THRASHER | ARCHITECTURE ENGINEERING FIELD SERVICES

ROANE COUNTY BOARD OF EDUCATION
ROANE COUNTY, WEST VIRGINIA

NEW SPENCER MIDDLE SCHOOL

ADDENDUM #3

July 1, 2022

THRASHER PROJECT #060-10259

TO WHOM IT MAY CONCERN:

A Pre-Bid Conference was held on Tuesday, June 14, 2022 on the above-referenced project, The following are clarifications and responses to questions posed by contractors for the above reference project.

A. GENERAL

1. Additional questions that have been already submitted will be responded to in the next Addendum.
2. The Cutoff for questions is Wednesday, July 6, 2022 @ 4:00 p.m. Questions received after the cutoff will not be addressed.

B. SPECIFICATIONS

1. The Index has been updated in this Addendum.
2. Specification 077100 Roof Specialties has been revised in this Addendum.
3. Specification 077200 Roof Accessories has been revised in this Addendum.
4. Specification 075323 Ethylene-Propylene Roofing has been revised this Addendum.
5. Specification 083323 Overhead Coiling Doors has been added in this Addendum
6. Specification 089000 Louvers and Vents has been added in this Addendum
7. Specification 126600 Telescoping Stands has been revised in this Addendum

C. DRAWINGS

1. C1.02 Pro-Demolition Plan has been revised and is included in this Addendum.
2. A4.08 Stairs and Elevator Plans sheet is included in this Addendum.

D. QUESTIONS AND RESPONSES

QUESTION

1. Drawings state caisson depth is 25’ on each one however it states to follow Geotech as well. Please confirm bid depth is 25’

RESPONSE

The average depth of 32’ and then have add or deduct item on contract for actual drill or install depth and we need to monitor the depth.

QUESTION

2. Spec lists Geotech in table of contents however didn’t see it in specs. Please send Geotech report in addendum

RESPONSE
Geotech report was included in addendum 1.

QUESTION
3. I understand submittal exchange is software to use for project. Please confirm if there is a cost to this program.

RESPONSE
It is free to the contractor if it is under one of our projects.

QUESTION
4. Is the contractor or owner paying for Builders risk?

RESPONSE
Contractor pays for builders risk.

QUESTION
5. Your Prebid agenda stated there were B&O tax however in Prebid the superintendent stated we were out of city limits. Please confirm if B&O tax is applicable

RESPONSE
No B&O taxes

QUESTION
6. Please be advised that our normal glass suppliers-WA Wilson-can only produce a maximum width/height of 80" in their tempering oven. If the intended oversized glass sizes do not change, these units will have to fabricated in like the one in Rochester NY at a ridiculously elevated cost. To clarify glass tempering restrictions, maximum width or height 80" total maximum sq ft is 50, so additional horizontals and or verticals will be required. We need radius/angle dimensions highlighted areas shown on the attached drawings. The opening/frame shown on A1.03 looks to be angled/segmented. We have sent the drawings to our supplier to see if they have any other restrictions to what is drawn. Page A6.02 shows 4" sills for Curtainwall assemblies-2-1/2" or 5" is all that's available, please confirm selection.

RESPONSE
Drawings will be issued in next addendum

QUESTION
7. Drawings A1.17 detail 5 shows railing at the roof edge. What does the architect want it made from? If at all possible we need some guidance on material and basis of design.

RESPONSE
Basis of Design: Superior Series 2000 Square Post Cable Railing

QUESTION
8. Angle framing under bathroom sink details show stainless angles, Can these be supplied galvanized?

RESPONSE
Galvanized is acceptable.

QUESTION

9. Stair specifications call for channel stair stringers. Drawing A4.08 represents the stringer like a tube steel stringer or is poorly drawn. Please clarify. I'm assuming all stair railings and exterior rails at the concrete steps are to be steel pipe and steel picket on the interior stair and galvanized two-line steel pipe on the exterior concrete stairs. Please confirm these are correct assumptions.

RESPONSE

Stair revised in addendum 3. Interior and exterior powered coated steel is acceptable.

QUESTION

10. Would it be possible for Thrasher to identify more of the roof details (A1.16 and A1.17) on the roof plan? Only three (3) are shown (4/A1.17, 5/A1.17 and 10/A1.17).

RESPONSE

A1.16 has curb detail, roof drain, scupper, and parapet details. A1.17 has 1 EDPM @ wall, 10 awning overhang detail, 4 entrance overhang detail, 7 roof vent, 8 roof ladder, and 9 roof hatch detail.

QUESTION

11. Are the non-tapered roof areas shown on the roof plan on a sloped deck. Want to make sure we are clear on this up front to avoid the issues.

RESPONSE

There are no non-tapered roof areas and no sloped decks on this project.

QUESTION

12. Bid Form Alternate 4 describes green roof for 20’ x 24 area. Note 9 on Drawing A1.15 incorporates detail 5/A1.17 (Green Roof Detail). This area is approximately 30’ x 88’. Please clarify

RESPONSE

Greenhouse is 20’x24’.

QUESTION

13. On the overall roof plan it doesn’t provide any section cuts to determine walls materials including coping. Not all of the walls are typical. Please provide this direction.

RESPONSE

Refer to typical parapet details are sheet A1.16.

QUESTION

14. Please provide specifications and Details of Top Rope Rock Climbing Wall.

RESPONSE

Revised from Top Rope to Traverse Climbing wall.

QUESTION
15. Please provide specifications for lockers in room 171 for Custodians.

RESPONSE
Reference single-tier heavy duty corridor lockers in section 105113 Metal Lockers.

QUESTION
16. Please provide location of flagpole.

RESPONSE
Refer to A1.02 keynote 36 for approx. location for flagpole.

QUESTION
17. Is the Green Roof to cover the area of roof including under the Green House, if this part of the alternate is not accepted?

RESPONSE
Concrete deck under the Green House is under base bid

QUESTION
18. Specification Section 312000, Paragraph 3.17.C. references the timeframe "Project Correction Period". What is that time period?

RESPONSE
If you're referring to the warranty period, which is typically 12 months unless SBA has a longer time frame.

QUESTION
19. Please confirm Substantial Completion time of 490 calendar days as addressed in Pre-bid Conference Meeting and on the Pre-bid Agenda.

RESPONSE
Refer to addendum 2. The Bidder will indicate the total number of days for construction. Please refer to Bid Form Article 6.03.

QUESTION
20. A1.07 and 1/A2.01: Aluminum Storefront Window at Steam Classroom 119 has shades (Keynote 23). Are shades to be the full height of the Storefront window?

RESPONSE
Yes

QUESTION
21. Please provide specifications and dimensions for the Cable Railing shown on A1.15, Roof Keynote 12 and 5/A1.17 & 6/A1.17.

RESPONSE
Basis of Design: Superior Series 2000 Square Post Cable Railing. Refer to dimension railing on plans.

QUESTION

22. Please clarify if the Liveroof Pavers on A7.03 are in Base Bid or Alternate 4> additionally, please provide details.

RESPONSE

Response – Liveroof pavers are in alternate 4.

QUESTION

23. We had also sent several questions after the pre bid and it looks as if only a couple of them were answered per addendum #2. Should we resubmit those questions?

RESPONSE

No, questions not responded to in this addendum, will be answered in Addendum 4.

QUESTION

24. Approve Cornell as an approved manufacturer

RESPONSE

Added Cornell as an approved manufacturer.

QUESTION

25. Is the operable wall located in Rooms 204/206?
    a. If so what is it's length?
    b. Does it extend the full width of the room?
    c. Please detail the storage /pocket area
    d. Is detail 8/A5.02 for this wall?

RESPONSE

Yes

a. 29' – 10 3/8"
b. Yes, it extends the full width of the room.
c. Pocket not required.
d. Yes

QUESTION

26. 6/A5.02 Vanity shows stainless steel angles supporting the vanity on both sides into CMU. Public Restrooms 161 and 167 have only one side CMU. The other side is toilet partitions. Is this what you intended?

RESPONSE

Yes, provide steel angle and bolt angle to CMU at wall locations.

QUESTION

27. Is the sill of door 181 set at the stage room 181 elevation or at the band room 185 elevation? According to the Structural drawings, it would be set to the band elevation.

RESPONSE

Sill of door 181 is at stage elevation.

QUESTION
28. Telescoping Stands Section 1266600 - Spec doesn't call out the row rise. Standard rise from Hussey Seating is 9-5/8".

RESPONSE
Provide manufacturer's standards.

QUESTION
29. Spec is also missing row spacing. Typically we would use 24" row spacing with 12" deep seats.

RESPONSE
Provide manufacturer's standards.

QUESTION
30. 2.3/4 calls out folding backrests. Are these required? If so, minimum row spacing is 30".

RESPONSE
Not required

QUESTION
31. 2.4/A/B & C: Portable Stairs & Portable Access Ramps; not sure why these items are listed. Are they required?

RESPONSE
Not required

QUESTION
32. 1/A1.15 refers to detail 10/A1.17 which is an Awning detail

RESPONSE
Correct, they are awnings

QUESTION
33. Will there be specifications issued for the work identified in Alternate 4 or are we to rely on the notes on Sheet A1.17?

RESPONSE
Basis of Design: LiveRoof Grower's Choice sedum modules with (2) native plugs per module and LiveRoof Roofstone Pavers and Base

QUESTION
34. Grade Beam Sizes Missing on S1.04.
   a. Between column lines 29 and 29.4 along top of drawing. GB10 shown on left side of caisson but no designation on right side intersecting GB8.
   b. Four parallel beams and one co-liner beam between column lines 26 and 29 starting at first beam above Y through AA.
   c. On right hand side of drawing in alignment with GB23s between column lines 33 and 40.

RESPONSE
a. This is GB10 also

b. Use same GB designation as on opposite side of caisson at these locations.
c. Use GB23 here as well.

QUESTION
35. GB20 is called out on S1.01 and S1.04 but is not listed on S5.02.

RESPONSE
This will be addressed and new drawings issued with next addendum.

QUESTION
36. GB7 is called out on S5.02 twice with two different reinforcement requirements.

RESPONSE
This will be addressed and new drawings issued with next addendum.

QUESTION
37. On drawing S1.05 in section A in the principals office drawings indicate in that corner that slab on grade is only 4"- SOG1 but in the center of this area drawings indicate SS12A- a 12" slab. I believe this area to all b 12" but want to verify. I have attached a picture of this area for clarity.

RESPONSE
These areas are 12" structural slabs and reinforced per the slab schedule.

QUESTION
38. What is the slab thickness in the hallways of area A & B. I am not seeing them noted on drawings S1.05 or S1.06

RESPONSE
These are both SS8A slabs.

QUESTION
44. Science lab 154 and 145 do not show a thickness. Please clarify?

RESPONSE
These are both SOG1 slabs.

QUESTION
45. What is the description for "Mark" SS1 on the framing drawings legend? Nothing is written out in the description and I see the Mark in are B coming in the corridor.

RESPONSE
SS1 will be deleted from the schedule. The mark in the corridor is changed to SOG1.

QUESTION
46. The drawings have tags for caissons indicating their diameter. This does not include a top of caisson or bottom of caisson per design. The geotechnical report does not provide this information either. Please provide a tag for each caisson with the needed information on the foundation drawings. Provide the layers so that we can see each caisson detailed by tags.

RESPONSE
Assumed caisson depth is 32 feet.

QUESTION
47. Please indicate how we are to price the variance of plus and minus lengths of caisson depths from planned lengths to as-built lengths.

RESPONSE
Unit cost will be per linear foot for each caisson size in the bid form.

QUESTION
48. Slab-on-grade tags SS8A and SS10A refer to the Slab Schedule. There isn't a slab SS8A or SS10A on this schedule. What do we do where this is shown on Sheets On S1.05,S106,S107,and S108.?

RESPONSE
These are listed in the schedule. New drawings will be issued with the next addendum.

QUESTION
49. On S1.05,S106,S107,S108 on the slab schedule it has the mark SS1 there is no design provided for this Tag. Please, will you provide this design?

RESPONSE
This is deleted from the schedule.

QUESTION
50. On S1.04 there is a footer called out GB20C in the footer detail there isn't a tag number GB20C.

RESPONSE
This will be corrected and a new drawing will be issued with the next addendum.

QUESTION
51. Many of the Grade Beam lines on the Foundation Plan do not match the specified width.

RESPONSE
Grade beams shown on the plans are graphical in nature to represent the members. Use sizes in the schedule.

QUESTION
52. On the Elevator shaft it doesn't call what type of grade beams no tag number.

RESPONSE
There is a mat foundation and no grade beams at this location.

QUESTION
53. On drawing s1.02 does not call out what type of footer is in the radius calls it out for the columns.

RESPONSE
The column footings are indicated on the plan and the wall footings between the columns shall be designation WF2.

QUESTION

54. Section 9/A4.08 does not appear to be generated from the Structural Drawings. What appears to be similar is a 4'0" elevator pit. Per the Structural plan view on S1.01 is 4 caissons – top of pile elevation 95'0" – a 12' concrete pad with sump pit, and masonry wall to finish floor. Is this correct?

RESPONSE

There is a 12" reinforced concrete mat slab and no grade beams at this location. Coordinate the size and location of the sump pit with mechanical drawings.

QUESTION

55. Refer to questions 30 and 31. 1/S3.07 shows a waterstop at door 200B. It does not show a waterstop at door 200A. Is this correct?

RESPONSE

Yes, this is correct.

QUESTION

56. Detail 1/S307 indicates a 6" slab on deck while 1/S3.07 shows a 4 ½" deck. Which is correct?

RESPONSE

There is 4 ½" of concrete above the 1 ½" metal deck, giving a total slab thickness of 6".

QUESTION

57. 3/A4.06 Louver, see specification. Will you provide a specification?

RESPONSE

A specification has been added in this Addendum.

E. <u>CLARIFICATIONS</u>

Remaining questions will be addressed in the next Addendum

If you have any questions or comments, please feel free to contact our office at your earliest convenience. As a reminder, bids will be received until 1:30 p.m. on Tuesday, July 14, 2022 at Roane County Board of Education, 813 Capital Street, Spencer, WV. Good luck to everyone and thank you for your interest in the project.

Sincerely,

THE THRASHER GROUP, INC.

AMANDA CHEUVRONT, AIA, NCARB
Project Manager

ROANE COUNTY BOARD OF EDUCATION
ROANE COUNTY, WEST VIRGINIA
FOR THE
NEW SPENCER MIDDLE SCHOOL

Thrasher Project # 060-10259
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SECTION 075323 - ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adhered ethylene-propylene-diene-terpolymer (EPDM) roofing system.
2. Roof insulation.
3. Cover board.
4. Walkways.

1.2 PREINSTALLATION MEETINGS

A. Preliminary Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For insulation and roof system component fasteners, include copy of FM Approvals' RoofNav listing.

B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:

1. Layout and thickness if insulation.
2. Base flashings and membrane terminations.
3. Flashing details at penetrations.
4. Tapered insulation, thickness, and slopes.
5. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

C. Samples: For the following products:

1. Roof membrane and flashings of color required.
2. Walkway pads or rolls, of color required.

D. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.

1.4 INFORMATIONAL SUBMITTALS

A. Manufacturer Certificates:

1. Performance Requirement Certificate: Signed by roof membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

    a. Submit evidence of complying with performance requirements.

2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.

B. Product Test Reports: For components of roof membrane and insulation, for tests performed by a qualified testing agency, indicating compliance with specified requirements.

C. Research reports.

D. Field Test Reports:

1. Concrete internal relative humidity test reports.
2. Fastener-pullout test results and manufacturer's revised requirements for fastener patterns.

E. Field quality-control reports.

F. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance data.

B. Certified statement from existing roof membrane manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed or listed in FM Approvals' RoofNav for roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 20 years from Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accelerated Weathering: Roof membrane shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.

B. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D 3746, ASTM D 4272, or the Resistance to Foot Traffic Test in FM Approvals 4470.

C. Wind Uplift Resistance: Design roofing system to resist the following wind uplift pressures when tested according to FM Approvals 4474, UL 580, or UL 1897:

1. Zone 1 (Roof Area Field): 60 lbf/sq. ft..
2. Zone 2 (Roof Area Perimeter): 90 lbf/sq. ft..

a. Location: From roof edge to 5 feet 6 inches inside roof edge.

3. Zone 3 (Roof Area Corners): 110 lbf/sq. ft..

a. Location: 5 feet 6 inches in each direction from building corner.

D. FM Approvals' RoofNav Listing: Roof membrane, base flashings, and component materials shall comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system, and shall be listed in FM Approvals' RoofNav for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals Certification markings.

1. Fire/Windstorm Classification: Class 1A-90.
2. Hail-Resistance Rating: MH.

E. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class B; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.2 ETHYLENE-PROPYLENE-DIENE-TERPOLYMER (EPDM) ROOFING

A. EPDM Sheet: ASTM D 4637/D 4637M, Type I, nonreinforced, EPDM sheet.

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

a. Carlisle SynTec Incorporated.
b. Firestone Building Products.
c. GenFlex Roofing Systems.
d. Versico Roofing Systems.

2. Thickness: 60 mils, nominal.
3. Exposed Face Color: Black.

2.3 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.

B. Sheet Flashing: 60-mil- thick EPDM, partially cured or cured, according to application.

C. Protection Sheet: Epichlorohydrin or neoprene nonreinforced flexible sheet, 55 to 60 mils thick, recommended by EPDM manufacturer for resistance to hydrocarbons, non-aromatic solvents, grease, and oil.

D. Slip Sheet: ASTM D2178/D2178M, Type IV; glass fiber; asphalt-impregnated felt.

E. Slip Sheet: Manufacturer’s standard of thickness required for application.

F. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.

G. Bonding Adhesive: Manufacturer's standard.

H. Seaming Material: Manufacturer's standard, synthetic-rubber polymer primer and 3-inch- wide minimum, butyl splice tape with release film.

I. Lap Sealant: Manufacturer's standard, single-component sealant, colored to match membrane roofing.

J. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.

K. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.

L. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening components to substrate, and acceptable to roofing system manufacturer.

M. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, molded pipe boot flashings, preformed inside and outside corner sheet flashings, reinforced EPDM securement strips, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

2.4 ROOF INSULATION

A. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.

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

    a. Atlas Roofing Corporation.
    b. Carlisle SynTec Incorporated.
    c. Firestone Building Products.
    d. Insulfoam - a division of Carlisle Construction Materials Inc.
    e. Rmax, Inc.

2. Size: 48 by 96 inches.
3. Thickness:

    a. Base Layer: 1-1/2 inches.
    b. Upper Layer: 2-1/2 inches.

B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.
1. Size: 48 by 48 inches.
2. Thickness:

    a. Base Layer: 2-inches.
    b. Upper Layer: 2-inches.

C. Tapered Insulation: Provide factory-tapered insulation boards.

1. Material: Match roof insulation.
2. Minimum Thickness: 1/4 inch.
3. Slope:

    a. Roof Field: 1/4 inch per foot unless otherwise indicated on Drawings.
    b. Saddles and Crickets: 1/2 inch per foot unless otherwise indicated on Drawings.

2.5 INSULATION ACCESSORIES

A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

B. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
1. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.

C. Cover Board: ASTM C1177/C1177M, glass-mat, water-resistant gypsum substrate, or ASTM C1278/C1278M, fiber-reinforced gypsum board.
1. Thickness: 1/4 inch.
2. Surface Finish: Factory primed.

D. Cover Board: ASTM C1289 Type II, Class 4, Grade 1, 1/2-inch-thick polyisocyanurate, with a minimum compressive strength of 80 psi.

E. Protection Mat: Woven or nonwoven polypropylene, polyolefin, or polyester fabric; water permeable and resistant to UV degradation; type and weight as recommended by roofing system manufacturer for application.

2.6 WALKWAYS

A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, approximately 3/16 inch thick and acceptable to roofing system manufacturer.

1. Size: Approximately 30 by 30 inches
2. Color: Contrasting with roof membrane.

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.

3.2 PREPARATION

A. Perform fastener-pullout tests according to roof system manufacturer's written instructions.

1. Submit test result within 24 hours of performing tests.

a. Include manufacturer's requirements for any revision to previously submitted fastener patterns required to achieve specified wind uplift requirements.

3.3 ROOFING INSTALLATION, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions, FM Approvals' RoofNav assembly requirements, and FM Global Property Loss Prevention Data Sheet 1-29.

B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.4 INSULATION INSTALLATION

A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.

B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.

C. Installation Over Metal Decking:

1. Install base layer of insulation with joints staggered not less than 24 inches in adjacent rows and with long joints continuous at right angle to flutes of decking.

    a. Locate end joints over crests of decking.
    b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
    c. Make joints between adjacent insulation boards not more than 1/4 inch in width.
    d. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches.

        1) Trim insulation so that water flow is unrestricted.

    e. Fill gaps exceeding 1/4 inch with insulation.
    f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
    g. Mechanically attach base layer of insulation using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to metal decks.

        1) Fasten insulation according to requirements in FM Approvals' RoofNav for specified Windstorm Resistance Classification.

2. Install upper layers of insulation and tapered insulation with joints of each layer offset not less than 12 inches from previous layer of insulation.

    a. Staggered end joints within each layer not less than 24 inches in adjacent rows.
    b. Install with long joints continuous and with end joints staggered not less than 12 inches in adjacent rows.
    c. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
    d. Make joints between adjacent insulation boards not more than 1/4 inch in width.
    e. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches.
    f. Trim insulation so that water flow is unrestricted.
    g. Fill gaps exceeding 1/4 inch with insulation.
    h. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
    i. Loosely lay each layer of insulation units over substrate.
    j. Adhere each layer of insulation to substrate using adhesive according to FM Approvals' RoofNav assembly requirements and FM Global Property Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification, as follows:
        1) Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

3.5 INSTALLATION OF COVER BOARDS

A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.

1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
2. At internal roof drains, conform to slope of drain sump.

    a. Trim cover board so that water flow is unrestricted.

3. Cut and fit cover board tight to nailers, projections, and penetrations.
4. Adhere cover board to substrate using adhesive according to FM Approvals' RoofNav assembly requirements and FM Global Property Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification, as follows:

    a. Set cover board in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F of equiviscous temperature.
    b. Set cover board in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

B. Install slip sheet over cover board and immediately beneath roofing.

3.6 ADHERED ROOFING INSTALLATION

A. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.

B. Unroll membrane roof membrane and allow to relax before installing.

C. Start installation of roofing in presence of roofing system manufacturer's technical personnel.

D. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

E. Bonding Adhesive: Apply to substrate and underside of roof membrane at rate required by manufacturer, and allow to partially dry before installing roof membrane. Do not apply to splice area of roof membrane.

F. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and perimeters.

G. Apply roof membrane with side laps shingled with slope of roof deck where possible.

H. Adhesive Seam Installation: Clean both faces of splice areas, apply splicing cement.

1. Firmly roll side and end laps of overlapping roof membrane to ensure a watertight seam installation.

2. Apply lap sealant and seal exposed edges of roofing terminations.
3. Apply a continuous bead of in-seam sealant before closing splice if required by roofing system manufacturer.

I. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape.

1. Firmly roll side and end laps of overlapping roof membrane to ensure a watertight seam installation.
2. Apply lap sealant and seal exposed edges of roofing terminations.

J. Spread sealant or mastic bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.

3.7 BASE FLASHING INSTALLATION

A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.

B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.

E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.8 WALKWAY INSTALLATION

A. Flexible Walkways: Install walkway products according to manufacturer's written instructions.

1. Install flexible walkways at the following locations:
   a. As required by roof membrane manufacturer's warranty requirements.

2. Provide manufacturer’s recommended clearance between adjoining pads.
3. Adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.9 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing system, inspect roofing system for

deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075323

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copings.
2. Roof-edge specialties.
3. Roof-edge drainage systems.
4. Reglets and counterflashings.

B. Preinstallation Conference: Conduct conference at Project site.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For roof specialties.

1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.

C. Samples: For each type of roof specialty and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For tests performed by a qualified testing agency.

B. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are SPRI ES-1 tested to specified design pressure.

1.6 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. SPRI Wind Design Standard: Manufacture and install copings roof-edge specialties tested according to SPRI ES-1 and capable of resisting the following design pressures:

1. Design Pressure: As indicated on Drawings.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

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

2.2 COPINGS

A. Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding 10 feet, concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps.

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

a. Architectural Products Company.
b. ATAS International, Inc.
c. Drexel Metals.
d. Metal-Era, Inc.
e. Petersen Aluminum Corporation.

2. Metallic-Coated Steel Sheet Coping Caps: Zinc-coated (galvanized) steel, nominal 0.028-inch thickness.

    a. Surface: Smooth, flat finish.
    b. Finish: Two-coat fluoropolymer.
    c. Color: As selected by Architect from manufacturer's full range.

3. Formed Aluminum Sheet Coping Caps: Aluminum sheet, 0.040 inch thick.

    a. Surface: Smooth, flat finish.
    b. Finish: Two-coat fluoropolymer.
    c. Color: As selected by Architect from manufacturer's full range.

4. Corners: Factory mitered and mechanically clinched and sealed watertight.
5. Coping-Cap Attachment Method: Snap-on or face leg hooked to continuous cleat with back leg fastener exposed, fabricated from coping-cap material.

    a. Snap-on Coping Anchor Plates: Concealed, galvanized-steel sheet, 12 inches wide, with integral cleats.
    b. Face-Leg Cleats: Concealed, continuous galvanized-steel sheet.

2.3 ROOF-EDGE SPECIALTIES

A. Drip Edge Fascia : Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 10 feet and a continuous formed galvanized-steel sheet, 0.028 inch thick, minimum, with extended vertical leg terminating in a drip-edge cleat. Provide matching corner units.

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

    a. Architectural Products Company.
    b. ATAS International, Inc.
    c. Drexel Metals.
    d. Metal-Era, Inc.
    e. Petersen Aluminum Corporation.

2. Metallic-Coated Steel Sheet Fascia Covers: Zinc-coated (galvanized) steel, nominal 0.028-inch thickness.

    a. Surface: Smooth, flat finish.
    b. Finish: Two-coat fluoropolymer.
    c. Color: As selected by Architect from manufacturer's full range.

3. Formed Aluminum Sheet Fascia Covers: Aluminum sheet, 0.040 inch thick thickness as required to meet performance requirements.

    a. Surface: Smooth, flat finish.

b. Finish: Two-coat fluoropolymer.
c. Color: As selected by Architect from manufacturer's full range.

4. Corners: Factory mitered and mechanically clinched and sealed watertight.
5. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
6. Corners: Factory mitered and mechanically clinched and sealed watertight.

B. Downspouts: Plain rectangular complete with mitered elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.

1. Zinc-Coated Steel: Nominal 0.028-inch thickness.
2. Formed Aluminum: 0.040 inch thick.

C. Parapet Scuppers: Manufactured with closure flange trim to exterior, 4-inch- wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof.

1. Zinc-Coated Steel: Nominal 0.028-inch thickness.
2. Formed Aluminum: 0.032 inch thick.

D. Conductor Heads: Manufactured conductor heads, each with flanged back and stiffened top edge, and of dimensions and shape indicated, complete with outlet tube that nests into upper end of downspout, exterior flange trim, and built-in overflow.

1. Zinc-Coated Steel: Nominal 0.028-inch thickness.
2. Formed Aluminum: 0.032 inch thick.

E. Zinc-Coated Steel Finish: Two-coat fluoropolymer.

1. Color: As selected by Architect from manufacturer's full range.

F. Aluminum Finish: Two-coat fluoropolymer.

1. Color: As selected by Architect from manufacturer's full range.

2.4 REGLETS AND COUNTERFLASHINGS

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

1. Drexel Metals.
2. Fry Reglet Corporation.
3. Heckmann Building Products, Inc.
4. Metal-Era, Inc.

B. Reglets: Manufactured units formed to provide secure interlocking of separate reglet and counterflashing pieces, from the following exposed metal:

1. Zinc-Coated Steel: Nominal 0.028-inch thickness.

2. Formed Aluminum: 0.040 inch thick.
3. Stainless Steel: 0.019 inch thick.
4. Corners: Factory mitered and mechanically clinched and sealed watertight.
5. Surface-Mounted Type: Provide reglets with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
6. Masonry Type, Embedded: Provide reglets with offset top flange for embedment in masonry mortar joint.

C. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches and in lengths not exceeding 12 feet designed to snap into reglets or through-wall-flashing receiver and compress against base flashings with joints lapped, from the following exposed metal:

1. Zinc-Coated Steel: Nominal 0.028-inch thickness.
2. Formed Aluminum: 0.032 inch thick.
3. Stainless Steel: 0.019 inch thick.

D. Accessories:

1. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.
2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

E. Zinc-Coated Steel Finish: Two-coat fluoropolymer.

1. Color: As selected by Architect from manufacturer's full range.

F. Aluminum Finish: Two-coat fluoropolymer.

1. Color: As indicated by manufacturer's designations.

G. Stainless-Steel Finish: No. 2B (bright, cold rolled, unpolished).

2.5 MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation.

B. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.

C. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304.

2.6 MISCELLANEOUS MATERIALS

A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
2. Fasteners for Aluminum: Aluminum or Series 300 stainless steel.
3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
4. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.

B. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

C. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.

D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.7 FINISHES

A. Coil-Coated Galvanized-Steel Sheet Finishes:

1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with ASTM A 755/A 755M and coating and resin manufacturers' written instructions.

    a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat.

B. Coil-Coated Aluminum Sheet Finishes:

1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

    a. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.

1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
2. Provide uniform, neat seams with minimum exposure of solder and sealant.
3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
4. Torch cutting of roof specialties is not permitted.
5. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Coat concealed side of uncoated aluminum and stainless-steel roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.
2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

D. Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.

F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work. Tin edges of uncoated copper sheets using solder for copper. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.2 COPING INSTALLATION

A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor copings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

1. Interlock face and back leg drip edges of snap-on coping cap into cleated anchor plates anchored to substrate at manufacturer's required spacing that meets performance requirements.
2. Interlock face-leg drip edge into continuous cleat anchored to substrate at manufacturer's required spacing that meets performance requirements. Anchor back leg of coping with screw fasteners and elastomeric washers at manufacturer's required spacing that meets performance requirements.

3.3 ROOF-EDGE SPECIALITIES INSTALLATION

A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.4 INSTALLATION OF ROOF-EDGE DRAINAGE-SYSTEM

A. Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.

B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.

1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet apart. Install expansion-joint caps.
2. Install continuous leaf guards on gutters with noncorrosive fasteners, hinged to swing open for cleaning gutters.

C. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c.

1. Provide elbows at base of downspouts at grade to direct water away from building.
2. Connect downspouts to underground drainage system indicated.

D. Parapet Scuppers: Install scuppers through parapet where indicated. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

E. Conductor Heads: Anchor securely to wall with elevation of conductor top edge 1 inch below scupper or gutter discharge.

3.5 REGLET AND COUNTERFLASHING INSTALLATION

A. Surface-Mounted Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap 4 inches over top edge of base flashings.

B. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap 4 inches over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches and bed with butyl sealant. Fit counterflashings tightly to base flashings.

3.6 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as roof specialties are installed.

END OF SECTION 077100

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Roof hatches.
   2. Roof pavers.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of roof hatches.

B. Shop Drawings: For roof hatches.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 WARRANTY

A. Special Warranty on Painted Finishes: Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within 10 years from date of Substantial Completion.

B. RoofStone limited 10 year warranty.

PART 2 - PRODUCTS

2.1 ROOF HATCH

A. Roof Hatches: Metal roof-hatch units with lids and insulated single-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, straight sides, and integrally formed deck-mounting flange at perimeter bottom.

B. Type and Size: Single-leaf lid, 36 by 36 inches.

C. Loads: Minimum 40-lbf/sq. ft. external live load and 20-lbf/sq. ft. internal uplift load.

D. Hatch Material: Zinc-coated (galvanized) steel sheet.

1. Thickness: Manufacturer's standard thickness for hatch size indicated.
2. Finish: Baked enamel or powder coat.
3. Color: As selected by Architect from manufacturer's full range.

E. Construction:

1. Insulation: Polyisocyanurate board.

   a. R-Value: 6.0 according to ASTM C 1363.
2. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
3. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
4. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
5. Fabricate curbs to minimum height of 12 inches above roofing surface unless otherwise indicated.
6. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate curb with perimeter curb height that is tapered to accommodate roof slope so that top surfaces of perimeter curb are level. Equip hatch with water diverter or cricket on side that obstructs water flow.

F. Hardware: Spring operators, hold-open arm, galvanized-steel spring latch with turn handles, stainless-steel butt- or pintle-type hinge system, and padlock hasps inside and outside.

G. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder.

1. Operation: Post locks in place on full extension; release mechanism returns post to closed position.
2. Height: 42 inches above finished roof deck.
3. Material: Steel tube.
4. Post: 1-1/2-inch- diameter pipe.
5. Finish: Manufacturer's standard baked enamel or powder coat.

   a. Color: As indicated by manufacturer's designations.

2.2 METAL MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation.

1. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.

2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil.

B. Stainless-Steel Sheet and Shapes: ASTM A 240/A 240M or ASTM A 666, Type 304.

C. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized according to ASTM A 123/A 123M unless otherwise indicated.

D. Steel Tube: ASTM A 500/A 500M, round tube.

E. Galvanized-Steel Tube: ASTM A 500/A 500M, round tube, hot-dip galvanized according to ASTM A 123/A 123M.

F. Steel Pipe: ASTM A 53/A 53M, galvanized.

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

B. Polyisocyanurate Board Insulation: ASTM C 1289, thickness and thermal resistivity as indicated.

C. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.

D. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.

E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.

2.4 ROOF PAVERS

A. LiveRoof
1. P.O. Box 533
Spring Lake, MI 49456
(616) 842-1392
LiveRoof.com

B. Paver Applications
1. Designed to follow roof contour.

C. RoofStone Pavers
1. Size: 12”x24”x4”
2. Color: Charcoal and Natural. Refer to finish and paint drawing for pattern.

D. Green Roof Interface
   1. Edging (LiveRoof RoofEdge) not required with LiveRoof Standard or Deep System when paver abuts LiveRoof or parapet.
   2. Edging required for LiveRoof Lite and Deep Systems.

E. Accessories
   1. Select quantity of corner shims based upon roof slope design. Each shim adds 1/10 inch height to corner pedestal that it is applied to. Ratio of 1 shim per pavers suggested for typical roof.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Confirm that roof deck is built in accord with roof system manufacturer's specifications.

B. Verify roof deck will carry the weight of RoofStone system.

C. Examine roof deck to verify surfaces are free of irregularities.

D. Do not begin installation until unsatisfactory conditions are corrected.

E. Verify that waterproofing manufacturer approved slip sheet "protective sheeting" is in place.

3.2 PREPARATION

A. Sweep slip sheet protective sheeting clean of gravel, grit, soil, or any other debris.

B. Do not apply RoofStone pavers to unclean surface.

3.3 INSTALLATION

A. General: Verify dimensions of roof openings for roof accessories. Install roof accessories according to manufacturer's written instructions.

   1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
   2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
   3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
   4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

C. Seal joints with elastomeric or butyl sealant as required by roof accessory manufacturer.

D. Determine efficient starting point based upon design and logistics.

E. Apply chalk line if appropriate for the design.

F. Install RoofStone pavers tightly against LiveRoof modules or RoofEdge restraint.

G. Using hands or feet check each RoofStone paver at time of paver placement, to confirm that it fits solidly on the roof deck. If paver rocks due to uneven grade, apply RoofStone shim(s) as needed to remove any rocking movement.

H. Do not place the next paver until certain there is no rocking motion/play in the previously placed module.

I. The plastic base is connected to the concrete top in multiple locations, and therefore may be custom cut as needed.

3.4 IRRIGATION PIPE INTERFACE

A. The plastic base of the RoofStone paver may be notched with appropriate saw. Make the notch as small as possible to accommodate the width of irrigation pipe. Elevate the irrigation pipe above roof deck with drainboard of ½" or taller height. Or other permanent shim so that irrigation pipe does not block the flow of water across the roof deck.

3.5 REPAIR AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780/A 780M.

B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 099113 "Exterior Painting."

C. Clean exposed surfaces according to manufacturer's written instructions.

D. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

E. During the course of the installation, immediately sweep away any soil, dust, stone chips, grit or debris created or imported during installation.

F. After installation, clean only with water using scrub brush. Do not apply chemical cleaners.

3.6 SEALING

A. Prior to installation, a nonsilicone, 90% breathable concrete sealer may be applied to the top surface of the paver, however it is not required. Sealer recommended for applications where staininducing liquids, berries or fruit are likely to be problematic.

B. Avoid getting sealer on roof surface as it may damage integrity of waterproofing system.

3.7 SNOW AND ICE REMOVAL

A. The use of de-icing agents including but not limited to Sodium Chloride (Salt), Calcium Chloride, Ammonium Nitrate, and Ammonium Sulfate, is prohibited; these chemicals will damage RoofStone pavers. Snow should be removed manually and sand or clay used as non-slip agents.

END OF SECTION 077200

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Fire-rated interior service doors.
   2. Counter door assemblies.
   3. Fire-rated counter door assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each type and size of overhead coiling door and accessory.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

   1. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
   2. Show locations of controls, locking devices detectors or replaceable fusible links, and other accessories.
   3. Include diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

B. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

B. Fire-Rated Door Assemblies: Complying with NFPA 80; listed and labeled by qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10B.

1. Temperature-Rise Limit: Where indicated, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F above ambient after 30 minutes of standard fire-test exposure.

C. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

D. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of doors that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Total Labor and Material Warrantee, minimum Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Complying with NFPA 80; listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10B.
1. Smoke Control: Provide doors that are listed and labeled with the letter "S" on the fire-rating label by a qualified testing agency for smoke- and draft-control based on testing according to UL 1784; with maximum air-leakage rate of 3.0 cfm/sq. ft. of door opening at 0.10 inch wgfor both ambient and elevated temperature tests.

2.2 DOOR ASSEMBLY

A. Interior Service Door: Overhead coiling door formed with curtain of interlocking metal slats.

1. Manufacturer: Overhead Door Model 620 “Stormtite”, or Architect approved equal. Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Clopay Building Products.
b. Cookson Company.
c. Cornell.
d. Overhead Door Corporation.
e. Wayne-Dalton Corp.

B. Operation Cycles: Door components and operators capable of operating for not less than 20,000.

C. Curtain R-Value: 6.0 deg F x h x sq. ft./Btu.

D. Door Curtain Material: Galvanized steel.

E. Door Curtain Slats: Flat profile slats of 2-5/8-inch center-to-center height.
   1. Insulated-Slat Interior Facing: Metal.

F. Bottom Bar: Two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch; fabricated from hot-dip galvanized steel, stainless steel, or aluminum extrusions and finished to match door.

G. Curtain Jamb Guides: Galvanized steel with exposed Premium Powder Coat finish matching curtain slats.

H. Hood: Match curtain material and finish.

   1. Mounting: Face of wall.

I. Locking Devices: Equip door with locking device assembly.

   1. Locking Device Assembly: Single-jamb side or as recommended by the manufacturer for use with electric door operators.

J. Electric Door Operator:

   1. Usage Classification: Standard duty, up to 25 cycles per hour and up to 90 cycles per day.
   2. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use.
   3. Motor Exposure: Exterior, wet, and humid.
   4. Motor Electrical Characteristics:

      a. Horsepower: 1 hp, or as recommended by the Manufacturer.
      b. Voltage: 115-V ac, single phase, 60 Hz.

   5. Emergency Manual Operation: Push-up type.
   6. Obstruction-Detection Device: Automatic photoelectric sensor and electric sensor edge on bottom bar .
   7. Control Station(s): Interior mounted, with Up/Down/Stop buttons, and NEMA 3 enclosure.
   8. Other Equipment: Portable radio-control system.

K. Curtain Accessories: Equip door with astragal, and pull-down strap.

L. Door Finish:
   1. Premium Powder-Coated Finish: Color as selected by Architect from manufacturer's full range.
   2. Interior Curtain-Slat Facing: Match finish of exterior curtain-slat face.

2.3 FIRE-RATED COUNTER DOOR ASSEMBLY

A. Fire-Rated Counter Door: Overhead fire-rated coiling door formed with curtain of interlocking metal slats.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. ACME Rolling Doors.
      b. Alpine Overhead Doors, Inc.
      c. ASTA Door Corporation.
      d. C.H.I. Overhead Doors, Inc.
      e. City-Gates.
      f. Clopay Building Products.
      g. Cookson; a CornellCookson company.
      h. Cornell.
      i. ENTREMATIC.
      j. Lawrence Roll-Up Doors, Inc.
      k. McKeon Rolling Steel Door Company, Inc.
      l. Overhead Door Corporation.
      m. Raynor.
      n. Wayne-Dalton Corp.

B. Operation Cycles: Door components and operators capable of operating for not less than 20,000.

C. Fire Rating: 1 hour with temperature-rise limit and with smoke control.

D. STC Rating: 27.

E. Door Curtain Material: Stainless steel.

F. Door Curtain Slats: Flat profile slats of 1-1/4-inchcenter-to-center height.
   1. Insulated-Slat Interior Facing: Metal.

G. Curtain Jamb Guides: Stainless steel with exposed finish matching curtain slats.

H. Hood: Match curtain material and finish.
   1. Mounting: As required for conditions in field.

I. Integral Frame, Hood, and Fascia: Stainless steel.
   1. Mounting: As required for conditions in field.

J. Sill Configuration: Integral stainless steel sill, full width of wall, with 2 inch turndown at each side with welded seems and crimped edges to eliminate sharp edges where exposed.

K. Locking Devices: Equip door with locking device assembly.
   1. Locking Device Assembly: Single-jamb side locking bars, operable from inside and outside with cylinders.

L. Manual Door Operator: Awning-crank operator.

M. Curtain Accessories: Equip door with smoke seals, automatic closing device, push/pull handles and poll hook.

N. Door Finish:
1. Stainless Steel Finish: ASTM A480 No. 2B (bright, cold rolled).
2. Interior Curtain-Slat Facing: Match finish of exterior curtain-slat face.

2.4 COUNTER DOOR ASSEMBLY

A. Counter Door: Coiling counter door formed with curtain of interlocking metal slats.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. C.H.I. Overhead Doors, Inc.
b. Clopay Building Products.
c. Cornell.
d. Overhead Door Corporation.
e. Wayne-Dalton Corp.

B. Operation Cycles: Door components and operators capable of operating for not less than 20,000.

C. Door Curtain Material: Stainless steel.

D. Door Curtain Slats: Flat profile slats of 1-1/2-inch (38-mm) center-to-center height.

E. Bottom Bar: Manufacturer's standard continuous channel or tubular shape, fabricated Stainless steel and finished to match door.

F. Curtain Jamb Guides: Stainless steel with exposed finish matching curtain slats.

G. Hood: Match curtain material and finish.
1. Mounting: Face of wall as indicated on Drawings.

H. Sill Configuration: No Sill

I. Locking Devices: Equip door with locking device assembly.
1. Locking Device Assembly: Single-jamb side locking bars, operable from inside with thumbturn.

J. Manual Door Operator: Push-up operation.

K. Curtain Accessories: Equip door with push/pull handles pull-down strap.

L. Door Finish:
1. Stainless Steel Finish: ASTM A480/A480M No. 2B (bright, cold rolled).

2.5 MATERIALS, GENERAL

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.6 DOOR CURTAIN MATERIALS AND CONSTRUCTION

A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
   1. Insulation: Fill slats for insulated doors with manufacturer's standard thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84 or UL 723. Enclose insulation completely within slat faces.
   2. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face, with minimum steel thickness of 0.010 inch**.**

B. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same Premium Powder Coat material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.\
   1. Removable Posts and Jamb Guides: Manufacturer's standard.

2.7 HOODS

A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.

   1. Include automatic drop baffle on fire-rated doors to guard against passage of smoke or flame.
   2. Integral Frame, Hood, and Fascia: Welded sheet metal assembly of the following sheet metal(s):

2.8 LOCKING DEVICES

A. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.
   1. Lock Cylinders: As standard with manufacturer and keyed to building keying system.
   2. Keys: Two for each cylinder.

B. Safety Interlock Switch: Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

2.9 COUNTER DOOR ACCESSORIES

A. Integral Metal Sill: Fabricate sills as integral part of frame assembly of Type 304 stainless steel in manufacturer's standard thickness with ASTM A480 No. 4 finish.

2.10 CURTAIN ACCESSORIES

A. Smoke Seals: Equip each fire-rated door with replaceable smoke-seal perimeter gaskets or brushes for smoke and draft control as required for door listing and labeling by a qualified testing agency.

B. Astragal: Equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.

C. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.

D. Pull-Down Strap: Provide pull-down straps for doors more than 84 inches high.

E. Pole Hooks: Provide pole hooks and poles for doors.

F. Automatic-Closing Device: Equip each fire-rated door with an automatic-closing device or holder-release mechanism and governor unit complying with NFPA 80 and an easily tested and reset release mechanism. Automatic-closing device shall be designed for activation by the following:
   1. Replaceable fusible links with temperature rise and melting point of 165 deg F interconnected and mounted on both sides of door opening.
   2. Manufacturer's standard UL-labeled smoke detector and door-holder-release devices.
   3. Manufacturer's standard UL-labeled heat detector and door-holder-release devices.
   4. Building fire-detection, smoke-detection, and -alarm systems.

2.11 COUNTERBALANCE MECHANISM

A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

B. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.12 MANUAL DOOR OPERATORS

A. General: Equip door with manual door operator by door manufacturer.

B. Push-up Door Operation: Lift handles and pull rope for raising and lowering doors, with counterbalance mechanism designed so that required lift or pull for door operation does not exceed 15 lbf .

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

B. Fire-Rated Doors: Install according to NFPA 80.

C. Smoke-Control Doors: Install according to NFPA 80 and NFPA 105.

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
   1. Perform acceptance testing according to NFPA 80.
      a. Fire-Rated Door Inspections: Inspect each fire-rated door in accordance with NFPA 80, section 5.2.
   2. Test door release, closing, and alarm operations when activated by smoke detector or building's fire-alarm system. Test manual operation of closed door. Reset door-closing mechanism after successful test.
   3. Operational Test: After electrical circuitry has been energized, operate doors to confirm proper motor rotation and door performance.

B. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

C. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

D. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80 and NFPA 101.

3.3 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 083323

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SECTION 089000 - LOUVERS AND VENTS

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.

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. Vertical Louver: Louver with vertical blades; i.e., the axes of the blades are vertical.

D. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.

E. Storm-Resistant Louver: Louver that provides specified wind-driven rain performance, as determined by testing according to AMCA 500-L.

1.4 PERFORMANCE REQUIREMENTS

A. 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.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes, without buckling, opening of joints, overstressing of components, failure of connections, or other detrimental effects.

C. 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.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.
   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.
   3. Wiring Diagrams: For power, signal, and control wiring for motorized adjustable louvers.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. 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.

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

F. Welding: Qualify procedures and personnel according to the following:
   1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
   2. AWS D1.3, "Structural Welding Code - Sheet Steel."
   3. AWS D1.6, "Structural Welding Code - Stainless Steel."

G. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

H. UL and NEMA Compliance: Provide motors and related components for motor-operated louvers that are listed and labeled by UL and comply with applicable NEMA standards.

1.6 PROJECT CONDITIONS

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5, T-52, or T6.

B. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.

C. Aluminum Castings: ASTM B 26/B 26M, Alloy 319.

D. Fasteners: Use types and sizes to suit unit installation conditions.
   1. Use tamper-resistant screws for exposed fasteners unless otherwise indicated.
   2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.
   3. For color-finished louvers, use fasteners with heads that match color of louvers.

E. Post installed 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 per ASTM E 488, conducted by a qualified independent testing agency.

2.2 FABRICATION, GENERAL

A. Assemble louvers in factory 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.

C. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, 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.

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

F. Provide vertical mullions of type and at spacings indicated, but not more than recommended by manufacturer, or 72 inches o.c., whichever is less.

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

H. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.3 FIXED, EXTRUDED-ALUMINUM LOUVERS

A. Horizontal, Drainable-Blade Louver:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Carnes Company, Inc.
   b. Greenheck Fan Corporation.
   c. Ruskin Company; Tomkins PLC.
2. Louver Depth: 6 inches.
3. Frame and Blade Nominal Thickness: Not less than 0.080 inch for blades and 0.080 inch for frames.
4. Mullion Type: Exposed.
5. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

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.

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 and vents 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. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.

F. Protect unpainted galvanized and nonferrous-metal surfaces that will be 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.

G. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Division 07 Section "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

A. Test operation of adjustable louvers and adjust as needed to produce fully functioning units that comply with requirements.

B. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.

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

D. Restore louvers and vents 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 089000

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SECTION 126600 - TELESCOPING STANDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Electrically operated telescoping stands.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For telescoping stands in both stacked and extended positions.

1. Include plans, elevations, sections, and attachment details.
2. Include diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Product certificates.

C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

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

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Telescoping stands shall withstand the effects of gravity loads, operational loads, and other loads and stresses according to ICC 300.

B. Accessibility Standard: Comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design and ICC A117.1.

2.2 TELESCOPING STANDS

A. System Description: Operable system of multiple-tiered seating on interconnected folding platforms that close for storage, without being dismantled, into a nested stack. Telescoping-stand units permit opening and closing of adjacent, individual and multiple rows, and close with vertical faces of platforms in the same vertical plane.

1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Telescoping-Stands Standard: ICC 300.

B. Wall-Attached Telescoping Stands: Forward-folding system, in which the bleachers open in the forward direction by moving the front row away from the stack to the fully extended position and the rear of bleacher understructure permanently attaches to wall construction.

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

   a. Interkal Inc.
   b. Irwin Seating Company; Folding Bleacher Company Subsidiary.
   c. Hussey Seating Co.

2. Operation: Electrically operated, with friction-type, integral power unit.
3. Electrical Characteristics for Each Seating Section:

   a. Horsepower: 1-1/2 horsepower.
   b. Voltage: 208 V ac, three phase, 60 hertz.

4. Electrical Controls:

   a. Control Devices: Wall-attached control system.
   b. Limit Switches: Automatically stop power system when telescoping stands reach fully opened or closed positions.

c. Motion Monitor: Flashing light with self-contained warning horn, rated at 85 dB at 10 feet, mounted under telescoping seating for audio and visual warning during operation.
d. Transformer: As required to coordinate current characteristics of motor and control station with building electrical system.

2.3 COMPONENTS

A. Benches: Seats and skirts.

1. Material: Molded plastic with contour surfaces.

a. Color: As selected by Architect from manufacturer's standard.

2. Bench Height: Not less than 16 inches or more than 18 inches.
3. Bench Depth: 12 inches.
4. Bench Seat Width: Not less than 18 inches.

B. Wheelchair-Accessible Seating: Locate seating cutouts to provide wheelchair-accessible seating at locations indicated on Drawings.

1. Equip tiers adjacent to wheelchair-accessible seating with front rails as required by ICC 300.
2. Equip cutouts with full-width front closure panels that match decking construction and finish and that extend from underside of tiers adjacent to cutouts to 1-1/2 inches from finished floor.

C. Risers: Steel sheet with manufacturer's standard, rust-inhibiting coating or hot-dip galvanized finish.

D. Safety Rails: Steel, finished with manufacturer's standard powder coat system.

1. Self-storing mid-aisle handrails located at centerline of each aisle with seating on both sides.
2. End rails (guards) that are telescoping and self-storing.
3. Back rails (guards) along rear of units where required by ICC 300.
4. Removable front rails (guards) along front of units where required by ICC 300.
5. Removable rails around accessible seating cutouts and truncations.
6. Removable, programming-support front rails to allow seating in upper rows while lower rows remain in the stored position.
7. Color: Manufacturer's standard neutral color.

E. Understructure: Structural steel.

1. Finish: Manufacturer's standard rust-inhibiting finish.
2. Color: Manufacturer's standard.

F. Support Column Wheels: Nonmarring, soft, rubber-face wheel assembly under each support column.

1. Include wheels of size, number, and design required to support stands and operate smoothly without damaging the flooring surface, but no fewer than four per column or less than 4 inches in diameter and 1-1/2 inch wide.

G. Control Devices:

1. Wall Attached: Manufacturer's standard control station, located within full view of each stand and its movement area. Provide two keys per station.

2.4 ACCESSORIES

A. Steps:

1. Slip-resistant, abrasive tread surfaces at aisles.
2. Intermediate aisle steps, fully enclosed, at each aisle.
3. Transitional top step, fully enclosed, at each aisle where last row of telescoping stands is adjacent to a cross aisle.
4. Removable front steps, fully enclosed, at each aisle, that engage with front row to prevent accidental separation or movement and are equipped with a minimum of four skid-resistant feet.

B. Closure Panels and Void Fillers:

1. Aisle closures at foot level that produce flush vertical face at aisles when system is stored.
2. End panels covering exposed ends of stands in the stored position.
3. Back panels covering rear of freestanding units. Panels extend full height and width of unit.
4. Panels at cutouts and truncations for accessible seating.
5. Rear fillers including supports for closing openings between top row and rear wall of adjoining construction.
6. Gap fillers for closing openings between stand units or between stand units and adjoining construction.

2.5 FABRICATION

A. Fabricate telescoping stands to operate easily without special tools or separate fasteners unless otherwise indicated.

B. Round corners and edges of components and exposed fasteners to reduce snagging and pinching hazards.

C. Form exposed work with flat, flush surfaces, level and true in line.

D. Supports: Fabricate supports to withstand, without damage to components, the forces imposed by use of stands without failure or other conditions that might impair their usefulness.

1. Cantilever bench seat supports to produce toe space uninterrupted by vertical bracing.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install telescoping stands according to ICC 300 and manufacturer's written instructions.

3.2 ADJUSTING

A. Adjust backrests so that they are at proper angles and aligned with each other in uniform rows.

3.3 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to inspect, adjust, operate, and maintain telescoping stands.

END OF SECTION 126600

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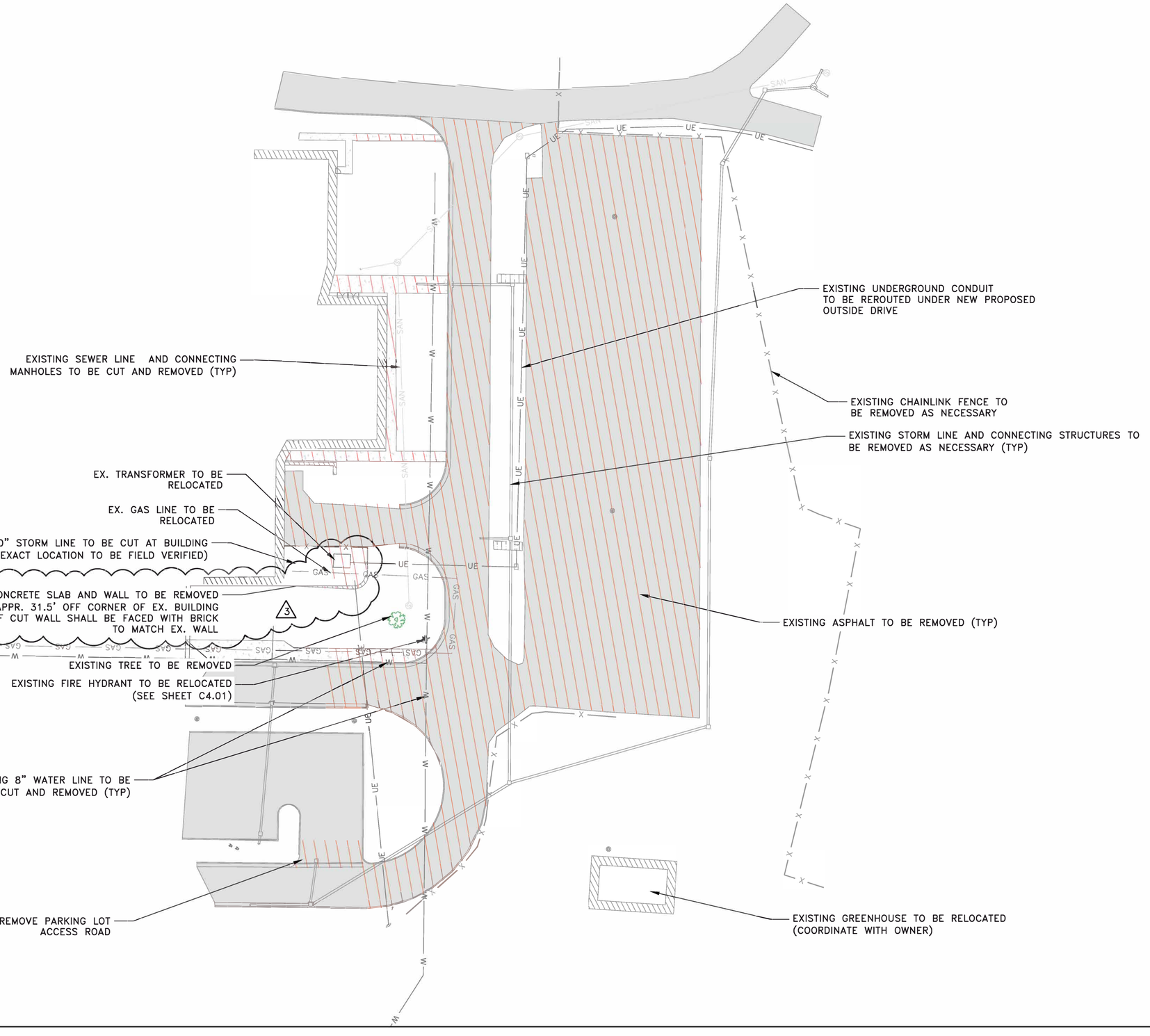

PLAN LEGEND

- EXISTING CONTOURS
- EXISTING EDGE OF ASPHALT
- EXISTING WATER LINE
- EXISTING SANITARY SEWER LINE
- EXISTING STORM LINE
- EXISTING BUILDING
- EXISTING BASEBALL FIELD
- EXISTING ASPHALT
- PROPOSED DEMO (ASPHALT, CURB & GUTTER, WALLS, SIDEWALK, ETC)

PLAN NOTES

1. REMOVAL OF ADDITIONAL MISCELLANEOUS SITE ELEMENTS SHALL BE REMOVED AS NECESSARY BY THE CONTRACTOR TO ALLOW FOR CONSTRUCTION ACTIVITIES.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION AND DEPTH OF UTILITIES PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY NOTABLE DISCREPANCIES.

THRASHER
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www.thethrashergroup.com

NO.	BY	DATE	DESCRIPTION
3	JG	07/01/2022	REVISION 3

THE NEW SPENCER MIDDLE SCHOOL
ROANE COUNTY SCHOOL
SPENCER, WV
MAY 16, 2022
CONSTRUCTION DOCUMENTS

DRAWN: CLM DATE: 03/18/21
CHECKED: JLG DATE: 04/14/22
APPROVED: JLG DATE: 04/14/22

PROJECT No.
060-10259

PROPOSED DEMOLITION PLAN

SHEET No.
C1.02

PLOT DATE/TIME: 6/30/2022 1:10 PM
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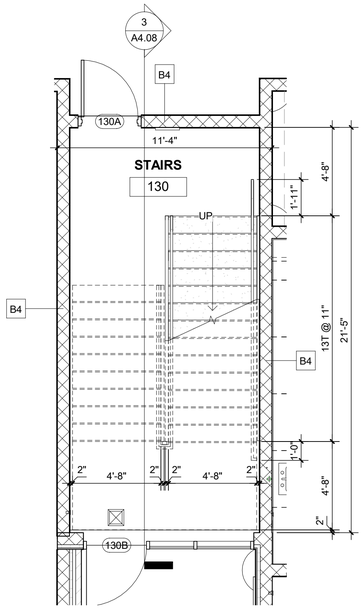
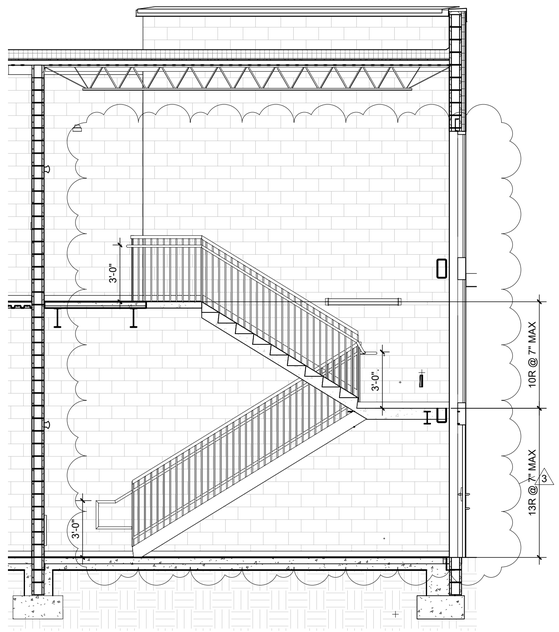
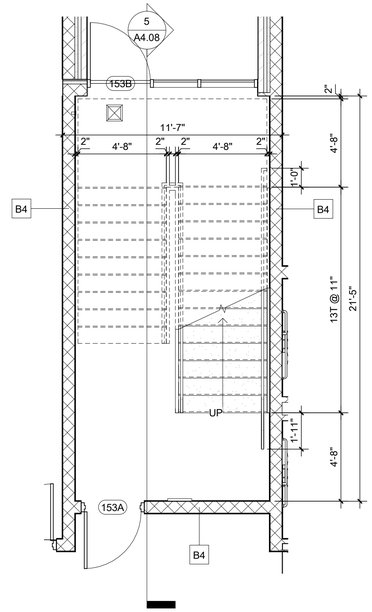


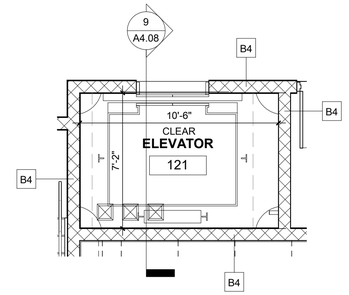
1 A4.08 STAIRS 130 LEVEL 01 PLAN
1/4" = 1'-0"



3 A4.08 STAIRS 130 SECTION
1/4" = 1'-0"



4 A4.08 STAIRS 153 LEVEL 01 PLAN
1/4" = 1'-0"



7 A4.08 ELEVATOR 121 PLAN LEVEL 01
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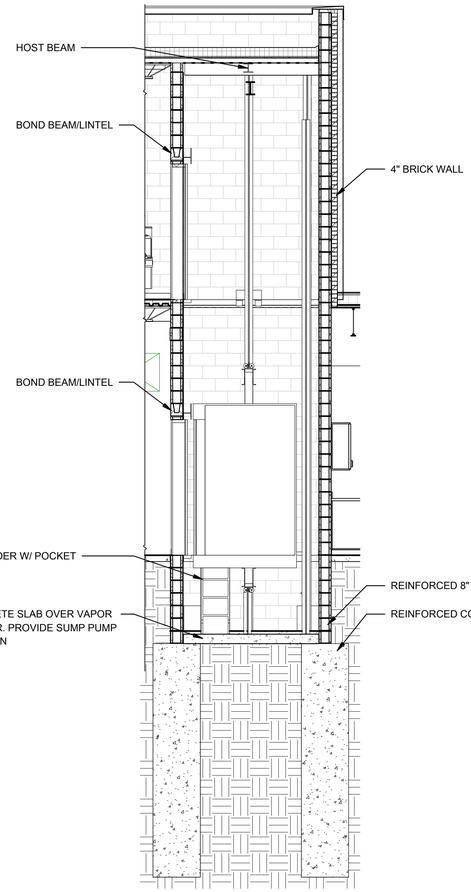

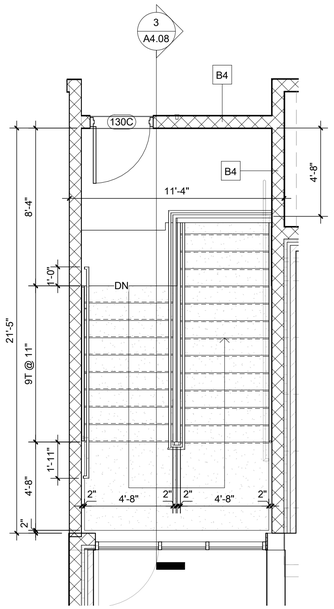

2 A4.08 STAIRS 130 LEVEL 02 PLAN
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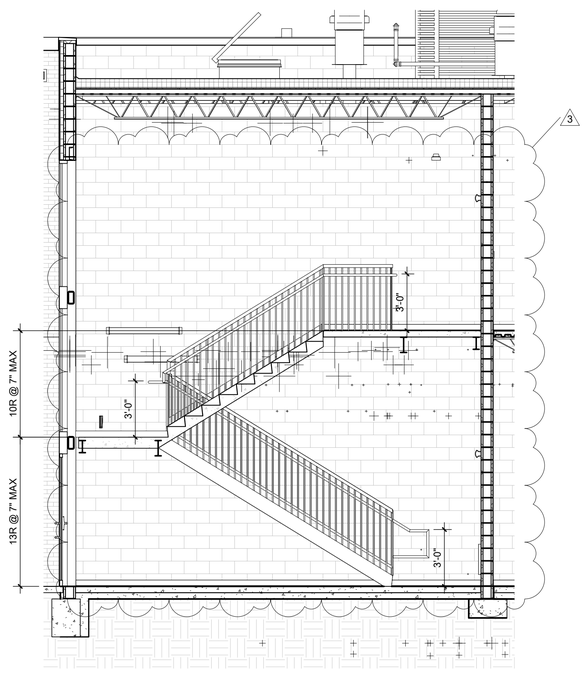
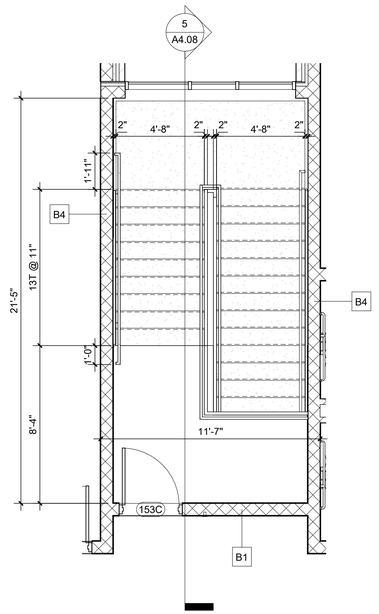


5 A4.08 STAIRS 153 SECTION
1/4" = 1'-0"



6 A4.08 STAIRS 153 LEVEL 02 PLAN
1/4" = 1'-0"

9 A4.08 ELEVATOR SECTION
1/4" = 1'-0"

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NO.	BY	DATE	DESCRIPTION
3	ALB	07/01/2022	REVISION 3

THE NEW SPENCER MIDDLE SCHOOL

ROANE COUNTY SCHOOLS
SPENCER, WV
APRIL 15, 2022
CONSTRUCTION DOCUMENTS

DRAWN: AJC,ALB,SAF DATE: 05/16/2022
CHECKED: AJC DATE: 05/16/2022
APPROVED: AJC DATE: 05/16/2022

PROJECT No.
060-10259

STAIRS & ELEVATOR PLANS & SECTIONS

SHEET No.
A4.08

LAYOUT TAB: STAIRS & ELEVATOR PLANS & SECTIONS
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