber shall then be tempered to a moisture content of 6% before use. This moisture content shall be maintained throughout production.

B. Plywoods:
All plywood shall be hardwood plywood. Softwoods such as Fir or Pine are not permitted.
1. Combination Core Plywood
a. Plywood shall be minimum 7-ply (3/4") combination core plywood and shall be compliant with ANSI/HPVA HP-1 2004
b. Plywood shall be minimum 9-ply (1") combination core plywood and shall be compliant with ANSI/HPVA HP-1 2004

2. Composition Core Plywood
Composition core plywood shall be 3-ply and shall be compliant with ANSI A208.1-1999, and/or ANSI A208.2-1994.

3. Face Veneers
Plywood face veneers shall be Grade A, plain sliced, slip matched, White Maple on face, and Grade 1, White Maple on back.

C. Banding:
Plywood panels shall be edge banded as specified with 3mm hardwood edgebanding to match the plywood veneer.

D. Hardboard:
Hardboard shall be a wood fiber/resinous combination formed with heat and pressure into sheets providing a hard, smooth surface.

E. Glass:
Glass used for framed sliding and swinging doors shall be 1/8" float glass. Glass used for unframed sliding doors, shall be 1/4" float glass.

F. Hardware and Trim:
1. Drawer and Door Pulls:
   Drawer and door pulls shall be mounted on 4" centers, offering a comfortable hand grip, and be securely fastened to doors and drawers.
   They shall be manufactured from:
   3/8" diameter stainless steel rod with a brushed satin finish.

Use of plastic pulls (molded or extruded), or a design not compatible for usage by the handicapped shall be unacceptable.

2. Flush Pulls:
   Flush pulls for sliding doors shall be satin finish chrome, providing a recessed finger grip.
   Finger holes or slots machined into doors shall be unacceptable.

3. Hinges:
   Hinges shall be the five (5) knuckle, satin finish stainless steel, institutional, offset type for all swinging doors. Hinges shall be 2-3/4" long, and secured to cabinet and doors with flathead screws, so applied to withstand a weight load of 150 lbs. minimum.

4. Locks:
   Disk Tumbler:
   Locks when shown or called for shall be a 5-disc tumbler with heavy duty interchangeable cylinder. Exposed lock noses shall be dull nickel (satin) plated and stamped with identifying numbers. Locks shall have capacity for 2000 primary key changes. Master key one level with the potential of 10 different, non-interchangeable master key groups.

5. Roller Catches:
   Roller Catches shall have a spring-loaded polyethylene roller and a steel strike plate.

6. Elbow Catches:
   Elbow catches and strike plates shall be cast aluminum with bronze finish.

7. Drawer Slides:
Drawer slides shall be zinc plated, cold rolled steel, full extension, linear ball bearing slides rated at 100 pounds minimum. The drawer shall be removable without the use of tools.

8. Leg Shoes:
   Leg shoes shall be provided on all table legs. Shoes shall be 2-1/2" high and a pliable, black vinyl material. Use of a leg shoe which does not conceal leveling or anchoring device will not be acceptable.

9. Floor Glides:
   Floor glides, where specified for movable open-leg tables, shall be a non-marring material at least 1" dia. to prevent indenting composition flooring and shall have at least a 5/8" height adjustment. Use of metal buttons will not be acceptable.

10. Dowels:
    Dowels used to join frames and panels shall be fluted hardwood not less than 8mm in diameter.

11. Shelf Support Clips:
    Shelf support clips shall be twin pin type for mounting on interior of cabinet end panels. Clips shall be corrosion resistant and shall retain shelves from accidental removal and tipping. Shelves shall be adjustable on 32mm centers. Surface mounted metal support strips and clips subject to corrosion are not acceptable.

12. Base Molding:
    Base molding shall be provided by others.

13. Support Rods, Upright Rod Assemblies and Rod Sockets:
    Upright rods, cross rods and ring support rods, where specified, shall be anodized Duraluminum (1/2" or 3/4" dia., as required). Rod sockets shall be chrome plated brass, secured through table tops with lock nut and spring washer. Rod clamps shall be heavy duty, designed to securely hold rod assembly in any position.

14. Label Holders:
    Label holders, where shown or called for, shall be self-adhesive type aluminum with satin finish and designed for 2-1/2" x 1-1/8" cards, unless otherwise specified.

15. Number Plates:
    Number plates, where shown or called for, shall be aluminum brad-attached type with satin finish and indented black lettering.

16. Sink Supports:
    Sink Supports, where required, shall be of a cradle type consisting of two 1-1/4" x 1-3/4" horizontal cleats and adjustable leveling bolts or glides. The horizontal cleats shall be supported by two 3/4" x 2-1/2" hardwood plywood cleats attached to the cabinet end panels, or by four 1/4" steel rods attached to the cabinet top frame.

17. Support Struts:
    Support struts shall consist of two 16 gauge channel uprights fastened top and bottom by two adjustable "U" shaped spreaders, each 12 gauge, 1-1/2" x length required. Struts shall be furnished to support drain troughs, and to support work top at plumbing space under fume hood superstructures or other heavy loads. They shall be fabricated so as to accept industry standard, pipe and conduit hangers.

2.02 CONSTRUCTION
A. General Requirements:
   It is the intent of this specification to provide a high-quality wood cabinet specifically designed for the laboratory environment. The cabinet shall be full overlay construction with 3/4" thick door and drawer fronts. The door and drawer fronts shall occupy a plane extending 3/4" past the plane of the front of the cabinet body. Edges of door and drawer fronts shall be square. The doors and drawer fronts shall overlay the face of the cabinet leaving minimal reveals between doors and drawers of approximately 1/8". All cabinet end panels shall be finished for the purpose of future relocation unless cabinet is selected with the "unfinished end" option. The exposed grain for doors and drawer fronts shall run vertical be matched to the door or drawer front above or below it. Knee spaces, backs of instructor stations, and student workstations to be vertical matched.

B. Base Cabinets:
   1. End Panels, Bottoms, and Shelves:
      All cabinet end panels shall be 3/4" thick White Maple veneer core plywood edge banded on exposed edges. End panels shall be multiple doweled, glued, and screwed to top frame members, intermediate rails, and bottoms. Cupboard bottoms shall be 3/4" thick White Maple veneer core plywood edge banded on exposed edge. All cupboard base cabinet shelves shall be full-width adjustable, 3/4" thick White Maple veneer core plywood edge banded on exposed edge. Integrally joined parts shall result in a totally enclosed cabinet.

   2. Backs:
      Cabinet backs shall be 1/4" thick hardboard, dadoed into end panels and securely fastened to cabinet bottom and top back rail. Backs that are attached to end panels with cleats shall be unacceptable.

   3. Top Frame:
      Two-piece Top Frame
      The cabinet top frame shall consist of a front rail and a back rail. The front rail shall be 3-1/8" x 1" hardwood with 3mm White Maple facing. The back rail shall be 2-1/2" x 3/4" hardwood plywood.

   4. Drawers:
      Drawers with Hardboard Bottom:
      Drawer sides, back, and sub-front shall be 1/2" thick, 9-ply Birch plywood. Drawer heads shall be 3/4" thick, White Maple, composite core plywood. A dovetail joint shall be used to attach the drawer sub-front and drawer back to the drawer sides. Drawer bottoms shall be 1/4" thick hardboard, set and hot-melt glued into 1/4" grooves, four sides. Each drawer shall have one pull mounted horizontally, drawers over 24" long shall have two pulls. Drawer sub-fronts attached to drawer sides with a lock-tenon joint shall be unacceptable.

   5. Doors:
      a. Swinging doors shall be 3/4", White Maple, composite core plywood edge banded on all four edges, mounted on cabinet with 1 pair of offset hinges and shall be latched with a roller catch. Double doors without locks shall have a roller catch on each door. Double doors with locks shall have an elbow catch mounted on the left-hand door and the lock and a roller catch mounted on the right-hand door. Each door shall have one pull mounted vertically.

      b. Sliding doors shall be 3/4" thick, White Maple, composite core plywood, edge banded on the vertical edges. Doors shall be suspended from adjustable hangers and glide on nylon rollers riding on a double extruded aluminum track attached to the top of the cabinet. Each door shall have one recessed pull.
C. Counter Mounted and Wall Mounted Cabinets:

1. Cabinet:
All cabinet end panels shall be 3/4" thick White Oak veneer core plywood edge banded on front and bottom edge. Tops and bottoms shall be 1" thick White Maple veneer core plywood edge banded on exposed edge, multiple doweled into end panels, and secured with glue and countersunk screws. Shelves shall be 1" thick White Maple veneer core plywood edge banded on exposed edge. Shelves shall be adjustable on 32mm centers utilizing shelf support clips. The backs in open and glazed door cases shall be 1/4" White Maple composite or veneer core plywood while the back not exposed to view shall be 1/4" hardboard. Case interior shall be flush.

2. Doors:
   a. Sliding Doors:
      1) Door Construction
         Panel doors shall be 3/4" thick, White Maple, composite core plywood, edge banded on the vertical edges. Glazed doors shall have 3/4" x 3-3/16" White Maple framing, mortised, tenoned, and glued. Glass shall be set into door frame and secured with a plastic retainer. Each door shall have one recessed pull.
      2) Door Mounting:
         Sliding doors shall be suspended from adjustable hangers and glide on nylon rollers riding on a double extruded aluminum track attached to the cabinet top.
   
   b. Sliding Plate Glass Doors:
      Solid glass doors shall be 1/4" thick float glass with polished edges. Doors shall be set in an aluminum bottom frame containing roller bearings and held in position with an aluminum guide at the top of the case.
   
   c. Swinging Doors:
      1) Door Construction:
         Panel doors shall be 3/4", White Maple, composite core plywood edge banded on all four edges. Glazed doors shall have 3/4" x 3-3/16" White Maple framing mortised, tenoned, and glued. Glass shall be set into door frame and secured with a plastic retainer. Each door shall have one pull mounted vertically.
      2) Door Mounting:
         Swinging doors shall be hung on 1 pair of offset hinges, under 48" in height, and 1-1/2 pair on cabinets 48" high.
      3) Door Latching:
         Doors shall latch with a roller catch. Double doors without locks shall have a roller catch on each door. Double doors with locks shall have an elbow catch mounted to the left-hand door and the lock and a roller catch mounted on the right-hand door.

D. Full Height Storage Cabinets:

1. Cabinet:
All cabinet end panels shall be 3/4" thick White Maple veneer core plywood, edge banded on front edge. Tops shall be 1" thick White Maple veneer core plywood, edge banded on exposed edge, multiple doweled into end panels, secured with glue and countersunk screws. Shelves shall be 1" thick White Maple veneer core plywood, edge banded on exposed edge. To assure a completely rigid case, the center shelf shall be multiple doweled into end panels, secured with glue and countersunk screws. All other shelves shall be adjustable on 32mm centers utilizing shelf support clips.

Cabinet bottoms shall be 3/4" thick White Maple veneer core plywood, edge banded on exposed edge, multiple doweled and glued securely to end panels. A 3/4" x 4" hardwood veneer core plywood toe space rail on 22" deep cabinets shall be offset 3" from face to
form a 4" high totally enclosed toe space. 12" and 16" deep cabinets shall have a 3/4" x 4" hardwood veneer core plywood toe space rail mounted flush with the face of the cabinet. The backs in open and glazed door cabinets shall be 1/4" White Maple composite or veneer core plywood while the back not exposed to view shall be 1/4" hardboard. Cabinet interior shall be flush.

2. Doors:
   a. Sliding Doors:
      1) Door Construction:
         Panel doors shall be 3/4" thick, White Maple, composite core plywood, edge banded on the vertical edges. Glazed doors shall have 3/4" x 3-3/16" White Maple framing, mortised, tenoned, and glued. Glass shall be set into door frame and secured with a plastic retainer. Each door shall have one recessed pull.
      2) Door Mounting:
         Sliding doors shall be suspended from adjustable hangers and glide on nylon rollers riding on a double extruded aluminum track attached to the cabinet top.
   b. Swinging Doors:
      1) Door Construction:
         Panel doors shall be 3/4", White Maple, composite core plywood edge banded on all four edges. Glazed doors shall have 3/4" x 3-3/16" White Maple framing, mortised, tenoned, and glued. Glass shall be set into door frame and secured with a plastic retainer.
         Each door shall have one pull mounted vertically.
      2) Door Mounting:
         Each door shall be hung on 1-1/2 pair of offset hinges.
      3) Door Latching:
         Doors shall latch with a roller catch. Double doors without locks shall have a roller catch on each door. Double doors with locks shall have an elbow catch and White Maple astragal mounted to the left-hand door and the lock and a roller catch mounted on the right-hand door.

E. Open-leg Tables:
   Legs shall be hardwood core with White Maple veneer, 2-1/2" square, with all corners radiused 1/32". Legs shall be secured to the apron frame by a heavy duty corner bolt and a 14-gauge metal corner brace. Corner braces shall be locked into apron rails by accurately located grooves and shall be securely fastened with screws. This construction shall guarantee equal tension on all wood and metal parts. All apron rails exposed to view shall be 3/4" thick, solid White Maple. Leg stretchers, where required, shall be 1-5/16" x 2-1/2", White Maple, securely joined to the legs without visible fasteners.

F. Adjustable Full Height Wall Shelving:
   1. Powder coated steel, double-slotted, full height uprights to allow for 1" shelving height adjustments
   2. Uprights designed to fit two shelving bracket ends when needed
   3. Shelves incorporate “flip-and-fold” relocation capability where shelf may be repositioned in the side brackets and adjustable on 1" increments to allow for cord pass through at wall locations. Adjustment is accomplished without the use of tools (mechanical fasteners are not allowed)
   4. Shelves are 9", 12", 18", and 24"D, and are available in lengths from 24" to 72" on 6" increments

G. Instructors Station:
   Kewaunee Matrix Instructor Station – part number = X33 Instructor Station. Shall serve as a demonstration table, desk, and specialty storage area for classroom instructors. Casework shall include: cupboard, drawers, and custom storage for overhead projectors.
Construction shall conform to paragraphs 2.01 and 2.02 above. Accessories shall include: Kemresin worksurface and drop-in sink with sink outlet (18"x15"x11"), hot and cold water mixing faucet, 90° double outlet gas fitting, two (2) rod sockets with aluminum rod assembly, four (4) GFI protected 120 VAC duplex receptacles, two (2) duplex RJ45 data jacks, and a keyboard tray with mouse platform, monitor arm, and CPU holder. See drawings for shape, angling, and storage and shelving requirements.

- 41.5"H sash height viewing window with lifetime belt and dual axle counterbalance system. Lower sash handle includes integral cable pass-throughs on both corners
- Underlying solvent/acid storage cabinets; acid cabinets to vent into fume hood worksurface in front of rear baffles
- LED lights with (3) color/temperature settings with (15) different intensity levels, providing 100 ft. candles at the worksurface
- Prewired double duplex GFCI receptacles on both post of each fume hood
- Flush lower airfoil at countertop. Venturi ports/openings at each post to address ASHRAE 110-2016 standards for enhanced containment at lower corners of sash opening.
- Prepiped for water (including cupsink) and gas utility services
- Provide fume hood ASHRAE 110-2016 testing at factory for Owner to witness at no charge to client.

I. Laminar Flow Hoods – Esco Airstream Laminar Flow Clean Bench – Model No. LHG4BG-F9
- 52.8"W x 31"D x 50"H external dimensions
- 45.7"W x 23.4"D x 28.5"H gross internal dimensions
- 90 fpm average airflow velocity
- 832 cfm
- >130 foot-candles fluorescent lamp intensity
- .05" (1.2mm)/18 gauge EG steel with Isocide™ Oven-Baked Epoxy-Polyester Powder Coating main body
- .05" (1.2mm)/18 gauge Stainless Steel (Type 304) with 4B finish work zone
- UV absorbing tempered safety glass (.2"/.5mm, colorless and transparent)
- 115-120V, single phase, 50/60HZ, 12.4 A full load amps
- STL telescoping stand with leveling feet, 26"-35"H and underlying horizontal strut
- Pre-filter to be included
- DC ECM blower to be included
- Air Flow Sensor
- Type 304 Stainless steel worksurface
- GFCI internal power receptacle (top of cabinet interior)

2.00 FINISH AND PERFORMANCE REQUIREMENTS
All cabinet end panels, whether exposed to view in the final installation or not, shall be stained and finished to match cabinet face to allow the cabinet to be relocated at a later date unless cabinet is selected with the "unfinished end" option.

A. Environmental Standards:
The finish must be low VOC and reclaimable with enclosed spray and/or roll coat application;
thus providing an environmentally responsible product. All panels and adhesives must meet CARB2 emission standards.

B. Wood Surface Preparation:
Prior to application of wood finish, all cabinet component surfaces shall be sanded smooth to remove loose fibers, scratch marks, and abrasions, with all dust thoroughly removed.

C. Wood Finish Application:
Cabinet components shall be finished using a state of the art flat-line system. The finish shall be applied under controlled conditions prior to casework assembly and attachment of hardware. This will provide maximum coverage and protection to the assembled product. The finish shall be fully UV cured to ensure proper performance.

D. Interior Wood Casework Finish:
Interior surfaces shall receive two applications of chemical-resistant, UV cured, epoxy top coat. The first application will be cured, sanded, and cleaned. The final top coat will then be applied and fully cured to match same SEFA rated finish as exterior.

E. Exterior Wood Casework Finish:
Exposed exterior surfaces, and interiors of glazed cabinets and open cabinets shall be stained and additionally sealed with two applications of chemical-resistant epoxy topcoat. The fully reclaimable low VOC water-borne stain shall be uniformly applied by a series of automated spray applicators. The stained components shall then travel through a series of heated chambers to incrementally achieve a temperature of 140 degrees F to dry the stain material. The first of two low VOC epoxy topcoats shall be applied, cured, sanded, and cleaned. The final topcoat will then be applied and UV cured, providing a semi-gloss sheen. The completed product shall meet the performance test requirements specified under PERFORMANCE TEST RESULTS paragraph F and SEFA.

F. Performance Test Results (Chemical Spot Tests):
1. Testing Procedure:
Chemical spot tests for non-volatile chemicals shall be made by applying 5 drops of each reagent to the surface to be tested and covering with a 1-1/4" dia. watch glass, convex side down to confine the reagent. Spot tests of volatile chemicals shall be tested by placing a cotton ball saturated with reagent on the surface to be tested and covering with an inverted 2-ounce wide mouth bottle to retard evaporation. All spot tests shall be conducted in such a manner that the test surface is kept wet throughout the entire test period, and at a temperature of 77° ±3° F. For both methods, leave the reagents on the panel for a period of one hour. At the end of the test period, the reagents shall be flushed from the surface with water, and the surface scrubbed with a soft bristle brush under running water, rinsed and dried. Volatile solvent test areas shall be cleaned with a cotton swab soaked in the solvent used on the test area. Immediately prior to evaluation, 16 to 24 hours after the reagents are removed, the test surface shall be scrubbed with a damp paper towel and dried with paper towels.

2. Test Evaluation:
Evaluation shall be based on the following rating system.

Level 0 – No detectable change.
Level 1 – Slight change in color or gloss.
Level 2 – Slight surface etching or severe staining.
Level 3 – Pitting, cratering, swelling, or erosion of coating. Obvious and significant deterioration.

After testing, panel shall show no more than three (3) Level 3 conditions.

3. Test Reagents
<table>
<thead>
<tr>
<th>Test No.</th>
<th>Chemical Reagent</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Acetate, Amyl</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>2.</td>
<td>Acetate, Ethyl</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>3.</td>
<td>Acetic Acid, 98%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>4.</td>
<td>Acetone</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>5.</td>
<td>Acid Dichromate, 5%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>6.</td>
<td>Alcohol, Butyl</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>7.</td>
<td>Alcohol, Ethyl</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>8.</td>
<td>Alcohol, Methyl</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>9.</td>
<td>Ammonium Hydroxide, 28%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>10.</td>
<td>Benzene</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>11.</td>
<td>Carbon Tetrachloride</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>12.</td>
<td>Chloroform</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>13.</td>
<td>Chromic Acid, 60%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>14.</td>
<td>Cresol</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>15.</td>
<td>Dichlor Acetic Acid</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>16.</td>
<td>Dimethylformamide</td>
<td>Cotton ball &amp; bottle</td>
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<tr>
<td>17.</td>
<td>Dioxane</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>18.</td>
<td>Ethyl Ether</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>19.</td>
<td>Formaldehyde, 37%</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>20.</td>
<td>Formic Acid, 90%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>21.</td>
<td>Furfural</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>22.</td>
<td>Gasoline</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>23.</td>
<td>Hydrochloric Acid, 37%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>24.</td>
<td>Hydrofluoric Acid, 48%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>25.</td>
<td>Hydrogen Peroxide, 3%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>26.</td>
<td>Iodine, Tincture of Iodine</td>
<td>Watch glass</td>
</tr>
<tr>
<td>27.</td>
<td>Methyl Ethyl Ketone</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>28.</td>
<td>Methylene Chloride</td>
<td>Cotton ball &amp; bottle</td>
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<td>29.</td>
<td>Mono Chlorobenzene</td>
<td>Cotton ball &amp; bottle</td>
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<td>30.</td>
<td>Naphthalene</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>31.</td>
<td>Nitric Acid, 20%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>32.</td>
<td>Nitric Acid, 30%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>33.</td>
<td>Nitric Acid, 70%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>34.</td>
<td>Phenol, 90%</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>35.</td>
<td>Phosphoric Acid, 85%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>36.</td>
<td>Silver Nitrate, Saturated</td>
<td>Watch glass</td>
</tr>
<tr>
<td>37.</td>
<td>Sodium Hydroxide, 10%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>38.</td>
<td>Sodium Hydroxide, 20%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>39.</td>
<td>Sodium Hydroxide, 40%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>40.</td>
<td>Sodium Hydroxide, Flake</td>
<td>Watch glass</td>
</tr>
<tr>
<td>41.</td>
<td>Sodium Sulfide, Saturated</td>
<td>Watch glass</td>
</tr>
<tr>
<td>42.</td>
<td>Sulfuric Acid, 33%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>43.</td>
<td>Sulfuric Acid, 77%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>44.</td>
<td>Sulfuric Acid, 96%</td>
<td>Watch glass</td>
</tr>
<tr>
<td>45.</td>
<td>Sulfuric Acid, 77% and Nitric Acid, 70%, equal parts</td>
<td>Watch glass</td>
</tr>
<tr>
<td>46.</td>
<td>Toluene</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>47.</td>
<td>Trichloroethylene</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>48.</td>
<td>Xylene</td>
<td>Cotton ball &amp; bottle</td>
</tr>
<tr>
<td>49.</td>
<td>Zinc Chloride, Saturated</td>
<td>Watch glass</td>
</tr>
</tbody>
</table>

* Where concentrations are indicated, percentages are by weight.

G. Performance Test Results (Heat Resistance):

Hot water (190°F - 205°F) shall be allowed to trickle (with a steady stream at a rate not less than 6 ounces per minute) on the finished surface, which shall be set at an angle of 45° from
horizontal, for a period of five minutes. After cooling and wiping dry, the finish shall show no visible effect from the hot water treatment.

H. Performance Test Results (Moisture Resistance):
A cellulose sponge (2" x 3" x 1") shall be soaked with water and placed on the finished surface for a period of 100 hours. The sponge shall be maintained in a wet condition throughout the entire test period. At the end of the test period, the surface shall be dried and no visible effect shall be shown on the finish.

I. Performance Test Results (Impact Resistance):
A one-pound ball (approximately 2" diameter) shall be dropped from a distance of 12 inches onto the finished surface of a 3/4" thick plywood panel supported underneath by a solid surface. There shall be no evidence of cracks or checks in the finish due to impact upon close eye-ball examination.

2.01 WORKSURFACES

A. Materials
1. Kemresin Epoxy Resin Tops
   a. Color: Grey
   b. Epoxy Resin tops shall consist of modified epoxy resin that has been especially compounded and cured to provide the optimum physical and chemical resistance properties required of a heavy-duty laboratory table top. Tops and curbs shall be a uniform mixture throughout their full thickness, and shall not depend upon a surface coating that is readily removed by chemical and/or physical abuse. Tops and curbs shall be non-glaring. Tops shall be 1" thick, exposed edges beveled top and bottom, and drip grooves provided on the underside at all exposed edges. 4" high curbs at the backs and ends of tops shall be 1" thick and bonded to the deck to form a square watertight joint. Sink cutouts shall be smooth and uniform without saw marks with the top edge beveled. The bottom edge of the sink opening shall be finished smooth with the edge broken to prevent sharpness. Corners of sink cutouts shall be radiused not less than ¾".

B. Performance Requirements:
1. Molded Epoxy Resin (Kemresin)
   a. Physical Properties:
      Flexural Strength (A.S.T.M. Method D790-90) = 15,000 PSI
      Compressive Strength (A.S.T.M. Method D695-90) = 30,000 PSI
      Hardness, Rockwell E (A.S.T.M. Method D785-89) = 100
      Water Absorption (A.S.T.M. Method D570-81)% by weight, 24 Hour = 0.04 % by weight, 7 Days = 0.05 % by weight, 2 Hour Boil = 0.04
      Specific Gravity = 1.97
      Tensile Strength = 8,500 PSI
   b. Performance Test Results (Heat Resistance):
      A high form porcelain crucible, size 0, 15 ml capacity, shall be heated over a Bunsen burner until the crucible bottom attains an incipient red heat. Immediately, the hot crucible shall be transferred to the top surface and allowed to cool to room temperature. Upon removal of the cooled crucible, there shall be no blisters, cracks or any breakdown of the top surface whatsoever
   c. Performance Test Results (Chemical Resistance):
      Tops shall resist chemical attacks from normally used laboratory reagents. Weight
change of top samples submerged in the reagents* listed in the next paragraph for a period of seven (7) days shall be less than one-tenth of one percent, except that the weight change for those reagents marked with ** shall be less than one percent. (Tests shall be performed in accordance with A.S.T.M. Method D543-67 at 77o F.).

*Where concentrations are indicated, percentages by weight.

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Concentration</th>
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</thead>
<tbody>
<tr>
<td>Acetic Acid, Glacial</td>
<td></td>
</tr>
<tr>
<td>Acetic Acid, 5%</td>
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<tr>
<td>Ammonium Hydroxide, 28%</td>
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<tr>
<td>Ammonium Hydroxide, 10%</td>
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<tr>
<td>Aniline Oil</td>
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</tr>
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<td>Benzene</td>
<td></td>
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<tr>
<td>Carbon Tetrachloride</td>
<td></td>
</tr>
<tr>
<td>Chromic Acid, 10%</td>
<td></td>
</tr>
<tr>
<td>Cottonseed Oil</td>
<td></td>
</tr>
<tr>
<td>Dichromate Cleaning Solution**</td>
<td></td>
</tr>
<tr>
<td>Diethyl Ether</td>
<td></td>
</tr>
<tr>
<td>Dimethyl Formamide</td>
<td></td>
</tr>
<tr>
<td>Distilled Water</td>
<td></td>
</tr>
<tr>
<td>Detergent Solution, 1/4%</td>
<td></td>
</tr>
<tr>
<td>Ethyl Acetate</td>
<td></td>
</tr>
<tr>
<td>Ethyl Alcohol, 95%</td>
<td></td>
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<tr>
<td>Ethyl Alcohol, 50%</td>
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<tr>
<td>Ethylene Dichloride</td>
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<tr>
<td>Heptane</td>
<td></td>
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<tr>
<td>Hydrochloric Acid, 37%</td>
<td></td>
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<tr>
<td>Hydrochloric Acid, 10%</td>
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<tr>
<td>Hydrogen Peroxide, 28%</td>
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<tr>
<td>Hydrogen Peroxide, 3%</td>
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<tr>
<td>Acetic Acid, 5%</td>
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<tr>
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<td>Distilled Water</td>
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<tr>
<td>Ethyl Acetate</td>
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<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Hydrogen Peroxide, 3%</td>
<td></td>
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</tbody>
</table>

NOTE: Dichromate cleaning solution is a formula from Lange’s Handbook of Chemistry.

d. Performance Test Results (Chemical Spot Tests - 24 Hours):
Chemical spot tests shall be made by applying 10 drops (approximately 1/2 cc) of each reagent to the surface to be tested. Each reagent (except those marked **) shall be covered with a 1-1/2” diameter watch glass, convex side down to confine the reagent. Spot tests of volatile solvents marked ** shall be tested as follows: A 1” or larger ball of cotton shall be saturated with the solvent and placed on the surfaces to be tested. The cotton ball shall then be covered by an inverted 2-ounce, wide mouth bottle to retard evaporation. All spot tests shall be conducted in such a manner that the test surface is kept wet throughout the entire 24-hour test period and at a temperature of 77 degrees F. + 3 degrees F. At the end of the test period, the reagents shall be flushed from the surfaces with water and the surface scrubbed with a soft bristle brush under running water, rinsed, and dried. Volatile solvent test areas shall be cleaned with a cotton swab soaked in the solvent used on the test area. Spots where dyes have dried shall be cleaned with a cotton swab soaked in alcohol to remove the surface dye. The test panel shall then be evaluated immediately after drying.

Ratings:

A = No effect or slight change in gloss.
B = Slight change in color or marked loss of gloss.
C = Slight surface etching or severe staining.
D = Swelling, pitting, or severe etching.
Reagents*                                     Rating          Acetic Acid, 98%                           A
Acetone**                                    A
          Ammonium Hydroxide, 28%                        A
          Carbon Tetrachloride**                        A
          Chloroform**                                 A
          Chromic Acid, 60%                             C
          Chromic Acid, 40%                             C
          Dichromate Cleaning Solution***               C
          Dimethyl Formamide                           A
          Ethyl Acetate**                               A
          Ethyl Alcohol**                              A
          Formaldehyde, 37%                            A
          Formic Acid, 90%                             A
          Hydrochloric Acid, 37%                        A
          Hydrofluoric Acid, 48%                        C
          Hydrogen Peroxide, 28%                        A
          Methanol**                                   A
          Methylethyl Ketone**                          A
          Nitric Acid, 70%                              B
          Phenol, 85%                                   A
          Phosphoric Acid, 85%                          A
          Sodium Carbonate, 20%                         A
          Sodium Hydroxide, 40%                         A
          Sodium Hydroxide, 10%                         A
          Sodium Hypochlorite, 5%                       A
          Sulfuric Acid, 96%                            D
          Sulfuric Acid, 85%                            A
          Toluene**                                     A
          Wrights Blood Stain                          A
          Xylene**                                      A

*Where concentrations are indicated, percentages are by weight.
**Indicates these solvents tested with cotton and jar method.
***Dichromate cleaning solution is a formula from Lange's Handbook of Chemistry.

2.02 SINKS CUPSINKS, AND DRAINS

A. Sinks:

2.03 FITTINGS

A. Materials:
   1. Red brass or bronze with polished chrome finish

B. Construction:
   1. See drawings for fittings requirements
   2. Service fixtures shall be WaterSaver brand needle valve series
   3. Mixing faucets shall include 8” swing-type gooseneck with aerator with blade handles
   4. Integral vacuum breakers at all general water faucets
   5. Traps provided by Plumbing Contractor
   6. Electrical Fittings by Electrical Contractor except at countertop mounted tombstones and instructor stations
7. Tombstone locations at student tables to be double gang, single-sided, bright polished aluminum with stainless steel faceplates. Receptacles to be GFCI duplex receptacles.

PART 3 - EXECUTION - LABORATORY CASEWORK AND RELATED PRODUCTS

3.00 SITE EXAMINATION

A. The owner and/or his representative shall assure all building conditions conducive to the installation of a finished goods product; all critical dimensions and conditions previously checked have been adhered to by other contractors (general, mechanical, electrical, etc.) to assure a quality installation.

3.01 INSTALLATION

A. Preparation:
Prior to beginning installation of casework, check and verify that no irregularities exist that would affect quality of execution of work specified.

B. Coordination:
Coordinate the work of the Section with the schedule and other requirements of other work being performed in the area at the same time both with regard to mechanical and electrical connections to and in the fume hoods and the general construction work.

Manufacturer to provide local, off-site factory storage, for up to 30 days, at no charge to General Contractor or Owner, for rolling just-in-time deliveries.

C. Performance:
1. Casework:
   a. Set casework components plumb, square, and straight with no distortion and securely anchor to building structure. Shim as required using concealed shims.
   b. Screw continuous cabinets together with joints flush, tight and uniform, and with alignment of adjacent units within 1/16" tolerance.
   c. Secure wall cabinets to solid supporting material, not to plaster, lath or gypsum board.
   d. Abut top edge surfaces in one true plane. Provide flush joints not to exceed 1/8" between top units.

2. Worksurfaces:
   a. Where required due to field conditions, scribe to abutting surfaces.
   b. Only factory prepared field joints, located per approved shop drawings, shall be permitted. Secure the joints in the field, where practical, in the same manner as in the factory.
   c. Secure worksurfaces to casework and equipment components with materials and procedures recommended by the manufacturer.

D. Adjust and Clean:
1. Repair or remove and replace defective work, as directed by owner and/or his representative upon completion of installation.

2. Adjust doors, drawers and other moving or operating parts to function smoothly.

3. Clean shop finished casework; touch up as required.

4. Clean worksurfaces and leave them free of all grease and streaks.

5. Casework to be left broom clean and orderly.
E. Protection:
   1. Provide reasonable protective measures to prevent casework and equipment from being exposed to other construction activity.

   2. Advise owner and/or his representative of procedures and precautions for protection of material, installed laboratory casework and fixtures from damage by work of other trades.

END OF SECTION
DEMOlITION NOTES:

1. A SEPARATE DEMOLITION PLAN HAS BEEN PREPARED TO REMOVE ASPHALT PARKING, CURB AND GUTTER, SEWERS, UNDERGROUND UTILITIES AND RELATED INFRASTRUCTURE. REFER TO THE DEMOLITION PACKAGE FOR REQUIRED REMOVAL PROCEDURES.

2. REMOVAL OF EXISTING STORM DRAINAGE STRUCTURES SHALL BE COORDINATED WITH THE CONSTRUCTION OF THE NEW BUILDING PAD. EXISTING STORM DRAINAGE INFRASTRUCTURE SHALL REMAIN IN SERVICE AND FUNCTIONING WITH THE EXCEPTION OF EXISTING UG SEWER LINES WHICH ARE TO BE REMOVED. EXISTING STRUCTURES REMAINING SHALL BE REQUIRED TO CONVEY STORMFLOW INTO THE EXISTING OUTLET. WORK SHALL BE REQUIRED TO DEMOLISH, DEMO GRADES AND UTILITY RELOCATION. CONTRACTOR SHALL PERFORM IN ACCORDANCE WITH MODES REQUIREMENTS AND PROJECT SAVING.

3. CONTRACTOR SHALL PROTECT ALL UTILITY MANHOLES AND OTHER UNDERGROUND STRUCTURES NOT SHOWN FOR REMOVAL WITH STEEL PLATES THAT EXTEND A MINIMUM OF 2 FEET BEYOND THE OUTSIDE OF THE STRUCTURE AND A MAXIMUM DEPTH OF 2 INCHES IN THE FILL MATERIAL.

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL INSTALL EROSION AND SEDIMENT CONTROL MEASURES BEFORE BEGINNING SITE OF UTILITY RELOCATION WORK AND SITE GRAZING AND SHALL COMPLY WITH THE REQUIREMENTS OF TENNESSEE NODES PERMIT FOR STORM WATER DISCHARGES ASSOCIATED UTILITY INSTALLATION, EXCAVATION, AND RELATED INFRASTRUCTURE.

2. THE CONTRACTOR SHALL CONDUCT ALL WORK IN ACCORDANCE WITH THE REQUIREMENTS OF APPLICABLE REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) AND ALL LOCAL, STATE, FEDERAL RULES AND REGULATIONS.

GRADING AND EARTHWORK NOTES:

THE FOLLOWING GENERAL EARTHWORK PROCEDURE SHALL BE FOLLOWED FOR CONSTRUCTION OF ROADSWAYS, EMBANKMENTS, AND OTHER GENERAL GRAVING ACTIVITIES. THE EXISTING OUTFALLS. WORK SHALL BE SEQUENCED WITH DEMOLITION, MASS GRADING, AND UTILITY RELOCATION. CONTRACTOR SHALL PERFORM WORK IN ACCORDANCE WITH THE REQUIREMENTS OF TDEC REQUIREMENTS AND STANDARD DRAWINGS.

1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION REQUIREMENTS.

2. ALL TREES, SHRUBS AND OTHER VEGETATION WITHIN GRAVING LIMITS SHALL BE REMOVED FROM THE AREA TO BE GRAZED. REMOVE ORGANIC MATERIAL AND EXISTING FOUNDATIONS, FENCES, SLABS, PAVEMENTS, AND BELOW-GRADE STRUCTURES TO UNACCEPTABLE ROCK CONDITIONS (PER GEOTECHNICAL REPORT AND /OR FIELD OBSERVATIONS) WILL ALSO BE CONSIDERED “UNCLASSIFIED”. ALL ELEVATIONS OF ROCK TO UNACCEPTABLE ROCK CONDITIONS (PER GEOTECHNICAL REPORT AND /OR FIELD OBSERVATIONS) WILL ALSO BE CONSIDERED “UNCLASSIFIED”.

3. EXISTING FOUNDATIONS, FENCES, SLABS, PAVING, AND BELOW-GRADE STRUCTURES SHALL BE REMOVED FROM THE AREA TO BE GRAZED. REMOVE ORGANIC MATERIAL AND/OR EXISTING ROCK OR UNDERGROUND UTILITY MANHOLES AND OTHER UNDERGROUND STRUCTURES NOT SHOWN FOR REMOVAL WITH STEEL PLATES THAT EXTEND A MINIMUM OF 2 FEET BEYOND THE OUTSIDE OF THE STRUCTURE AND A MAXIMUM DEPTH OF 2 INCHES IN THE FILL MATERIAL.

4. ALL UTILITY TRENCHES SHALL BE BACKFILLED TO 98% MAXIMUM DENSITY UNDER PAVEMENT AND 95% MAXIMUM DENSITY UNDER VEGETATED AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRENCH SAFETY.

5. ALL UTILITY TRENCHES SHALL BE BACKFILLED FOR MAXIMUM DENSITY UNLESS PAYMENT AND 95% MAXIMUM DENSITY UNDER VEGETATED AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRENCH SAFETY.

6. REFER TO THE ELECTRICAL SITE PLANS FOR INFORMATION AND LOCATIONS OF RELOCATED UNDERGROUND ELECTRIC AND COMMUNICATION LINES.

7. REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR INFORMATION AND LOCATIONS OF RELOCATED HOT/CHILLED WATER LINES.

UTILITY NOTES:

1. SANITARY SEWER GRAVITY LINE SHALL BE PVC SDR35. SANITARY MANHOLES SHALL BE 4 FT DIAMETER, ECCENTRIC, REINFORCED CONCRETE MANHOLES.

2. SEWER LINES, SERVICE LINES, CLEANOUTS, MANHOLES, BACKFILL, ENGAGEMENT OF PE FRUIT, OR ANY OTHER APPEARANCE PER STANDARD SPECIFICATIONS AND DETAILS.

3. ANY MANHOLE IN THE SEWER LINES ENTERING AT ELEVATION OF GREATER THAN THE OUTLET SHALL BE CONNECTED BY A "DROP CONNECTION" MEETING TDEC AND LOCAL UTILITY REQUIREMENTS. MANHOLE ELOC CHANNEL, SEARCH, AND CONNECTIONS SHALL BE MADE FOR TDEC REQUIREMENTS AND STANDARD DRAWING.

4. SANITARY SEWER CROSSINGS WITH POTABLE WATER LINES SHALL BE ACCOMPLISHED IN ACCORDANCE WITH TDEC REQUIREMENTS AND PROJECT SPECIFICATIONS.

5. ALL UTILITY TRENCHES SHALL BE MAINTAINED TO MIN MAXIMUM DENSITY UNLESS PAYMENT AND 95% MAXIMUM DENSITY UNDER VEGETATED AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRENCH SAFETY.

6. ALL UTILITIES PRIOR TO ANY CONSTRUCTION.

NOTE

CONTRACTOR IS RESPONSIBLE FOR ALL TRENCH SAFETY.

Call Before You Dig!

The existing utilities shown herein have been located from a field survey. The Engineer makes no guarantees that the UNDERGROUND utilities shown comprise all such utilities in the area, either in service or abandoned. The Engineer does not certify that they are located as accurately as possible from the information available. The Engineer has not physically located the underground utilities. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ANY AND ALL UTILITIES PRIOR TO ANY CONSTRUCTION.

OSHA RULES SHALL BE ABIDED BY

USEFUL INFORMATION

CALL BEFORE YOU DIG

1-811-NDDIG (1-811-6334)

(423) 269-7303

For any questions, call your local utilities.

423.269.7303

TENNESSEE

A GREAT PLACE TO LIVE AND WORK
Modifications to construction fence to allow egress from building.

Sheet Title: Site Utility Plan

14038 SHEET TITLE:
OF JOB FILE SHT
144 SHEET DATE

FISHER + JOHNSON CITY, TENNESSEE
EAST TENNESSEE STATE UNIVERSITY

ASSOCIATES
Architecture/Planning
511 TUSCULUM BOULEVARD
GREENEVILLE, TENNESSEE 37745
PH 423.823.0100
EMAIL JOHN@JOHNFISHERARCHITECT.COM

C1.0
SITE UTILITY PLAN

REV.
# REV. DESCRIPTION REV. DATE
52020-10 (V&M)
07/31/2020
PROPOSED FIRE HYDRANT SERVICE LINE

STA. 0+00 - STA. 0+88.33

SCALE 1 inch = 30 feet Horiz.
1 inch = 5 feet Vert.
PROPOSED FIRE HYDRANT SERVICE LINE

STA. 0+00 - STA. 0+85.69
SCALE 1 inch = 30 feet Horiz.
1 inch = 5 feet Vert.

SITE UTILITY

PROFILES

Rev. #  

Rev. Description  

Rev. Date

NORTH CAROLINA

SOUTH CAROLINA

KENTUCKY

GEORGIA

TENNESSEE

ADDENDUM NO. 1 - MOVED HYDRANT 02-23-2021

ASSOCIATES

Architecture/Planning

511 TUSCULUM BOULEVARD

GREENEVILLE, TENNESSEE 37745

PH 423.823.0100

EMAIL JOHN@JOHNFISHERARCHITECT.COM

LAMB HALL RENOVATION

EAST TENNESSEE STATE UNIVERSITY

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

FISHER + ASSOCIATES

JOHNSON CITY, TENNESSEE

CONTRACTING ENGINEERS, INC.

127 BOB FITZ ROAD, SUITE 2

GRAY, TENNESSEE 37615

PHONE: (423) 467-8401
CONCRETE PAVING NOTES:
1. ALL WALKS TO HAVE 1% MIN. - 2% MAX CROSS SLOPE
2. REF. PLANS FOR WALK WIDTH, JOINTING AND ADJACENT CONDITIONS
3. RUNNING SLOPES NOT TO EXCEED 5% UNLESS OTHERWISE NOTED ON PLANS. REF. CIVIL DRAWINGS FOR FINISH GRADES

TYPICAL EXPANSION JOINT
3 8" RUBBER EXPANSION JOINT; CAULK TO MATCH CONCRETE COLOR

(C-1) CONCRETE PAVING PROVIDE STEEL DOWEL IN SLEEVE @ EXP. JOINTS AT 18" O.C.

4" COMPACTED AGGREGATE BASE @ 95% PROCTOR

COMPACTED SUBGRADE
6" x 6" - W2.9 x W2.9 WWM CONT.
(SET ON METAL CHAIRS PRIOR TO POURING SLAB)

(C-1) CONCRETE PAVING @ 3500 PSI; SEE L100 SERIES FOR FINISH

1 4" WIDE , 1 3" DEPTH OF CONCRETE CONTROL JOINT; TYP.

TYPICAL CONCRETE PAVING AND EXP. JOINT - SECTIONS
6" TURN DOWN AT EDGES

TYPICAL BRICK VENEER WALL - SECTION
#4'S AT EACH NOSE, TYP.
3 8" RUBBER EXPANSION JOINT; CAULK TO MATCH CONCRETE, TYP.

(M-1) HANDRAIL; REF. DETAIL 4/L4.00
CORE DRILL PAINTED BLACK STEEL POST 12" INTO CONCRETE STEM.
FILL WITH NON-SHRINKING GROUT. COLOR TO MATCH CAP, SUBMIT SAMPLE TO LANDSCAPE ARCHITECT FOR APPROVAL.
ESCUTCHEON PLATE TO COVER CORE DRILL AND GROUT; TYP.

NOTE: HANDRAILS TO MEET ALL LOCAL, STATE AND FEDERAL CODES. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR ALL HANDRAILS.

TOP-OF-FENCE SHALL FOLLOW SLOPE OF EXISTING GRADE.
- PRIME POSTS WITH PORTER PAINTS ALKYD METAL PRIMER - RED
- PAINT POSTS WITH PORTER PAINTS BLACK ALKYD ENAMEL - GLOSS BLACK
2" TOP RAIL - JULIUS BLUM #4441-1 1/2" X 1 1/2" TUBE
6'-0" MAX.
3'-6" 1'-6" FINISH GRADE
3500 PSI CONCRETE FOOTING

1 1/2" SQUARE POST - 12 GAUGE TUBULAR STEEL
WHERE FENCE IS TO BE INSTALLED IN EXISTING PAVING OR WALLS, IMBED A MINIMUM OF 8".

TYPICAL CONCRETE STAIRS - SECTION
5" MIN.
TOP-OF-STAIR, REF. CIVIL AND REF. L3.00 GRADING PLAN
BOTTOM-OF-STAIR, REF. CIVIL AND REF. L3.00 GRADING PLAN

1'-0" TREADS TYP.
TYP. 1'-0" MIN.

NOTE:
- TOP OF FENCE SHALL FOLLOW SLOPE OF EXISTING GRADE.
- PRIME POSTS WITH PORTER PAINTS ALKYD METAL PRIMER - RED
- PAINT POSTS WITH PORTER PAINTS BLACK ALKYD ENAMEL - GLOSS BLACK
2" TOP RAIL - JULIUS BLUM #4441-N SQUARE END
LIFE SAFETY LEGEND

WALL & FLOOR COVERING RATING LEGEND

LIFE SAFETY NOTES

GROUND LEVEL EGRESS PLAN

1/8" = 1'-0"

LAMBR HALL RENOVATION
EAST TENNESSEE STATE UNIVERSITY
JUNIOR CITY, TENNESSEE

FISHER + ASSOCIATES
ARCHITECT/ENGINEER

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

1/7/12/20/TCM

Sheet Title
Sheet Date
Sheet Scale
Sheet No.

GROUN D LEVEL EGRESS PLAN

LAMBR HALL RENOVATION
EAST TENNESSEE STATE UNIVERSITY
JUNIOR CITY, TENNESSEE

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JUNIOR CITY, TENNESSEE

FISHER + ASSOCIATES
ARCHITECT/ENGINEER

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

1/7/12/20/TCM

Sheet Title
Sheet Date
Sheet Scale
Sheet No.
Sheet Title: GROUND FLOOR PLAN

Sheet Date: 10/23/2021

Builder's Number: 1000021

Description: Lamkin Renovation

EAST TENNESSEE STATE UNIVERSITY

FISHER + ASSOCIATES

LAMB HALL RENOVATION

JOHNSON CITY, TENNESSEE

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

Notes:
- SHADED AREAS indicate new 1 HR fire barriers (assembly varies)
- G BELOW "X1" indicate new 2 HR fire barriers (assembly varies)

Legend:
- 1/4" = 1'-0"

EAST TENNESSEE STATE UNIVERSITY
LAMB HALL RENOVATION
JOHNSON CITY, TENNESSEE

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

1. Installation steps:
   a. Mount channels on wall with thru bolts.
   b. Remove blocks from below channels.
   c. Weld bottom plate to channels.

2. All structural steel shapes and plates shall be ASTM A-36 steel.

3. Shop prime steel with one coat alkyd primer.
1. INSTALL A WET SPRINKLER SYSTEM THROUGHOUT THE BUILDING.

2. Flow test data:
   - Riser Elev 1700 ft
   - Required Pressure 100 PSI
   - Required Flow 1000 GPM

3. Residual Pressure: 60 psi

4. Hydraulic calculations are to be submitted for review after the engineer of record is satisfied that the shop drawings satisfy the requirements of NFPA 13.

5. The spaces are classified as "Light Hazard" (except where noted below) protection.

6. Pipe and fittings:
   - Horizontal distance loss 4.48 PSI
   - Vertical rise loss/gain 32.46 PSI
   - Horizontal distance loss 10.38

7. Equation: Pressure required at head = (Q / K)^2
   - Safety factor 10 PSI
   - Equation: Pressure required at head = (Q / K)^2

8. Connection types:
   - With cement mortar lining and seal coat according to AWWA C104.
   - Local fire department sizes and threads, and bottom outlet with pipe threads.

9. Protection:
   - Ductile Iron C-100
   - Pipe: ERW or CW Schedule 10 or 40.
   - All fittings shall comply with NFPA 13.
   - CPVC pipe and fittings (or approved equal)

10. Joint type: with cement mortar lining and seal coat according to AWWA C104.

11. Pipe and fittings:
   - Steel pipe: ERW or CW Schedule 10 or 40.
   - All fittings shall comply with NFPA 13.

12. Finishes including sleeve: rough chrome

13. Quick response sidewall sprinklers shall be installed at each stairway landing.

14. Spare head cabinet shall be located as close to riser as possible and must contain a minimum of six heads. This shall include two sprinkler heads of quick response, dry.

15. A 100 GPM hose stream shall be added to the sprinkler requirements for quick response, dry.

16. Backflow preventer loss 7 PSI

17. Penetration of fire and smoke barriers/partitions shall be adequately sealed/protected. See also firestop details on DWG.

18. Hose GPM demand (100 Light, 250 ordinary, 500 extra hazard) 100 gpm

19. Available pressure:
   - Remote area: GPM demand (Density x Area x Overage) 180 gpm
   - Standpipe GPM demand (if required) 0 gpm

20. System demand curve:
   - Total GPM (Remote Area + Standpipe + Hose) 280 gpm

21. Hose stream available:
   - A "SURE-TEST" combination test and drain valve with 1/2" orifice

22. Wet system fire riser detail

23. East Tennessee State University
   - Lamb Hall renovation

24. SBC NO.: 166/005-09-2017CM
STAIR/CORRIDOR
ISOLATION/TESTING LAB
CARDIOPULMONARY SCIENCE LAB
CARDIOPULMONARY SCIENCE LECTURE
RADIOLOGIC SCIENCE LAB
ELEV.
ELEV. EQUIP.
JAN
WOMEN
STORAGE
EQUIP. STORAGE
RADIOLOGIC SCIENCE LECTURE
STAIR/CORRIDOR
FIRE RISER, REFER TO DETAIL ON SHEET FP000
FDC & ALARM
STANDPIPE "A"
STANDPIPE "B"
FIRE PUMP LOCATION, REFER TO DETAIL ON SHEET FP001
1
FP001
2
FP001
6" STAND PIPE LINE UP
4" FIRE LINE SERVING SPRINKLER SYSTEM UP
INSTALLATION OF ALL SPRINKLER SYSTEM PIPING FROM THE POINT OF SERVICE MUST BE PERFORMED BY A TENNESSEE REGISTERED SPRINKLER CONTRACTOR.
NOTE:
1. PROVIDE SEISMIC BRACING FOR FIRE PUMP AND COMPONENTS AS PER NFPA 20 4.13.5
2. PROVIDE SEISMIC BRACING FOR FIRE LINE RISERS AS PER NFPA 13 9.2.5

EXISTING NON-RATED (ASSEMBLY VARIES)
EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)
EXISTING 2 HR FIRE BARRIER (ASSEMBLY VARIES)
WALL & FLOOR/CEILING RATING LEGEND
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

FIRE PUMP, REFER TO DETAIL ON SHEET FP001
FIRE PUMP SYSTEM, REFER TO DETAIL ON SHEET FP001
FIRE RISER, REFER TO DETAIL ON SHEET FP000
### Prototype Casing

**List of Items**

**1. Control**

- Control ° F ° F ° F ° F ° F
- 97.7

**2. Pre-Hot Water**

- Air Temp Entering
- Hot Water Leaving
- 80/ 67

**3. Pre-Cooling**

- Rows

**4. Pre-Heating**

- Coils

**5. Elevation**

- 650

**6. Pressure Reducing Valves**

- 2.5

**7. MCA MOCP**

- 15

**8. Piping Doghouse**

- AHU-2 and AHU-3

**9. Steam to Hot Water Heat Exchanger**

- Schedule

**10. Package Gas/Electric Unit**

- Schedule

**11. Condensate Return Pump**

- Schedule

**12. NEMA 2 Starter Panel**

- With Disconnect & Circuit Breakers

**13. Factory-Mounted**

- NEMA 2

**14. System**

- Pressure Reducing Valve

**Notes:**

- 2.0 15
- 2.7 15
- 2.7 20
- 2.76 20
- 8. PROVIDE AHU-2 AND AHU-3 WITH PIPING DOGHOUSE.
- 16.0 25
- STEAM TO HOT WATER HEAT EXCHANGER SCHEDULE
- AHD-16
- JAN 2018
- FCU
- JCI
- B&G
- 9.6
- 15
- E1510-4GC
- JCI
- FCU
- E1510-4GC
- JCI
- FCU
- 14.0
- 3,000
- 375
- 83,600
- 58,600
- 180,000
- 96,000
- 1200
- 43.3
- 50
- 3.0
- 208/3
- J07ZRN12R2B1B
- 11.2/ 1.25
- 3,000
- 375
- 83,600
- 58,600
- 180,000
- 96,000
- 1200
- 43.3
- 50
- 3.0
- 208/3
- J07ZRN12R2B1B
- AHD-08
- AHD-16
- AHD-20
<table>
<thead>
<tr>
<th>VAV BOX WITH HOT WATER REHEAT COIL SCHEDULE</th>
<th>NEW NON-VAV 3-26</th>
<th>EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR (CFM)</td>
<td>INLET DIA. (P.D.)</td>
<td>AIR (CFM)</td>
</tr>
<tr>
<td>190</td>
<td>410</td>
<td>VAV 3-24</td>
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<tr>
<td>26</td>
<td>1-6</td>
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<tr>
<td>225</td>
<td>450</td>
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<td>26</td>
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</tr>
<tr>
<td>26</td>
<td>1-3</td>
<td>15</td>
</tr>
<tr>
<td>36</td>
<td>1-13</td>
<td>15</td>
</tr>
<tr>
<td>220</td>
<td>440</td>
<td>VAV 3-24</td>
</tr>
<tr>
<td>26</td>
<td>0-1</td>
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<td>33</td>
<td>3-6</td>
<td>15</td>
</tr>
<tr>
<td>24</td>
<td>2-1</td>
<td>15</td>
</tr>
<tr>
<td>250</td>
<td>360</td>
<td>VAV 3-24</td>
</tr>
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<td>24</td>
<td>2-6</td>
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<td>360</td>
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<td>400</td>
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<td>15</td>
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<td>26</td>
<td>1-15</td>
<td>15</td>
</tr>
<tr>
<td>320</td>
<td>640</td>
<td>VAV 3-24</td>
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<td>26</td>
<td>1-15</td>
<td>15</td>
</tr>
<tr>
<td>150</td>
<td>320</td>
<td>26</td>
</tr>
</tbody>
</table>
HWR FROM BUILDING LOAD
HWS TO BUILDING LOAD
HX-1 HWR HWS
T2
T1
NC
CONDENSATE RETURN
HWP-2
CR
VFD VFD
HWP-1
DP
L H
OA-T HW-SP
65° F 30° F
140° F 180° F

LOCATION OF DIFFERENTIAL TRANSMITTER SHALL BE AT ENTRY TO ORIGINAL BUILDING.

STEAM/WATER HEAT EXCHANGER POINTS LIST

<table>
<thead>
<tr>
<th>POINT DESCRIPTION</th>
<th>TEMP/SETPOINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEAT EXCHANGER LEAVING TEMPERATURE AI</td>
<td></td>
</tr>
<tr>
<td>HEATING EXCHANGER ENTERING TEMPERATURE AI</td>
<td></td>
</tr>
<tr>
<td>STEAM VALVES AO</td>
<td></td>
</tr>
<tr>
<td>HW SUPPLY TEMPERATURE</td>
<td>HW RETURN TEMPERATURE</td>
</tr>
</tbody>
</table>

HOT WATER SUPPLY SETPOINT SHALL BE RESET BASED UPON OUTSIDE AIR CONDITIONS. HOT WATER SUPPLY TEMPERATURE SHALL INITIALLY BE BASED ON THE RESET SCHEDULE BELOW (ALL SETPOINTS ADJ.)

THE HOT WATER SYSTEM SHALL BE ENABLED BY THE BUILDING AUTOMATION SYSTEM (BAS) OR BY THE OPERATOR. UPON ACTIVATION OF THE HOT WATER SYSTEM, THE FOLLOWING SHALL OCCUR IN THIS ORDER:

1. THE HW PUMP SHALL BE ENERGIZED; AND STATUS OF PUMP PROVEN BY CURRENT TRANSMITTER. THE HW SYSTEM DIFFERENTIAL PRESSURE SENSORS LOCATED IN THE BUILDING SHALL VARY THE SPEED OF THE RESPECTIVE PUMP VIA ITS VFD TO MAINTAIN SETPOINT.

2. UPON VERIFICATION OF PUMP STATUS, HOT WATER SUPPLY TEMPERATURE SENSOR (T1) SHALL MODULATE THE NORMALLY CLOSED STEAM VALVE UNTIL SETPOINT IS REACHED.

THIS OPERATION SHALL BE REVERSED WHILE SYSTEM IS UNLOADING.

HOT WATER SUPPLY SETPOINT SHALL BE RESET BASED UPON OUTSIDE AIR CONDITIONS.

THE STEAM VALVE SHALL BE INTERLOCKED SO THAT IT CANNOT OPERATE UNLESS EITHER THE LEAD OR LAG HOT WATER PUMP IS IN OPERATION.

UPON FAILURE OF ONE PUMP, AN ALARM SHALL BE GENERATED AND THE OTHER PUMP SHALL START AND OPERATE.

THE LEAD PUMP AND LAG (STANDBY) PUMPS SHALL ALTERNA TE RUNTIME EVERY 30 DAYS (ADJ.).

MISCELLANEOUS CONTROL POINTS LIST

OUTSIDE AIR DRY BULB TEMP. AI
OUTSIDE AIR RELATIVE HUMIDITY
MAKE-UP WATER CONTROL VALVE FLOW

CHILLED WATER FAN COIL BOX DETAIL

SUPPLY DUCT
FLEXIBLE CONNECTION
DRAIN PAN
POWER SUPPLY
4" CONCRETE PAD
FLEXIBLE HOSE CONNECTION
CONDENSATE DRAIN - CONDENSATE IS TO BE PUMPED FROM UNIT
2" AIR FILTER RACK
CHWS
CHWR
VARIABLE FREQUENCY DRIVE
FAN COIL
CONDENSATE DRAIN PAN, PROVIDE FLOAT SWITCH FOR UNIT SHUTOFF
UNISTRUT

EXPANSION TANK-AIR ELIMINATOR-MAKE UP WATER
GLASS TUBE TO HAVE GLASS FILLED
WATER LEVEL SIGHT GLASS
W/ BALL CHECKS, SHUT-OFF VALVES
BALL VALVE (TYP.)
PRESSURE GAUGE TYP. FOR SIZING.
REFER TO HYDRONIC SPECIALTY SCHEDULE
WATER OUT

"AIRTROL" TANK FITTING
SAME SIZE AS CONN. ON SEPARATOR. DO FOR STRAINER REMOVAL
HOLD MIN. CLEARANCE SUPPORT & LEVELING SCREWS
PROVIDE STRUCTURAL FLOOR
AIR SEPARATOR AND STRAINER.
COMBINATION TANGENTIAL
3/4" HOSE BIBB
GATE VALVE
"LOCK SHIELD" CRANE NO. 441 NOT REDUCE EQUAL TO
BACKFLOW PREV.
P.R.V. MANUALLY ADJUSTABLE
REDUCED PRESS.
ASME P.R.V.
TEFLON SEATS
UNION (TYPICAL)
BUTTERFLY VALVE WATER IN

NOTE:
SUPPORTED STAND.
MOUNT HIGH AS POSSIBLE IN MECH. ROOM.
PROVIDE STRUCTURAL STEEL FLOOR
AIR BARRIER ATTACHMENT TO SHEET METAL BASEMENT PIPING
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
NEW 2 HR FLOOR CEILING HORIZONTAL ASSEMBLY ABOVE ASSEMBLY VARIES (SEE UL DESIGN NO. J994)
NEW 1 HR FLOOR CEILING ASSEMBLY ABOVE ASSEMBLY VARIES (SEE UL DESIGN NO. D902)
ALL WALLS TAGGED "X1" OR "X2" ARE 1 HR SMOKE BARRIERS
CHILLED WATER SEQUENCE OF OPERATION:

CHILLED WATER SEQUENTIAL OPERATION IS DESIGNED TO ENHANCE COMFORT Levels WHILE MINIMIZING OPERATION COSTS. CHILLED WATER IS SUPPLIED FROM THE MAIN CAMPUS DISTRICT CHILLED WATER SYSTEM AND REDUCED AT PRIMARY AND SECONDARY PUMPS.

THE WATER SEQUENTIAL MODES ARE AS FOLLOWS:

1. **PRIMARY TURN OFF**: THE LEAD TERTIARY PUMP WILL START AND THE LEAD TERTIARY CW PUMP ELECTRICITY WILL BE TURNED OFF.
2. **PRIMARY TURN ON**: THE LEAD TERTIARY PUMP WILL START AND THE LEAD TERTIARY CW PUMP ELECTRICITY WILL BE TURNED ON.
3. **SECONDARY TURN OFF**: THE LEAD TERTIARY PUMP WILL START AND THE LEAD TERTIARY CW PUMP ELECTRICITY WILL BE TURNED OFF.
4. **SECONDARY TURN ON**: THE LEAD TERTIARY PUMP WILL START AND THE LEAD TERTIARY CW PUMP ELECTRICITY WILL BE TURNED ON.

THE SYSTEM DESIGNS AND SPECIFICATIONS ARE BASED ON THE REQUIREMENTS OF THE BUILDING AND THE OPERATING PARAMETERS. IT IS RECOMMENDED TO REVIEW THE CHILLED WATER SEQUENCE OF OPERATION TO ENSURE THAT THE SYSTEM DESIGNS ARE ACCURATE AND MEET THE BUILDING REQUIREMENTS.

CHILLED WATER SYSTEM POINTS LIST

- CWS - TEMP (T1) AI
- TERTIARY CHILLED WATER PUMP #1 REMOTE START/STOP
- TERTIARY CHILLED WATER PUMP #1 STATUS
- TERTIARY CHILLED WATER PUMP #1... CHILLED WATER PUMP #2 SPEED SETPOINT
- TERTIARY CHILLED WATER PUMP #2 SPEED
- TERTIARY CHILLED WATER PUMP #2 FAILURE ALARM
- CHILLED WATER BTU METER DIFFERENTIAL PRESSURE SENSOR. LOCATED AT ENTRANCE TO ORIGINAL BUILDING.
HS
TS SD
RELIEF
VFD
CR
BAS
OA
1 ADDENDUM NO.1 2/23/2021
PH 423.823.0100
511 TUSCULUM BOULEVARD
EAST TENNESSEE STATE UNIVERSITY
LAMB HALL RENOVATION
SBC NO.: 166/005-09-2017CM
- EXISTING 2 HR FIRE BARRIER (ASSEMBLY VARIES) ABOVE
- NEW 1 HR FLOOR/CEILING HORIZONTAL ASSEMBLY - FILE OF

AHU-2,3 SEQUENCE OF OPERATION - VAV:


3. THE DISCHARGE AIR TEMPERATURE SENSOR SHALL MODULATE THE CHILLED WATER COIL VALVE (N.C.) TO MAINTAIN DISCHARGE AIR TEMPERATURE SETPOINT.

5. THE DUCT STATIC PRESSURE SENSOR SHALL MODULATE THE SUPPLY AIR FAN VFD TO MAINTAIN SETPOINT. UPON FAN AIRFLOW REDUCING TO 60%, (ADJ.) PRESSURE SETPOINT SHALL BE ADJUSTED TO 75%. (ADJ.) BALANCED VALUE UNTIL SUCH TIME ANY ZONE CANNOT MAINTAIN ZONE SETPOINT WITHIN 4 DEGREES (ADJ.). A STATIC PRESSURE FAN START/STOP SPEED INPUT


7. PHOTOELECTRIC SMOKE DETECTORS IN THE S.A. AND R.A. DUCTS SHALL SHUT THE UNIT DOWN, CLOSE THE OA DAMPER AND SEND AN ALARM SIGNAL TO THE FIRE ALARM SYSTEM. RESPECTIVE FIRE/SMOKE DAMPERS SHALL CLOSE WHEN UNIT IS DE-ENERGIZED.

10. BAS CONTRACTOR TO MONITOR SUPPLY FAN KW THROUGH BACNET/MSTP INTEGRATION. VFD'S SHALL BE PROVIDED WITH BACNET GATEWAY.
EXHAUST FANS
SHALL BE STARTED BY THE BAS AND RUN CONTINUOUSLY DURING OCCUPIED HOURS. PROVIDE OPERATION SCHEDULE FOR FAN THAT IS ADJUSTABLE THROUGH THE BAS SYSTEM.

VAV SEQUENCE OF OPERATION:
THE SPACE THERMOSTAT SHALL MODULATE THE VAV DAMPER (FROM MAXIMUM TO MINIMUM POSITION AS INDICATED ON MONITOR SUPPLY AIR FLOW CFM, LEAVING AIR TEMPERATURE, DAMPER CONTROL, HW VALVE POSITION, SPACE TEMPERATURE.

VARIABLE VOLUME TERMINAL UNITS (ALL) POINTS LIST
- SPACE TEMP AI
- HOT WATER CONTROL VALVE AO
- TERMINAL DAMPER AO
- LEAVING AIR TEMPERATURE AI

EXHAUST FANS POINTS LIST
- REMOTE START/STOP DO
- STATUS DI
- ALARM DI

SPLIT SYSTEM A.C. UNIT - IT COMM. POINTS LIST
- FAN STATUS DI
- SPACE HUMIDITY AI
- SPACE TEMP AI
- STATUS DI
- ALARM DI

VARIABLE FREQUENCY DRIVES (VFD) (ALL)
- SPEED AO
- FAULT INTEGRATION
- STATUS DI
- REMOTE START/STOP DO
- KW INTEGRATION

SPLIT SYSTEM CONTROL (COOLING ONLY) AC1-11
- COOLING SHALL BE ENERGIZED ANYTIME ROOM TEMPERATURE EXCEEDS LOCAL ROOM TEMPERATURE SET POINT.
- ONCE ROOM TEMPERATURE RETURNS TO SET POINT MINUS A DIFFERENTIAL, COOLING SHALL BE DE-ENERGIZED.
- SUPPLY FAN MODE SHALL BE SELECTABLE BY OWNER FOR EITHER "AUTO" OR "ON". DURING THE "AUTO" MODE, SUPPLY FAN SHALL CYCLE WITH CALL FOR COOLING. DURING THE "ON" MODE, SUPPLY FAN SHALL OPERATE CONTINUOUSLY.

NEW NON-RATED (ASSEMBLY VARIES)
- NEW 1 HR FIRE BARRIER (ASSEMBLY VARIES)
- NEW 2 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
- X1
- X2

MECHANICAL DETAILS
01/29/2021
Rev. #Rev. Description Rev. Date
1 ADDENDUM NO.1 2/23/2021
REMOVE EXISTING DUCTLESS MINI SPLIT SYSTEM.

GROUND LEVEL MECHANICAL FLOOR PLAN

REMOVE EXISTING SUSPENDED FAN COIL AND ASSOCIATED CONTROLS. CAP EXISTING FLOOR MOUNTED FAN COIL AND THERMOSTAT TO BE REMOVED.

EXISTING EXHAUST DUCT TO REMAIN.

DEMOLITION EXISTING VENTILATION SUPPLY AIR DUCTWORK AND GRILLES TO REMAIN, REFER TO SHEET M116 FOR DEMOLITION WORK IN THIS ROOM.

REMOVE EXISTING EXHAUST GRILLE.

EXISTING FLOOR MOUNTED FAN COIL TO BE REMOVED. CAP PIPING ASSEMBLY VARIES (SEE UL DESIGN No. J994)

WALL & FLOOR/CEILING RATING LEGEND

EXISTING NON-RATED (ASSEMBLY VARIES)

NEW NON-RATED (ASSEMBLY VARIES)

EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)

EXISTING 2 HR FIRE BARRIER (ASSEMBLY VARIES)

NEW 1 HR FIRE BARRIER (ASSEMBLY VARIES)

NEW 2 HR FIRE BARRIER (ASSEMBLY VARIES)

1 HR FLOOR/CEILING HORIZONTAL ASSEMBLY ABOVE

NEW 1 HR FLOOR CEILING HORIZONTAL ASSEMBLY ABOVE

DEMOLITION KEY NOTES:

01/29/2021 SHEET DATE

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

01 ADDENDUM NO.1 2/23/2021

EAST TENNESSEE STATE UNIVERSITY

LAMB HALL RENOVATION

JOHNSON CITY, TENNESSEE

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

MECHANICAL PLAN - DEMOLITION

GROUND FLOOR
EXISTING CHILLED WATER/HOT WATER SUSPENDED FAN COIL TO REMAIN.

REMOVE ALL EXISTING EXHAUST DUCTWORK AND DIFFUSERS IN THIS AREA.

EXISTING FLOOR MOUNTED FAN COIL TO BE REPLACED. TEMPORARILY CAP PIPING IN EXISTING DUCTWORK DISTRIBUTION, GRILLES, AND CONTROLS TO REMAIN IN PLACE.

REMOVE EXISTING AIR HANDLER AND ALL ASSOCIATED HYDRONIC PIPING.

EXISTING EXHAUST HOOD AND ASSOCIATED FAN TO REMAIN.

ASSEMBLY VARIES (SEE UL DESIGN No. D902)

DEMOLITION

ASSEMBLY VARIES (SEE UL DESIGN No. J994)

REMOVE ALL EXISTING MECHANICAL SYSTEMS IN ORIGINAL BUILDING UNLESS NOTED.

EXISTING CHILLED WATER/HOT WATER SUSPENDED FAN COIL TO BE REMOVED.

EXISTING NON-RATED (ASSEMBLY VARIES)

EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)

EXISTING 2 HR FIRE BARRIER (ASSEMBLY VARIES)

NEW 1 HR FIRE BARRIER (ASSEMBLY VARIES)

NEW 2 HR FIRE BARRIER (ASSEMBLY VARIES)

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

NEW 1 HR FLOOR/CEILING HORIZONTAL ASSEMBLY

NEW 2 HR FLOOR CEILING HORIZONTAL ASSEMBLY

DATE: 01/29/2021

JOB NO.: 14038

FILE NO.: M011

JOB TITLE: EAST TENNESSEE STATE UNIVERSITY

SHEET TITLE: MAIN LEVEL MECHANICAL FLOOR PLAN - DEMOLITION
EXISTING FLOOR MOUNTED CHILLED WATER/HOT WATER FAN COIL TO EXISTING VENTILATION SUPPLY DUCTWORK AND GRILLES TO REMAIN.

SECOND LEVEL MECHANICAL FLOOR PLAN

ASSEMBLY VARIES (SEE UL DESIGN No. J994)

REMOVE ALL EXISTING EXHAUST DUCTWORK AND GRILLES IN THIS AREA.

ASSEMBLY VARIES (SEE UL DESIGN No. D902)

REMOVE EXISTING AIR HANDLER. CAP HYDRONIC PIPING BACK AT MAIN EXISTING FLOOR MOUNTED FAN COIL TO BE REPLACED. REMOVE FAN COIL REMOVE ALL EXISTING SUPPLY DUCTWORK, GRILLES, AND CONTROLS IN REMOVE EXISTING OUTSIDE AIR INTAKE LOUVER AND ASSOCIATED EXISTING FLOOR MOUNTED CHILLED WATER/HOT WATER FAN COIL TO BE REPLACED.

DEMOLITION KEY NOTES:

- REMOVE ALL EXISTING SUPPLY DUCTWORK, GRILLES, AND CONTROLS IN
- REMOVE EXISTING OUTSIDE AIR INTAKE LOUVER AND ASSOCIATED
- Existing 1 HR FIRE BARRIER (ASSEMBLY VARIES)
- Existing 2 HR FIRE BARRIER (ASSEMBLY VARIES)
- New 1 HR FIRE BARRIER (ASSEMBLY VARIES)
- New 2 HR FIRE BARRIER (ASSEMBLY VARIES)
- Existing 1 HR FIRE BARRIER (ASSEMBLY VARIES)
- Existing 2 HR FIRE BARRIER (ASSEMBLY VARIES)
- All walls tagged "X1" or "X2" are 1 HR SMOKE BARRIERS
- New 1 HR FLOOR/CEILING HORIZONTAL ASSEMBLY ABOVE
- New 2 HR FLOOR/CEILING HORIZONTAL ASSEMBLY ABOVE

EAST TENNESSEE STATE UNIVERSITY
LAMB HALL RENOVATION
JOHNSON CITY, TENNESSEE
SBC NO.: 166/005-09-2017CM

ARCHITECTURE/PLANNING
ASSOCIATES

FISHER + ASSOCIATES
Architectural Planning

1 ADDENDUM NO.1 2/23/2021

#Rev. Description Rev. Date
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5/1/2021 6/9/2021 7/17/2021

FACILITY SYSTEMS CONSULTANTS, LLC
EAST TENNESSEE STATE UNIVERSITY
LAMB HALL RENOVATION
JOHNSON CITY, TENN

501 TUSCULUM BOULEVARD
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PH: 423.823.0100
EXISTING CHILLED WATER/HOT WATER SUSPENDED FAN COIL TO REMAIN.

DEMOLITION
REMOVE EXISTING FLOOR MOUNTED FAN COIL, AND ASSOCIATED CONTROLS. CAP

REMOVE ALL EXISTING SUPPLY DUCT, GRILLES AND CONTROLS IN THIS AREA.
EXISTING EXHAUST FAN, DUCTWORK, GRILLES AND EXHAUST LOUVER TO REMAIN.

THIRD LEVEL MECHANICAL FLOOR PLAN
EXISTING FLOOR MOUNTED FAN COIL TEMPORARILY CAP PIPING.

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

NEW 1 HR FLOOR/CEILING HORIZONTAL ASSEMBLY
NEW 2 HR FLOOR CEILING HORIZONTAL ASSEMBLY

FILE NO. 12/04/00-01/27/CM
SBC NO.: 166/005-09-2017CM

EAST TENNESSEE STATE UNIVERSITY
LAMB HALL RENOVATION

DEMOLITION KEY NOTES:
1. REMOVE EXISTING 18X18 EXHAUST RISER, AND ASSOCIATED DUCTWORK
2. EXISTING FLOOR MOUNTED COIL TO REMAIN
3. HYDRONIC PIPING BACK AT SOURCE

SHEET DATE 01/29/2021

1 ADDENDUM NO. 1 2/23/2021
EXISTING CHILLED WATER/HOT WATER FLOOR MOUNTED FAN COIL TO BE REPLACED.
EXISTING CHILLED WATER/HOT WATER FLOOR MOUNTED FAN COIL TO BE REMOVED.
EXISTING CHILLED WATER/HOT WATER SUSPENDED FAN COIL, RELOCATED FROM ASSEMBLY VARIES (SEE UL DESIGN No. J994)
FOURTH LEVEL MECHANICAL FLOOR PLAN
EXISTING CHILLED WATER/HOT WATER SUSPENDED FAN COIL TO BE REPLACED.
REMOVE ALL EXISTING DUCTWORK, DIFFUSERS, HANGERS, HYDRONIC PIPING IN THIS
EXISTING CHILLED WATER/HOT WATER SUSPENDED FAN COIL TO BE REMOVED AND EXISTING FAN COIL TO REMAIN.
REMOVE EXISTING HYDRONIC PUMPS AND ASSOCIATED PIPING.
EXISTING EXHAUST FAN TO BE REMOVED
EXISTING FLOOR MOUNTED FAN COIL TO REMAIN.
REMOVE EXISTING ROOF MOUNTED EXHAUST FAN AND ASSOCIATED
ASSEMBLY VARIES (SEE UL DESIGN No. D902)
EXISTING EXHAUST FAN TO REMAIN
EXISTING CHILLED WATER/HOT WATER SUSPENDED FAN COIL TO REMAIN.
ASSEMBLY VARIES (SEE UL DESIGN No. J994)
EXISTING INCINERATOR AND ASSOCIATED EXHAUST FAN TO REMAIN.
REMOVE EXISTING AIR HANDLER AND ALL ASSOCIATED PIPING.
REMOVE EXISTING HEAT EXCHANGER AND ALL ASSOCIATED STEAM
TFCU22
GROUND LEVEL MECHANICAL FLOOR PLAN
ASSEMBLY VARIES (SEE UL DESIGN No. J994)
ASSEMBLY VARIES (SEE UL DESIGN No. D902)

EXISTING NON-RATED (ASSEMBLY VARIES)
EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)
EXISTING 2 HR FIRE BARRIER (ASSEMBLY VARIES)
NEW 1 HR FIRE BARRIER (ASSEMBLY VARIES)
NEW 2 HR FIRE BARRIER (ASSEMBLY VARIES)

ABOVE NEW 2 HR FLOOR CEILING HORIZONTAL ASSEMBLY

- HR SMOKE BARRIERS

EXISTING VENTILATION SUPPLY. CONNECT NEW 8" Ø DUCT TO EXISTING DUCTWORK. BALANCE NEW AIR DEVICE TO CFM SHOWN.
EXISTING DUCTWORK. BALANCE NEW AIR DEVICE TO CFM SHOWN.

NEW FLOOR MOUNTED FAN COIL. CONNECT TO EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.

1/29/2021

SHEET DATE

KEY NOTES:

- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.

- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.

- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.

- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.

- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.

- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.

- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.

- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.

- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMOSTAT, WALL MOUNTED.
- NEW 20"x12" FLOOR MOUNTED FAN COIL WITH EXISTING HYDRONIC PIPING IN THIS LOCATION. PROVIDE NEW THERMO
New fan coil in existing location. Connect to existing ventilation supply to remain, 100 CFM. Provide fire/smoke dampers at exit of shaft. Combos fire/smoke dampers at exit of shaft. Use same location for fire/smoke dampers.

NEW FAN COIL IN EXISTING LOCATION. CONNECT TO EXISTING VENTILATION SUPPLY TO REMAIN, 100 CFM. PROVIDE FIRE/SMOKE DAMPERS AT EXIT OF SHAFT. COMBO FIRE/SMOKE DAMPERS AT EXIT OF SHAFT.
ASSEMBLY VARIES (SEE UL DESIGN No. J994)

HR SMOKE BARRIERS

#Rev. Description Rev. Date

375 CFM

26"x12"

18"

240 CFM

274e 274e 274e 274e

37

262e 262e 262e 262e

OFFICE OFFICE OFFICE OFFICE

18"x10"

10"ø

1200 CFM

10"x10"

OFFICE OFFICE OFFICE OFFICE

18"

18"

100 CFM

18"

2-3

18"

200 CFM

10"ø

115 CFM

8"ø

SCIENCE CORR. SCIENCE CORR. SCIENCE CORR. SCIENCE CORR.

8"x6"

10"ø

217 217 217 217

165 CFM

12"x10"

12"ø

8"ø

CUSTODIAL CUSTODIAL CUSTODIAL CUSTODIAL

8"x8"

8"x8"

8"x10"

8"x14"

DEAN'S OFFICE DEAN'S OFFICE DEAN'S OFFICE DEAN'S OFFICE

8"ø

8"ø

8"ø

8"ø

ASSOCIATES ASSOCIATES ASSOCIATES ASSOCIATES

200 CFM

6"x4"

110 CFM

6"ø

80 CFM

8"ø

115 CFM

8"ø

OFFICE OFFICE OFFICE OFFICE

202e 202e 202e 202e

OFFICE OFFICE OFFICE OFFICE

200 CFM

8"ø

6"ø

12"ø

6"x4"

200 CFM

8"ø

6"ø

8"ø

90 CFM

8"ø
NEW FLOOR MOUNTED FAN COIL IN EXISTING LOCATION.

EXISTING 2 HR FIRE BARRIER (ASSEMBLY VARIES)

ALL WALLS TAGGED "X1" OR "X2" ARE 1-2 HR FLOOR CEILING HORIZONTAL ASSEMBLY

NEW 2 HR FLOOR CEILING HORIZONTAL ASSEMBLY

EXISTING SUSPENDED FAN COIL TO REMAIN.

EAST TENNESSEE STATE UNIVERSITY
LAMAR HALL RENOVATION

SBC NO.: 166/005-09-2017CM
TVAV 3
EXISTING VENTILATION AIR SUPPLY GRILLE TO REMAIN 300 CFM.

EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)

ALL WALLS TAGGED "X1" OR "X2" ARE 1 NEW 1 HR FLOOR/CEILING HORIZONTAL ASSEMBLY ABOVE.
NEW STEAM CONDENSATE RETURN PUMP (CRP-1).

CONNECT NEW CHILLED WATER AND HOT WATER MAINS TO EXISTING HYDRAULIC RUNOUTS.

NEW HEAT EXCHANGER.

NEW PRV STATION.

ROUTE NEW 4" STEAM PIPING UP HIGH.

CONNECT EXISTING 3" CHWR AND 2" HWR TO NEW 6" CHWS/CHWR RISER IN THIS LOCATION.

CONNECT NEW 6" CHWS/CHWR TO EXISTING CHWS/CHWR RISER IN THIS LOCATION.

CONNECT EXISTING 3" CHWR AND 2" HWR TO NEW 6" CHWS/CHWR RISER IN THIS LOCATION.

EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)

EXISTING 2 HR FIRE BARRIER (ASSEMBLY VARIES)

EXISTING NON-RATED (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

EXISTING NON-RATED (ASSEMBLY VARIES)

EXISTING 2 HR FIRE BARRIER (ASSEMBLY VARIES)

EXISTING 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)

EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)

EXISTING 2 HR FIRE BARRIER (ASSEMBLY VARIES)

EXISTING NON-RATED (ASSEMBLY VARIES)
NEW FAN COIL IN EXISTING LOCATION. CONNECT TO EXISTING 3/4" CHWS, CHWR AND CONDENSATE IN
EXISTING 3/4" CHILLED WATER SUPPLY/RETURN AND 3/4" HOT WATER SUPPLY/RETURN UP TO SERVE
EXISTING 3/4" CHILLED WATER SUPPLY/RETURN UP TO SERVE FAN COILS ON FLOOR ABOVE. PIPING TO
ASSEMBLY VARIES (SEE UL DESIGN No. D902)

CONNECT NEW 1" CHWS/CHWR AND 1" HWS/HWR AND 3/4" CONDENSATE FROM EXISTING PIPING IN THIS
ASSEMBLY VARIES (SEE UL DESIGN No. J994)
EXISTING 3/4" HWS/HWR UP TO SERVE FAN COIL ON FLOOR ABOVE.
3/4" HWS/HWR AND 3/4" CONDENSATE IN THIS LOCATION.
CONDENSATE TO NEW FAN COIL IN THIS LOCATION.
INSTALL NEW ISOLATION VALVES AT EACH FLOOR TO ALLOW ISOLATION OF HYDRONIC SYSTEM AT FLOOR LEVEL.
PIPING IS SERVED FROM BELOW.
EXISTING FLOOR MOUNTED FAN COIL AND ASSOCIATED HYDRONIC PIPING TO REMAIN.

ASSEMBLY VARIES (SEE UL DESIGN No. J994)

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

SECOND LEVEL HYDRONIC FLOOR PLAN

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

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

CONNECT NEW 1" CHWS/CHWR AND 3/4" HWS/HWR PIPING TO NEW FAN COIL IN THIS LOCATION.
CONNECT NEW FAN COIL TO EXISTING 1" CHWS/CHWR IN THIS LOCATION.
ASSEMBLY VARIES (SEE UL DESIGN No. J994)
CONNECT NEW FAN COIL TO EXISTING 3/4" CHWS/CHWR, 3/4" HWS/HWR IN THIS LOCATION.
EXISTING FAN COIL TO REMAIN.
EXISTING NON RATED (ASSEMBLY VARIES)
NEW NON 1 HR FIRE BARRIER (ASSEMBLY VARIES)
Connect new plumbing fixtures to existing sanitary sewer & vent piping from plumbing fixtures being demolished.

Demolish unused sanitary and vent back to floor/wall/ceiling, cap and seal watertight.

Vacuum System "B" (existing to remain)

New compressed air dryer, Ingersol Rand D170IT

Existing compressed air tank

New air compressor, Ingersol Rand W22ie, (30 HP 91 CFM)

Existing vacuum service to remain

Contractor to verify existing drain in pit. If drain exists, verify functionality and rectify any issues with drainage.

Existing non-rated (assembly varies)

Existing 1 hr fire barrier (assembly varies)

Existing 2 hr fire barrier (assembly varies)

Wall & floor/ceiling rating legend

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

Walls tagged "X1" or "X2" are 1 hr smoke barriers
NEW DOMESTIC WATER BFP/PRV, REFER TO DETAIL ON SHEET P000

MECHANICAL

ELEV. EQUIP.

JAN

WOMEN

CONNECT NEW PLUMBING FIXTURES TO EXISTING DOMESTIC WATER PIPING FROM PLUMBING FIXTURES BEING DEMOLISHED.

DEMOLISH ANY UNUSED WATER PIPING BACK TO WALL/CEILING, CAP AND SEAL WATERTIGHT.

VACUUM SYSTEM "B" (EXISTING TO REMAIN)
VACUUM SYSTEM "A" (EXISTING TO REMAIN)

NEW COMPRESSED AIR DRYER, INGERSOL RAND D170IT
EXISTING COMPRESSED AIR TANK TO REMAIN

WATER FILTRATION (TO REMAIN)
LIQUID NITROGEN GENERATOR (TO BE REMOVED)
REFER TO FIRE PROTECTION DRAWING FOR FIRE PUMP LOCATION.

DOMESTIC HOT WATER HEAT EXCHANGER, REFER TO DETAIL ON SHEET P001

CONDENSATE COLLECTION SYSTEM TO HVAC HOT WATER SYSTEM

NEW AIR COMPRESSOR, INGERSOL RAND W22ie, (30 HP 91 CFM)
2"AIR(EX), 1 1/2"NG(EX), 2 1/2"CW(EX), 1 1/2"HW(EX) & 3/4"HWR(EX). REFER TO SHEET P211 FOR CONTINUATION

EXISTING VACUUM SERVICE TO REMAIN

P1

- HW RECIRC PUMP

NEW 1 1/2"HW BYPASS FROM PLANT (FIELD CONNECT IN TUNNEL +/- 25 FT.)
NEW 1"HWR BYPASS FROM PLANT (FIELD CONNECT IN TUNNEL +/- 25 FT.)

EXISTING 4"CW SERVICE HB1
HOSE BIBB TO BE REPLACED

3"NG (EX)
GAS METER RELOCATED, CONNECT NEW 3"NG TO EXISTING 3"NG. REFER TO SHEET P210 FOR CONTINUATION.

1/2" CW
1/2" HW
1/2" CW

NEW 3/4"AIR(EX), 3"NG(EX), 3"CW(EX), 2"HW(EX) & 1"HWR(EX) UP TO ABOVE.

3/4" O2
REFER TO SHEET P210 FOR CONTINUATION

ROUTE 1/2"CW/HW TO NEAREST CW/HW OF EQUAL SIZE OR GREATER AT RESTROOMS

OXYGEN TANK STORAGE, CONTRACTOR TO PROVIDE MANIFOLD, TANKS BY OWNER'S SUPPLIER.
LIGHTING NOTES:

1. SYSTEM PROGRAMMING SHALL ALLOW MANUAL OVERRIDE VIA LOW VOLTAGE SWITCHES SHOWN ON PLAN.

2. FIXTURES IN REQUIRED PATHS OF EGRESS SHALL BE UNSWITCHED NIGHT LIGHTS. THIS SHALL MAP LOCAL UNSWITCHED LIGHTING CIRCUITS AS INDICATED ON DRAWINGS.

3. EMERGENCY LIGHTING CIRCUITS. COORDINATE PROGRAMMING WITH ETSU FACILITY OPERATIONS.

1. CONTRACTOR SHALL REMOVE ALL EXISTING LIGHTING FIXTURES, LIGHTING CONTROLS, AND ASSOCIATED BRANCH WIRING IN ALL AREAS WHERE NEW PROVIDE ALL NEW WIRING AS INDICATED.

4. "LH" BY J. BOX INDICATES LIGHTING CONTROL SYSTEM "HUB" UNIT, LUTRON VIVE SERIES IN BATTERY PACK. "EM"
THIRD FLOOR PLAN

ADDENDUM #1

NOTE #1

NOTE #2

WALL LEGEND

ARE 1
NEW 1 HR FIRE BARRIER (ASSEMBLY VARIES)
EXISTING 1 HR FIRE BARRIER (ASSEMBLY VARIES)
RATED (ASSEMBLY VARIES)
RATED (ASSEMBLY VARIES)
TRUE NORTH

NOTE #6

NOTE #8

STAIR

CLASS/LAB

CLASS/LAB

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NOTE #2

NOTE #6

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NOTE #2
CONNECT SPRINKLER ALARM BELL ON EXTERIOR OF BUILDING. COORDINATE CONNECT ALL SPRINKLER FLOW/TAMPER SWITCHES TO BUILDING FIRE ALARM SYSTEM.

CONTRACTOR SHALL REMOVE ALL WIRING SERVING HVAC/PLUMBING EQUIPMENT AS SHOWN.

RECESSED OUTLET BOXES ON OPPOSITE SIDES OF FIRE RATED PARTITIONS TO BE FURNISHED BY SPRINKLER SYSTEM CONTRACTOR.

CONNECT CONDENSER WATER PUMP, 10HP, 208/3.

CONFIRM EXACT ROUGH QUANTITIES WITH SPRINKLER SYSTEM SUBCONTRACTOR.

FIRE PUMP CONTROL PANEL TO BE FURNISHED BY SPRINKLER SYSTEM CONTRACTOR, PRIOR TO BEGINNING CONDUIT INSTALLATION FOR HVAC/PLUMBING EQUIPMENT.

NOTE#11

NOTE#12

NOTE#5

NOTE#6

NOTE#7

LAMB HALL ADDITION AND RENOVATION

JOHNSON CITY, TENNESSEE 37614

GREENEVILLE, TENNESSEE 37745

FISHER + ASSOCIATES

ARCHITECTURAL / INTERIOR DESIGN

2617 Sutherland Ave.

Knoxville, TN. 37939

Vendom Engineers Inc.

FIRE ALARM AND HVAC WIRING

GROUND FLOOR - FIRE ALARM AND HVAC WIRING

FILE SHEET

JOB NO. 14038

E3.0

WEST TENNESSEE STATE UNIVERSITY

ARCHITECT - JOHN FISHER

ARCHITECTS/PLANNERS

362-7735

EMAIL JOHN@JOHNFISHERARCHITECT.COM
CONTRACTOR SHALL REMOVE ALL EXISTING FIRE ALARM WIRING, DEVICES, OFFICE 14 RECESSED OUTLET BOXES ON OPPOSITE SIDES OF FIRE RATED PARTITIONS ALL WALLS TAGGED "X1" OR "X2" RATED (ASSEMBLY VARIES)
CONTRACTOR SHALL REMOVE ALL EXISTING FIRE ALARM WIRING, DEVICES, AND HVAC EQUIPMENT AS INDICATED. NEW EQUIPMENT AS INDICATED. REFER TO MECHANICAL/PLUMBING DRAWINGS FOR EXTENT OF WORK TO BE COMPLETED. CONTRACTOR SHALL MAINTAIN EXISTING FIRE ALARM SYSTEM IN PLACE IN OPERATION THROUGHOUT CONSTRUCTION PROJECT AND HVAC SYSTEM IN PLACE AND OPERATIONAL. DISCREPANCIES BETWEEN ELECTRICAL DRAWINGS AND VOLTAGE INFORMATION APPROVED BY AHJ.

NEW HVAC/PLUMBING EQUIPMENT AS INDICATED. OLD EQUIPMENT AND RELOCATED OLD EQUIPMENT TO BE REMOVED. REFER TO MECHANICAL/PLUMBING DRAWINGS FOR EXTENT OF WORK TO BE COMPLETED. CONTRACTOR SHALL MAINTAIN EXISTING FIRE ALARM SYSTEM IN PLACE IN OPERATION THROUGHOUT CONSTRUCTION PROJECT AND HVAC SYSTEM IN PLACE AND OPERATIONAL. DISCREPANCIES BETWEEN ELECTRICAL DRAWINGS AND VOLTAGE INFORMATION APPROVED BY AHJ.
THE CONTRACTOR WILL BE RESPONSIBLE FOR TESTING, CERTIFYING AND IN AREA NOTED, EXISTING STRUCTURED CABLING DROPS, WALL PLATES, ARRANGE WITH G.C. TO PAINT ANY EXPOSED TELECOMMUNICATIONS CONDUIT IN AREAS NOTED, REMOVE EXISTING TELECOMMUNICATIONS WIRING AND THE CONTRACTOR WILL BE RESPONSIBLE FOR PROPERLY SECURING AND "RP" BY WI
ADDENDUM #1

PROVIDE 2/23/2021

IN AREA NOTED, EXISTING STRUCTURED CABLING DROPS, WALL PLATES,

NOTE#1

REFER TO ENLARGED TELECOMMUNICATIONS ROOM PLANS ON DRAWING T2.1

FOURTH FLOOR PLAN

ETSU ITS WILL REMOVE AND REINSTALL EXISTING AV AND IT ACTIVE

NOTE#1

STORAGE

NOTE#1

INCUBATOR

COOLER

NOTE#1

MECH

NOTE#1

BC

NOTE#1

CONFERENCE

EXEC. AID

EXEC. AID

EXEC. AID

NOTE#2

THROUGH FLOOR BOX NOTED AT

NOTE#2

NOTE#2

NOTE#2

NOTE#2

NOTE#2

NOTE#2

NOTE#4

NOTE#2

NOTE#2

NOTE#2

NOTE#2