addendum #03

project: ETSU IPER Center (Building 60 Renovation)  
RCA 13-024 SBC 166/005-06-2013

to: Nick Self – BurWil Construction, CM/GC

from: Patrick Core – Red Chair Architects  
220 W. Jackson Avenue  
Knoxville, TN 37902

date: 10/17/2016

This Addendum forms a part of the Contract Documents and modifies the original Bidding Documents dated 06/24/16 as noted below. All such modifications, amendments, and/or supplements shall be considered as through originally specified and/or shown on the Drawings or in the Specifications. This Addendum shall be acknowledged on the Bid Form. Failure to do so may subject Bidder to disqualification. All parties receiving this document are responsible for reviewing all items included in this Addendum regardless of headings as listed herein.

This Addendum consists of Two (2) pages and the attached Drawings and Specifications as listed below. Refer to bubbled areas on attached Drawing sheets for changes.

attachments:
1. FSC Addendum #3 dated 10/17/16 (4 pages - 8-1/2" x 11")
2. Substitution Request, Flush Wood Doors (13 pages - 8-1/2" x 11")
3. Revised specifications (67 pages - 8-1/2" x 11")
4. Revised drawings (31 pages - 24" x 36")

changes to prior Addenda:
5. Addendum 1, changes to drawings, Item 20 – Insert item 20a: C106: Detail revised.

changes to Bidding Requirements:
6. None

changes to Agreement:
7. None

changes to Conditions of the Contract:
8. None

changes to Specifications:
9. Section 00 01 10 R3 – Table of Contents: Refer to highlighted areas for revised specification sections.
10. Section 00 11 19 R2 – Request for GMP: Roof bond requirements updated.
11. Section 01 21 13 – TBR Allowances: Section removed.
12. Section 01 21 15 – List of Allowances: Section removed (see 01 22 15 for unit price quantity allowances
13. Section 01 22 15 R3 – List of Unit Price Items: Base quantities updated.
14. Section 01 23 00 R2 – Alternates – section added.
15. Section 01 50 00 R2 – Temporary Facilities and Controls, Part 3.2 – contact information updated.
16. Section 01 78 39 R3 – Project Record Documents – see revised language
17. Section 07 01 50.19 R1 – Preparation for Re-Roofing – section added
19. Section 07 21 19 – Foamed In Place Insulation – section updated.
20. Section 07 31 00 R1 – Slate Roofing – section added
21. Section 07 50 35 R1 – Roof Warranty Execution – section added
22. Section 07 50 36 R1 – Roof Warranty – section added.
23. Section 08 91 19 R2 – Fixed Louvers – section updated.
25. Section 22 08 00 – Plumbing Systems Commissioning – section added.
26. Refer to FSC Addendum #3 for further information.

changes to Drawings:
27. Sheet G001 : R3 – Index updated.
28. Sheet G102 : R2 – Location of FEC updated at Corridor 294.
29. Sheet AS102: R2 – Trees & shrubs not in contract
30. Sheet AD101: R2 – Plan / scoping updated
31. Sheet A102: R2 – Plan revised at Corridor 294
32. Sheet A201: R1 – Gutters & Downspouts may be replaced or repaired
33. Sheet A414: R2 - Updated plans & axon
34. Sheet A415: R2 - Updated sections/interior elevations.
35. Sheet A416: R2 - Updated details.
36. Sheet A417: R1 - Updated details.
37. Sheet A500: R3– Updated floor finishes
38. Sheet A501: R2 – Updated floor finishes at entrances
39. Sheet A502: R2– Updated floor finishes
40. Sheet A503: R2– Updated floor finishes
41. Sheet A510: R2 – Updated finishes
42. Sheet A511: R2 – Updated finishes
43. Sheet A512: R2 – Updated finishes
44. Sheet A513: R2 – Updated finishes
45. Sheet A601: R1 – Updated interior elevations & finishes
46. Sheet A603: R2 - Updated interior elevations & finishes
47. Sheet A801: R2 – Updated doors / muntin patterns
48. Sheet T001: R2 – Refer to bubbled areas
49. Sheet T100: R2 – Refer to bubbled areas
50. Sheet T101: R2 – Refer to bubbled areas
51. Sheet T102: R2 – Refer to bubbled areas
52. Sheet T103: R2 – Refer to bubbled areas
53. Sheet T104: R2 – Refer to bubbled areas
54. Sheet T107: R1 – Refer to bubbled areas
55. Sheet T108: R1 – Refer to bubbled areas
56. Sheet T202: R2 – Refer to bubbled areas
57. Sheet T203: R2 – Refer to bubbled areas
58. Refer to FSC Addendum #3 for further information.

clarifications:
59. None

end of addendum
ADDENDUM NUMBER 3
A Renovation Project for
ETSU Building 60 IPER Center
Johnson City, Tennessee
October 17, 2016

Changes/Modifications to the Drawings and Specifications:

**Mechanical**

1. Section 23.09.23 “Direct Digital Control (DDC) System for HVAC”: Add the following:

   *2.4 H. Volumetric Devices: Fan Inlet Air Flow Probes and Indicating Transmitters*

   1. Fan inlet air flow sensors and indicating transmitters shall be factory mounted in the air handling units. Fans shall be supplied with a factory mounted complete air flow measuring system and shall consist of total and static pressure pick-ups at various positions around the fan inlet cone throat and intake wall. The flow measuring station shall not obstruct the inlet to the fan and shall not have any effect on fan performance (flow or static pressure) or fan sound pressure levels. Traverse probes located in the fan inlet will not be acceptable due to increased noise levels and decreased fan efficiency. The flow measuring station shall be piezometer type as manufactured by Twin Cities or approved equal. Airflow sensing accuracy shall be +/- 5% of measured flow.

   2. For fan locations outside of air handling unit where factory mounted inlet sensor type cannot be used, fan inlet probes shall be pitot type average velocity sensors designed for installation inside the inlet bell/funnel of in-line centrifugal fans. Provide fan inlet airflow measuring probes with +/- 2% accuracy to be Paragon Controls Inc. FE-1050 or Air Monitor equivalent.

   3. The airflow transmitter shall be an industrial quality, electronic solid state, ultra low span, +/-0.25% accuracy transmitter with integral square root, scaling, and output filter with indication. Each transducer shall be provided with an indicating meter operating independent of all other control devices which provides a direct readout of the air volume as derived from the total and static input signals received from the respective airflow measuring element. The meter shall be a differential pressure type that is diaphragm actuated and is flush mounted on the enclosure door. The meter shall be calibrated to an accuracy of +/- 2% measured flow. Provide individual airflow transmitters, especially selected for the required spans of each of the above primary elements to be Paragon Controls Inc. as required for applicable range with auto.

   4. Factory technician from home office to visit site and provide written certification that Paragon inlet probes and airflow transmitters have been installed and are functioning per manufacturer's requirements.

2. Sheet M001 “VAV Box Schedule”:

   Omit note below VAV schedule regarding control transformers. All control transformers shall be as specified in Section 23 36 00.
3. Sheet M003 "Fan Coil Unit Schedule":

Revise Heating Capacity to 9850 BTUH for FCU's 1-3, 1-4, 1-5, 1-6, 1-7, 1-9, 1-10, 1-13, 1-14, 1-15, 1-18, 1-19, 2-1, 2-3, 2-5, 2-2-7, 2-8, 2-9, 2-10, 2-11, 2-12, 2-13, 2-14, 2-15, 2-16, 2-17, 2-23. Thermostats shall be by the control contractor. Two way control valves serving Fan Coil Units shall be by fan coil unit manufacturer.

4. Sheet MS101

Revise routing of 3" steam and 2" steam: condensate to miss the Tree drip line. Allow an additional 40 feet of piping to avoid the tree line. Underground steam and steam piping submittals to include location of moment guides, anchors and expansion loops.

5. Section 23 21 23 Hydronic Specialties

Add Armstrong to the list of manufacturers.

6. Sheet M001 "VAV Box Schedule":

Revise VAV 04 to 550 primary cfm, 200 minimum cfm, and 380 heating cfm. VAV 04 to be a 8 inch box with 16.5 MBH heating and 1.1 gpm.

7. Sheet M100:

Revise two supply registers in Restroom- Space -B55 to 8 x 6 & 125 cfm instead of 6 x 6, 50 cfm each. Revise the low pressure supply ductwork serving VAV 03 to a 10 x 10. Connect a 8 inch round to a diffuser sized for 150 cfm to serve Corridor adjacent to the water coolers.

8. Sheet M101:

Revise two supply registers in Restroom- Space -155 to 8 x 6 & 125 cfm instead of 6 x 6, 50 cfm each. Revise the low pressure supply ductwork serving VAV 1-11 to a 12 x 10. Connect a 10 inch round to a diffuser sized for 265 cfm to serve Corridor outside Electrical Room 151.

9. Sheet M102:

Revise two supply registers in Restroom - Space - 255 to 8 x 6 & 125 cfm instead of 6 x 6, 50 cfm each. Revise the low pressure supply ductwork serving VAV 2-6 to a 12 x 10. Connect a 8 inch round to a diffuser sized for 170 cfm to serve Corridor outside Electrical Room 251.

10. Sheet M103:

Revise two supply registers in Restroom- Space -355 to 10 x 6 & 150 cfm instead of 6 x 6, 50 cfm each. Revise the low pressure supply ductwork serving VAV 3-11 to a 12 x 10.

11. Specification 23 64 23 Scroll Water Chillers

Add manufacturer Diakin to 2.1 A.
12. Specification 23 36 00 Variable Volume Terminal Units

   Add manufacturer Price to 1.1 A.

13. Specification 23 73 13 Modular Indoor Central Station Air Handling Units

   Add manufacturer Diakin to 2.1 A.

Plumbing

   1. WC3 shall be a tank type water closet equal to that of Zurn Z5551, 1.5 gpf.

Fire Protection

   1. Backflow on fire riser shall be equal to Zurn Wilkins 375.

Electrical

   1. Refer to Specification Section 27 15 00 - VOICE AND NETWORK HORIZONTAL CABLING SYSTEM. Refer to Part 2 - Products, 2.1 Materials. Replace paragraph "E" with the following:

      Voice and network horizontal cabling: Cabling shall be as specified in ITS Guidelines, Appendix A. All network cabling shall have blue outer insulation. Leave 8" of slack for each termination at wall outlet location. Leave one meter (3.28') slack at the end of each conduit run. Cable slack shall not be stored in bundled loops. Cable slack shall be stored in an extended loop or in a Figure 8 configuration. Provide two data cables to each communications outlet illustrated on the drawings, unless noted otherwise.

   2. Refer to Drawing E001 - Electrical Legend, Details, and Notes

      a. Refer to the Legend. Refer to the symbols for standard and counter-height duplex and quad receptacles. Revise last sentence to indicate that USB Charging Type receptacles are required in Corridors, Conference Rooms, Orientation/Debrief Rooms, Commons, Lobbies, and other public spaces only.

      b. Refer to Lighting Fixture Schedule.

         i. Revise last column to be titled "Alternate Manufacturers".

         ii. For fixture types A, A1, B, B1, D, and G note in fixture Description that these fixtures shall have a 10 year warranty for all fixture components.

         iii. For fixture type G, note in fixture Description that this fixture type is direct only, omit reference to "Top Glow Lens".

         iv. Revise catalog number for type H to be "STR4 LED35 MO 8" TW M D1 SC UNV X7 ND". Note in fixture Description that this fixture type shall have a trim-less mud-over flange.

         v. For fixture type W, note in Description that this fixture type shall be equipped with conduit knock-outs on all four sides for direct conduit entry.

         vi. At bottom of fixture schedule revise Note 3 to read: "ALL FIXTURES SHALL BE FURNISHED COMPLETE WITH LAMPS AND DRIVERS. UNLESS NOTED OTHERWISE, LED LAMPS SHALL BE 3500K, WITH A MINIMUM CRI OF 82. LED DRIVERS SHALL BE ELECTRONIC WITH A MAXIMUM THD OF 10 PERCENT.

         vii. At bottom of fixture schedule add Note 4 to read: "THE CATALOG NUMBER ABOVE IS THE BASIS OF DESIGN. THE ALTERNATE MANUFACTURERS LISTED ARE PRE-APPROVED ASSUMING THEIR PRODUCT MEETS
ALL ASPECTS OF THE SPECIFIED FIXTURE WITH REGARD TO QUALITY, AESTHETICS, MOUNTING, FINISH, PERFORMANCE, AND SUITABILITY OF APPLICATION.

3. Refer to Drawing E005 – Panelboard Schedules. Refer to Panelboard “B0”, circuits 15 and 17. Revise load description to be “SPARE” in lieu of current description. Revise load to be 0 VA.

4. Refer to Drawing E007 – Panelboard Schedules. Refer to Panelboard “D2”, circuit 3. Revise load description to be “Dryer Booster Fan” in lieu of current description. Revise load to be 100 VA.

5. Refer to Drawing E101 – First Floor Lighting Plan.
   a. Refer to Room 107, Grab-N-Go. Add a type “J” can in center of space; omit short section of track lighting (type “C”) on East wall.
   b. Refer to Room 167, IPER GA. Change fixture type to “B” in lieu of “D” shown.

6. Refer to Drawing E103 – Third Floor Lighting Plan. Refer to Room 394 “Corridor”, just outside Room 323 “Elec”. Tag two fixtures in corridor at this location as type “A1”.

7. Refer to Drawing E200 – Basement Power Plan. Refer to Enlarged IT Room B52 & SIM AV B53 Power Plan. In IT Room B52, note 2nd Data Rack closest to the door as “future”. Omit power circuit and receptacles B0-15, 17.

8. Refer to Drawing E201 – First Floor Power Plan. Refer to Enlarged IT Room 152 Power Plan. In IT Room 152, add 3rd Data Rack closest to the door. Relocate end receptacles shown on Rack #2 to new Rack #3, power circuit and receptacles B1-7 & 8.

9. Refer to Drawing E202 – Second Floor Power Plan. Refer to Room 294 Corridor, on South wall adjoining IT Room 252. Relocate receptacle shown at that location to the short wall to the East adjoining Sim Clinic Exam Room 261.

10. Refer to Drawing E300 – Basement Mechanical Power. Refer to Boiler Room to the East of the B60. Adjacent to EF-2, add a 120 volt connection for EF-5 at 100 watts. Connect to same circuit, M1-9. Provide toggle type disconnect.

11. Refer to Drawing E302 – Second Floor Mechanical Power. Refer to Adv Kit/S.P. Break Room 214. Refer to clothes dryer in Northeast corner. In chase behind dryer add a 120 volt, connection at 80 watts for an inline booster fan. Extend branch circuit to panelboard D2, 1/2" – 2#12, 1#12G, to circuit number 3; 20A/1P breaker.

12. Refer to attached revised sheets T001, T100, T101, T102, T103, T104, T107, T108, T202, and T203.

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

October 17, 2016
By: Facility Systems Consultants, LLC
SECTION 01 25 33
PRODUCT SUBSTITUTION REQUEST FORM

To: Red Chair Architects.

Project: ETSU Com Bldg #60

Specified Item: Flush Wood Doors
Algonquin VT Industries, Amaco, Inc.

Proposed Substitute: Eggars Industries

1. The following are attached (Mark all that apply):
   - [ ] Complete Description
   - [ ] Laboratory Tests
     - Information on the availability of maintenance services and replacement materials for proposed substitute(s)
   - [ ] Catalog
   - [ ] Spec Data
     - Names, addresses, and phone numbers of fabricators and suppliers for proposed substitute(s)

2. This substitution will have the following effects on dimensions, gauges, weights, etc.:
   None

3. This substitution will have the following effects on wiring, piping, ductwork, etc.:
   None

4. This substitution will have the following effects on other trades:
   None

5. This substitution will have the following effect on construction schedules:
   None

6. The proposed substitute(s) differs from the specified product(s) in quality and performance as follows:

7. Manufacturers guarantees for the substitute(s) and the specified product(s) are (check one):
   - [X] the same
   - [ ] different (if different, explain below)
8. If the proposed substitution is accepted, it will result in:
   - [ ] no cost impact
   - [ ] a cost increase of
   - [ ] a cost decrease of

   (If change in cost is indicated, itemization or specified Cost Itemization Form is attached)

9. License fees or royalties are pending on the proposed substitute.
   - [ ] No
   - [ ] Yes (if yes, explain below)

10. The undersigned or the firm represented shall pay for additional studies, investigations, submittals, redesign, and analysis by the Designer necessitated by this substitution request.

    Substitutions must be requested in accordance with applicable Contract requirements. After bidding, substitutions are to be submitted only by Contractor. Substitute products should not be ordered or installed without written acceptance.

    Submitted by: [Sign here]
    Name: Jerry D. Mckinahan
    for: Appalachian Commercial Products
    Address: 226 Birch Street
           Blountville, TN 37617
    Date: 10/11/2014
    Telephone: 423-233-2952

Designer's Review Comments:
   - [ ] Accepted
   - [x] Accepted as noted
   - [ ] Rejected
   - [ ] Rejected (received too late)
   - [ ] Rejected (submittal incomplete)

Additional comments:
Submittals will be required prior to construction

For the Designer:
Signature here: [Signature]
Date: 10/17/16
FLUSH DOORS

Eggers' 5-ply flush doors are the very embodiment of form marrying function - extraordinary beauty and exceptional durability. We are able to produce a variety of custom architectural designs to suit all styles and needs.
5-Ply Flush Doors

Eggers employs the highest level of artistic craftsmanship alongside hot press technology and bonded cores to produce the most elegant, high-performing doors. Our 5-ply flush doors can be specified to your needs - lead-lined, bullet-resistant, acoustical, impact-resistant, non-rated and fire-rated through 90-minute.

Let Eggers' unique offerings set your project apart. Create a stunning first impression by utilizing our precise sketch face capabilities; add to the beauty of your project by using our striking Vinterio veneer face option; or create a streamlined modern design by specifying our beadless lite flush door on your next project.

Whatever the impression you want to make, the combination of your creativity and Eggers' craftsmanship will bring your vision to reality.
Specialty Door Offerings

Steadwood Acoustical Capabilities

Eggers' acoustical doors have the highest STC ratings in the industry. Our capabilities allow you to combine the privacy of acoustical performance with other special functionality to meet the design requirements and building codes for your project. Eggers' offerings include, but are not limited to:

- Acoustical designs with fire ratings up to 90-minute.
- STC ratings up to 52 for flush doors.
- STC ratings up to 40 for stile & rail doors.
- Veneer, MDO, vinyl or plastic laminate faces.
- A variety of gasket system options with or without raised thresholds and automatic door bottoms.
- Complete gasket system and installation instructions provided with STC doors.
- Combined STC and LEED®/FSC® certified offerings.
- Some STC ratings also provide x-ray shielding.

Lead-Shielded Doors

Our lead-shielded doors are ideal for use in x-ray rooms and radiation treatment facilities. Manufactured under strict quality control, Eggers' lead-shielded doors provide the highest radiation protection.

- Standard offerings in 1/32", 1/16" or 1/8" total lead thickness. Higher thicknesses per engineering review.
- Balanced at one half total thickness per side.
- Available in 20-, 45- and 60-minute fire ratings.
- Lite cutouts and factory glazing available.
- Singles available up to 4' x 10' and pairs available up to 8' x 10', with a maximum individual door weight of 500 lbs.

Bullet-Resistant Doors

Eggers' bullet-resistant doors offer the aesthetic quality of wood while providing the highest rated protection available. Bullet-resistant doors help ensure safety from direct arm fire in government and other public facilities.

- Available in resistance levels 1-8, per UL 752.
- All protection ratings are eligible for a UL 20-minute fire label.
- Glazing available in doors, up to the required ballistics rating.
- Veneer, MDO or plastic laminate faces.

For our complete Soundwood Acoustical Capabilities, please visit www.eggersindustries.com and click on technical data.
<table>
<thead>
<tr>
<th>Feature</th>
<th>Single</th>
<th>Double</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Max. Size</strong></td>
<td>4' x 10'</td>
<td>8' x 10' parallel and dbl. overlap</td>
<td>4' x 10' (per leaf)</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>1-3/16 - 2-1/4&quot;</td>
<td></td>
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<tr>
<td><strong>Core</strong></td>
<td>Particleboard, UF-free particleboard, FSC certified particleboard, stave. FSC certified stave, structural composite lumber (SCL), FSC certified structural composite lumber and agiliber</td>
<td></td>
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<tr>
<td><strong>Max. Door &amp; Transom Non-Rabbetted</strong></td>
<td>4' x 14' (with transom bar)</td>
<td>4' x 14' (with transom bar)</td>
<td>4' x 14' with or without a transom bar or rabbetted</td>
</tr>
<tr>
<td><strong>Stiles</strong></td>
<td>Veneered structural composite lumber, solid lumber edges available upon request</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rays</strong></td>
<td>No-Rail construction is standard for SCL; 1-1/8&quot; for all other core types (multiple-ply optional)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reinforcements</strong></td>
<td>Blocking for screw attached surface hardware required for agiliber; not required for extra heavy duty applications for SCL and stave core or heavy duty applications with particleboard</td>
<td></td>
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<tr>
<td><strong>Faces</strong></td>
<td>All available domestic and foreign veneers, medium density overlay (MDO), and high pressure laminates and vinyl</td>
<td></td>
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<tr>
<td><strong>Crossbande</strong></td>
<td>1/11&quot; high density fiberboard</td>
<td></td>
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<tr>
<td><strong>Lites</strong></td>
<td>Up to 1296 sq. in. standard, SCL, and stave core available with 2988 sq. in. Beadless lite construction available requires maximum 6&quot; top rail and factory glazing. Factory glazing recommended to comply with new NFPA standards</td>
<td></td>
<td>Size restricted only by min. margins. Beadless lite construction available requires maximum 6&quot; top rail and factory glazing</td>
</tr>
<tr>
<td><strong>Louvers</strong></td>
<td>Metal louvers up to 576 sq. in. where allowed by code</td>
<td></td>
<td>Wood or metal</td>
</tr>
<tr>
<td><strong>Latching Hardware</strong></td>
<td>Cylinders, mortised, unit, or card locks; 5&quot; backset and deadbolts available</td>
<td></td>
<td>Most available latching hardware</td>
</tr>
<tr>
<td><strong>Hinges</strong></td>
<td>Per NFPA 80 - butts, pocket pivots, continuous hinges; pivots (electrical options available)</td>
<td></td>
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<tr>
<td><strong>Flushbolts</strong></td>
<td>N/A</td>
<td>Automatic corner or extension bolts up to 36&quot;</td>
<td>Corner or extension bolts up to 48&quot;</td>
</tr>
<tr>
<td><strong>Fire Exit Hardware</strong></td>
<td>Rim, surface and concealed vertical rod (full or top rod only), and fire exit hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Closers, Stops, Holders</strong></td>
<td>Listed surface hardware or concealed hardware having mortise up to 23-3/4&quot; x 1-1/2&quot; x 1-3/8&quot;</td>
<td>Listed surface hardware or concealed hardware having mortise 1-3/8&quot; wide</td>
<td></td>
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<tr>
<td><strong>Drop Seals</strong></td>
<td>Listed and approved surface, semi-mortised or mortised</td>
<td></td>
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</tr>
<tr>
<td><strong>Special Details</strong></td>
<td>Machining for hardware; installation of lites and louvers; sketch facade; applied moulding; beadless lite construction; kickplates; solid wood grillwork and divided lites; reveals; raceways</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Finish</strong></td>
<td>UV-cured, primed, painted (MDO only), sealer, full sealer, catalyzed polyurethane, and opaqued varnish</td>
<td></td>
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<tr>
<td><strong>Warranty</strong></td>
<td>Life of installation (interior); 3 years (SCL exterior)</td>
<td></td>
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<tr>
<td><strong>Standards</strong></td>
<td>WOMA I.S. 1A, AWS Section 9 Edition 1, NFPA 252, UL 10B, UL 10C, NFPA 80</td>
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</tr>
<tr>
<td><strong>ENGINEERING SPECIFICATIONS</strong></td>
<td><strong>48-MINUTE FIRE DOOR DATA</strong></td>
<td><strong>60-MINUTE FIRE DOOR DATA</strong></td>
<td><strong>90-MINUTE FIRE DOOR DATA</strong></td>
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<tr>
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<tr>
<td><strong>Max. Size</strong></td>
<td>4' x 10'</td>
<td>4' x 9'</td>
<td>8' x 6'</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>1-3/4&quot; - 2-1/4&quot;</td>
<td></td>
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<tr>
<td><strong>Max. Door &amp; Transom</strong></td>
<td>4' x 11&quot; (max. transom size 4' x 4') - doors and transoms must be separated by horizontal transom bar. Transoms over 4&quot; must be separated by vertical and horizontal transom bars.</td>
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<tr>
<td><strong>Max. Door &amp; Transom Rabatted</strong></td>
<td>36&quot; x 10'</td>
<td>N/A</td>
<td>N/A</td>
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<tr>
<td><strong>Sides</strong></td>
<td>Veneered laminated edges, solid lumber outedge edges available upon request; category A, B or neutral pressure.</td>
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<tr>
<td><strong>Rails</strong></td>
<td>Typical rails are 1/2&quot; to 3/4&quot; on top and 1/2&quot; on bottom, construction may include lumber, treated lumber or laminated construction as required by fire door procedures for the application and options.</td>
<td></td>
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<tr>
<td><strong>Reinforcements</strong></td>
<td>Optional 5&quot; x full core width top and bottom reinforcing, 5&quot; x 10&quot; standard latchcase and bolt reinforcing, or blocking as specified</td>
<td></td>
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<tr>
<td><strong>Fascia</strong></td>
<td>All available domestic and foreign veneers - medium density overlays (MDO), and high pressure laminate and vinyl.</td>
<td></td>
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</tr>
<tr>
<td><strong>Crossbars</strong></td>
<td>Min. 1/16&quot; high density fiberboard.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vision Panels</strong></td>
<td>Up to 1296 sq. in./max. 36&quot; wide, max. 54&quot; high. Special construction glass can be up to 1714 sq. in./max. 36&quot; wide, max. 86-1/2&quot; high. Factory glazing recommended to comply with new NFPA 80 standards.</td>
<td>Up to 1296 sq. in./max. 36&quot; wide, max. 54&quot; high. Factory glazing recommended to comply with new NFPA 80 standards.</td>
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<tr>
<td><strong>Louver</strong></td>
<td>Up to 24&quot; x 24&quot; (not available in doors used as means of egress)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Latching Hardware</strong></td>
<td>Cylinders, mortise, unit, or card locks; 5&quot; backset and deadbolts available</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hinges</strong></td>
<td>Per NFPA 80 - butts, continuous hinges, pivots (electrical options available)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Top &amp; Bottom Bolts</strong></td>
<td>N/A</td>
<td>Listed surface, manual extension (max. 24&quot;) &amp; automatic bolts</td>
<td>Listed surface, manual extension (max. 24&quot;) &amp; automatic bolts</td>
</tr>
<tr>
<td><strong>Fire Exit Hardware</strong></td>
<td>Listed and approved fire exit hardware, reinforced blocking options available for screw mounting (min. #10 x 1-1/2&quot; sheet metal screws). No prep for surface mounted. LBR available.</td>
<td></td>
<td></td>
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<tr>
<td><strong>Closers, Stops, Holders</strong></td>
<td>Listed surface mounted closers, concealed closers, and stops not exceeding 23-3/4&quot; x 1-1/2&quot; deep x 1-3/8&quot; wide</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drop Seats</strong></td>
<td>Listed and approved</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Special Details</strong></td>
<td>Cut for horizontal openings; install glazing and metal louvers; applied moldings per approval; stile &amp; rail sketch faces for applied moldings; wood veneer wrapped metal edges and rabatets; kickplates up to 45°; solid wood grillwork; reveals up to 3/8&quot; wide and 3/8&quot; deep.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Finish</strong></td>
<td>UV-cured, primed, painted (MDO only), sealer, full sealer, catalyzed polyurethane, and opaque varnish</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Warranty</strong></td>
<td>Life of installation - not suitable for exterior installations</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Standards</strong></td>
<td>WDMA 1.1A, AWS Section 9 Edition 1, NFPA 252, UL 10B, UL 10C, NFPA 80</td>
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<td></td>
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</tbody>
</table>

1 Metal edges not required. 2 Full height metal edges on sides are optional with surface hardware or locks & flush bolts, but not allowed with CFR hardware. 3 Spring bolts or metal stops required to secure the transom. 4 The bottom rail of rabatted panels will be edge backed. 5 Minimum margins from the opening. 6-10" to back edge or adjacent to openings, 1-10" to first prep & less than 100 sq. in., require fire-resistant glazing to maintain temperature 1 hour rating. 7 Veneer edges available for metal vision panels. 8 Doors will be manufactured and labeled in accordance with procedures and product approval's established by and between Egger Industries and Woodside Fenestration or Underwriters Laboratories. 9 Minimum 10" margin from top of door opening to bottom of door unreinforced to comply with ADA. MDF chipboard for plastic laminate face doors will be painted.
SUGGESTED SPECIFICATIONS FOR DOORS WITH LITE OPENINGS

Note Regarding ADA
The minimum bottom rail dimensions below are based on fire and/or warranty requirements. It is the specifier’s responsibility to determine the code requirements of his/her application. Where ADA compliance is required, doors must be ordered with 10” bottom rails.

Removable True-Divided Lite Grillwork
Removable true-divided lite grillwork is an innovative offering from Eggars Industries. It’s a cost effective and practical alternative to traditional true-divided lites. The grillwork provides a high-end appearance without the need for high maintenance. It easily snaps in and out of door lite openings for effortless cleaning.
- Glass is held permanently in place with our standard lite bead.
- Minimum visible glass in each lite opening is 100 sq. in. with minimum dimension of 10” x 10”.
- Grillwork is available in curved profile or layout.
- Grillwork is available with 1/4” glass.
- Interio only, not available for exterior doors.
- Not available in fire-rated doors.
- Grillwork will be the same specie as the lite beads.
- Maximum lite size 80” high x 40” wide.

Non-Rated Full-Lite Doors
- 1-1/2” minimum between lock and lite cutout.
- 3” minimum between multiple lite cutouts
- True-divided lites available.
- Grillwork available to achieve aesthetics of a French door.
- 5-ply construction, SCL or stave core.
- Stiles bonded to core and sanded as a single unit.
- Standard edge strip is minimum 1” veneered SCL, solid lumber or multiply edge available upon request.
- Glass can be factory glazed or field glazed with glass type specified.
- 5” minimum stiles and rails to meet warranty requirements.
- Beadless lite construction available.

20-Minute Full-Lite Doors
- 20-minute door utilizes clear glass that is fire- and safety-rated.
- 20-minute fire rating with visible lite up to 2,868 sq. in. (87–916” maximum height x 36” maximum width).
- 1-1/2” minimum between lock and lite cutout.
- 3” minimum between multiple lite cutouts.
- Factory glazing recommended on fire rated doors to comply with new NFPA standards.
- True-divided lites available - maximum cutout of 35-78” wide by 89-58” high (various layouts available/maximum dimension of a single pane of glass is 54”).
- Solid wood grillwork available to achieve aesthetics of a French door.
- 5” minimum stiles and rails.
- 5-ply construction, SCL or stave core.
- Stiles bonded to core and sanded as a single unit.
- Standard edge strip is minimum 1” veneered SCL, solid lumber or multiply edge available upon request.
- Glass to be safety- and fire-rated.
- Beadless lite construction available.

45-Minute Full-Lite Doors
- 45-minute fire rating with visible lite up to 1,714 sq. in. using Firelite Plus (86-1/2” maximum height x 36” maximum width).
- 3” minimum between lock and lite cutout.
- 6” minimum between multiple lite cutouts.
- Solid wood grillwork available to achieve aesthetics of a French door.
- 6” minimum top rails and side stiles. 10” minimum bottom rail.
- Reinforced face construction.
- Stiles bonded to mineral core and sanded as a single unit.
Matching Faces

Balance Match
- Each panel face is assembled from veneer leaves of uniform width before edge trimming.
- Panels may contain an even or odd number of leaves and distribution may change from panel to panel within a sequence set.

Center Match
- Each panel face is assembled of an even number of veneer leaves of uniform width before edge trimming.
- There is a veneer joint in the center of the panel producing horizontal symmetry.

Running Match
- Each panel face is assembled from as many veneer leaves as necessary.
- Results in a non-symmetrical appearance with some veneer leaves of unequal width.
- Often the most economical method at the expense of aesthetics.

Book Match
- Veneer joints match, creating a symmetrical pattern. Yields maximum continuity of grain.
- Prominent characteristics will ascend or descend across the match.
- Because right side and loose side faces alternate in adjacent leaves, they reflect light and accept stain differently and this may yield a noticeable color variation, termed "Barber Pole." Barber Pole is considered a defect.
- This effect may be minimized through the use of proper finishing techniques.

Slip Match
- Adjoining leaves are slipped out in sequence with all the same-face sides being exposed.
- The joint may not be noticeable if grain is straight.
- Figure repeats but grain does not match at joints.
- Produces a uniform color because all faces have a similar light reflection.
- A leaning effect may occur if the specie used does not demonstrate a straight grain.

Diamond Match

Sunburst

For additional information, please refer to AWS Quality Standards Edition 1, Section 4.
## DURATION OF WARRANTIES

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<td>SCL</td>
<td>Life of original installation</td>
<td>Three years from date of original installation</td>
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<tr>
<td>Slat</td>
<td>Life of original installation</td>
<td>Not warranted</td>
</tr>
<tr>
<td>Plastic</td>
<td>Life of original installation</td>
<td>Not warranted</td>
</tr>
<tr>
<td>Mineral Core</td>
<td>Life of original installation</td>
<td>Not warranted</td>
</tr>
<tr>
<td>Acoustical</td>
<td>Life of original installation</td>
<td>Not warranted</td>
</tr>
<tr>
<td>Acoustical Airport - Flush</td>
<td>Life of original installation</td>
<td>Five years from date of original installation</td>
</tr>
<tr>
<td>Lead Shielded</td>
<td>Life of original installation</td>
<td>Not warranted</td>
</tr>
<tr>
<td>Stile &amp; Rail - Non-Rated</td>
<td>Life of original installation</td>
<td>Three years from date of original installation</td>
</tr>
<tr>
<td>Stile &amp; Rail - 20 Minute</td>
<td>Life of original installation</td>
<td>Not warranted</td>
</tr>
<tr>
<td>Stile &amp; Rail - 45, 60, 90 Minute</td>
<td>Life of original installation</td>
<td>Not warranted</td>
</tr>
<tr>
<td>Full Lite Construction</td>
<td>Life of original installation</td>
<td>Not warranted</td>
</tr>
<tr>
<td>Bullet Resistant</td>
<td>Life of original installation</td>
<td>Three years from date of original installation</td>
</tr>
<tr>
<td>Flush Curtain</td>
<td>Life of original installation</td>
<td>Not warranted</td>
</tr>
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All doors manufactured by EGGER'S INDUSTRIES of Neenah, Wisconsin and EGGER'S INDUSTRIES of Two Rivers, Wisconsin (hereafter referred to as Eggers) are warranted to be free from defects in material and workmanship which would render them unserviceable or unfit for the ordinary, recommended uses for the time periods as set forth below. This warranty automatically applies to purchasers of doors from Eggers and extends on resale of the product. Claims should be processed through the intermediate suppliers. It is the responsibility of Eggers' intermediate suppliers to make the initial jobsite visit on a complaint to verify the issue and collect necessary documentation (i.e., sizes, pictures, etc.). On occasion, it may be necessary for Eggers to send a representative to the jobsite. If an Eggers representative is required to go to the jobsite and the issue is determined not to be a manufacturer's issue, then the intermediate supplier will be charged for all applicable expenses related to the jobsite visit.

**LIMITATIONS OF LIABILITY**

Eggers shall not be liable for incidental, indirect or consequential damages arising from the manufacture, use or sale of these goods. (This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.) Eggers' liability is expressly limited to the repair or replacement of non-conforming goods or the refund of the purchase price, at the option of Eggers.

If any door becomes defective after installation, Eggers agrees to bear the **reasonable expense** of repairs, rework, machining, finishing, removing and rehanging such repairs. Rework, removal and rehanging shall be performed only after approval is obtained from Eggers and the cost of such work has been determined. In the event the defect for which the doors are being rejected was apparent prior to hanging, Eggers is not obligated to pay removal and rehanging charges.

**NOTICE REQUIREMENT**

Since Eggers cannot control the handling or exposure of doors after shipment, a specific duty of inspection is imposed upon the purchaser as a condition precedent to any claim under this warranty. Such inspection must be made upon receipt of the goods and written notice of any claim must be received by Eggers within 30 days of receipt of the goods, or discovery of the defect. **NO CLAIM UNDER THIS WARRANTY SHALL BE ACTIONABLE UNLESS THE FOREGOING NOTICE IS GIVEN AS SET FORTH HEREIN.**

It shall not be the policy of Eggers Industries to inspect finished installations for the sole purpose of certifying that the installation is within warranty.

**MATTERS EXCLUDED FROM THIS WARRANTY**
TRUE STILE & RAIL AND 5-PLY FLUSH DOORS
Warranty Information

Date: April, 2014

Eagers Industries

Since methods and conditions or installation and use are beyond the control of Eagers, this warranty is not effective unless the doors are stored, handled, finished, used and installed in strict accordance with the provisions set in the following guidelines of this warranty.

Eagers Door Warranty
Tolerances, Exclusions and Instructions

TOLERANCES
1. Stile, rail and core show-through (telegraphing) shall not be considered a defect unless the focc of the door varies from a true plane in excess of 1/100 (.010) in any 3" span.
2. Warp shall not be considered a defect unless it exceeds 1/16" in the plane of the door itself. For doors 1-3/4" or thicker, warp shall not exceed 1/16" in doors 3/8" x 7/8" or smaller, nor shall it exceed 1/16" in any 3/8" x 7/0" section of larger doors. For doors less than 1-3/4" thick, warp shall not exceed 1/16" in doors 3/8" x 7/8" or smaller. Warp is any distortion in the door itself and does not refer to the relationship of the door to the frame, jambs, or adjacent doors. Warp is measured by placing a straight edge on the concave face and determining the maximum distance from straight edge to door face.
3. Tolerances for all applied molding locations are ± 1/8" reference to all margins.

HANDLING, FINISHING AND INSTALLATION INSTRUCTIONS
1. Store doors flat on a level surface in a dry, well-ventilated building. Protect doors with an opaque covering that does not permit light to penetrate to keep the doors clean and avoid discoloration. Covering must allow air circulation. If doors are to be stored more than a week, all edges should be sealed. Deliver doors or frames to building site after HVAC system is operating and balanced and plaster or cement is dry.
2. Doors should not be subjected to extreme heat and/or humidity. Relative humidity should not be less than 25% or greater than 85% and temperatures should not be less than 50 degrees F or greater than 90 degrees F.
3. Handle with care and do not drag doors across one another or across other surfaces.
4. The utility or structural strength of the doors must not be impaired in the fitting of the door, the application of hardware or cutting and altering for lites, louvers, panels or any other special details.
5. Use three hinges for doors 7'/6" in height or less, and one additional hinge for each increment of 30" of height over 7'/6".
6. Allow a fitting clearance of 11/16" to 1/2" at each side and at the top.
7. Seal all edges immediately after field fitting.
8. Prior to field applied finishes, doors must be sanded. The finisher should thoroughly sand the doors with 150-grit sandpaper going with the grain direction of the veneer. A hand block should be used to remove all scuffs, handling marks, scratches, raised grain, blemishes and effects of exposure to moisture that may occur during handling, unloading and storage.
9. Some woods, particularly Oak, contain chemicals which react with iron. Do not use steel wool on Oak doors.
10. Doors to be prefinished at the factory should be checked against approved finish sample prior to hanging. (Installation of prefinished doors shall constitute acceptance.)
11. Stile and rail doors not prefinished at the factory must be stained and sealed, or painted, within 10 working days after the doors arrive from Eagers. Stile and rail doors supplied to Hawaii or Alaska must be factory finished.
12. Pilot holes must be drilled for all screws that act as hardware attachments. Self-tapping or combination woodtooth screws are not warranted for use on wood doors.

EXCLUSIONS
This warranty does not cover:
1. The appearance of field finished doors.
2. Natural variations in the color, texture, character, or cut of the wood.
3. Doors with cutouts closer than 5" to the door edge or doors with adjacent cutouts such as hardware, lites, louvers, etc. closer than stated minimums.
4. Doors which have cutout areas exceeding 3% of door height. However, waives in writing from the factory are available on a per job basis. This exclusion is waived on special full lite construction warranted for life of original installation for Interior use.
5. Doors that are improperly hung and door frames that are not plumb, square and level and do not allow the door to swing freely.
6. Warpage of doors less than 1-3/4" thick which are wider than 30" or higher than 7'-6".
7. Normal wear and tear including wear-through of finish.
8. Doors supplied outside the United States for telegraphing or warpage unless approved by the factory.
9. Cracking of plastic laminated surfaced doors with openings cut by other than Eagers or its authorized representative. Radius of 1/4" at corners of openings must be maintained.
10. Incompatibility of hardware with a particular door construction. This includes mortises such as concealed closers, magnetic holders, etc. deeper than 2" or wider than 1-1/4" and concealed vertical rod devices, unless special reinforced construction is ordered.
11. Constructions involving different species, face materials, or veneer grain configurations on opposite sides of the door. This includes doors with different plastic colors or patterns on each face. This may create an unbalanced condition not warranted against warpage, cracking, delaminations, etc. Exclusion may be waived for SCL core flush doors or stile and rail doors with proper approval in the form of a letter from manufacturing. Exclusion may be waived for SCL core flush doors or stile and rail doors with proper approval in the form of a letter from manufacturing.
12. Constructions, other than flush SCL, involving appliances (excluding applied molding) that are applied to only one face of the door.
13. Doors that are not stored as outlined in the Handling, Finishing and Installation Instructions.
14. Doors that are stored longer than six months.
15. OEM's warranty applies to all accessories supplied by Eggers.
16. Doors that have any form of face grooving which penetrate the crossbanding in excess of limitations set by the factory.
17. Doors altered by others for size by re-railing or re-stitting or relacing or defects resulting from other machining or alterations performed by others.
18. Stylus molding on one side of the door. Applied molding or one side of door if molding is over 1-3/4" wide, 3/4" high or over 24 linear feet. Miter joints and flatness on moldings over 3' in width.
19. Doors up to 7'6" in height with less than three hinges and doors with less than one additional hinge for each incremental 30" of height over 7'. This exclusion is waived on non-rated particle, aggribber, or stave core up to 8', stile & rail doors up to 8' and SCL core doors up to 90° when installed with top and bottom pivot hardware.
20. Doors machined for corner mortised flush bolts unless installed with metal edges or flush bolt cap.
22. Lites not glazed by Eggers, including glass breakage and damage to the door.

NOTE: Action on any claim for warp or telegraphing defects may be deferred at the option of the manufacturer for a period not to exceed 12 months to permit conditioning of the doors to temperature and humidity conditions.

**EXTERIOR FLUSH AND STILE AND RAIL DOOR GUIDELINES**

An exterior door is defined as one that cannot be controlled on both sides for temperature and humidity.

When exterior doors are machined for hardware or a lite opening, opportunity exists for moisture penetration into the door which will eventually cause deterioration. Therefore, the existence of the following conditions will void the warranty for exterior installations:
1. Doors installed outside the continental 48 states.
2. Failure to double seal all machined surfaces including openings and hardware cuts with exterior sealers.
3. Failure to properly protect lite cutouts in exterior doors to prevent moisture from seeping into the core. Lip moldings and exterior caulking are required. The top of an exterior door must be properly protected by flashing (except STC doors for airport housing).
4. Failure to provide adequate overhead protection. Adequate overhead protection includes a maximum of 4 ft. between the top of the door and the bottom of the overhead, a minimum overhead protection of 4 ft. out from the face of the door and a minimum protection extension of 4 ft. out from each side of the door.
5. Failure to provide the entire door including top and bottom edges with two coats of a good quality paint, varnish or lacquer.
6. This warranty does not cover telegraphing and checking of exterior doors.

Additional Exterior Guidelines
1. Eggers will not quote the Stylus door for an exterior application.
2. Eggers will not quote exterior doors with concealed hardware (vertical rods, flush bolts and closer/holders/stop).
3. Eggers will not quote exterior doors with machining for pivots and magnetic switches in the top rail of the door.
4. Eggers will not quote exterior doors with louvers.
5. The 20-minute door will be quoted for exterior applications, but no lite cutouts will be allowed.
6. Eggers will not quote 45, 60 and 90-minute flush doors for exterior application.
7. Eggers will not quote doors for applications with applied moulting and reveals.

Exterior finishes should be used on the exterior faces and all edges of exterior doors. A complete and continuous finish must be maintained on all surfaces of the door and must be refinished annually.

**Airport Housing Projects**

STC doors have been approved for residences around airports in Southern California and the Southwest with a five-year warranty. Contact the factory regarding exterior STC door requirements for airport housing projects in other locations. Top flashings not required on STC doors.

It should be noted that both the WDMA and AWI Standards indicate that wood doors are not recommended for exterior use.
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**ETSU CoM Building #60 Interprofessional Education and Research Center**

**sbc project no. 166/005-06-2013**

13-024
**END OF SECTION 00 01 10**

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<td>01 21</td>
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<td>01 21</td>
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The following Sections were deleted:
- 00 01 15 - List of Drawings
- 01 21 13 - TBR Allowances
- 01 21 15 - TBR List of Allowances
- 04 01 20 - Brick Masonry Repair and Repointing

---

SECTION = revised specification section issued in Addendum #1, dated 8/11/16
SECTION = revised specification section issued in Addendum #2, dated 9/14/16
SECTION = revised specification section issued in Addendum #3, dated 10/17/16
REQUEST FOR GMP

For Project: ETSU INTERPROFESSIONAL EDUCATION AND RESEARCH CENTER (BUILDING 60)

A. A Guaranteed Maximum Price (GMP) is requested for the Work described in this Project Manual and the associated drawings and addenda. You are to obtain bids for trade subcontracts, and develop the proposal GMP in accordance with the CM/GC Master Contract.

B. The GMP shall be for:
   - [X] a new Contract.
   - [ ] an amendment to an existing Contract.

C. The GMP shall offer alternates as specified. In addition, voluntary alternates:
   - [X] may be proposed, up to 3 in number.
   - [ ] may not be proposed.

D. Contract Bond, in the amount of 100% of the Contract Sum, on the Owners standard form is required. If this proposal is for an amendment, a rider to the existing bond acknowledging the amendment and the revised Contract Sum is required. A Three-Year Roof Bond is:
   - [X] required, for:
     1. Horizontal/plaza deck assembly waterproofing & topping – $80,000
     2. Areas of roof repair and replacement indicated on drawings (membrane and slate roof areas) -- $50,000
   - [ ] not required.

E. Substantial completion of this Work shall be achieved in the number of calendar days Contract Time allotted each Phase below, from and including the Commencement of each, and accepting the conditions for Liquidated Damages, per day, in the amount set forth for each, wholly and severally for each Phase:

<table>
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<th>Phase</th>
<th>Commencement</th>
<th>Contract Time</th>
<th>Liquidated Damages</th>
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<tbody>
<tr>
<td>All</td>
<td>Notice to Proceed for all Work</td>
<td>548 days</td>
<td>$500</td>
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END OF SECTION
**PART 1 - GENERAL**

1.01 SECTION INCLUDES the list of Unit Price items, and applicable established Unit Prices. Solicited unit prices are denoted in the “Definitions” Article below by having “(S)” as the Unit Price per Unit. Refer to Section 01 22 13 for general administrative requirements.

1.02 DEFINITIONS for each Unit Price item are as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Related Sections</th>
<th>Base Quantity</th>
<th>Unit</th>
<th>Unit Price per unit</th>
<th>Work Included</th>
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<tr>
<td>1</td>
<td>31 20 00</td>
<td>5</td>
<td>CU YD</td>
<td></td>
<td>Rock Removal and replacement with controlled low strength material</td>
</tr>
<tr>
<td>2</td>
<td>31 20 00</td>
<td>5</td>
<td>CU YD</td>
<td></td>
<td>Rock removal and replacement with suitable compacted soil backfill</td>
</tr>
<tr>
<td>3</td>
<td>31 20 00</td>
<td>5</td>
<td>CU YD</td>
<td></td>
<td>Rock removal and replacement with compacted crushed stone backfill</td>
</tr>
<tr>
<td>4</td>
<td>31 20 00</td>
<td>5</td>
<td>CU YD</td>
<td></td>
<td>Unsuitable soil removal and replacement with controlled low strength material</td>
</tr>
<tr>
<td>5</td>
<td>31 20 00</td>
<td>300</td>
<td>CU YD</td>
<td></td>
<td>Unsuitable soil removal and replacement with suitable compacted soil backfill</td>
</tr>
<tr>
<td>6</td>
<td>31 20 00</td>
<td>5</td>
<td>CU YD</td>
<td></td>
<td>Unsuitable soil removal and replacement with compacted crushed stone backfill</td>
</tr>
<tr>
<td>7</td>
<td>04 03 23</td>
<td>1,400</td>
<td>FT</td>
<td></td>
<td>Miscellaneous re-pointing of masonry (in addition to specific areas of re-pointing indicated on drawings)</td>
</tr>
<tr>
<td>8</td>
<td>01 35 91</td>
<td>50</td>
<td>TILES</td>
<td></td>
<td>Replacement of loose/damaged roof tile from owner’s existing stock</td>
</tr>
<tr>
<td>9</td>
<td>06 03 12</td>
<td>500</td>
<td>CU IN</td>
<td></td>
<td>Restoration of wood rafters and brackets at soffits (in addition to specific areas of epoxy restoration shown on drawings)</td>
</tr>
<tr>
<td>10</td>
<td>07 01 50.19</td>
<td>10</td>
<td>BOARD</td>
<td>FT</td>
<td>Replacement of existing damaged wood roof blocking and deck pieces with equal wood board materials.</td>
</tr>
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</table>
PART 1 - GENERAL

1.01 SECTION INCLUDES identification of each Alternate by number, and describes the basic changes to be incorporated into the Work if a particular alternate is made a part of the work by specific provisions in the Agreement between the Owner and the Contractor.

1.02 RELATED SECTIONS are referenced in the definition of each Alternate.

1.03 COORDINATION of related work and modifications to surrounding work as required to properly integrate each Alternate, and to provide the complete construction required by the Contract Documents, is the responsibility of the Contractor.

1.04 DESCRIPTION OF ALTERNATES:

Alternate #1 - Refer to ES100 and E003. Replace existing 15kV S&C Vista (3-Way) "SW7" with new 15kV S&C Vista (4-Way) Switch. Coordinate Building #178 and Campus outages with Campus authorities. Re-work existing 600A in/out circuits to new switch, existing 200A Building 178 circuit, and new Building #60 200A circuit to new switch. See Electrical Alt. #1 15kV one-line diagram and details on E003 for more information.
SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.
2. Section 312319 "Dewatering" for disposal of ground water at Project site.

1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.

B. Water from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.

1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.

3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
5. Other dust-control measures.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top and bottom rails. Provide concrete or galvanized-steel bases for supporting posts.

B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:

1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack and marker boards.
3. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
4. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 "Closeout Procedures".

C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

2. Contact Owner’s Representatives before any utility shutdown or interruption:
   a. Eddie Harkleroad
      Office (423) 439-7749
   b. Ian Watson
      Office (423) 439-7762
      Mobile (423) 202-2642

3. Give 2 working days advance notice of any utility shutdown or interruption that will affect occupied building spaces.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

D. Water Service: Connect to Owner’s existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

E. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

F. Heating: Provide temporary heating required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

G. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied adjacent buildings on campus.

H. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
I. Electric Power Service: Connect to Owner’s existing electric power service. Maintain equipment in a condition acceptable to Owner.
   1. Connect temporary service to Owner’s existing power source, as directed by Owner.

J. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
   1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
   2. Provide superintendent with cellular telephone for use.

K. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access Project electronic documents and maintain electronic communications.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
   1. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.
   1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
   2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Section 312000 "Earth Moving."
   3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
   4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course.

C. Traffic Controls: Comply with requirements of authorities having jurisdiction.
   1. Protect existing site improvements to remain including curbs, pavement, and utilities.
   2. Maintain access for fire-fighting equipment and access to fire hydrants.

D. Parking: Use designated areas of Owner’s existing parking areas for construction personnel.

E. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
   1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

F. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
   1. Identification Signs: Provide Project identification signs as indicated on Drawings.
   2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
      a. Provide temporary, directional signs for construction personnel and visitors.

3. Maintain and touchup signs so they are legible at all times.

G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
   1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

I. Temporary Elevator Use: Use of new elevator is not permitted.

J. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.

K. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
   1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

L. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

C. Temporary Erosion and Sedimentation Control: Comply with requirements specified in Section 311000 "Site Clearing."
D. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings.

1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

E. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

F. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

G. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

H. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel.

I. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

J. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

K. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

L. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Prohibit smoking in construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.5 MOISTURE AND MOLD CONTROL


B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
   1. Protect porous materials from water damage.
   2. Protect stored and installed material from flowing or standing water.
   3. Keep porous and organic materials from coming into prolonged contact with concrete.
   4. Remove standing water from decks.
   5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
   1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
   2. Keep interior spaces reasonably clean and protected from water damage.
   3. Periodically collect and remove waste containing cellulose or other organic matter.
   4. Discard or replace water-damaged material.
   5. Do not install material that is wet.
   6. Discard, replace, or clean stored or installed material that begins to grow mold.
   7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
   1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
   2. Use permanent HVAC system to control humidity.
   3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
      a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
      b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
      c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.
3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Decorum: All personnel onsite to maintain appropriate and professional decorum. Construction activities will occur in student, faculty and staff occupied facility and appropriate behavior and non-solicitation shall be in place at all times.

C. Maintenance: Maintain facilities in good operating condition until removal.

     1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

     1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.

     2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

     3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 “Closeout Procedures.”

END OF SECTION 01 50 00
SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.
4. Miscellaneous record submittals.

B. Related Requirements:
1. Section 017300 "Execution" for final property survey.
2. Section 017700 "Closeout Procedures" for general closeout procedures.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set of marked-up record prints.
   
   1) Submit paper-copy set of marked-up record drawings.
   OR
   2) Submit PDF electronic files of scanned record drawings.
   OR
   3) Submit annotated PDF electronic file of record drawings.

2. Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

B. Record Specifications: Submit one paper copy or annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

C. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.
PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Drawings: Maintain one set of marked-up paper copy of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record drawings to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record drawings.

   a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
   b. Accurately record information in an acceptable drawing technique.
   c. Record data as soon as possible after obtaining it.
   d. Record and check the markup before enclosing concealed installations.
   e. Cross-reference record prints to corresponding archive photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

   a. Dimensional changes to Drawings.
   b. Revisions to details shown on Drawings.
   c. Depths of foundations below first floor.
   d. Locations, **identifications**, and depths of **new and existing** underground utilities and **other underground items**
   e. **location by dimension and identification of utilities, valves, tap points, equipment, service access, test points, and related features**
   f. **description and details of features for maintenance, service, replacement, or expansion of the Work**
   g. Revisions to routing of piping and conduits.
   h. Revisions to electrical circuitry.
   i. Actual equipment locations.
   j. Duct size and routing.
   k. Locations of concealed internal utilities.
   l. Changes made by **Addenda**, Change Order, or Construction Change Directive.
   m. Changes made following Architect's written orders.
   n. Details not on the original Contract Drawings.
   o. Field records for variable and concealed conditions.
   p. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.

4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Markup of paper copy or Annotated PDF electronic file with comment function enabled.
3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:
   a. Project name.
   b. Date.
   c. Designation "PROJECT RECORD DRAWINGS."
   d. Name of Architect.
   e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.

B. Format: Submit record Specifications as annotated PDF electronic file or scanned PDF electronic file of marked-up paper copy of Specifications.

2.3 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.
PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 01 78 39
SECTION 07 01 50.19 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Full tear-off of roof areas indicated.
   2. Partial tear-off of roof areas indicated.
   3. Temporary roofing.

B. Related Requirements:
   1. Section 011000 "Summary" for use of the premises and phasing requirements.
   2. Section 015000 "Temporary Facilities and Controls" for temporary construction and environmental-protection measures for reroofing preparation.

1.3 UNIT PRICES

A. Work of this Section is affected by roofing removal and replacement unit price.

1.4 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

B. Roof Re-Cover Preparation: Existing roofing system is to remain and be prepared for new roof installed over it.

C. Full Roof Tear-Off: Removal of existing roofing system from deck.

D. Partial Roof Tear-Off: Removal of selected components and accessories from existing roofing system.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include plans, sections, and details.
C. Temporary Roofing Submittal: Product data and description of temporary roofing system. If temporary roof remains in place, include surface preparation requirements needed to receive permanent roof, and submit a letter from roofing manufacturer, stating acceptance of the temporary roof and that its inclusion does not adversely affect the roofing system's resistance to fire and wind.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1. Include certificate that Installer is approved by warrantor of existing roofing system.
2. Include certificate that Installer is licensed to perform asbestos abatement.

B. Fastener pull-out test report.

C. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations. Submit before Work begins.

D. Landfill Records: Indicate receipt and acceptance of demolished roofing materials and hazardous wastes, such as asbestos-containing materials, by a landfill facility licensed to accept them.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Minimum 10 years experience in roofing similar projects.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning roofing removal. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Reroofing Conference: Conduct conference at Project site.

1. Meet with Owner; Architect; Owner's insurer if applicable; testing and inspecting agency representative; roofing system manufacturer's representative; roofing Installer, including project manager, superintendent, and foreman; and installers whose work interfaces with or affects reroofing, including installers of roof deck, roof accessories, and roof-mounted equipment.

2. Review methods and procedures related to roofing system tear-off and replacement, including, but not limited to, the following:
   a. Reroofing preparation, including roofing system manufacturer's written instructions.
   b. Temporary protection requirements for existing roofing system components that are to remain.
   c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
   d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
   e. Existing roof deck conditions requiring notification of Architect.
   f. Existing roof deck removal procedures and Owner notifications.
   g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
   h. Structural loading limitations of roof deck during reroofing.
i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.

j. HVAC shutdown and sealing of air intakes.

k. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.

l. Asbestos removal and discovery of asbestos-containing materials.

m. Governing regulations and requirements for insurance and certificates if applicable.

n. Existing conditions that may require notification of Architect before proceeding.

1.8 FIELD CONDITIONS

A. Existing Roofing System: EPDM roofing where indicated. Existing slate tile roof where indicated.

B. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

D. Conditions existing at time of inspection for bidding are maintained by Owner as far as practical.

1. A wood deck survey of existing conditions from below is available for Contractor's reference. This report is intended to supplement rather than serve in lieu of Contractor's own investigations. Contractor is responsible for conclusions derived from existing documents.

E. Limit construction loads on roof to avoid damage to existing roofing and deck in accordance with owner's existing warranty requirements at membrane area and to avoid damage at slate roof area.

F. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

1. Remove only as much roofing in one day as can be made watertight in the same day.

G. Hazardous Materials: A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.

2. Do not disturb hazardous materials or items suspected of containing hazardous materials except according to procedures specified elsewhere in the Contract Documents.

3. Coordinate reroofing preparation with hazardous material remediation to prevent water from entering existing roofing system or building.

1.9 WARRANTY

A. Existing Warranties: At existing membrane roof, remove, replace, patch, and repair materials and surfaces cut or damaged during reroofing, by methods and with materials so as not to void existing roofing system warranty. Notify warrantor before proceeding.

1. Notify warrantor of existing roofing system on completion of reroofing, and obtain documentation verifying that existing roofing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.
PART 2 - PRODUCTS

2.1 TEMPORARY PROTECTION MATERIALS
   A. Expanded Polystyrene (EPS) Insulation: ASTM C 578.
   B. Plywood: DOC PS1, Grade CD Exposure 1.
   C. OSB: DOC PS2, Exposure 1.

2.2 TEMPORARY ROOFING MATERIALS
   A. Design and selection of materials for temporary roofing are Contractor's responsibilities.
   B. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).
   C. Base Sheet: ASTM D 4601, Type II, nonperforated, asphalt-impregnated and -coated, glass-fiber sheet.
   D. Glass-Fiber Felts: ASTM D 2178, Type IV, asphalt-impregnated, glass-fiber felt.
   E. Asphalt Primer: ASTM D 41/D 41M.
   F. Roofing Asphalt: ASTM D 312, Type III or IV.
   G. Base Sheet Fasteners: Capped head, factory-coated steel fasteners, listed in FM Global's "Approval Guide."

2.3 INFILL AND REPLACEMENT MATERIALS
   A. Use infill materials matching existing roofing system materials unless otherwise indicated.

2.4 AUXILIARY REROOFING MATERIALS
   A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing roofing system.

PART 3 - EXECUTION

3.1 PREPARATION
   A. Shut off rooftop utilities and service piping before beginning the Work.
   B. Test existing roof drains to verify that they are not blocked or restricted. Immediately notify Architect of any blockages or restrictions.
   C. Protect existing roofing system that is not to be reroofed.
D. At membrane areas:

1. Loosely lay 1-inch (25-mm-) minimum thick, expanded polystyrene (EPS) insulation over existing roofing in areas indicated. Loosely lay 1/2-inch (12-mm) plywood or OSB panels over EPS. Extend EPS past edges of plywood or OSB panels a minimum of 1 inch (25 mm).
2. Limit traffic and material storage to areas of existing roofing that have been protected.
3. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.

E. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

F. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing roofing system components that are to remain.

3.2 ROOF TEAR-OFF

A. Partial Roof Tear-Off: Where indicated, remove existing roofing and immediately check for presence of moisture by visually observing substrate that is to remain.

1. Coordinate with Owner's inspector to schedule times for tests and inspections immediately after removal.
2. With an electrical capacitance moisture-detection meter, spot check substrate that is to remain.
3. Inspect and notify architect of areas of wet roof blocking, curbs, and/or nailers. Removal and replacement is paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.
4. Salvage existing slate tiles for reuse where tile is in good and reusable condition.
5. Remove fasteners from deck.

3.3 DECK PREPARATION

A. Inspect deck after tear-off of roofing system.

B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect. Do not proceed with installation until directed by Architect.

C. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect. Do not proceed with installation until directed by Architect.

D. Replace damaged decking as indicated on Drawings (see structural in addition to architectural)
E. Replace roof decking as directed by Architect. Roof decking replacement will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.

3.4 TEMPORARY ROOFING

A. Install approved temporary roofing over area to be reroofed.

B. Install temporary roofing over area to be reroofed. Install two glass-fiber felts, lapping each sheet 19 inches (483 mm) over preceding sheet.

C. Remove temporary roofing before installing new roofing.

3.5 BASE FLASHING REMOVAL

A. Remove existing base flashings. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.

B. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish.

C. Inspect parapet sheathing, wood blocking, curbs, and nailers for deterioration and damage. If parapet sheathing, wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.

D. When directed by Architect, replace wood blocking, curbs, and nailers with new like materials.

3.6 DISPOSAL

A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

   1. Storage or sale of demolished items or materials on-site is not permitted.

B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 07 01 50.19
SECTION 07 14 16 - COLD FLUID-APPLIED WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY
   A. Section Includes:
      1. Polyurethane waterproofing, horizontal systems.
      2. Waterproof Expansion Joints
   B. Related Sections:
      1. Section 00 61 43 Three Year Roof Bond.
      2. Section 07 17 00 – Bentonite Waterproofing (for vertical waterproofing assemblies)
      3. Section 07 50 35 – Roof Warranty Execution
      4. Section 07 50 36 – Roof Warranty

1.2 PREINSTALLATION MEETINGS
   A. Preinstallation Conference: Conduct conference at Project site.
      1. Review waterproofing requirements including, but not limited to, the following:
         a. Surface preparation specified in other Sections.
         b. Minimum curing period.
         c. Forecasted weather conditions.
         d. Special details and sheet flashings.
         e. Repairs.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product.
      1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
      2. Include manufacturer’s written instructions for evaluating, preparing, and treating substrate.
   B. Shop Drawings:
      1. Show locations and extent of waterproofing.
      2. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.
      3. Include setting drawings showing layout, sizes, sections, profiles, and joint details of pedestal-supported concrete pavers.
C. Samples: For each exposed product and for each color and texture specified, including the following products:

1. Flashing sheet, 8 by 8 inches (200 by 200 mm).
2. Membrane-reinforcing fabric, 8 by 8 inches (200 by 200 mm).
3. Insulation, 8 by 8 inches (200 by 200 mm).
4. Drainage panel, 4 by 4 inches (100 by 100 mm).

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.
B. Field quality-control reports.
C. Warranty

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer and as required by manufacturer to provide warranty listed.
B. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for installation.

1. Build mockup for each typical waterproofing installation including accessories to demonstrate surface preparation, crack and joint treatments, inside and outside corner treatments, and protection.
   a. Size: 100 sq. ft. (9.3 sq. m) in area.
   b. Description: Each type of wall, deck, and plaza installation.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer.

1. Do not apply waterproofing to a damp or wet substrate, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F (3 deg C) above dew point.
2. Do not apply waterproofing in snow, rain, fog or mist, or when such weather conditions are imminent during application and curing period.
B. Maintain adequate ventilation during application and curing of waterproofing materials.
1.7 WARRANTY

A. Provide warranty in accordance with Tennessee Board of Regents Warranty requirements as indicated in sections 075035 Roof Warranty Execution and 075036 Roof Warranty.

1. Warranty Period: 30 years from date of Substantial Completion. Warranty includes materials and labor.

2. Contractor shall provide roof bond on work related to this section in accordance with 00 61 43 Three Year Roof Bond.

1.8 Schedule

1. Horizontal Waterproofing Assembly: (interior side to exposed side) (also referred to as ‘Plaza Deck” and/or “split slab” plaza)
   a. Surface Preparation as required for surface (primers and/or mechanical preparation)
   b. Polyurethane Waterproofing and auxiliary materials
   c. Reinforcing Membrane
   d. Protection Course
   e. Drainage Panel
   f. High load insulation (4” thickness)

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Source Limitations for Waterproofing System: Obtain waterproofing materials, protection course, and molded-sheet drainage panels from single source from single manufacturer.

2.2 SINGLE-COMPONENT POLYURETHANE WATERPROOFING


1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Carlisle Coatings & Waterproofing Inc. (Basis of Design: CCW Mira Seal Plaza Deck System)
   b. BASF Corporation; Construction Systems.
   c. Tremco Incorporated.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials recommended in writing by waterproofing manufacturer for intended use and compatible with one another and with waterproofing.

1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
B. Primer: Manufacturer's standard primer, sealer, or surface conditioner; factory-formulated acrylic latex, polyurethane, or epoxy.

C. Sheet Flashing: 50-mil- (1.3-mm-) minimum, nonstaining, uncured sheet neoprene.
   1. Adhesive: Manufacturer's recommended contact adhesive.

D. Membrane-Reinforcing Fabric: Manufacturer's recommended fiberglass mesh or polyester fabric, manufacturer's standard weight.

E. Joint Reinforcing Strip: Manufacturer's recommended fiberglass mesh or polyester fabric.

F. Joint Sealant: Multicomponent polyurethane sealant, compatible with waterproofing; ASTM C 920, Type M, Class 25 or greater; Grade NS for sloping and vertical applications and Grade P for deck applications; Use NT exposure; and as recommended by manufacturer for substrate and joint conditions.
   1. Backer Rod: Closed-cell polyethylene foam.

2.4 PROTECTION COURSE

A. Protection Course at vertical application: Fan folded, with a core of extruded-polystyrene board insulation faced on one side with plastic film, nominal thickness of 1/4 inch (6 mm), with compressive strength of not less than 8 psi (55 kPa) according to ASTM D 1621 and maximum water absorption by volume of 0.6 percent according to ASTM C 272.
   1. Manufacturers: Subject to compliance with requirements and approval by waterproofing manufacturer, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      a. Carlisle Coatings & Waterproofing Inc
      b. Dow Chemical Company
      c. Owens Corning

B. Protection Course at horizontal application: nonwoven polypropylene protection fabric to cushion and protect the waterproofing membrane. Puncture resistance per ASTM D4833 of 235 lbs. As manufactured by the waterproofing manufacturer or as approved for use in warranted system by waterproofing manufacturer.

2.5 MOLDED-SHEET DRAINAGE PANELS

A. Vertical Applications: Nonwoven-Geotextile-Faced, Molded-Sheet Drainage Panel: Composite subsurface drainage panel consisting of a studded, nonbiodegradable, molded-plastic-sheet drainage core; with a nonwoven, needle-punched geotextile facing with an apparent opening size not exceeding No. 70 (0.21-mm) sieve laminated to one side of the core and a polymeric film bonded to the other side; and with a vertical flow rate of 9 to 18 gpm per ft. (112 to 220 L/min. per m).
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. American Hydrotech, Inc
      b. BASF Corporation; Construction Systems
2.6 INSULATION

A. At Plaza Deck System (horizontal application) - Board Insulation: Extruded-polystyrene board insulation according to ASTM C 578, square edged, 4 inch thickness

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

   a. Dow Chemical Company (The).
   b. Kingspan Insulation.
   c. Owens Corning.

2. Type VII, 60-psi (414-kPa) minimum compressive strength.

2.7 WATERPROOF EXPANSION JOINTS

A. At Plaza Deck System (horizontal application) – 1/2-inch wide Waterproof Expansion Joint with preformed sealant. Preformed sealant shall be silicone pre-coated, preformed, pre-compressed, self-expanding, sealant system.

   1. **Basis of Design Product:** Provide DSM as manufactured by EMSEAL JOINT SYSTEMS, LTD 25 Bridle Lane, Westborough, MA 01581-2603, Toll Free: 800-526-8365 and as indicated on Drawings for horizontal-plane expansion joint locations.
a. Alternate manufacturers must demonstrate that their products meet or exceed the design criteria and must submit certified performance test reports performed by nationally recognized independent laboratories as called for in Submittals. Submittal of alternates must be made three weeks prior to bid opening to allow proper evaluation time.

2. Provide traffic durable, watertight, expansion joint by EMSEAL Joint Systems for expansion joints and isolation joints in decks. Typical locations include, but are not limited to the following: applications for joints over occupied space, below-grade, stair tower perimeters, elevator perimeters, stadium tread and risers, parking deck joints, treatment plant perimeters and covers, ice-floor perimeter joints, and structural expansion joints. System shall perform waterproofing, traffic bearing and movement-accommodation functions as the result of a single installation and without the addition of gutters, vapor barriers, bladders, or other devices suspended beneath or within the system in any way.

3. Sealant system shall be compromised of three components: 1) cellular polyurethane foam impregnated with hydrophobic 100% acrylic, water-based emulsion, factory coated with highway-grade, fuel resistant silicone; 2) field-applied epoxy adhesive primer, 3) field-injected silicone sealant bands.

4. Provide Material shall be capable of movements of +50%, -50% (100%) total of nominal material size.

5. Silicone coating to be highway-grade, low-modulus, jet-fuel resistant silicone applied to the impregnated foam sealant at a width greater than maximum allowable joint extension and which when cured and compressed will form a bellows.

6. DSM to be installed into manufacturer’s standard field-applied epoxy adhesive.

7. DSM to be installed slightly recessed from the surface such that when the field-applied injection band of silicone is installed between the substrates and the foam-and-silicone-bellows, the system will be essentially flush with the substrate surface.

8. Select the sealant system model appropriate to the movement and design requirements at each joint location that meet the project specification or as defined by the structural engineer of record.

9. Manufacturer’s Checklist must be completed by expansion joint subcontractor and returned to manufacturer at time of ordering material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.

2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
3.2 PREPARATION

A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.

C. Close off deck drains and other deck penetrations to prevent spillage and migration of waterproofing fluids.

D. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, acid residues, and other penetrating contaminants or film-forming coatings from concrete.

E. Remove fins, ridges, and other projections, and fill honeycomb, aggregate pockets, holes, and other voids.

F. At existing masonry surfaces, provide tuck pointing to achieve substrate uniformity per waterproofing manufacturer’s recommendations and requirements.

3.3 PREPARATION AT TERMINATIONS, PENETRATIONS, AND CORNERS

A. Prepare surfaces at terminations and penetrations through waterproofing and at expansion joints, drains, sleeves, and corners according to waterproofing manufacturer's written instructions and to recommendations in ASTM C 898/C 898M and ASTM C 1471.

B. Apply waterproofing in two separate applications, and embed a joint reinforcing strip in the first preparation coat when recommended by waterproofing manufacturer.

3.4 JOINT AND CRACK TREATMENT

A. Prepare, treat, rout, and fill joints and cracks in substrate according to waterproofing manufacturer's written instructions and to recommendations in ASTM C 898/C 898M and ASTM C 1471. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.

2. Apply bond breaker on sealant surface, beneath preparation strip.
3. Prime substrate along each side of joint and apply a single thickness of preparation strip at least 6 inches (150 mm) wide along each side of joint. Apply waterproofing in two separate applications and embed a joint reinforcing strip in the first preparation coat.

B. Install sheet flashing and bond to deck and wall substrates where required according to waterproofing manufacturer's written instructions.

1. Extend sheet flashings for 8 inches onto perpendicular surfaces and items penetrating substrate.

3.5 WATERPROOFING APPLICATION

A. Apply waterproofing according to manufacturer's written instructions and to recommendations in ASTM C 898/C 898M and ASTM C 1471.
B. Start installing waterproofing in presence of manufacturer's technical representative.

C. Apply primer over prepared substrate unless otherwise instructed in writing by waterproofing manufacturer.

D. Reinforced Waterproofing Applications: Mix materials and apply waterproofing by roller, notched squeegee, trowel, or other suitable application method.
   1. Apply first coat of waterproofing, embed membrane-reinforcing fabric, and apply second coat of waterproofing to completely saturate reinforcing fabric and to obtain a seamless reinforced membrane free of entrapped gases and pinholes, with an average dry film total thickness of 120 mils (3 mm).
   2. Apply reinforced waterproofing to prepared wall terminations and vertical surfaces.
   3. Verify manufacturer's recommended wet film thickness of waterproofing every 100 sq. ft. (9.3 sq. m).

E. Cure waterproofing, taking care to prevent contamination and damage during application and curing.

F. Install protection course with butted joints over waterproofing before starting subsequent construction operations.
   1. For horizontal applications, install protection course loose laid over fully cured membrane.
   2. For vertical applications, set protection course in nominally cured membrane, which will act as an adhesive. If membrane cures before application of protection course, use adhesive.

3.6 MOLDED-SHEET DRAINAGE PANEL INSTALLATION

A. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate, according to manufacturer's written instructions. Use adhesive or another method that does not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.
   1. For vertical applications, install protection course before installing drainage panels.

B. Molded-Sheet Collector-Panel System: Install according to manufacturer's written instructions. Connect to piped subdrainage system shown on Civil drawings.

3.7 INSULATION INSTALLATION

A. Install one or more layers of board insulation to achieve required thickness over waterproofed surfaces. Cut and fit to within 3/4 inch (19 mm) of projections and penetrations.

B. On vertical surfaces, set insulation units in adhesive applied according to manufacturer's written instructions.

C. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.
3.8 INSULATION DRAINAGE PANEL INSTALLATION

A. Install drainage panels over waterproofed surfaces. Cut and fit to within 3/4 inch (19 mm) of projections and penetrations.

B. Ensure that drainage channels are aligned and free of obstructions.

C. On vertical surfaces, set insulation drainage panels in adhesive or tape applied according to manufacturer's written instructions.

D. On horizontal surfaces, loosely lay insulation drainage panels according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

3.9 WATERPROOF EXPANSION JOINT INSTALLATION

A. Preparation of the Work Area

1. The contractor shall provide properly formed and prepared expansion joint openings constructed to the exact dimensions and elevations shown on manufacturer’s standard system drawings or as shown on the contract drawings. Deviations from these dimensions will not be allowed without the written consent of the engineer of record.

2. The contractor shall clean the joint opening of all contaminants immediately prior to installation of expansion joint system. Repair spalled, irregular or unsound joint surfaces using accepted industry practices for repair of the substrates in question. Remove protruding roughness to ensure joint sides are smooth. Ensure that there is sufficient depth to receive the full depth of the size of the DSM being installed. Refer to Manufacturers Installation Guide for detailed step-by-step instructions.

3. No drilling, or screwing, or fasteners of any type are permitted to anchor the sealant system into the substrate.

4. System to be installed by qualified subcontractors only according to detailed published installation procedures and/or in accordance with job-specific installation instructions of manufacturer's field technician.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections:

1. Testing agency shall verify thickness of waterproofing during application for each 600 sq. ft. (56 sq. m) of installed waterproofing or part thereof.

2. Electronic Leak-Detection Testing – refer to Section 07 72 72 Membrane Leak Detection System
   a. Testing agency shall test each deck area for leaks using an electronic leak-detection method that locates discontinuities in the waterproofing membrane.
   b. Testing agency shall perform tests on abutting or overlapping smaller areas as necessary to cover entire test area.
   c. Testing agency shall create a conductive electronic field over the area of waterproofing to be tested and electronically determine locations of discontinuities or leaks, if any, in the waterproofing.
   d. Testing agency shall provide survey report indicating locations of discontinuities, if any.
B. Manufacturer's Field Service: Engage a site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components and to furnish daily reports to Architect.

C. If test results or inspections show waterproofing does not comply with requirements, remove and replace or repair the waterproofing as recommended in writing by manufacturer, and make further repairs after retesting and inspecting until waterproofing installation passes.

D. Prepare test and inspection reports.

3.11 PROTECTION

A. Do not permit foot or vehicular traffic on unprotected membrane.

B. Protect waterproofing from damage and wear during remainder of construction period.

C. Protect installed protection course, board insulation and drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

D. Protect the waterproof expansion joint system and its components during construction. Subsequent damage to the expansion joint system will be repaired at the general contractor's expense. After work is complete, clean exposed surfaces with a suitable cleaner that will not harm or attack the finish.

E. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

F. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION 07 14 16
SECTION 07 21 19 - FOAMED-IN-PLACE INSULATION

PART 1 - GENERAL

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

1.2 SUMMARY
A. Section Includes:
   1. Open-cell spray polyurethane foam.
B. Related Requirements:
   1. Section 079200 “Joint Sealants” for spray polyurethane foam insulation installed as part of a barrier system.

1.3 ACTION SUBMITTALS
A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS
A. Qualification Data: For Installer.
B. Product Test Reports: For each product, for tests performed by a qualified testing agency, IAS International Accreditation Service.
C. Evaluation Reports: For spray-applied polyurethane foam-plastic insulation and thermal barrier system, from ICC-ES.

1.5 QUALITY ASSURANCE
A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer. Any repairs by an Icynene licensed contractor.
B. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
C. Fire Resistance Characteristics: As determined by testing identical products (based on a 4 inch (100 mm) minimum thickness) according to ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
D. Fire Resistance Characteristics: As determined by testing identical products according to NFPA 285 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect spray polyurethane foam components as follows:

1. Component A and B: store between 60 degrees F (15 degrees C) and 90 degrees F (32 degrees C).
2. Component B can be frozen but must be protected from overheating over 120 degree F (49 degree C) and prolonged storage over 100 degree F (37 degree C).
3. Component B: mix thoroughly prior to use.
4. Components should be a matched set (system) as supplied by the manufacturer.
5. Use components within their labeled shelf-life.
6. Use components as supplied with no site alterations or additions.

1.7 WARRANTY

A. Refer to manufacturer’s standard warranty terms (as applicable).

PART 2 - PRODUCTS

2.1 PERFORMANCE CHARACTERISTICS

A. Air Material Air Leakage Rate: Maximum material air leakage rate of less than 0.004 cfm/ft² under a pressure differential of 0.3 in w.g. (1.6 psf) (0.02 L/m² at 75 Pa) per ASTM E 2178 or E 282.

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Development Index: 450 or less.

C. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

D. Compressive strength: Minimum 40 psi (276 kPa) (ASTM C1029 Type II).

E. Sustainability Requirements: Provide spray polyurethane foam insulation as follows:

1. Low Emitting: Insulation tested according to CA/DPH/EHLB/v1.1-2010.
2. Resistant to fungal growth as per ASTM C1338.
3. Containing no PBDE.
2.2 OPEN-CELL SPRAY POLYURETHANE FOAM

A. Open-Cell Spray Polyurethane Foam: Spray-applied polyurethane foam using water as a blowing agent. Minimum density of 0.5 lb/cu. ft. (8.0 kg/cu. m) and minimum aged R-value at 1-inch (25.4-mm) thickness of 3.7 deg F x h x sq. ft./Btu at 75 deg F (0.65 K x sq. m/W at 24 deg C).

1. Basis-of-Design Product: Subject to compliance with requirements, provide Icynene Inc.; Icynene Classic Eco or comparable product by one of the following:
   a. BASF Corporation.
   b. Bayer Material Science (Bay Systems)

2.3 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by insulation manufacturer where required for adhesion of insulation to substrates.

B. Thermal Barrier: Provide thermal barrier or ICC-approved alternative assembly using intumescent coatings.

1. Thermal Barrier: Foil Thermal Barrier Blanket approved for use by manufacturer for insulation product. Basis of Design: Icynene Fi-Foil Perforated, or
2. ICC-Approved Intumescent Coating: Basis of Design: Icynene DC315, 22 mil thickness

PART 3 - EXECUTION

3.1 PREPARATION

A. Verify that substrates are clean, dry, and free of substances that are harmful to insulation.

B. Priming: Prime substrates where recommended by insulation manufacturer. Apply primer to comply with insulation manufacturer's written instructions. Confine primers to areas to be insulated; do not allow spillage or migration onto adjoining surfaces.

3.2 INSTALLATION

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Spray insulation to envelop entire area to be insulated and fill voids.

C. Apply in multiple passes to not exceed maximum thicknesses recommended by manufacturer. Do not spray into rising foam.

D. Do not apply insulation within 3-inches (76 mm) of heat emitting devices or where the temperature is in excess of 200 degrees F (93 degrees C), as per ASTM C411 or in accordance with applicable codes.

E. Framed Construction: Install into cavities formed by framing members to achieve the following thicknesses:
   1. Roof areas with drop ceilings below: 5.5 inches
2. Roof areas with gypsum board on furring applied directly to rafters (at mansard areas) – thickness to fill rafter cavity.

F. Miscellaneous Voids: Apply according to manufacturer's written instructions.

3.3 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.

B. Thermal Protection: Protect installed spray polyurethane foam insulation with qualified thermal or ignition barrier per applicable building codes.

3.4 INSTALLATION OF THERMAL BARRIER COMPONENTS

A. Install thermal barrier components – membranes and accessories – as required to meet NFPA and IBC code requirements.

B. Thermal barrier product to be applied at all roof/ceiling areas where the insulation is not in contact with gypsum board ceiling finish.

END OF SECTION 07 21 19
SECTION 07 31 00 - SLATE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Natural slate roofing shingles.
B. Moisture shedding underlayment.
C. Metal roof flashing.
D. Snow guards.
E. Roofing cant and nailing strips.
F. Roofing nails.
G. Hip and Ridge Cap.

1.2 RELATED SECTIONS

A. Section 06100 - Rough Carpentry: Framing and Sheathing.
B. Section 06150 - Wood Decking.
C. Section 07600 - Flashing and Sheet Metal.

1.3 REFERENCES

B. ASTM A 666 - Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet and Strip.
C. ASTM B 101 - Specification for Lead-Coated Copper Sheet and Strip for Building Construction.
D. ASTM B 370 - Specification for Copper Sheet and Strip for Building Construction.
I. ASTM D 312 - Specification for Asphalt Used in Roofing.


1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. **Product Data**: For each type of product indicated.

C. Shop Drawings: Details for specially configured metal flashing, jointing methods and locations for flashing, and other roofing system details.

D. **Selection Samples**:
   1. Pieces of actual slate shingles, illustrating complete range of colors available, for Architect's selection.
   2. Pieces of actual metal ridge cap, 12 inches (300 mm) long and full width.
   3. Actual snow guard, full size.

E. **Verification Samples**:
   1. Actual slate shingles in color selected, illustrating full range of color variation to be expected in finished work.
   2. Underlayment 12 inches (300 mm) square.

F. Material Test Reports: For each slate type, performed by a qualified testing laboratory as approved by North Country Slate, per ASTM C406.

G. Certificate of Country of Origin: For each type of slate, identifying the country in which the slate shingles were quarried and fabricated.

H. Distributor's Warranties: Distributors warranty for slate shingles specified.

I. Installer's Warranties: Installers warranty for work specified.

J. Installer's Qualifications: Installer's natural roofing slate project references; not fewer than four.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Company experienced in installing natural slate roofing of the type and scope specified in this section and employing persons with not fewer than five years of documented experience. Company shall provide skilled workers, thoroughly trained and experienced in the necessary crafts of natural slate roof systems and who are familiar with this specification and methods
required for a warrantable roof.

B. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups, unless such deviations are specifically approved by Architect in writing.
   2. Install in area and of size designated by Architect.
   3. Do not proceed with remaining work until finish color, texture, pattern, joint sizes, and installation workmanship are approved by Architect.
   4. Correct mock-up area as required to produce acceptable work.
   5. Mock-up may be incorporated into final construction upon Owners approval.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver shingles to project site in distributor's crates/pallets, labeled with data indicating source.
B. Handle shingles to prevent chipping, breakage, soiling, or other damage. Protect edges with wood or other rigid material.
C. Place and stack crates/pallets to distribute weight evenly and to prevent breakage or cracking.
D. Store underlayment rolls on end, on pallets or other raised surfaces. Do not double stack rolls.
E. Protect unused underlayment from weather, sunlight and moisture when left overnight or when roofing work is not in progress.
F. Stage roofing materials on the building in a manner to avoid significant or permanent damage to the roof deck or structural supporting members.

1.7 WARRANTY

A. Slate Shingle Distributors Warranty: Submit slate shingle distributors warranty, signed by the distributor and covering the slate shingles described in this section, in which the distributor agrees to replace slate shingles that fail in materials. The duration of this warranty shall be established by ASTM C406 and grade indicated in this specification.
B. Roofing Installer's Warranty: Submit roofing installer's warranty, signed by roofing Installer and covering Work of this Section, in which roofing Installer agrees to repair or replace slate roofing that fails in materials or workmanship within the following warranty period:
   1. Warranty Period: Five years from date of Substantial Completion.

1.8 EXTRA MATERIALS

A. Provide an additional 1 percent of installed field slates for Owners use in roof maintenance.

PART 2 PRODUCTS

2.1 MANUFACTURES

A. Use slate from owner’s existing stock for replacement of roof tiles at areas indicated. If quantity of owner's existing stock is exceeded for re-roof area, provide new slate to match existing.
B. Manufacturers which provide slate include but are not limited to North Country Slate, 8800 Sheppard Ave. E., Toronto, ON, Canada M1B 5R4. ASD. Tel: (416) 724-4666. Toll Free Tel: (800) 975-2835.
2.2 SHINGLES

A. Slate Shingles: Hard, dense, sound rock, with chamfered edges, punched or drilled for two nails each. Slate shingles shall be punched or drilled back to front, and on the thinner end when there is variation in thickness along the length of the shingle.

B. No slate shingles with broken corners shall be installed when either the base or leg of the right triangle piece broken off is greater than 1-1/2 inches (38 mm). No broken corners on covered ends which sacrifice nailing strength or laying a watertight roof. Broken corners are acceptable for cutting stock. Not more than 2 percent of broken slates, including those having cracks materially precluding ringing when sounded, shall be accepted.

C. Slate shall be free of any visible inclusions of oxidizable iron pyrite.

D. Curvature or twist in slate shingles shall not exceed 1/8 inch in 12 inches (3 mm in 100 mm). Curved slate shingles shall be trimmed and punched to permit them to be laid with convex side up. Knots, knurls and cramps are acceptable on the exposed slate shingle face. Knots, knurls and cramps on the back or covered portion of slate shingles, which prevent close contact of slate shingles or the laying of a watertight roof, will not be accepted.

E. Slate shingles shall be trimmed with 90-degree square corners. Face dimensions of slate shingles shall not differ from those specified by more than 1/8 inch (3 mm).
   1. Source: Obtain slate required for the project from a single quarry, with consistent color range, physical properties and texture throughout.
   2. Grade: ASTM C 406 Grade S2: Expected service life 40-75 years.
   3. Thickness: To match existing.
   4. Size: To match existing.
   5. Unit of Measurement: The number of pieces per square for metric dimension slates, not exact dimensional equals to inch dimension slates, shall be adjusted upward for their smaller coverage per square.
   6. Starter Slate Size: Length of starter slates to be the exposure of the field slates plus the specified headlap and rounded up to the nearest full inch. Starter slates are to be front-side punched and installed chamfered edge down.

2.3 UNDERLAYMENT


2.4 SHEET METAL FLASHINGS

A. Flashing: ASTM B 370 copper, cold rolled, 16 oz/sq ft (0.56 mm thick), natural finish.

2.5 ACCESSORIES

A. Snow Guards: Fabricated from non-ferrous metal, designed to be installed without penetrating slate shingles, and complete with predrilled holes or hooks for anchoring. Match existing snow guards or reuse existing where possible.

B. Slating Nails for Non-Preservative, or Preservative Treated Plank or Plywood Deck and Nailers: Slater’s stainless steel ring shank nails, 0.120 inch (3 mm) or No. 11 gauge Stubs, not less than twice
the nominal slate thickness plus 1 inch (25.4 mm) in length, with 3/8 inch (9 mm) head. Point should penetrate through underside of deck except where the underside of roof deck is exposed to view, where shorter nails are acceptable. Nails 1/2 inch (13 mm) or longer than field slate nails for slate hip and ridge installation.

C. Wood Nailers and Cant Strips: Preservative-treated wood, as specified in Section 06100 - Rough Carpentry, attached with Type 304 or 316 stainless steel nails.

D. Felt Underlayment Nails: stainless-steel, wire nails with low-profile capped heads or disc caps, 1 inch (25 mm) minimum diameter.

E. Polymer Sealant: ASTM C 920 silicone sealant of type, grade, class, and use classification required to seal joints in slate-shingle roofing and remain watertight.

2.6 FLASHING FABRICATION

A. Form flashing to profiles indicated on drawings and as required to protect roofing materials from physical damage and shed water.

B. Form sections square and accurate in profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that roofing penetrations and plumbing stacks are in place and properly flashed to deck surface.

B. Verify that roof openings are correctly framed.

C. Verify that deck surfaces are sound, smooth, properly secured; and free of ridges, depressions and voids; properly sloped and dry.

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

3.2 PREPARATION

A. Comply with slate shingle distributor’s recommendations on preparation of acceptable roof deck.

B. Broom clean deck surfaces prior to installation of underlayment.

3.3 INSTALLATION

A. Proceed with installation only after written approval and acceptance of all materials and accessories has been issued by the architect.

B. Underlayment:
   1. Install a minimum of two layers of No. 26 asphalt-saturated felt or one layer of No. 40 asphalt-saturated and coated felt with standard-size slate, as long as the slate is laid with a 4 inch (100 mm) minimum head lap.
   2. Install underlayment over entire deck surface. At hips, valleys, and ridges, install additional 36 inch (915 mm) width of underlayment, centered on the valley or ridge.
   3. On overhanging eaves that require more than a single 36-inch (915 mm) width of underlayment, overlap not less than 6 inches (150 mm), assuring that overlapped area is located on overhang, outside wall line.
   1. Install flashing at all locations where roof intersects other roofs, sidewall or parapet walls, chimneys, ventilators, and similar projections, and at gable edges. Ensure that dissimilar sheet and fastener metals are galvanically separated.
   2. Open Valley: Install minimum 20 inch (510 mm) wide open valley sheet metal flashing over 36 inch (915 mm) wide underlayment, with field underlayment lapped over edges of flashing not less than 4 inches (100 mm). Fasten metal with cleats. Overlap metal a minimum of 8 inches (200 mm).

D. Wood Nailer and Cant Strips:
   1. Cant Strip: Install 2 inch (50 mm) wide by 48 inch (1220 mm) long wood cant strips at eaves. Nominal thickness of cant strip shall be equal to the slate thickness specified. Attach with hot-dip galvanized steel nails. Apply eave flashing and underlayment over cant strip.
   2. Nailers: Install 2 inch (50 mm) wide by 48 inch (1220 mm) long preservative treated wood nailers as detailed at ridge and hips, directly over underlayment. Nominal thickness of ridge nailer shall be equal to two times the slate thickness specified. Nominal thickness of hip nailers shall be three times the slate thickness specified. Attach with Type 304 or 316 stainless steel nails. Protect with additional layer of underlayment before installing hip and ridge accessory.

E. Slate Grading:
   1. Slate Grading: Sort slates according to thickness into a minimum of three grades. Install thickest slates beginning at the eaves and introduce consecutive thickness grades as installation proceeds up the roof slope, creating a smooth overall appearance. Blend slates from all crates/pallets together to achieve a uniform color and texture to the roof.

   1. Match existing shingle pattern. Where existing shingle pattern conflicts with information in next paragraphs, match existing shingle pattern.
   2. Double shingles at eaves and cornice line. Beginning at eaves, project shingle 2 inches (50 mm) beyond perimeter with no gutters or troughs, or 1 inch (25 mm) with gutters or troughs. Lay shingles in horizontal courses. Provide at least the specified head lap between succeeding courses of shingles and stagger joints between courses a minimum of 3 inches (75 mm). Provide 1 inch (25 mm) to 2 inches (50 mm) projection of shingles at gable and rake edges.
   3. Cut and fit shingles neatly around vents, pipes, ventilators, and other roof projections.
   4. Slate shingles overlapping sheet metal shall have nails placed so as to avoid penetrating the sheet metal.
   5. Nail slate shingles so nail heads touch shingle lightly, without producing strain on the slate.

G. Hips:
   1. Install slate shingles at hips in pattern as indicated on drawings and nail in place. Only where heads of nails are exposed, cover with plastic cement. Match appearance of existing adjacent construction.

H. Ridges:
   1. Install slate shingles at ridges in pattern as indicated on drawings and nail in place. Only where nail heads are exposed, cover with plastic cement. Match appearance of existing adjacent construction.

I. Snow Guard Installation: Install snow guards in rows at locations indicated according to manufacturers
written installation instructions. Space snow guards in each row, offsetting by half this dimension between succeeding rows. Match existing construction.

J. Adjusting and Clean Up:
1. Remove and replace damaged or broken slates using slate repair hooks or nail and bib repair procedure where standard nailing is not possible.
2. Remove excess materials and debris from the Project site.

3.4 PROTECTION

A. Lay out progression of work to prevent other trades from working on or above completed roofing.

B. Minimize traffic over finished roof surface. If necessary, wear soft-soled shoes and walk on the 'butt' of the shingles in order to avoid breakage.

END OF SECTION 07 31 00
SECTION 07 50 35
TOTAL ROOFING SYSTEM WARRANTY INSTRUCTIONS

PART 1 – GENERAL: not used

PART 2 – PRODUCTS
2.01 The Total Roofing System Warranty shall be provided on the form of Section 07 50 36. No other warranty form is acceptable, and no other warranty, stipulations, or qualifications may be incorporated or attached. If more than one building, roof, or type of membrane is provided in the Contract, provide a separate warranty for each, even if they are alike. All informational blanks on the warranty form shall be filled in prior to execution.

PART 3 – EXECUTION
3.01 Prior to the Manufacturer’s final inspection, which is a distinct and different inspection from the Designer’s final inspection of the Work of the Contract, and prior to the Manufacturer’s execution of the Total Roofing System Warranty, submit a mock-up of the Total Roofing System Warranty to the Designer, completely filled out with all information except, if not yet certain, the warranty number and individual persons names, titles, signatures, dates of signature, and contact information. Obtain Designer’s approval of this mock-up, and use this for the executed warranty. Execute the Warranty in two (2) counterparts for inclusion in the two (2) sets of Project data Binders (See specification section 01 78 21). All signatures on counterparts shall be “wet” (blue ink on paper, affixed by hand) signatures. Provide copies attached to final pay requests (See specification 01 29 76).

3.02 Filling in the upper portion of page 1:
A. SBC Project Number: fill in the “the Project” identification shown on page 1 of the construction Agreement in the format of 000/000-00-000XX, in which characters might or might not have been included for the Xs.
B. Warranty Period: fill in “thirty (30) years”.
C. Warranty Number: fill in a unique number provided by the Manufacturer for its own tracking purposes. Fill this is identically in the blanks near the upper right of each page of the form.
D. Building, Campus and Address: fill in:
   1. the name of the institution;
   2. “main campus” or the name of the campus if not the main campus;
   3. the name of the building and address or the campus ID number;
   4. if only a portion of a building, indicate which portion using conventions of the institution;
E. Roofing System Manufacturer & Address: fill in completely.
F. Roofing System Manufacturer Contact, Phone, and Email: fill in the name of the appropriate person to provide warranty service response on behalf of the Manufacturer, and their commonly used phone number and email address.
G. Manufacturer Authorized Roofing Applicator: fill in name and address of the “Roofing Contractor” (or subcontractor) that installed the System covered by this warranty.
H. Designer: fill in name of Designer shown on page 1 of the construction Agreement.
I. Contractor: fill in name of the general Contractor shown on page 1 of the construction Agreement, if different from the Applicator identified above. If the same, fill in “same”.

3.03 Filling in THE TOTAL ROOFING SYSTEM COMPONENTS on page 1
Refer to the roofing system specifications for the list of components to be included in the Total Roofing System Warranty. The components already named in the form shall be included if they occur in this system. Strike out components already named in the form that are not included in this roofing system and add components not already named in the form that are specified for inclusion.
3.04 Filling in where THE ROOFING CONTRACTOR CERTIFIES on page 1:
   A. Roofing Contractor: fill in the name of the Roofing Contractor, same as the Authorized Roofing Applicator above (per 3.02.G in this section).
   B. Authorized Signature: a suitably authorized representative of the Roofing Contractor with authority to bind the Roofing Contractor to the terms of this certification shall sign here.
   C. Fill in the name of the person providing the Authorized Signature, their title within the Roofing Contractor organization, and the date on which the signature is affixed.

3.05 Filling in where THE MANUFACTURER WARRANTS on page 1:
   A. Manufacturer: fill in the name of the Manufacturer, same as the Roofing System Manufacturer above (per 3.02.E in this section).
   B. Authorized Signature: a suitably authorized representative of the Manufacturer with authority to bind the Manufacturer to the terms of this Warranty shall sign here.
   C. Fill in the name of the person providing the Authorized Signature, their title within the Manufacturer organization, and the date on which the signature is affixed.

3.06 Filling in the ROOFING SYSTEM INFORMATION on page 2:
   A. Fill in an “X” or similarly in one of the provided boxes to indicate that the roof is a “New Roof” over new construction or is a “Reroof” over existing construction.
   B. Warranty Number: fill in same as in upper right of page 1.
   C. Area of Roof Installed: fill in the total square feet (SF) of the roof installed.
   D. Date of Substantial Completion: Fill in the date certified by the Designer.
   E. Date of Warranty Expiration: Fill in the date equal to the Date of Substantial Completion (per 3.06.D this section) plus the Warranty Period filled in at the top of page 1 (per 3.02.B this section).
   F. ROOFING SYSTEM COMPONENTS:
      Complete all information for each item listed. Provide complete description of each component in the system. When different components or systems are present, describe each condition and location. If the particular component is not used in this system, fill in “n/a” in the space.
   G. MANUFACTURER’S MEMBRANE INFORMATION:
      Provide Manufacturer unique roll identification number for each roll used in this project.
   H. MANUFACTURER FINAL INSPECTION:
      1. The Manufacturer’s final inspection is limited in scope to the Roofing System, and is a distinct and different inspection from the Designer’s final inspection of the Work of the Contract.
      2. Fill in name and title of the Manufacturer’s representative making the inspection. Fill in the date of the inspection. Provide signature by that representative.
      3. Fill in the name and title of the Designer representative that was present at inspection.
      4. Fill in the name and title of the Owner’s representative (other than the Designer) that was present at inspection.

3.07 Executing the Warranty by the TOTAL ROOFING SYSTEM MANUFACTURER at the bottom of page 4:
   A. Fill in Roofing System Manufacturer’s name, same as on page 1 (per 3.02.E and 3.05.A this section).
   B. Once the roof work is acceptable to the Roofing System Manufacturer, affix signature of Roofing System Manufacturer’s authorized and binding representative. Fill in date of signature.
   C. Fill in the name and title of the Roof System Manufacturer’s signatory.

END OF SECTION
SECTION 07 50 36
TOTAL ROOFING SYSTEM WARRANTY
State of Tennessee

The Roofing System Manufacturer, (Manufacturer) warrants to the Tennessee Board of Regents (Owner) of the above building, that subject to the Terms, Conditions, and Limitations stated in this no dollar limit (NDL) warranty, the Manufacturer will repair any leak in the Total Roofing System installed by a Manufacturer authorized roofing applicator (Roofing Contractor) for a period stated above commencing with the date of Substantial Completion. The Manufacturer will repair or replace system defects or failures.

The TOTAL ROOFING SYSTEM COMPONENTS are defined as the following; all materials as manufactured or authorized by the Manufacturer: including, but not limited to: membrane, flashings, counterflashings, adhesives and sealants, insulation, cover boards, fasteners, fastener plates, fastening bars, metal work, insulation adhesives, and any other products utilized in this installation. (Strike out materials not included in this system and add other materials included as required):

THE ROOFING CONTRACTOR CERTIFIES that the Total Roofing System was installed in strict accordance with the Manufacturer’s recommendations utilizing only the Manufacturer’s authorized products to install the Total Roofing System and that all products were protected while in their possession prior to installation and had no moisture or water trapped in the Total Roofing System. The Roofing Contractor certifies that all necessary steps were taken to ensure that all conditions were met for the issuance of The Total Roofing System Warranty by the Manufacturer.

THE MANUFACTURER WARRANTS that if it cannot supply a specified product for inclusion in a Total Roofing System Warranty, the Roofing Contractor must obtain prior written approval from the Manufacturer for all products not supplied by the Manufacturer to be incorporated in the Total Roofing System Warranty. The Manufacturer will issue a Total Roofing System Warranty. In addition to a final inspection of the completed installation by the Manufacturer, the Manufacturer is also entitled to supplement their final field inspection with the Roofing Contractors above certification. There will be NO exceptions or exclusions to the Total Roofing System Warranty based upon products used or installation issues by the authorized Roofing Contractor, provided all materials installed are provided or authorized by the Roofing System Manufacturer.

Total Roofing System Warranty
07 50 36 - 1
ROOFING SYSTEM INFORMATION

☐ New Roof ☐ Reroof

Warranty Number

Area of Roof Installed (SF) Date of Substantial Completion Date of Warranty Expiration

TOTAL ROOFING SYSTEM COMPONENTS – list all that apply:

- Type of Roof deck(s)
- Type of metal flashing / trim / coping, etc.
- Type of vapor barrier
- Type of air barrier
- Type and thickness of flat insulation Method of attachment
- Type and slope of tapered insulation Method of attachment
- Type of recovery board Method of attachment
- Type of flashing Method of attachment
- Membrane type and color

MANUFACTURER’S MEMBRANE INFORMATION
List manufacturer’s roll identification for ALL rolls of used: If additional space is needed, attach additional sheet

MANUFACTURER FINAL INSPECTION performed by:

Print or type name and title Date Signature

Designer Representative present for Final Inspection:

Print or type name and title

Owner Representative present for Final Inspection: (when practical)

Print or type name and title
1. Owner shall provide the Manufacturer with written notice within thirty (30) days of the discovery of any leak(s) in the roof system.

2. The Manufacturer shall within fourteen (14) calendar days, commencing with receipt of written notice from the Owner, inspect the roofing system in the presence of the Owner’s representative (when practical) and if the cause(s) of the leak(s) is found the responsibility of the Manufacturer under this warranty, promptly make or cause to be made, the repair(s) or replacements(s) necessary to return the roofing system to the condition which is watertight and remediate moisture. All repair expenses incurred in connection herewith will be the responsibility of and borne by the Manufacturer.

3. If upon joint inspection by the Manufacturer and the Owner’s representative of the roofing system as provided in Paragraph 2, the cause(s) of any leak(s) is found not the responsibility of the Manufacturer under this warranty, the Manufacturer will immediately advise the Owner of the type and extent of repair(s) required to be made at the Owner's expense and if such repair(s) be promptly and reasonably made by the Manufacturer, this warranty will remain in effect for the unexpired portion of the warranty period; otherwise, this warranty will become null and void with respect to the area(s) or item(s) affected.

4. In the event the Manufacturer and Owner disagree as to the cause(s) and responsibility of the leak(s), then the Owner, without prejudice to any other remedy Owner may have, may make repair(s) of any leak(s) in accordance with Manufacturer recommendations if timely made available. Such action by the Owner shall not constitute a violation of this warranty. The Owner reserves the right to pursue reimbursement from the Manufacturer for all cost(s) and expense(s) of such repair(s), subject to the Manufacturer's responsibility under this warranty. If it is determined that the Manufacturer has no responsibility for the leak(s) under this warranty, the Owner will reimburse the Manufacturer for direct expenses encountered for trips requested by the Owner after the initial inspection.

5. In the event an emergency condition arises where, in the reasonable opinion of the Owner immediate reasonable repair(s) are necessary to avoid substantial damage to the building or its contents and the Manufacturer advises the Owner in writing of its inability, for reasons beyond its control, to inspect and repair the roof system as necessary within fourteen (14) days of written notification from the Owner, then the Owner may make such temporary repair(s) as in the opinion of the Owner are essential and necessary and such action by the Owner shall not constitute a violation of this warranty. In these circumstances, the Manufacturer shall reimburse the Owner for all reasonable costs and expenses of such temporary repair(s) subject to the Manufacturer's responsibility under this warranty.

6. In the event the Manufacturer fails to respond to written notification of known or suspected leak(s) as provided in Paragraph 2, the Owner may, after fourteen (14) days following receipt by the Manufacturer of an additional written notice and without prejudice to any other remedy he may have, make permanent repair(s) of any leak(s) and recover all reasonable costs and expenses of such repair(s) from the Manufacturer. The Manufacturer will, upon demand by the Owner, promptly reimburse the Owner these reasonable repair costs and expenses. Such action by the Owner shall in no way negate the responsibilities of the Manufacturer under this warranty for the unexpired portion of the warranty period.

7. Except as provided in Paragraphs 4, 5 & 6, any alterations of the roofing system after completion and acceptance including the placement of fixtures, utilities and equipment on or through the roof or additions thereto, will render this warranty null and void with respect to the area(s) or item(s) affected unless prior written authorization of such alterations of the roof system or additions thereto is given by the Manufacturer. Such authorization will not be unreasonably withheld.

8. This warranty shall not be applicable to the extent the roofing system sustains damage(s) by any of the following:
   (a) Acts of God and natural disasters, including but not limited to lightning, hurricanes, tornadoes, and earthquakes, winds of (3 second) peak gust speeds of 72 MPH or higher (determined by the nearest US Weather Station measured at 10 meters above ground or at the given address if reliable pinpoint wind data is available for the address), hail with a diameter greater than two inches;
   (b) Acts of negligence (whether of omission or commission), fire, accidents, or misuse, including but not limited to vandalism, civil disobedience, or acts of war, provided same are not caused by the Manufacturer and/or the Contractor.
   (c) Failure by the Owner to use reasonable care in maintaining the roof and appurtenances, provided same caused the leak(s) or item(s) affected; or,
   (d) For built-up and modified bitumen roofs: A roof design or specification authorized by the Owner with less than 1/8” per foot slope for drainage.
   (e) Building design issues that affect the performance of the Total Roofing System.

9. When the roof system has been damaged by any of the foregoing causes, repair(s) shall be at the Owner's expense and such repair(s) shall be made as provided in Paragraph 3; otherwise, this warranty will become null and void with respect to the area(s) or item(s) affected.
10. Until such time as the third year of this warranty has expired, the Manufacturer's obligations hereunder shall be joint and several with the Contractor. For the purpose of this paragraph, all of the Contractor's actions, whether of omission or commission, that are subject to this warranty are likewise the actions of the Manufacturer hereunder and shall in no way negate or reduce the responsibilities of the Manufacturer under this warranty.

11. As part of the repair of leaks, the Manufacturer shall replace roof insulation included in the warranty that become damaged as a result of a roof leak, provided the roof leak is not excluded under the Terms, Conditions, and Limitations set forth in this warranty. The replacement of damaged roof insulation shall be limited to those boards that have lost the structural integrity necessary to support and restrain the System when it is subjected to dynamic loads such as typical roof service traffic, winds up to 72 mph, hail up to two inches in diameter, and periodic accumulations of water, snow, or ice. In the event that roof insulation is damaged as a result of a roof leak, the Manufacturer will advise the Owner of the type and extent of insulation and recovery board replacement to be made at the Owner's expense. Failure by the Owner to properly make these repairs in a reasonable manner using a Manufacturer licensed applicator and within a reasonable period of time shall render this Warranty null and void in the area of the damage. Neither the Manufacturer nor the Owner shall have any obligation to replace roof insulation and recovery board if the area affected by the leak is less than fifty (50) square feet.

12. The Manufacturer certifies that it:
   a) Manufactures or purchases products for the purpose of designing, developing, and marketing a roof system;
   b) Provides recommendations, specifications, and details for the roofing system materials and installation;
   c) Trains and authorizes Roofing Contractors;
   d) Provides technical assistance to Roofing Contractors;
   e) Approves or prepares shop drawings; and,
   f) Provides a technical representative employed by the Manufacturer for the final inspection, and to all inspections required by this warranty.

13. During the period of this warranty, the Manufacturer, its agents or employees, will have free access to the roof during regular business hours of the Owner.

14. Owner shall be responsible for the costs associated with the removal and replacement, as well as any damage caused by the removal and replacement of any overburden, super strata, or overlays, either permanent or temporary, excluding accepted stone ballast or pavers, as necessary to expose the system for inspection and/or repair.

15. Alterations or repairs to the System that are not completed in accordance with Manufacturer's published specifications, not completed by an authorized contractor, and/or where current notification procedures were not followed are excluded and this warranty will become null and void with respect to the area(s) or item(s) affected.

16. For a 30 year single ply membrane roof system, the Total Roofing System Warranty shall cover the proper repair of leaks caused by unintentional, accidental and occasional puncture damage to the membrane as a result of normal rooftop inspection, maintenance or service; however, it does not cover damage caused by snow removal or damage caused by other trades during construction. There shall be no man hour limitation per year on accidental puncture repairs covered by this provision of the warranty. Resulting wet insulation shall be treated as set forth in Paragraph 11 above.
SECTION 08 91 19 - FIXED LOUVERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Fixed, extruded-aluminum louvers.

B. Related Requirements:

1. Section 081113 "Hollow Metal Doors and Frames" for louvers in hollow-metal doors.
2. Section 081416 "Flush Wood Doors" for louvers in flush wood doors.
3. Section 099000 "Painting" for field-painting interior louvers.

1.3 DEFINITIONS

A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.

B. Horizontal Louver: Louver with horizontal blades (i.e., the axes of the blades are horizontal).

C. Wind-Driven-Rain-Resistant Louver: Louver that provides specified wind-driven rain performance, as determined by testing according to AMCA 500-L.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.

B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.

1. Show weep paths, gaskets, flashing, sealant, and other means of preventing water intrusion.
2. Show mullion profiles and locations.

C. Samples: For each type of metal finish required.
D. Delegated-Design Submittal: For louvers indicated to comply with structural performance requirements, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed according to AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.

B. Windborne-debris-impact-resistance test reports.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design louvers, including comprehensive engineering analysis by a qualified professional engineer, using structural performance requirements and design criteria indicated.

B. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act normal to the face of the building.

1. Wind Loads: Determine loads based on pressures as indicated on Drawings.

C. Seismic Performance: Louvers, including attachments to other construction, shall withstand the effects of earthquake motions determined according to ASCE/SEI 7. See notes on structural drawings for Sds, Importance Factor.
D. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.


2.3 FIXED, EXTRUDED-ALUMINUM LOUVERS

A. Horizontal, Wind-Driven-Rain-Resistant Louver - Typical at all exterior louvers:
   a. Airolite Company, LLC (The)
   b. Construction Specialties, Inc
   c. Ruskin Company
   2. Louver Depth: 5 inches.
   3. Frame and Blade Nominal Thickness: Not less than 0.060 inch for blades and 0.080 inch for frames.
   4. Louver Performance Ratings:
      a. Free Area: Not less than 8.92 sq. feet for 48-inch-wide by 48-inch-high louver.
      b. Air Performance: Not more than 0.10-inch wg (25-Pa) static pressure drop at 550-fpm (2.8-m/s) free-area exhaust / intake velocity.
      c. Wind-Driven Rain Performance: Not less than 95 percent effectiveness when subjected to a rainfall rate of 3 inches per hour and a wind speed of 29 mph at a core-area intake velocity of 300 fpm.
   5. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.4 LOUVER SCREENS

A. General: Provide screen at each exterior louver.
   1. Screen Location for Fixed Louvers: Interior face.
   2. Screening Type: Bird/Insect screening.

B. Secure screen frames to louver frames with machine screws with heads finished to match louver, spaced a maximum of 6 inches (150 mm) from each corner and at 12 inches (300 mm) o.c.

C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.
   1. Metal: Same type and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.
   2. Finish: Same finish as louver frames to which louver screens are attached.
   3. Type: Rewirable frames with a driven spline or insert.

D. Louver Screening for Aluminum Louvers:
1. Bird/Insect Screening: Aluminum, 18-by-16 (1.4-by-1.6-mm) mesh, 0.012-inch (0.30-mm) wire.

2.5 BLANK-OFF PANELS

A. Insulated, Blank-Off Panels: Laminated panels consisting of an insulating core surfaced on back and front with metal sheets and attached to back of louver.

1. Thickness: 1 inch (25 mm).
2. Metal Facing Sheets: Aluminum sheet, not less than 0.032-inch (0.81-mm) nominal thickness.
3. Insulating Core: extruded-polystyrene foam.
4. Edge Treatment: Trim perimeter edges of blank-off panels with louver manufacturer's standard extruded-aluminum-channel frames, not less than 0.080-inch (2.03-mm) nominal thickness, with corners mitered and with same finish as panels.
5. Seal perimeter joints between panel faces and louver frames with gaskets or sealant.
6. Panel Finish: Same type of finish applied to louvers, but black color.
7. Attach blank-off panels with clips.

2.6 MATERIALS

A. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T5, T-52, or T6.
B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
C. Galvanized-Steel Sheet: ASTM A 653/A 653M, G90 zinc coating, mill phosphatized.
D. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, No. 2B finish.
E. Fasteners: Use types and sizes to suit unit installation conditions.

1. Use hex-head or Phillips pan-head screws for exposed fasteners unless otherwise indicated.
2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.
3. For fastening galvanized steel, use hot-dip-galvanized steel or 300 series stainless-steel fasteners.
4. For fastening stainless steel, use 300 series stainless-steel fasteners.
5. For color-finished louvers, use fasteners with heads that match color of louvers.
F. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, made from stainless-steel components, with capability to sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed for masonry, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
G. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.7 FABRICATION

A. Factory assemble louvers to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
B. Vertical Assemblies: Where height of louver units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates.
   1. Continuous Vertical Assemblies: Fabricate units without interrupting blade-spacing pattern.
   2. Horizontal Mullions: Provide horizontal mullions at joints.

C. Maintain equal louver blade spacing to produce uniform appearance.

D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
   1. Frame Type: Channel unless otherwise indicated.

E. Include supports, anchorages, and accessories required for complete assembly.

F. Provide vertical mullions of type and at spacings indicated, but not more than is recommended by manufacturer, or 72 inches o.c., whichever is less.
   1. Exposed Mullions: Where indicated, provide units with exposed mullions of same width and depth as louver frame. Where length of louver exceeds fabrication and handling limitations, provide interlocking split mullions designed to permit expansion and contraction.

G. Provide subsills made of same material as louvers for recessed louvers.

H. Join frame members to each other and to fixed louver blades with fillet welds concealed from view unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.8 ALUMINUM FINISHES

A. Finish louvers after assembly.

B. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
   1. Color: Dark bronze, to be confirmed by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.
3.2 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Form closely fitted joints with exposed connections accurately located and secured.

D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

E. Protect unpainted galvanized and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

F. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 079200 "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

A. Clean exposed louver surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.

B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.

C. Restore louvers damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 08 91 19
SECTION 12 48 13 - ENTRANCE FLOOR MATS AND FRAMES

Part 1 General

1.01 Summary

A. This section includes the following types of entrance flooring systems: Floor Mats & Frame Assemblies

1.02 References

A. American Society for Testing and Materials (ASTM)
B. The Carpet and Rug Institute (CRI)
C. The National Floor Safety Institute (NFSI)

1.03 Submittals

A. General: Submit the following in accordance with conditions of contract and Division 1 specifications.
B. Product data for each type of floor mat and frame specified, including manufacturer's specifications and installation instructions.
C. Shop drawings in sufficient detail showing layout of mat and frame specified including details indicating construction relative to materials, direction of traffic, spline locations, profiles, anchors and accessories.
D. Samples for selection and verification purposes: Submit a sample of the floor mat and frame members with showing color of exposed floor mat, frame and accessories required.
E. Maintenance data in the form of manufacturer's printed instructions for cleaning and maintaining floor mats.

1.04 Quality Assurance

A. Flammability in accordance with ASTM D2859, Un-Charred area greater than 3”.
B. Slip resistance in accordance with ASTM D-2047-96, Coefficient of Friction, minimum 0.60 for accessible routes.
C. Single Source Responsibility: Obtain floor mats and frames from one source of a single manufacturer.
D. Utilize 100% polypropylene fibers

1.05 Delivery, Storage and Handling: Deliver materials to the project site ready for use and fabricated in as large sections and assemblies as practical, in unopened original factory packaging clearly labeled to identify manufacturer.

1.06 Project Conditions: Field measurements: Check actual openings for mats by accurate field measurements before fabrication. Record actual measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.

Part 2 Products

2.01 Manufacturers

A. Design is based on manufacturer's literature from Construction Specialties, Inc. unless otherwise indicated. Other manufacturers are permitted if providing products equal to basis of design, including but not limited to: Mats, Inc. and American Floor Mats.
2.02 Materials

A. 100% polypropylene carpet fibers

B. Nitrile rubber backing

2.03 Entrance Floor Mats

A. Entrance carpet shall be manufactured from
B. 100% UV resistant polypropylene fibers with a face weight of 44 oz. Overall depth ½" (.47", 11.94mm).
   Supplied with all weather non-skid rubber backing.
C. Custom sized vinyl edged mats. Provide at every building entrance in width to match door(s) by 4 feet deep.
D. Color and Pattern as selected by architect from standard berber colors and patterns offered by manufacturer.

E. Mat to be adhered to floor surface using releasable adhesive supplied by manufacturer.

2.04 Mat Frames

A. VE- Vinyl Edging - 1 1/2" (38.1mm) Tapered vinyl edging sewn on entrance carpet perimeter, with reinforced corners, for surface mounted applications, available in Black.

Part 3 Execution

3.01 Examination

A. Verification of conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

1. Do not proceed until unsatisfactory conditions have been corrected.

3.02 Preparation

A. Floor preparation, temperature and proper glue methods as listed in installation instructions by manufacturer.

3.03 Installation

A. Install the work of this section in strict accordance with the manufacturer's recommendations.

B. Set mat at height recommended by manufacturer for most effective cleaning action.

C. Coordinate top of mat surfaces with bottom of doors that swing across to provide ample clearance between door and mat

3.04 Protection

A. After completing required frame installation and concrete work, provide temporary filler of plywood or fiberboard in recesses, and cover frames with plywood protective flooring. Maintain protection until construction traffic has ended and project is near time of substantial completion.

B. Defer installation of floor mats until time of substantial completion of project.

END SECTION 12 48 13
SECTION 22 08 00 – PLUMBING SYSTEMS COMMISSIONING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Specification Section 01 91 13 – Commissioning

C. Specification Section 23 08 00 – Mechanical & Controls Systems Commissioning

D. Specification Section 26 08 00 – Electrical & Lighting Systems Commissioning

G. Commissioning Plan (to be provided in Construction Phase containing process workflows, communication protocols, project-specific equipment checklists and project-specific functional performance test procedures)

1.2 COMMISSIONED SYSTEMS

A. The following systems, equipment and their components are included in the scope of the commissioning activities and are considered to be commissioned systems and equipment.

1. Plumbing Piping and Valves

2. Plumbing Piping Specialties

3. Domestic Water Pumps

4. Water Heaters – Electric

1.3 RESPONSIBILITIES

A. The Contractor shall be responsible for scheduling, supervising and performing start-up, testing and commissioning activities specified in this section and necessary to demonstrate to the Owner successful operation of the commissioned systems.

PART 2 - PRODUCTS

2.1 MEANS OF ACCESS

A. The Contractor shall provide means for the CxA to access, observe and visually confirm proper operation of all equipment and systems. These means shall be in compliance with all OSHA and job-site safety regulations.
2.2 TEST EQUIPMENT

A. The Contractor shall provide the necessary equipment to fully test the commissioned systems as defined in the functional performance test procedures to be provided by the CxA.

B. The test equipment shall meet the following minimum requirements.
   1. All test equipment shall be in good mechanical and electrical condition.
   2. Accuracy of metering in test equipment shall be appropriate for the test being performed.

C. Calibration
   1. Calibration of all test equipment shall be current.
   2. Calibration accuracy shall be traceable to National Institute of Standards and Technology (NIST).
   3. Test equipment shall be calibrated in accordance with the following schedule.
      a. Field instruments
         1) Analog – At least every 6 months
         2) Digital – At least every 12 months
      b. Leased Specialty Equipment – At least every 12 months
   4. Dated calibration labels shall be visible on all test equipment.
   5. Calibration records shall be provided for all test equipment used in the project.

PART 3 EXECUTION

3.1 EQUIPMENT RECEIPT INSPECTION CHECKLISTS

A. Equipment receipt inspection checklists, provided by the CxA, shall be completed by the Contractor online using CxAlloy TQ commissioning software. Free access to the software will be provided by the CxA to the Contractor’s personnel.

3.2 EQUIPMENT PRE-FUNCTIONAL CHECKLISTS

A. Equipment pre-functional checklists, provided by the CxA, shall be completed by the Contractor online using CxAlloy TQ commissioning software. Free access to the software will be provided by the CxA to the Contractor’s personnel.

3.3 START-UP PLAN

A. The Contractor shall perform start-up testing for each piece of equipment to ensure that the equipment and systems are properly installed and ready for operation, so that functional performance testing may proceed without delays.
B. The Contractor shall prepare a start-up plan for each piece of equipment. This plan shall be submitted to the CxA for review and comment. The start-up plan shall consist, at a minimum of the following:

1. The manufacturer’s standard start-up and check out procedures copied from the installation manuals.

2. Checklists and procedures with specific spaces for recording and documenting the inspection of each procedure and a summary block for deficiencies and explanations.

C. Two (2) weeks prior to expected start-up for a piece of equipment, the Contractor shall notify the Owner and the CxA in writing. The execution of the start-up plan shall be directed and performed by the Contractor. The CxA and/or the Owner may be present for the start-up of the first unit of each type of equipment.

D. The Contractor shall submit the completed equipment checklists to the CxA for review. The Contractor shall note all non-compliance items on these checklists. The Contractor shall notify the CxA when outstanding items have been corrected.

E. The Contractor shall complete the start-up plan and resolve or correct all issues resolved before functional testing may begin.

3.4 FUNCTIONAL PERFORMANCE TESTS

A. The Contractor shall provide all documentation as requested to the CxA for development of functional performance testing procedures. This documentation shall include, at a minimum, manufacturer installation, start-up, operation and maintenance procedures. The CxA may request further documentation as necessary for the development of functional performance tests.

B. Functional performance tests shall be performed on all of the commissioned systems and equipment.

C. The Contractor shall review the functional performance test procedures developed by the CxA.

1. The Contractor shall respond in writing to the CxA regarding the acceptability of the proposed test procedures.

2. The Contractor shall note any necessary modifications to the procedures due to the actual equipment/systems or safety concerns and shall submit these to the CxA for consideration.

E. The Contractor shall place equipment and systems into operation and continue the operation as required during each working day of the testing activities.

F. The Contractor shall accomplish the functional performance testing of equipment based on procedures developed by the CxA and as reviewed by the Contractor.

1. The Contractor shall provide skilled technicians to operate the systems during functional performance testing. At a minimum, the contractor should provide one trade technician familiar with the system being tested and one controls technician to operate the system through the BAS.

2. The Contractor shall correct any deficiencies identified during testing and retest equipment as required.

G. Functional performance testing is intended to begin upon completion of a system. Functional performance
testing may proceed prior to the completion of the system at the discretion of the CxA and the Contractor.

H. Functional testing shall verify all sequences of operation defined in the Contract Documents for the commissioned equipment and systems.

1. Testing shall occur by overriding setpoints or sensor readings at the BACS or by other means mutually agreed to by the Contractor, the CxA, and the Owner to initiate sequences of operation and verifying the response of the system.

2. Sequences of operation shall be verified under normal power, emergency power, and fire alarm scenarios.

I. Upon successful completion of all functional performance tests, the Contractor(s) shall perform Integrated Systems Testing. The testing shall document and verify the proper response of all Division 23 systems to all potential utility and emergency power operating and failure scenarios.

END OF SECTION 22 08 00
GENERAL NOTES - SITE PLAN

1. INSTALL AND MAINTAIN TEMPORARY EROSION METAL SIGN. VERIFY FINAL LOCATION IN FIELD. REFER TO FIRE PROTECTION.

MAINTAIN THROUGH ESTABLISHMENT OF PERMANENT EROSION CONTROL. DO NOT ALLOW EROSION AND/OR RUNOFF OF MUD/SILT FROM THE PROPERTY.

AS.06 PROTECT EXISTING GRANITE SETTS TO REMAIN.

AS.19 NEW CONC. SLAB AND DRAIN - SEE CIVIL. SLOPE NO PART OF PUBLIC STREETS ARE TO REMOVED, RESLOPED, RESET AND SANDED. TO SITE. COVER TOPSOIL FOR REDISTRIBUTION TIE INTO NEW/EXISTING SLOPES AT TOP/BOTTOM. DURING FINISH GRADING. REMOVE ROCKS, BAR GRATING AND ASSOCIATED SUPPORTS.

AS.20 PORTION OF RAMPED GRANITE SETTS TO BE GRADING, STRIP TOPSOIL AND STOCKPILE ON

AS.22 NEW 4" CONC. PAD FOR MECH / ELEC. WORK AREA BOUNDARY

AS.23 NEW 6" STL. PIPE BOLLARD POURED W/ CONCRETE AND ROUNDED STEEL CAP.

AS.26 CLEAN OUT EXISTING AREA WAY AND REPLACE BAR GRATING AND ASSOCIATED SUPPORTS.

AS.27 CAREFULLY SHORE OR REMOVE, CLEAN, ORGANICS, BRUSH, RUBBISH, ROCKS, LOGS AND STUMPS.

AS.29 1/2" LANDSCAPE RIVER STONE W/ 4" STL. EDGING

AS.30 SEED ALL DISTURBED AREAS UNLESS NOTED

AS.32 1/2" LANDSCAPE RIVER STONE W/ 4" STL. EDGING

AS.33 PROTECT EXISTING TREE PER DETAIL ON AS103.

AS.37 NEW PARKING SPACES AND WALK - SEE CIVIL

AS105 NEW EVERGREEN TREES AT PROPERTY LINE

AS106 NEW SHRUBS AND TREES, STONE, PAVING, ETC. SLOPED AREAS EXCEEDING TYP., NIC 3:1 SHALL HAVE SOD.

AS.49 NEW CONCRETE SIDEWALK

10. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE AT ALL SITE AREAS DURING CONSTRUCTION (NO PONDING / PUDDLES). ALL GRADES AND PAVING SHALL SLOPE AWAY FROM BUILDING AND PARKING AREAS AND 4" MIN. BELOW NEW LOUVER SILL.

11. ALL DISTURBED SITE AREAS SHALL HAVE SEED AND STRAW FOR NEW TURF UNLESS NOTED

12. THE CONTRACTOR SHALL PRESERVE AND PROTECT EXISTING TREES WHICH DO NOT UNREASONABLY INTERFERE WITH OWNER. CONTRACTOR IS RESPONSIBLE FOR REPAIRING DAMAGED UTILITIES DURING CONSTRUCTION AT NO COST TO THE OWNER.

13. NOTIFY ARCHITECT REGARDING DISCREPANCIES AND Do NOT PROCEED WITH WORK UNTIL DIRECTION IS RECEIVED. WORK DONE WITHOUT

14. CONTRACTOR TO LOCATE LOCATION SIGNAGE AND STRIPING OF FIRE LANES WITH THE FIRE AUTHORITY HAVING JURISDICTION.

15. ALL EDGES OF PAVEMENT TO HAVE A CURB AND 4" MIN. BELOW NEW LOUVER SILL.

16. ACCESS ROUTES TO SITE SHALL BE BASED WITH AN ISSUE DATE

17. CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION.

18. ALL AREAS TO BE DEMOLISHED ELEMENTS AND PAVING TO BE REMOVED, RESLOPED, RESET AND SANDED. TO SITE. COVER TOPSOIL FOR REDISTRIBUTION TIE INTO NEW/EXISTING SLOPES AT TOP/BOTTOM. DURING FINISH GRADING. REMOVE ROCKS, BAR GRATING AND ASSOCIATED SUPPORTS.

19. NEW CONCRETE SIDEWALK - SEE CIVIL

20. FOR ADDITIONAL INFORMATION, SEE CIVIL, MECHANICAL, ELECTRICAL, ETC.

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GENERAL NOTES - DEMOLITION

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AD101

Demo plan - level 1
1. **Handrail Detail**
   - Section:
   - Notes:

2. **Handrail Detail**
   - Section:
   - Notes:

3. **Handrail Detail**
   - Section:
   - Notes:

4. **AA PLAN DETAIL**
   - Notes:

5. **BB SECTION DETAIL**
   - Notes:

6. **CC PLAN DETAIL**
   - Notes:

**Notes**:
- **CUSTOM STEEL RAILING**
- **EXISTING CONSTRUCTION TO REMAIN (VIF)**
- **1/2" GLASS INFILL PANEL AT EXISTING METAL RAILING**
- **VERIFY ALL EXISTING STAIR, RAILING, LEVEL AND LANDING DIMENSIONS IN FIELD, TYP.**
- **PROVIDE NEW BOTTOM RAIL TO MATCH EXISTING THIS LOCATION AND WHERE MISSING, V.I.F.**
- **EXISTING METAL RAILING HAS OFFSETS AT SOME LANDINGS - KEEP REVEAL BETWEEN RAIL AND GLASS INFILL AT 1", TYP. - V.I.F.**
- **EXISTING METAL RAILING TO REMAIN**
- **EXISTING CONCRETE STAIR TO REMAIN**
- **EXISTING PIPE RAIL CLAMPS (CUSTOM STEEL) BEYOND AT POSTS AS REQUIRED**
- **GLASS GUARD PANEL WITH STEEL FRAME AS REQUIRED**
- **BOLTED BASE FLANGE AT POSTS AS NEEDED**
- **1 1/2" V.I.F.**
- **ø 6" V.I.F.**
- **EXISTING PIPE RAIL CLAMP**
- **RAILING ABOVE STEEL FRAME GLASS WITH WELDED PLATE POST CLAMPED TO EXISTING PIPE POST BOLT OR WELD CLAMP TO FRAME/PLATE POST STAIR EDGE BELOW**
- **EXISTING POST CLAMP**
- **RAILING ABOVE**
**ACCESSORY DEVICE COLORS**
1. ELECTRICAL DEVICES, INCLUDING RECEPTACLES, SWITCHES
   AND COMMUNICATION DEVICES
2. LIGHT FIXTURES AND OUTLETS AND TRIM SHALL BE WHITE (WHEN
   PAINTED) OR A SIMILAR COLOR, AS STATED IN THE PROJECT
   SPECIFICATIONS.
   ATTACHED DETAIL SHEETS OR SMART MODELS.

**BASE + TRIM LEGEND**
- WT2-PT#: PAINTED HARDWOOD BASE, SPECIAL PROFILE
- SB-PT#: STAINLESS STEEL BASE OVER NEW CONCRETE SLAB ON GRADE
- D-PT#: DSM-1ply REDCO TOP NAME OVER NEW CONCRETE SLAB ON GRADE
- A-PT#: ARMSTRONG HOMOGENEOUS

**COATINGS LEGEND**
- W: WHITE NEUTRAL
- L: LIGHT NEUTRAL
- G: GRAY NEUTRAL
- B: BROWN NEUTRAL
- N: NATURAL
- R: RED NEUTRAL
- Y: YELLOW NEUTRAL

**BASEMENT AREAS**
- C: CHARCOAL
- C: CHARCOAL
- C: CHARCOAL

**OFFICES ON LEVEL 1**
- C: CHARCOAL
- C: CHARCOAL
- C: CHARCOAL

**LUXURY VINYL TILE FLOOR:**
- LVT 1 (A): VINYL TILE FLOOR (CAFE AREAS/CORRIDORS)
- LVT 1 (B): VINYL TILE FLOOR (ADJACENT AREA)
- LVT 1A: VINYL TILE FLOOR (LUXURY VINYL SLIP-RESISTANT)

**POURED EPOXY FLOORING:**
- SF-1: RESILIENT SHEET FLOORING (SURGERY AREA)
- SF-2: RESILIENT SHEET FLOORING (SIM. CLINIC)
- SF-3: RESILIENT SHEET FLOORING (STAIR TREADS)

**LVT 1A**

**FRP: FIBERGLASS REINFORCED PANELS**
- F: FORMICA
- F: FORMICA

**STAINLESS STEEL TRANSITIONS AND STAIR NOSINGS AT ALL CERAMIC TILE**
- T: TREP-GS EB
- T: TREP-GS EB

**项目亮点**
- 项目亮点
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### Base + Trim Legend

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<tr>
<td>P21</td>
<td>Primer Color: WHITE TYPICAL AT GYP. BD. WALLS</td>
</tr>
<tr>
<td>P22</td>
<td>Primer Color: BLACK TYPICAL AT GYP. BD. WALLS</td>
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### Coatings Legend

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<thead>
<tr>
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<tr>
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<td>Primer Color: TAN TYPICAL AT GYP. BD. WALLS</td>
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<td>Primer Color: BROWN TYPICAL AT GYP. BD. WALLS</td>
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<td>Primer Color: BLACK TYPICAL AT GYP. BD. WALLS</td>
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<tr>
<td>P7</td>
<td>Primer Color: RED TYPICAL AT GYP. BD. WALLS</td>
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<td>Primer Color: BLUE TYPICAL AT GYP. BD. WALLS</td>
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### FLOOR FINISHES LEGEND

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</tr>
<tr>
<td>A21</td>
<td>Ceramic Floor Tile (Matching Wall Color)</td>
</tr>
</tbody>
</table>

### General Notes - Finishes

1. **C-1**. Unbonded concrete slab with an unprimed membrane.
2. **C-2**. Unbonded concrete slab with a primed membrane.
3. **C-3**. Unbonded concrete slab with a coated membrane.
4. **C-4**. Unbonded concrete slab with a painted membrane.

### Schedules

Schedules for material selections and finish specifications are provided in the document. Details include specific materials, colors, and installation procedures.
### SCHEDULE NOTES

1. **General Instructions**
   - All materials shall be of proper quality and shall conform to the latest applicable standards and codes of the AIA and ASHRAE.
   - All construction shall be done in accordance with the latest standards and codes of the AIA and ASHRAE.

2. **Electrical System**
   - All electrical systems shall be installed in accordance with the latest National Electrical Code (NEC) and all applicable local codes.

3. **Plumbing System**
   - All plumbing systems shall be installed in accordance with the latest Uniform Plumbing Code (UPC) and all applicable local codes.

4. **Mechanical System**
   - All mechanical systems shall be installed in accordance with the latest American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards.

### GENERAL NOTES - FINISHES

1. **Contractor Responsibility**
   - The contractor is responsible for inspecting and verifying the finishes prior to installation and shall provide a written report to the owner.

2. **Paint**
   - All painted finishes shall be applied in a manner that will provide long-lasting and durable results.

3. **Ceramic Tile**
   - All ceramic tile shall be installed in accordance with the latest American National Standards Institute (ANSI) standards.

4. **Carpet**
   - All carpet shall be installed in accordance with the latest Underwriters Laboratories (UL) standards.

5. **Laminate Flooring**
   - All laminate flooring shall be installed in accordance with the latest Underwriters Laboratories (UL) standards.

6. **Resilient Flooring**
   - All resilient flooring shall be installed in accordance with the latest National Floor Installers Association (NFIA) standards.

7. **Wood Flooring**
   - All wood flooring shall be installed in accordance with the latest National Wood Flooring Association (NWFA) standards.

8. **Stainless Steel**
   - All stainless steel shall be installed in accordance with the latest American National Standards Institute (ANSI) standards.

9. **Gypsum Board**
   - All gypsum board shall be installed in accordance with the latest National Gypsum Association (NGA) standards.

10. **Formica**
    - All Formica shall be installed in accordance with the latest Formica Corporation standards.

11. **Sheet Metal**
    - All sheet metal shall be installed in accordance with the latest National Sheet Metal and Air Conditioning Contractors' Association (SMACN) standards.

12. **Drywall**
    - All drywall shall be installed in accordance with the latest American National Standards Institute (ANSI) standards.

13. **Fireplace**
    - All fireplaces shall be installed in accordance with the latest National Fire Protection Association (NFPA) standards.

14. **Electrical Outlets**
    - All electrical outlets shall be installed in accordance with the latest National Electrical Code (NEC) and all applicable local codes.

15. **Light Fixtures**
    - All light fixtures shall be installed in accordance with the latest National Electrical Code (NEC) and all applicable local codes.

16. **Plumbing Fixtures**
    - All plumbing fixtures shall be installed in accordance with the latest Uniform Plumbing Code (UPC) and all applicable local codes.

17. **Mechanical Fixtures**
    - All mechanical fixtures shall be installed in accordance with the latest American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards.

18. **Painting**
    - All painting shall be done in accordance with the latest American Society of Painters in Industrial and Commercial (ASPC) standards.

19. **Ceramic Tile**
    - All ceramic tile shall be installed in accordance with the latest American National Standards Institute (ANSI) standards.

20. **Carpet**
    - All carpet shall be installed in accordance with the latest Underwriters Laboratories (UL) standards.

21. **Laminate Flooring**
    - All laminate flooring shall be installed in accordance with the latest National Floor Installers Association (NFIA) standards.

22. **Resilient Flooring**
    - All resilient flooring shall be installed in accordance with the latest National Floor Installers Association (NFIA) standards.

23. **Wood Flooring**
    - All wood flooring shall be installed in accordance with the latest National Wood Flooring Association (NWFA) standards.

24. **Stainless Steel**
    - All stainless steel shall be installed in accordance with the latest American National Standards Institute (ANSI) standards.

25. **Gypsum Board**
    - All gypsum board shall be installed in accordance with the latest National Gypsum Association (NGA) standards.

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    - All Formica shall be installed in accordance with the latest Formica Corporation standards.

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    - All sheet metal shall be installed in accordance with the latest National Sheet Metal and Air Conditioning Contractors' Association (SMACN) standards.

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    - All drywall shall be installed in accordance with the latest American National Standards Institute (ANSI) standards.

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    - All fireplaces shall be installed in accordance with the latest National Fire Protection Association (NFPA) standards.

30. **Electrical Outlets**
    - All electrical outlets shall be installed in accordance with the latest National Electrical Code (NEC) and all applicable local codes.

31. **Light Fixtures**
    - All light fixtures shall be installed in accordance with the latest National Electrical Code (NEC) and all applicable local codes.

32. **Plumbing Fixtures**
    - All plumbing fixtures shall be installed in accordance with the latest Uniform Plumbing Code (UPC) and all applicable local codes.

33. **Mechanical Fixtures**
    - All mechanical fixtures shall be installed in accordance with the latest American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards.

34. **Painting**
    - All painting shall be done in accordance with the latest American Society of Painters in Industrial and Commercial (ASPC) standards.

35. **Ceramic Tile**
    - All ceramic tile shall be installed in accordance with the latest American National Standards Institute (ANSI) standards.

36. **Carpet**
    - All carpet shall be installed in accordance with the latest Underwriters Laboratories (UL) standards.

37. **Laminate Flooring**
    - All laminate flooring shall be installed in accordance with the latest National Floor Installers Association (NFIA) standards.

38. **Resilient Flooring**
    - All resilient flooring shall be installed in accordance with the latest National Floor Installers Association (NFIA) standards.

39. **Wood Flooring**
    - All wood flooring shall be installed in accordance with the latest National Wood Flooring Association (NWFA) standards.

40. **Stainless Steel**
    - All stainless steel shall be installed in accordance with the latest American National Standards Institute (ANSI) standards.

41. **Gypsum Board**
    - All gypsum board shall be installed in accordance with the latest National Gypsum Association (NGA) standards.

42. **Formica**
    - All Formica shall be installed in accordance with the latest Formica Corporation standards.

43. **Sheet Metal**
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    - All plumbing fixtures shall be installed in accordance with the latest Uniform Plumbing Code (UPC) and all applicable local codes.

49. **Mechanical Fixtures**
    - All mechanical fixtures shall be installed in accordance with the latest American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standards.

50. **Painting**
    - All painting shall be done in accordance with the latest American Society of Painters in Industrial and Commercial (ASPC) standards.
1. LOOP TO FACP FOR NETWORK. (LOOP IN AND OUT)
2. WALL RACK FOR AUDITORIUM A/V EQUIPMENT.
3. PATH FOR COMMUNICATIONS SERVICE ENTRANCE, CORE EXTERIOR WALL AS NECESSARY. ENTER AT BASEMENT CEILING ELEVATION;
4. ACCESS CONTROL (SEABOND), CCTV, AND A/V EQUIPMENT RACK ARE LOCATED HERE IN LIEU OF IT ROOM. THIS SERVES FLOORS SEE T104 FOR ENLARGED IT ROOM DETAILS.
5. RELOCATE EXISTING FIBER OPTIC SPLICE CABINET FOR FIRE ALARM TO THIS LOCATION AND RE-WORK LOOP PER NOTES ON ES100.
6. SEPERATE CONDUIT FOR FIRE ALARM, (2)-2" EMT.
7. NEW STUD WALL 1 HOUR RATED FIRE BARRIER (2)-3" EMT.
8. 12" DATA CABLE TRAY AND C TRAY TO CABLE TRAY B57.
9. Wire to cable tray B98.
10. Wire to cable tray B04, B05, B13.
11. 1 12" CABLE TRAY.

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**GENERAL NOTES:**

1. ALL CABLES TO BE Routed TOGETHER WITHIN A COMMON CONDUIT OR CABLE TRAY. NO FLOOR OR WALL CONDUIT TO BE CUT OR ALTERED.
2. PERIODEICAL PHASING OF FLOOR BOXES, COMMUNICATION CABLES, AND ELECTRICAL CABLES SEPARATE FLOOR BOXES ONLY FOR COMMUNICATION PARTITION, SUCH THAT ALL CABLES ARE PROPERLY SEGREGATED.
3. DATA CABLES TO BE Routed TOGETHER WITHIN A COMMON CONDUIT OR CABLE TRAY. NO FLOOR OR WALL CONDUIT TO BE CUT OR ALTERED.
4. LOCATION FOR COMMUNICATION CABINET IN FLOOR WALL TO BE CONFIRMED BY CONSTRUCTION CONTRACTOR.
1. PROVIDE CAT 6 JUMPERS TO BUILDING DDC (BMS) CONTROL
   SYSTEM FOR MECHANICAL.
2. FOR OUTDOOR WIRELESS ACCESS POINT, PROVIDE CAT 6 DATA
   JACK ABOVE CEILING IN ADJACENT INTERIOR OFFICE WITH
   PLATE, INSTALL A PATCH CABLE BETWEEN WAP AND FACE
   PLATE; WAP BY ETSU ITS; COORDINATE IN FIELD.

REFERENCE NOTES

GENERAL NOTES
1. PROVIDE GREEN BONDING JUMPER AT ALL JOINTS.
2. PROVIDE GREEN BONDING JUMPER AT ALL JOINTS.
3. PROVIDE GREEN BONDING JUMPER AT ALL JOINTS.
4. PROVIDE GREEN BONDING JUMPER AT ALL JOINTS.
1. PROVIDE CAT6 CABLE DROP TO BUILDING DDC (BMS) CONTROL SYSTEM FOR MECHANICAL.
   PROJECTOR LOCATION A/V CABLES AND CAT6; CEILING MOUNTED.
2. SEE T104 FOR ENLARGED IT ROOM DETAILS.
3. DATA PORTS MARKED "AV" WILL HAVE (2) STANDARD DATA CABLES AND (2) SPECIAL PURPOSE DATA CABLES LANDED IN SEPERATE PATCH PANEL WITH YELLOW JACKS.
4. DATA PORTS MARKED "AV" WILL HAVE (2) STANDARD DATA CABLES AND (2) SPECIAL PURPOSE DATA CABLES LANDED IN SEPERATE PATCH PANEL WITH YELLOW JACKS.

GENERAL NOTES:
1. ALL CABLE TRAY SECTIONS SHALL BE BONDED TOGETHER WITH #8 GREEN BONDING JUMPER AT ALL JOINTS.
2. ALL CABLE TRAYS SHALL BE BONDED TO TMGB OR TGB IN IT/TR ROOM ON EACH FLOOR.
3. ALL ROUGH-IN BOXES, FLOOR BOXES, CONDUITS, CABLE TRAYS, CONTRACTOR; ALL CABLING, TERMINATIONS AND TESTING BY DIVISION 27 COMMUNICATIONS CONTRACTOR.
4. BALANCE CABLES IN CABLE TRAY EVENLY, AT STARTING POINTS AND EVERY 40 FT INSTALL TRAPEZE TYPE HANGER TO PREVENT TWISTING.
REFERENCE NOTES

1. SYSTEM FOR MECHANICAL.

2. PROJECTOR LOCATION A/V CABLES AND CAT6; CEILING MOUNTED.

3. ACCESS CONTROL (SEABOND), CCTV, AND A/V EQUIPMENT RACK ARE LOCATED HERE IN LIEU OF IT ROOM. THIS SERVES FLOORS 2ND AND 3RD.

4. SEE T104 FOR ENLARGED IT ROOM DETAILS.

5. AND (2) SPECIAL PURPOSE DATA CABLES LANDED IN SEPERATE

WALL LEGEND

EXISTING TO REMAIN

NEW STUD WALL

NEW CMU WALL

NEW BRICK / BRICK VENEER WALL

NON-RATED SMOKE BARRIER (PER NFPA 101)

2 HOUR RATED FIRE BARRIER

INSTALL ROUGH-IN BOXES FOR POWER, COMMUNICATIONS, AND A/V BEHIND RACEWAY WITH HORIZONTAL P-RINGS. INSTALL DEVICES AND PLATES IN FACE OF RACEWAY, TYPICAL ALL.

WIREMOLD RACEWAY, TYPICAL

WIREMOLD G6000 SURFACE, METAL RACEWAY WITH DIVIDERS FOR POWER AND DATA/AV.

All cable tray sections shall be bonded together with No. 8 Green Bonding Jumper at all joints.

All cable trays shall be bonded to TMGB or TGB in it/tr.

All rough-in boxes, floor boxes, conduits, cable trays, grounding and bonding shall be by Division 26 Electrical Contractor; all cabling, terminations and testing by.

Third Floor Communications Plan

General Notes:

1. All cable tray sections shall be bonded together with No. 8 Green Bonding Jumper at all joints.

2. All rough-in boxes, floor boxes, conduits, cable trays, grounding and bonding shall be by Division 26 Electrical Contractor; all cabling, terminations and testing by.

3. Signage and legends shall be by Division 26 Electrical Contractor; all cabling, terminations and testing by.

4. Existing to remain.

5. New stud wall.

6. New CMU wall.

7. New brick / brick veneer wall.

8. Non-rated smoke barrier (per NFPA 101).

9. 2 hour rated fire barrier.

10. Non-rated smoke partition (per IBC 508.2).

11. Install rough-in boxes for power, communications, and A/V behind raceway with horizontal p-rings. Install devices and plates in face of raceway, typical.

12. Wall legend.

13. Reference notes.


15. Projector location A/V cables and CAT6; ceiling mounted.

16. Access control (Seabond), CCTV, and A/V equipment rack are located here in lieu of IT room. This serves floors 2nd and 3rd.

17. See T104 for enlarged IT room details.

18. And (2) special purpose data cables landed in separate.

19. All cable tray sections shall be bonded together with No. 8 green bonding jumper at all joints.

20. All cable trays shall be bonded to TMGB or TGB in IT/TR.

21. All rough-in boxes, floor boxes, conduits, cable trays, grounding and bonding shall be by Division 26 Electrical Contractor; all cabling, terminations and testing by.

22. The design detail and invention of this drawing, being property of Red Chair Architects, shall not be copied or disclosed without written consent.

23. 1/8" = 1'-0"
1. ALL ROUGH-IN, CONDUIT, BOXES, FLOOR BOXES, AND CABLE TRAYS SHOWN ON THIS PLANS IS TO BE FURNISHED AND INSTALLED BY DIVISION 26 ELECTRICAL CONTRACTOR.

2. ALL CABLE TRAY SECTIONS SHALL BE BONDED TOGETHER.

3. ALL CABLE TRAYS SHALL BE BONDED TO TMGB OR TGB IN IT/TR ROOM ON EACH FLOOR.

4. ALL ROUGH-IN BOXES, FLOOR BOXES, CONDUITS, CABLE TRAYS, GROUNDING AND BONDING SHALL BE BY DIVISION 26 ELECTRICAL CONTRACTOR.

REFERENCE NOTES:
1. THIS CABLE TRAY IS MOUNTED ABOVE THE DATA CABLE TRAY. SEE TYPICAL DETAIL ON SHEET T002.
1. ALL ROUGH-IN, CONDUIT, BOXES, FLOOR BOXES, AND CABLE TRAYS SHOWN ON THIS PLANS IS TO BE FURNISHED AND INSTALLED BY DIVISION 26 ELECTRICAL CONTRACTOR.

2. FIELD VERIFY ALL EXACT A/V LOCATIONS VERSUS DRAKE SYSTEMS DRAWINGS PRIOR TO ROUGH-IN.

3. ALL CABLE TRAY SECTIONS SHALL BE BONDED TOGETHER WITH #8 GREEN BONDING JUMPER AT ALL JOINTS.

4. ALL CABLE TRAYS SHALL BE BONDED TO TMGB OR TGB IN IT/TR ROOM ON EACH FLOOR.

5. ALL ROUGH-IN BOXES, FLOOR BOXES, CONDUITS, CABLE TRAYS, GROUNDING AND BONDING SHALL BE BY DIVISION 26 ELECTRICAL CONTRACTOR; ALL CABLING, TERMINATIONS AND TESTING BY DIVISION 27 COMMUNICATIONS CONTRACTOR.

REFERENCE NOTES:
1. THIS CABLE TRAY IS MOUNTED ABOVE THE DATA CABLE TRAY. SEE TYPICAL DETAIL ON SHEET T002.