ADDENDUM #1

August 20, 2025

CRAWFORDSVILLE READINESS CENTER MONDERNIZATION
INDIANA NATIONAL GUARD
CRAWFORDSVILLE, INDIANA

Invitation to Bid #**:**
IFB NO: MDI-SAB-26-B-013

Prepared by:

GEDA Architects
108 E. Jackson Street
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TO: ALL INTERESTED BIDDERS OF RECORD

This Addendum #1 forms part of the Contract Documents and modifies the original Bidding Documents dated July 31, 2026. Failure to acknowledge receipt of this addendum may subject Bidder to disqualification.

CLARIFICATIONS / GENERAL INFORMATION

1. Attached is a list of attendees who were at the pre-bid meeting on Thursday, August 13, 2026

2. Refer to the attached Pre-Bid Meeting Notes.

3. The original construction drawings referenced in Specification Section 00 31 19 are included in this addendum. This is Owner's information for bidders' convenience and is intended to supplement rather than serve in lieu of bidders' own investigations. There is no warranty of any kind, expressed or implied, as to the completeness or accuracy of this information.

CHANGES TO THE DRAWINGS

1. Sheet S601 FOUNDATION & FRAMING SECTIONS
    a. Modified reinforcement configuration

2. Sheet A021 WALL ASSEMBLIES
    a. Revise drawing title to WALL AND ROOF ASSEMBLIES
    b. Add Roof Types 1 & 2 to the drawing.
    c. Replace Wall Type 7 with Vault Wall Sections 6, 7 & 8.

3. Sheet A101 – FIRST FLOOR PLAN – SOUTH
    a. Replace wall types at vault with wall sections as indicated.
    b. Add wall types and note to provide sheathing in IT CLOSET 112.

4. Sheet A102 – FIRST FLOOR PLAN – NORTH
    a. Replace wall types at vault with wall sections indicated.
    b. Add wall type 3B to SUPPY OFFICE 114, where indicated.

5. Sheet A120 – ROOF PLAN
    a. Add roof top designations & delete roof detail. See A021 for Roof Assemblies.

6. Sheet A450 – INTERIOR ELEVATIONS
    a. Add or revise casework details as indicated.

7. Sheet PD100 – FIRST FLOOR PLUMBING DEMOLITION PLAN
    a. Added note to demo floor drain in mechanical room.

8. Sheet P101 – FIRST FLOOR PLUMBING PLAN
    a. Added new floor drain in mechanical room.
    b. Added keynote 10.

9. Sheet P601 – PLUMBING SCHEDULES
    a. Added PLUMBING DRAINAGE FITTING SCHEDULE.

10. Sheet EL101 – FIRST FLOOR LIGHTING PLAN
    a. Revised lighting in OCIE Storage Rm 129.
    b. Added timeclock in Boiler Room 140.

11. Sheet E601 – LIGHTING SCHEDULES
    a. Revised LIGHTING CONTROL SEQUENCE per clouded area.

12. Sheet ABI 1 A801 – FINISH PLANS
    a. Add casework details.
    b. Modify legend as indicated.

13. Sheet ABI 6 A101 – FIRST FLOOR KITCHEN PLAN
    a. Add casework elevation.
    b. Modify sheet notes as indicated.
    c. Add GENERAL FINISH NOTES and FINISH LEGEND

CHANGES TO THE SPECIFICATIONS

1. Specification Section 05 12 00 – STRUCTURAL STEEL FRAMING
    a. Modify paragraph 3.5A to call for Contractor engaging testing agency.

2. Specification Section 01 77 00 – CLOSEOUT PROCEDURES
    a. Add paragraph 1.05, D to the requirements for Closeout Submittals.
    b. Add paragraph 3.03 SHELF STOCK, which includes a schedule of shelf stock items to be provided at the conclusion of the project.

3. Specification Section 02 41 19 – SELECTIVE DEMOLITION
    a. Add Section 00 31 26 to the Related Requirements section.
    b. Revise paragraph 1.7, A to note the Owner will vacate the property during construction.
    c. Revise paragraph 1.7, D Hazardous Materials as indicated.
    d. Revise paragraph 3.4, A, F to include reference to Section 00 31 26.

4. Add Specification Section 07 41 13 - Metal Roof Panels, attached, to the project manual.

5. Add Specification Section 07 41 16 - Metal Soffit Panels, attached, to the project manual.

6. Add Specification Section 09 65 13 - Resilient Base and Accessories, attached, to the project manual.

7. Add Specification Section 09 68 13 - Tile Carpeting, attached, to the project manual.

8. Add Specification Section 12 35 30 - Casework, attached, to the project manual.

9. Specification Section 23 64 23.13 – Air-Cooled, Scroll Water Chillers
    a. Specification Section to be reissued in its entirety.
    b. Various modifications and clarifications made throughout the section have been highlighted.

10. Specification Section 23 73 13.10 – Modular Central-Station Air-Handling Units
    a. Specification Section to be reissued in its entirety.

b. Various modifications and clarifications made throughout the section have been highlighted.

11. Specification Section 23 74 33 – Dedicated Outdoor-Air Units
    a. Specification Section to be removed from the Project Manual in its entirety.

SUBSTITUTION REQUESTS

Note: Approval of a substitute does not relieve the Manufacturer of the requirements of the Specification Section or the Contractor of the responsibility to comply with all other requirements of the Contract Documents.

Specification Section: Varies - approved equals for the chiller, AHU-1 and Doas-1
Manufacturer: **Dunham Bush**
Response: **Not Approved.**

Specification Section: 07 42 13 – Modular Metal Wall Panels
Manufacturer: **Zeeff Panel Systems**
Response: **Not Approved.**

Specification Section: 07 27 26 Fluid Applied Membrane Air Barriers
Manufacturer: **TK-AirMax2104**
Response: **Approved.**

Specification Section: 07 95 00 Expansion Control
Manufacturer: **Erie Metal Specialties, Inc.**
Response: **Approved.**

Specification Section: 07 27 26 Fluid Applied Membrane Air Barriers
Manufacturer: **9 Wood**
Response: **Approved.**

CONTRACTOR QUESTIONS & RESPONSES:

1. Question: Is this project just 1 prime bid for the exterior work, footing work, roofing, etc? Or are there different bid packages?

   Response: **This project will be awarded to a single prime contractor.**

2. Question: How do I obtain an updated plan holders list?

   Response: **You can find the planholder list by navigating to the project via Reprographix ePlanroom. https://www.reprographix.com/eplanroom Click on View Projects, select the project and navigate to the Planholder List tab.**

3. Question: Will flooring specs be included in the next Addendum?

   Response: **Yes, refer to attached Specification Sections.**

4. Question: Please note that the Low ‘E’ coating called for in section 08 80 00 3.08 A. (Guardian SN-54) was discontinued by Guardian as of December 2025. Please advise of a new Low ‘E’ coating that would be acceptable.

Response: **The official replacement, SunGuard SNX 60+ is acceptable.**

5. Question: Referencing the above insulated glass callout, the outboard lite that is to receive the Low ‘E’ coating is defined as Tinted to be selected from manufacturer's full range. Can you clarify if it will be an industry standard (Gray, Bronze or Green) or be a more exotic tint (Azuria, Pacifica, etc.)?

Response: **The tint will be selected from the industry standard color range.**

6. Question: Regarding the Insulated glass, the Glass Type Legend on sheet A501, type B is listed as Obscured, 1” Thermal. Can you confirm what type of obscured that is needed? We could provide an Acid Etched glass or a White Laminated inboard lite instead of Clear Laminated? Will the exterior lite be Tinted with Low ‘E’ no matter what?

Response: **Provide acid etched glass on the inboard lite. Yes, the exterior lite will be tinted with a Low E coating on the Number 2 Surface.**

7. Question: Again referring back to the Glass Type Legend (Sheet A501), type C is listed as Spandrel. We are assuming that this would be a 1” thick Insulated Spandrel glass unit; can you confirm if that is correct? Also, can you confirm:
   a. Will Spandrel color be chosen from standard or a custom color?
   b. Will the exterior lite be a Clear H.S. lite with Spandrel on #2 and the interior be the Clear Laminated called for in the specifications? Or will the exterior be the Tinted Low ‘E’ glass and the spandrel be on the interior lite? If so, will the interior lite still need to be laminated?

Response: **The spandrel color will be chosen from standard. The exterior lite will be tinted low E. The interior lite will be spandrel. Lamination of the interior lite is not required.**

8. Question: The glass type for frame ‘S3/A501’ calls out glass type A but with integrated glass panels with acid etch patterns. Can you confirm if the intent for this glass will be:
   a. Outboard = 1/4" Tinted Low ‘E’ tempered glass
   b. Air Space = 1/2" Argon Filled
   c. Inboard = Re-use existing glass with Etched glass

   Or will glass be a different configuration? On the existing glass, since it is in a safety glazing location the existing glass will need to be Tempered or Laminated glass.

Response: **The etched glass panels are to be encapsulated between the outboard and inboard glass panels specified for the typical insulated glazing unit. Install a safety film, such as 3M Safety & Security Film to protect the glass prior to removing from the existing frame existing etched glass panels shall receive a .**

9. Question: On Sheet A501, frames S5, S6 C S7 are noted to be non-thermal frames with 1/4" Clear Tempered glass. If alternate #1 were accepted, these would become interior and the

framing and glass are completely appropriate. However, at the base bid these frames are all exterior and that construction would not meet Indiana Energy Code for exterior framing. Please confirm if the base bid should include thermal frames with insulated glass.

Response: **The base bid will not be accepted without ABI 1.**

10. Question: Sheet A501 has some detail cuts that reference detail '5/A360'. However, this detail doesn't exist on that sheet. Please provide this detail.

Response: **See attached, revised A360.**

11. Question: Borrow lite elevation BL1 on sheet A501 has no glass callout or detail cut. Please confirm glass type and type of frame (Aluminum/Hollow Metal/Wood).

Response: **This is a hollow metal borrowed lite frame with tempered ¼" glass.**

12. Question: Specification section 084113 section 2.5 (Entrance Door Systems) refers back to section 084113 but there doesn't appear to be any other information on the aluminum doors required. Can we expand on the aluminum doors with callouts for type of stile required; Thermal or non-thermal; etc?

Response: **See attached, revised 084113 with additional information on the door requirements.**

13. Question: Specification section 084413 2.6 B references InLighten Light Shelves. Looking at the framing elevations I don't see any interior Light Shelves noted on the Curtainwall or the storefront framing elevations. Please confirm if Light Shelves are required and which frames might be receiving them, as the specification notes both Curtainwall and Storefront.

Response: **Light Shelves are not required.**

14. Question: Specification section 084413 2.7 references Aluminum Finishes. It then lists all of Kawneer's available finishes. However, the storefront (section 084113) notes the finish of aluminum to be a 3 coat Kynar painted 'Charcoal'. Can you confirm if the curtainwall will be the same finish? Also, as an FYI, Kawneer offers a standard 2-coat kynar painted 'Charcoal' that would be quite a bit more cost efficient. Would a 2 coat be acceptable as an alternate finish choice?

Response: **Kawneer Standard 2-Coat Kynar finish in Charcoal is acceptable.**

15. Question: The Contract Documents identify existing hazardous materials, including asbestos-containing materials (ACM) and lead-based paint (LBP). Please clarify whether removal,

remediation, and abatement of existing hazardous materials will be performed by the Owner under a separate contract.

General Contractor pollution/environmental liability policies typically exclude asbestos, lead, and other hazardous-material abatement operations. If the intent is for the General Contractor to contract for or assume responsibility for hazardous-material abatement, our insurance carrier will not provide coverage for that exposure. We anticipate this insurance limitation may also affect the ability of other qualified General Contractors to bid the project.

Please confirm that hazardous-material investigation, testing, removal, remediation, disposal, and abatement will be performed under a separate contract by the Owner, with the General Contractor responsible only for coordination of the Owner's abatement activities with the construction schedule. If hazardous-material abatement is instead intended to be included within the General Contractor's scope, please identify the specific Contract Document provision establishing that responsibility and provide the required insurance coverage and limits applicable to the General Contractor for this work.

Response: **The General Contractor is responsible for removal, remediation and abatement of all hazardous material encountered during construction activities, according to the Hazard Management Plan included in the Project Manual. It is permissible for the General Contractor to subcontract this portion of the work to a contractor who specializes in hazardous material abatement.**

All hazardous material included in the report provided in Specification Section 00 31 26 must be repaired, encapsulated, enclosed or removed according to the instructions in the Hazard Management Plan and included in the base bid cost.

Any hazardous materials found after work begins that are not identified in the report will be treated as unforeseen conditions and addressed with the allowance dollars or a change order, including any additional time required.

Refer to General Demolition Note 1 on AD series drawings, Specification Section 003126 Existing Hazardous Material Information and Specification section 02 41 19 Selective Demolition. Refer to the sample contract provided in the State Administrative Section for insurance requirements.

16. Question: The Hazard Management Plan and asbestos/lead survey information provided with the Contract Documents is dated 2018. Please confirm whether any additional or supplemental hazardous-material inspections, surveys, or testing have been performed since the 2018 reports. If so, please provide those reports to all bidders by Addendum.

Please also confirm that any asbestos-containing materials (ACM), lead-based paint (LBP), or other hazardous materials encountered during construction that are not specifically identified in the hazardous-material information provided to bidders will be considered an unforeseen condition.

General Contractor's insurance does not provide coverage for hazardous-material abatement operations. Accordingly, please confirm that investigation, testing, remediation, removal, and disposal of previously unidentified hazardous materials will be performed by the Owner through appropriately licensed and insured contractors, and will not become the responsibility of the General Contractor.

Response: **The 2018 Hazard Management Plan is the most recent survey. Refer to the response to Question 15 for responsibilities to be included in the Base Bid cost and those that will be considered unforeseen. The General Contractor may subcontract any work that requires a specialty license and/or insurance.**

17. Question: Please confirm whether the Crawfordsville Readiness Center will remain occupied and operational during construction.
If the facility will remain operational, please provide required phasing, areas that must remain accessible, scheduled drill/event dates, allowable working hours, noise/dust restrictions, temporary egress requirements, and restrictions on interruption of building systems.

Response: **The owner will not occupy the site during construction.**

18. Question: Please identify all security and site-access requirements applicable to the General Contractor and subcontractors, including employee identification, background checks, badging, vehicle access/inspection, restricted areas, escorts, work-hour restrictions and advance submission of personnel information.
Please identify any associated fees or processing times that should be included in the Bid.

Response: **The General Contractor will have free access to the site during construction and will be responsible for securing the site. See the State Administrative Section for Government Issued ID and E-Verify requirements. GC is responsible for investigating and including all associated costs.**

19. Question: Please confirm whether Builder's Risk insurance is to be provided by the Owner or General Contractor.
Please also confirm the controlling liability insurance requirements where requirements contained in the State General Conditions and other Contract provisions differ.

Response: **The General Contractor is responsible for providing his own insurance while he has ownership of the site. Coverage begins when the Owner turns the site over to the contractor and continues through Substantial Completion.**

20. Question: Please identify all Owner-furnished or Government-furnished equipment, materials and systems associated with this project.
For each item, please identify anticipated delivery date and responsibility for receiving, unloading, inspecting, storing, protecting, installation, connections, startup and testing.

Response: **Refer to Specification Section 01 10 00, 1.6, C. for Owner Furnished/Contractor installed items. Owner and Contractor responsibilities are set forth in Paragraphs 1.5 A and B of the same section. Delivery date will be coordinated during construction at a time that is mutually advantageous to both parties.**

21. Question: Please provide share-drive access to all available existing/as-built drawings for the Crawfordsville Readiness Center referenced in Document 003119, including available architectural, structural, mechanical, plumbing, electrical, fire protection and site/utility drawings.

Response: **Drawings have been posted to Reprographix.**

22. Question: It looks like they are removing existing casework within the kitchen area. I do not see any notes on A101, nor do I see any elevations provided for what is being put back in place at this area. Can you please confirm if this is 2 base cabinets and 2 wall cabinets with a countertop? What material is the countertop to be?

Response: **Refer to ABI 6 Kitchen Improvements for the extent of casework removal in the kitchen area.**

23. Question: On Sheet C200 are all of the existing asphalt areas getting the "all other pavement seal, tack coat, and re-stripe as shown on the plans"? We aren't sealing concrete areas are we? If those areas are getting seal coat, do you really want tack coat before seal coat?

Response: **No, concrete areas are not being sealed. Tack coat should only be used between asphalt layers.**

26. Question: You don't want to seal coat the new asphalt do you? That should oxidize and breathe for a while before coating.

Response: **Correct, new asphalt is not receiving a seal coat.**

27. Question: If the seal coat is in this job would you please provide some kind of spec for what you want. There's stuff that's mostly water, there's other kinds that's a lot more expensive. There are all kinds of products that will make the parking lot black. I'm assuming you'd want to pick something that has some grit to it so it's not as slippery?

Response: **"Seal coat" in this instance should be considered equivalent to INDOT Fog Seal and shall follow Section 412 of the INDOT Specification Manual and 902.01b AE-F Materials.**

28. Question: Can the Architect provide a drawing or sketch from the original building documents which show the existing roof assembly, or can a new drawing be created to accurately show the components? The attachment of the new metal roofing is very important and so it is critical to understand if there is a metal deck below, or perhaps some kind of structural purlins?

Response: **The original building drawings are included for reference as a part of this addendum. See also roof type on A021.**

29. Question: With regard to Detail 1/A120, High Density Polyiso cover board is typically ½" thick. We are not aware of anyone that makes a ¾" thick HD board. Also, please clarify the desired method for attachment of this insulation layer (screws or foam adhesive).

Response: **½" thick is acceptable, see attached, revised drawing. Adhere with foam adhesive.**

30. Question: We do not find any written specifications for the new metal roofing system. Please provide specifications for the metal panels, underlayment, insulation and vapor barrier

as shown in Detail 1/A120. The drawings reference Keynote 074113.A, but this is not in the specifications.

Response: **See attached specifications.**

31. Question: The existing gutter is an unusual/special shape. A detail of the new gutter design/eave condition would be very helpful to bid the project properly.

Response: **See attached, revised A120.**

End of Questions & Responses

ATTACHMENTS:
Notice to Bidders and Pre-Bid Meeting Report
Pre-Bid Meeting Sign-in Sheet

Drawings:
S601 – FOUNDATION & FRAMING SECTIONS
A021 – WALL & ROOF ASSEMBLIES
A101 – FIRST FLOOR PLAN – SOUTH
A102 – FIRST FLOOR PLAN – NORTH
A120 – ROOF PLAN
A450 – INTERIOR ELEVATIONS
PD100 – FIRST FLOOR PLUMBING DEMOLITION PLAN
P101 – FIRST FLOOR PLUMBING PLAN
P601 – PLUMBING SCHEDULES
EL101 – FIRST FLOOR LIGHTING PLAN
E601 – LIGHTING SCHEDULES
ABI 1 – A801 FINISH PLANS
ABI 6 – A101 FIRST FLOOR KITCHEN PLAN

Specifications:
01 77 00 – Closeout Procedures
02 41 19 – Selective Demolition
05 12 00 – Structural Steel Framing
07 41 13 – Metal Roof Panels
07 41 16 – Metal Soffit Panels
09 65 13 – Resilient Base and Accessories
09 68 13 – Tile Carpeting
12 35 30 – Casework
23 64 23.13 – Air-Cooled, Scroll Water Chillers
23 73 13.10 – Modular Central-Station Air-Handling Units

END OF ADDENDUM #1

IFB No.: MDI-SAB-26-B-013
August 13, 2026, 10:00 a.m. EDT
Crawfordsville Readiness Center Modernization

1. **Introductions (PM and A&E)**

2. **Administration (PM) -**

   A. **Notice to Bidders for Projects Valued by the State Armory Board, over $150,000**

   Notice is hereby given that sealed bids for:

   1) Notice is hereby given that sealed bids for the CRAWFORDSVILLE READINESS CENTER MODERNIZATION at 1405 SOUTH WASHINGTON STREET, CRAWFORDSVILLE IN 47933, for the Indiana Army National Guard will be received via email to Elysia Justice, Deputy Contracting Officer at contractingpublicbid@ago.in.gov until 10:00 o'clock AM (Eastern Daylight Savings Time) on Thursday, September 3, 2026. All bids will be read aloud via conference call **1-317-552-**1674 Conference ID: 561 250 260# at 11:00 o'clock AM (EDT). Any bid received after the designated time, for any reason, will not be read.

   2) Proposals shall be submitted on the proper Bid Form and delivered via email bearing the name, and address of the bidder, all as described in the Instruction to Bidders, which are found in the Project Manual (specifications). A Bid Bond made payable to the State Armory Board, State of Indiana, must be included with the bid. Said bond shall be in the minimum amount of five (5%) percent of the maximum bid amount including all additive alternate bids.

   3) All bidders must be Certified Contractors, and hold a Valid Certificate of Qualification **1542.01** (INSTITUTIONAL BLDGS: HOSPITALS, SCHOOLS, PRISONS) **OR 1542.04** (ADDITIONS, ALTERATIONS, REMODELING, AND REPAIR) from the Certificate Board, Room 467, Indiana Government Center, 402 West Washington Street, Indianapolis, Indiana, at the time of bid opening. Certification with the Department of Transportation does not meet the above-mentioned requirement for pre-qualification. The bidder must be qualified in the classification of the prime contract.

   4) The contract for this work shall be awarded or rejected within sixty (60) calendar days from the date of opening bids. Funds are presently available for this acquisition. The State Armory Board reserves the right to reject any-and-all bids.

   5) DAVIS BACON ACT - This project does fall under the Davis Bacon Act.

   6) Contracts resulting from this solicitation will be required to conform to I.C. 4-13-18 (Contractor's Employee Drug Testing).

   7) Contractors interested in bidding and/or reviewing this project may obtain complete contract documents, in either printed or electronic form, by registering as a plan holder and placing online orders at Repro Graphix, Inc., 437 N. Illinois St. Indianapolis, IN 46204, 317.637.3377. Printed copies are available on order. Contractors to verify cost with the plan room. Electronic files may be downloaded at

      https://ePlanroom.reprographix.com

8) The Architect/Engineer for this project is GEDA Architects, LLP 108 East Jackson Street, Muncie, IN 47305, 765-289-9155, www.gedaarchitects.com. Contact information for RFIs and/or product substitution requests: April Dowdle, adowdle@gedaarchitects.com **All RFIs and/or product substitution requests must be submitted in writing via email no later than Thursday, August 20, 2026.**

B. Additional Information to Bidders (PM)

1) In the bid packet there is a Bidder's Check List, please use it.

2) RFIs – will be during bidding period only. RFIs must be submitted not later than 20 August 2026, via email.

3) Substitutions requests will be during bidding period only. Requests must be submitted via email. Substitution requests must be submitted by 20 August 2026.

4) Additional Site Visits (Daake – 317 508 3421 or TJ Thiel, Physical Plant Director – 317 864 1854 **or SFC Brightwell – 765 409 1997**).

5) 20% OF THE WORK **-** The General Contractor shall perform 20% of the value of work (measured in dollars of the total contract price) with his own forces, and not more than 80% of the value of work is to be subcontracted. The 20% conducted by the General Contractor is to be measured by labor and not material/equipment.

6) UNITED STATES DEPARTMENT OF HOMELAND SECURITY EMPLOYER E-VERIFY. In accordance with Indiana enacted S.B. 590, dated July 01, 2011, the successful bidder, and all subcontractors will be required to be enroll in the UNITED STATES DEPARTMENT OF HOMELAND SECURITY EMPLOYER E-VERIFY program, and verify the legal employment status of all employees working on this project.

7) Normal Workdays: As established by the General Contractor.

8) Normal Work Hours: As established by the General Contractor.

9) Submission of Post-Bid Information
   (a) Submit comprehensive list of subcontractors and suppliers within 24 hours after Bid Award.
   (b) Construction Schedule – On the Bid Form provide the number of Calendar Days that are determined by the Bidder submitting the bid. The number of Calendar days are based on your experience working in Indiana, inclusive of bad-weather days, weekends, and Federal Holidays.

3. Other Concurrent Owner Projects in the area (PM)

A. None

4. Security, Staging, and Laydown Area (PM)

A. Site Access/Deliveries

- The GC is responsible for planning and coordinating site access and deliveries during the scope of this project

B. Everyone entering the work site must have a government ID.

C. The GC will have access to all areas in the perimeter of the Crawfordsville Readiness Center.

D. Utilities: General Contractor responsibilities. The INNG will continue to maintain and pay the utilities bills for the duration of the project if the bills remain "reasonable."

- This includes water, gas, electric, and sanitary services. Cable and internet service must be provided by the Contractor.

E. The GC will have access to the existing restrooms. If using during construction, GC will be responsible for returning facilities to clean, fully functional condition before project turn over.

5. Project Description with Plans (A&E)

A. GEDA provided a brief description of the project, including a description of the alternate bid items.

B. Alternate Bid Items (ABI) were identified as follows:

ABI 1 – Building Addition
ABI 2 – Access Drive
ABI 3 – Drill Floor Ceiling
ABI 4 – Terrazzo Flooring
ABI 5 – FMS Improvements
ABI 6 – Kitchen Improvements

C. The Base Bid will not be accepted without ABI 1. The Building Addition is identified as an alternate bid item for funding purposes only, as renovation work and new work are funded separately. It is important that the costs for Base Bid and ABI 1 scope are allocated properly, as the bid for each portion of the work must fall within the allocated budget from each funding source.

6. Owner Comments (PM)

No additional comments.

7. General Discussion (All)

While the Owner and the design team are available to provide basic project information during the site tour, all questions must be submitted in writing via e-mail to adowdle@gedaarchitects.com and all responses, including scope clarifications and authorization of substitutions will be issued via Addendum to all bidders through Reprographics Plan Room.

8. Site Tour (A&E)

Due Date Summary:

Pre-Bid Meeting and 2nd Advertisement (Today):	**10:00 p.m. EDT**	**August 13, 2026**
Substitution Requests and RFIs:	**5:00 p.m. EDT**	**August 20, 2026**
Final Addenda Issued:	**5:00 p.m. EDT**	**August 27, 2026**
Bids Due Via Email to:	**10:00 a.m. EDT**	**September 3, 2026**
Public Bid Opening via conference call at 1(317) 552-1674 Conference ID: 561 250 260#	**11:00 a.m. EDT**	**September 3, 2026**

Crawfordsville Readiness Center Modernization Pre-Bid Meeting

13 August, 2026

NAME	COMPANY	EMAIL	PHONE NUMBER
Mike Daake	INNG	michael.b.daake.civ@army.mil	317 508 3421
Randy Yeiter	3D Professional Contr.	dhawkins@3dproinc.com	317 507-8028
Jack Gonzalez	Kettelhut Const.	jag@kettelhut.com	765-447-2181
Roger Musscho	Musscho Erc	RMusscho@comcast.net	4260737
Blake Nixon	C-Cat	Bnixon@C-Cat.com	317-951-6718
Scott Gourley	Delta	Sgourley@DeltaSolutionsIN.com	317 751-6653
Eli Moore	First Dve Company	emoore@firstdvecompany.com	317-403-8195
Casey Hoersten	Verkler	cahoersten@verkler.com	317-297-7054
Aidan Dreibelbis	TRL Turner	adreibelbis@rlturner.com	260-242-1014
Jay Threlkeld	Koorsen	jay.threlkeld@koorsen.com	317-339-8757
Dan Trotter	Environmental Assurance Co Inc	dtrotter@eaciusa.com	765 969 2357
Sutton Smith	Anderson Plumbing	suttonsmith34@icloud.com	765-585-0695
Austin C. Bickle	KBSO Consulting	—	—
Steve Julian	Central IN Glass	Sjulian@CINglass.com	765.449.6958
Kevin Robbins	HMH Contractors	Kevin.robbins@hmhmechanical.com	765-437-0650
David DeSplinter	Hagerman	ddesplinter@hagermangc.com	317-607-0160

Crawfordsville Readiness Center Modernization Pre-Bid Meeting

13 August, 2026

NAME	COMPANY	EMAIL	PHONE NUMBER
GREGG STARK	BCMI	BIDS@BCMI.US	317-269-0543
DAVE REEF	BRAND ELECTRIC	dreef@brandelectric.com	765-296-3437
DANNY MIDDLETON	ANDERSON ELECTRIC	Dannym@anderson-electric.com	317.799.4822
Grant Cavanagh	Shuck Corporation	gcavanagh@shuckcorp.com	317-370-9041
Matthew Harrison	IEI	matthewharrison@Indstelectric.com	317-599-6941
Kevin Kendall	RL Turner	kkendall@rlturner.com	317-873-2212
Andrew Ohab	City Wide Paving	andrew@cwpaving.com	317-652-9129
Ashley McCauley	Hannig Construction	amccauley@hannigconstruction.com	812.235.6218
JOSIAH PORTTEUS	JC RIPBERGER	josiahp@jcripberger.com	317-873-3383
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SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

1.03 RESPONSIBILITY

A. The GENERAL CONTRACTOR is responsible to save, process, make copies provide files, make as-built notes, etc., and ensure correctness of all **PROJECT RECORD DOCUMENTS** of all required materials listed here within.

B. The GENERAL CONTRACTOR is responsible to deliver all materials listed here within to the A&E for review and or comment.

1.04 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.05 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

D. Shelf Stock Inventory

1.06 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.07 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 calendar days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Engineer. Label with manufacturer's name and model number where applicable.

    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Engineer's signature for receipt of submittals.

5. Submit test/adjust/balance records.
6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

USE AS A CHECKLIST:

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 01 79 00 "Demonstration and Training."
6. Advise Owner of changeover in heat and other utilities.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements, including touchup painting.
10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of three days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Results of completed inspection will form the basis of requirements for final completion.

1.08 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

USE AS A CHECKLIST:

1. Submit a final Application for Payment according to Section 01 29 00 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.

B. Inspection: Submit a written request for final-finish inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.09 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by ma or element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

    a. Project name.
    b. Date.
    c. Name of Engineer.
    d. Name of Contractor.
    e. Page number.

4. Submit list of incomplete items in the following format:

    a. MS Excel electronic file. Engineer will return annotated file.
    b. Three paper copies. Engineer will return two copies.

1.10 SUBMITTAL OF PROJECT WARRANTIES

A. Partial Occupancy: Areas partially re-occupied by the Owner are granted Beneficial Occupancy. However, Beneficial Occupancy does not start warranties. Warranties will begin once the Contracting Officer as granted Substantial Completion for the entire project.

B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

1. Bind warranties and bonds in heavy-duty, three inch (3") "D"-Ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch white paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Warranty Electronic File:

    a. Scan warranties
    b. Scan bonds
    c. Assemble complete warranty and bond submittal package into a single indexed electronic PDF file with LINKS enabling navigation to each item.
    d. Provide bookmarked table of contents at beginning of document.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.01 FINAL-FINISH CLEANING

A. General: Perform final-finish cleaning for occupancy ready. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

    USE AS A CHECKLIST:

    a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    b. Sweep and hose-off with water paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    e. Remove snow and ice to provide safe access to building.
    f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective sur- faces to their original

condition.

g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

h. Sweep concrete floors broom clean in unoccupied spaces.

i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.

j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.

k. Remove labels that are not permanent.

l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

n. Replace disposable air filters and clean permanent air filters. Clean ex- posed surfaces of diffusers, registers, and grills.

o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.

p. Clean HVAC system in compliance with NADCA Standard 1992-01.

q. Provide written report on completion of cleaning.

r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.

s. Leave Project clean and ready for occupancy.

C. Pest Control: Comply with pest control requirements in Section 01 50 00 "Temporary Facilities and Controls." Prepare written report.

D. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 50 00 "Temporary Facilities and Controls."

3.02 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be re- paired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.

2. Touch up and otherwise repair and restore marred or exposed finishes and sur- faces. Replace finishes and surfaces that that already show evidence of repair or restoration.

   a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

3.03 SHELF STOCK

A. Provide all shelf stock materials in clearly marked packages. Shelve on premises or palletize for removal off site according to Owner direction.

B. Provide a complete inventory of all shelf stock materials as a part of the Record Documents.

C. Provide Shelf Stock Materials according to the following schedule:

CRAWFORDSVILLE SHELF STOCK SCHEDULE		
Product	**Amount**	**NOTE**
Ceiling tiles	10%	Unopened boxes in original packaging. If more than one type in project, include 10% of each type.
Wall tiles	1 box	1 unopened box of each type of ceramic wall tile used in project
Floor tiles	1 box	1 unopened box of each type of ceramic floor tile used in project.
Vinyl Base	1 box	1 unopened box of each type of vinyl base used in project.
Carpet tiles	5%	5% of each type of carpet tiles used in project
HVAC Filters	2 sets	2 complete sets of pre-filters
HVAC Filters	1 set	1 Complete set of final filters. This does not include the 1 complete set required at Substantial completion.
Electric Motor/Fan Belts	2 sets	2 sets for each belt driven fan
Electric Motor/Fan Sheeves	1 set	1 set for each belt driven fan
Light Fixtures	1 each	LR2, LS1, LP1, LP2
Light Controls	4 each	The most common wall mounted dimmer switch in the project.
Wire Mesh Caging Locks	2 each	2 new lock sets to match installed sets. Not including cores.
Paint	1 gallon	1 unopened gallon of each wall color used.
Door Hardware	50 each	50 of each type of screw/fasteners used on doors. In original packaging or in container clearly labled with type and use. I.e., hinge screws.
Door Hardware	4 each	4 full sets of most common interior door handle sets. Not to include cores.

END OF SECTION

SECTION 024119 - SELECTIVE DEMOLITION

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. Salvage of existing items to be reused or recycled.

B. Related Requirements:

1. Section 00 31 26 “Existing Hazardous Material Information” for requirement to treat existing hazardous materials.
2. Section 011000 "Summary" for restrictions on the use of the premises.
3. Section 017300 "Execution" for cutting and patching procedures.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for dust control and for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.

C. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.

D. Predemolition Photographs or Video: Submit before Work begins.

1.6 CLOSEOUT SUBMITTALS

A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.7 FIELD CONDITIONS

A. Owner will vacate the property during construction.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before selective demolition, Owner will remove the following items:

a. OCIE Lockers
b. Computers, paperwork, and personal items.
c. Posters and papers from walls.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: Refer to Specification Section 00 31 26 for Existing Hazardous Material Information.

1. All Hazardous Materials identified in this report that will be disturbed by construction activities are to be repaired, encapsulated, enclosed or removed according to the instruction identified in this report as a part of the base bid.

2. An allowance is provided for any Hazardous Materials discovered through the course of construction that are **NOT** identified in this report.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

G. Storage or sale of removed items or materials on-site is prohibited.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. Perform an engineering survey of existing conditions of building to determine whether removing any element might result in structural deficiency or unplanned building collapse of any portion of structure or adjacent structures during selective building demolition operations. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

E. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

F. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and/or preconstruction videos.

1. Inventory and record the condition of items to be removed and salvaged. Provide photographs and/or video of conditions that might be misconstrued as damage caused by salvage operations.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Arrange to shut off indicated services/systems with utility companies.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.

b. Piping to Be Abandoned in Place: Do not abandon in place. Remove all piping no longer in service.
c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
g. Ducts to Be Abandoned in Place: Do not abandon in place. Remove all mechanical equipment and ductwork no longer in service.

C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.
5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
2. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
3. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

4. Dispose of demolished items and materials promptly. Comply with requirements in Section 003126 “Existing Hazardous Material Information and Section 017419 "Construction Waste Management and Disposal."

B. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in Owner's storage area designated by Owner.
4. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

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. Extent of structural steel work is indicated on the Drawings, including framing plans, schedules, notes, and details to show the size and location of members, typical connections, and type of steel required.

1.3 ACTION SUBMITTALS

A. Shop Drawings: Submit Shop Drawings to include all information necessary for fabrication and erection as follows:

1. Details of proposed connections for each member size, steel grade, connection type and design reaction indicated on the drawings. Use standard details where appropriate. Refer to Part 2 – Products “Design” for criteria.
2. Structural calculations prepared and sealed by a qualified engineer licensed in the State of Indiana for each connection condition indicated above. Submit sample calculations for typical connections for review before preparation of Detail Drawings.
3. Base plate and anchor rod plans showing the location, size and identification marks of all base plate, bolts, grades of steel and setting elevations.
4. Erection Plans (minimum 1/8”=1’-0” scale) showing type, size, weight and identification marks of all structural steel members. Include temporary members required for erection, dimensions locating all members relative to column grid lines, elevations of all members, and clear cross references with all other related drawings. Also, include the necessary information and instructions regarding field welds and field bolts including type, size and extent of field welds, types of electrodes, joint welding procedures, welding sequence and size and type of field bolts.
5. Detail Drawings showing complete details for the fabrication of all structural steel members and components including, but not limited to: identification marks, dimensions, size, type, weight and grade of steel; requirements for installation of other materials or parts of construction, such as punched or drilled holes, cleats, openings, etc.; type, size and extent of shop and field welds; type of electrodes, joint welding procedures, welding sequences, size and type of shop and field bolts; cleaning requirements prior to painting; type and dry thickness of paint. Use welding symbols used by the American Welding Society.
6. Drawings and calculations of all shop and field modifications and/or remedial work.
7. Drawing index sheets, including updated sheets, at the same time that details are submitted.
8. Contract Document plan drawings may be reproduced by the Contractor with the following provisions:

a. Plan drawings may be reproduced only to locate piece marks. The responsibility for producing complete and accurate shop drawings remains with the Contractor.
b. The Contractor must remove all title blocks, notes, references, revision marks, and section marks referring to the Contract Document plan drawings.
c. Only the plans, modified as described above, may be reproduced. Contract Document detail drawings may not be reproduced, in whole or in part, for any reason.

B. Substitutions: Substitutions for the members sizes, type(s) of steel, connection details, or any other modifications proposed by the Contractor will be considered by the Architect/Engineer under the following conditions:

1. The revisions in no case result in additional cost to the Owner. In considering cost savings to the Owner, adequate compensation for the Engineer's review of these substitutions should be considered.
2. The request is made in writing and accepted prior to the submission of shop drawings.
3. It is suitably demonstrated that there is a substantial cost or time advantage to the Owner.
4. Sufficient sketches, engineering calculations by a Structural Engineer licensed in the State of Indiana, and other data submitted to facilitate the review by the Architect/Engineer.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data; For qualified Fabricator, Erector and Connection Engineer.

B. Welding certificates.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

D. Product Data: Submit copies of manufacturer's specifications and installation instructions for each proprietary product, including laboratory test reports and such other data as may be required to show compliance with the specifications. Indicate by transmittal form that copies of such data have been distributed to the Fabricator/Installer and the Testing Laboratory.

1. Certified copies of mill reports covering the chemical and physical properties of the steel.
2. High strength bolts, each type, including nuts and washers.
3. Unfinished bolts and nuts.
4. Welding electrodes, each type.
5. Shop coat primer paint(s).
6. Grout.

E. Record Surveys: Submit three (3) copies of certified survey(s) by the Contractor's licensed professional surveyor as specified in Part 3-Execution for both the base conditions prior to erection and the final erected steel frame.

F. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing, including the following:

1. Power source (constant current or constant voltage).
2. Electrode manufacturer and trade name, for demand critical welds.

G. Source quality-control reports.

H. Calculation submittal letter: with the shop and erection drawings, provide final substantiating connection information in the form of calculations and a letter stating that the shop and erection drawings properly incorporate the connection designs signed and sealed by the licensed connection engineer in responsible charge of the connection design. Provide a means by which the substantiating connection information is referenced to the related connections on the shop and erection drawings for the purpose of review.

1.5 QUALITY ASSURANCE

A. The Fabricator shall have 10 years of comparable experience in installations of this type and shall employ labor and supervisory personnel familiar with the type of installation, experienced in fabrication and erection of structural steel for projects of similar size and complexity. The Fabricator's qualifications shall be subject to review by the Architect/Engineer.

A. The Erector shall have 10 years of successful experience erecting structural steel for structures of this type and complexity in the region of this project. The Erector's qualifications shall be subject to review by the Architect/Engineer.

B. The Detailer shall have 10 years' experience preparing detailed shop drawings and CNC downloads for structures of this type and complexity. The Detailer's qualifications shall be subject to review by the Architect/Engineer.

C. The Contractor's Connection Engineer(s) shall be qualified to perform the type of work required by the project. The Engineer(s) shall be a professional engineer licensed in the State of Indiana and shall have 10 years experience being in responsible charge of work of this nature. The proposed Engineer(s) qualifications shall be subject to review by the Architect/Engineer.

D. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint Endorsement P1 or SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."

E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel."

1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

F. Pre-Construction Conference:

1. Conduct a meeting prior to the preparation of Shop Drawings to review the detailed requirements for preparing calculations and shop drawings, sequence of submittals, erection tolerances, welding qualifications, inspection procedures, surveys, and other similar matters.
2. Responsible representatives from all concerned parties are required to attend the meeting including, but not limited to, the following:
   a. Contractor's superintendent.
   b. Architect/Engineer.
   c. Structural steel detailer and/or fabricator.
   d. Structural steel contractor's connection engineer.

e. Erector.
f. Owner’s Testing Laboratory.
g. Surveyor.

3. Record and distribute legible meeting minutes within 10 business days to all parties in attendance at the meeting and an additional copy to the Owner’s representative.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.7 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. W-Shapes and Channels: ASTM A 992.

B. Angles, Plate and Bar: ASTM A 36, unless indicated as ASTM A 572, Grade 50.

C. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade C, structural tubing.

D. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.

B. High-Strength Bolts, Nuts, and Washers: ASTM A 490, Type 1, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers with plain finish.

1. Do not use A325 and A490 bolts of the same diameter. Different grade bolts must vary in diameter by a minimum of ¼ inch.

C. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade DH heavy-hex carbon-steel nuts; and ASTM F 436 , Type 1, hardened carbon-steel washers.

1. Finish: Hot-dip zinc coating. Bolts and nuts to be shipped as assembly from the same supplier.

D. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex, or round head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.

1. Finish: Plain.

E. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1, Type B.

F. Unheaded Anchor Rods: ASTM F 1554, Grade 36.

1. Configuration: Straight.
2. Nuts: ASTM A 563 heavy-hex carbon steel.
3. Plate Washers: ASTM A 36 carbon steel.
4. Washers: ASTM F 436, Type 1, hardened carbon steel.
5. Finish: Plain.

G. Threaded Rods: ASTM A 36.

1. Nuts: ASTM A 563 hex carbon steel.
2. Washers: ASTM F 436, Type 1, hardened carbon steel.
3. Finish: Plain.

H. Clevises and Turnbuckles: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1035.

I. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.

J. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

2.3 PRIMER

A. Typical Shop Primer- (Steel not exposed to the elements or humid, chemically-laden air): Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

B. For steel columns exposed to view in the finished construction: Series 1 Omnithane Primer by Tnemec Company.

C. Galvanizing Repair Paint: SSPC-Paint 20 with dry film containing a minimum of 94 percent zinc dust by weight.

1. Galvilite by ZRC Worldwide.

2. Approved equal.

D. For steel exposed to the elements: Series 90-97 Zinc Rich Urethane Primer by Tnemic Company.

2.4 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 DESIGN

A. Connections:
1. Design and detail all connections to resist the loads and reactions indicated on the Drawings or specified herein. Use details consistent with the details shown on the Drawings, supplementing where necessary. The details shown on the Drawings are conceptual, show only the minimum requirements to convey design intent, and do not indicate the required weld sizes or numbers of bolts unless specifically noted. Use rational engineering design and standard detailing practice in detailing, accounting for all loads and eccentricities in both the connection and the members. Promptly notify the Architect/Engineer of any location where the connection design criteria is not clearly indicated. The design of all connections is subject to the review and acceptance of the Architect/Engineer.
2. A combination of bolts and welds to transmit loads in the same faying surface is not permitted.
3. Use ASD; data are given at service-load level.
4. Use beam-to-column connections which minimize the eccentric loading on the column. Detail and fabricate unrestrained simple beam end connections to minimize end restraint of the beam. Design all parts of such connections (such as welds, bolts, and material) taking eccentricity into account.
5. The contractor shall design and provide any stiffeners plates, doubler plates, reinforcing plates, etc. and their connections that may be required to develop and/or transfer the forces and/or connection design criteria called for in the contract documents.
6. Design connections to withstand the combined effects of shear, axial forces, moments and torques and as required by applicable code(s) and the contract documents.
7. All forces shown on the drawings are to be assumed reversible unless noted otherwise and must be checked for both directions. If no transfer/pass-through forces are shown on

the contract documents, the most critical combinations of members forces and directions shall be assumed for the connection design.

8. Welding of High-Restraint Welds: use double bevels in lieu of single bevels where practical. Detail joints to allow for weld shrinkage. In cases of plates in more than one plane, show welding operation sequence on the drawings. In general, start welding at the most restrained part of the weldments and proceed to the least restrained.

2.6 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Mark and match-mark materials for field assembly.
4. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.

C. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 1, "Solvent Cleaning, SSPC-SP 2, "Hand Tool Cleaning or SSPC-SP 3, "Power Tool Cleaning." Remove all materials that might impair proper adhesion of spray fireproofing.

F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.

G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.7 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened unless indicated as Pretensioned or Slip Critical.

B. Weld Connections: Comply with AWS D1.1 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.8 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
2. Surfaces to be field welded, including the top surface of beams to receive steel deck and/or shear connectors fastened by welding.
3. Surfaces to be high-strength bolted with slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
5. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 2, "Hand Tool Cleaning" or SSPC-SP 3, "Power Tool Cleaning" for typical structural steel not exposed to the elements or humid, chemically-laden air.
2. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning" for structural steel columns exposed to view in the finished construction.
3. SSPC-SP 6/NACE No. 3, “Commercial Blast Cleaning” for structural steel exposed to the elements.

C. Priming of steel not exposed to view in the finished construction: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 2.0 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection.
3. If, for any reason, any surface to field welded is painted, remove the paint completely to within the stated limits before welding. If high strength, slip-critical bolted connection contact surfaces are painted, the allowable load per bolt used in design must be in accordance with RCSC “Specification” value for the paint used.

D. Priming of steel columns exposed to view in the finished construction: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 2.5 to 3.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces. Steel will receive a finish top coat(s) per Division 9.

E. Priming of steel exposed to the exterior environment: Immediately after surface preparation, apply primer according to manufacturer’s written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 3.0 to 4.0 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces. Steel will receive a finish top coat(s) per Division 9.

2.9 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123.

1. Fill vent and drain holes that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.
2. Galvanize lintels and shelf angles attached to structural-steel frame and located in exterior walls.

2.10 SOURCE QUALITY CONTROL

A. Testing Agency: General Contractor will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.

1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

C. Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1 and the following inspection procedures, at testing agency's option:

1. Liquid Penetrant Inspection: ASTM E 165.
2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
3. Ultrasonic Inspection: ASTM E 164.
4. Radiographic Inspection: ASTM E 94.

E. In addition to visual inspection, shop-welded shear connectors will be tested and inspected according to requirements in AWS D1.1 for stud welding and as follows:

1. Bend tests will be performed if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
2. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

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

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Base, Bearing and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened unless indicated as Pretensioned or Slip critical .

B. Weld Connections: Comply with AWS D1.1 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.

B. Bolted Connections: Bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Field welds will be visually inspected according to AWS D1.1.

1. In addition to visual inspection, field welds will be tested and inspected according to AWS D1.1 and the following inspection procedures, at testing agency's option:

a. Liquid Penetrant Inspection: ASTM E 165.
b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
c. Ultrasonic Inspection: ASTM E 164.
d. Radiographic Inspection: ASTM E 94.

D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1for stud welding and as follows:

1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1.

E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.6 REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.

B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

END OF SECTION 05 12 00

SECTION 07 4113 - METAL ROOF PANELS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:

1. Factory-formed and field-assembled, standing-seam metal roof panels.
2. Accessories, including prefinished roof curbs.
3. Underlayment.
4. Insulation.
5. Sub-framing attachment system to steel deck.
6. Vapor retarder.

B. Related Sections include the following:

1. Division 05 Section "Steel Deck" for steel roof deck supporting metal roof panels.
2. Division 07 Section "Sheet Metal Flashing and Trim" for flashings and other sheet metal work.
3. Division 07 Section "Joint Sealants" for field-applied sealants not otherwise specified in this Section.

1.03 PERFORMANCE REQUIREMENTS

A. This section includes the design of roof panel assemblies in accordance with performance requirements and applicable codes.

B. Provide metal roof panel assemblies that comply with performance requirements specified as determined by testing manufacturers' standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.

C. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift resistance class indicated.

1. Fire/Windstorm Classification: Class 1A- 90.

D. Structural Performance: Provide metal roof panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592:

1. Wind Loads: Determine loads based on minimum design wind pressures indicated on Drawings, or if not indicated, in accordance with local codes.
2. Snow Loads: Indicated on drawings, or if not indicated, in accordance with local codes.
3. Deflection Limits: Engineer metal roof panel assemblies to withstand design loads with vertical deflections no greater than 1/240 of the span.

E. Thermal Movements: Provide metal roof panel assemblies that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects.

Base engineering calculation on surface temperatures of materials due to both solar heat gain and night-time-sky heat loss.

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

1.04 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal roof panel and accessory. Include documentation certifying that the products comply with provisions of the Buy American Act.

B. Shop Drawings: Show fabrication and installation layouts of metal roof panels; details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work.
1. Accessories: Include details of flashing and trim, gutters, downspouts, and snow guards at a scale of not less than 1-1/2 inches per 12 inches.
2. Roof curbs.
3. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Coordination Drawings: Roof plans drawn to scale and coordinating penetrations and roof-mounted items. Show the following:
1. Roof panels and attachments.
2. Sub-framing attachment system.
3. Roof-mounted items including roof hatches, equipment supports, pipe supports and penetrations, lighting fixtures, snow guards, and items mounted on roof curbs.

D. Samples for Initial Selection: For each type of metal component indicated, submit manufacturer’s standard color chart for initial selection of 3-5 samples for Verification.
1. Include similar Samples of trim and accessories involving color selection.

E. Samples for Verification: Submit 12-inch long section of metal roof panel showing finishes, vertical joint return, and anchoring details.
1. Include similar size Samples of trim and accessories involving color selection.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for the following:
1. Metal Roof Panels: Include reports for air infiltration, water penetration, thermal performance, fire-test-response characteristics, and structural performance.
2. Insulation and Vapor Retarders: Include reports for thermal resistance, fire-test-response characteristics, water-vapor transmission, and water absorption.

G. Pre-Installation Notice: Provide a copy of the Pre-Installation Notice to show the Manufacturer’s required Pre-Installation notice has been approved by the Manufacturer.

H. Sample Warranty – Complying with the terms of this specification.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer with minimum of 5 years of experience with successfully completed projects of similar size.
1. Installing Contractor must be approved by the manufacturer.
2. Installing Contractor must employ workers trained by the manufacturer.

3. Installers shall be thoroughly trained and experienced in the necessary crafts and completely familiar with and comply to the recommendations and details of the manufacturer and the “Architectural Sheet Metal Manual published by SMACNA.
4. Installer's responsibilities include fabricating and installing metal roof panel assemblies and providing professional engineering services needed to assume engineering responsibility.
5. Engineering Responsibility: Preparation of data for metal roof panels, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those per-formed for installations of metal stairs (including handrails and railing systems) that are similar to those indicated for this Project in material, design, and extent.

C. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.

D. Source Limitations: Obtain metal roof panels through one source from a single manufacturer.

E. Fire-Resistance Ratings: Where indicated, provide metal roof panels identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

1. Combustion Characteristics: ASTM E 136.
2. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.
3. Metal roof panels shall be identified with appropriate markings of applicable testing and inspecting agency.

F. Surface-Burning Characteristics: Provide insulated metal roof panels having insulation core material with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

1. Flame-Spread Index: 25 or less, unless otherwise indicated.
2. Smoke-Developed Index: 450 or less, unless otherwise indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, metal roof panels, and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.

B. Unload, store, and erect metal roof panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal roof panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Protect strippable protective covering on metal roof panels from exposure to sunlight and high humidity, except to extent necessary for period of metal roof panel installation.

E. Protect foam-plastic insulation as follows:
1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.
3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

1.07 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal roof panels to be performed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements: Verify locations of roof framing and roof opening dimensions by field measurements before metal roof panel fabrication and indicate measurements on Shop Drawings.

1.08 COORDINATION

A. Coordinate installation of roof curbs, equipment supports, and roof penetrations among disciplines, including roof panel manufacturer, curb manufacturer, and Division 23 Sections, “HVAC.”

B. Coordinate metal panel roof assemblies with rain drainage work, flashing, trim, and construction of purlins and rafters, parapets, walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace metal roof panel assemblies that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

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

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel 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.

C. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam met-al roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.

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

PART 2 - PRODUCTS

2.01 PANEL MATERIALS

A. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40; structural quality.
2. Surface: Smooth, flat finish.
3. Exposed Finishes: Apply the following coil coating, as specified or indicated on Drawings.

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

1) Fluoropolymer Three-Coat System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with physical properties and coating performance requirements of AAMA 2605, except as modified below:

4. Concealed Finish: Apply pretreatment and 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. Panel Sealants:

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C 920; elastomeric polyurethane, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal roof panels and remain weathertight; and as recommended in writing by metal roof panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.02 THERMAL INSULATION FOR FIELD-ASSEMBLED METAL ROOF PANELS

A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B. High Density Polyisocyanurate Cover Board: Non-com Non-combustible, water-resistant high density, closed cell polyisocyanurate core with coated glass mat facers, complying with ASTM D 1623, and with the following additional characteristics:

1. Size: 48″ (1.22 m) by 96″ (2.44 m), nominal (if mechanically fastened) or 48″ (1.22 m) by 48″ (1.22 m), nominal (if adhered)
2. Thickness: 0.5″ (12.7 mm)
3. R-Value: 2.5 based on ASTM tests C158 and C177
4. (4) Surface Water Absorption: <3%, maximum, when tested in accordance with ASTM C 209
5. Compressive Strength: 120 psi (827 kPa), when tested in accordance with ASTM 1621
6. Density: 5 pcf (80 kg/m3), when tested in accordance with ASTM 1622
7. Factory Mutual approved for use with FM 1-60 and 1-90 rated roofing assemblies
8. Mold Growth Resistance: Passed, when tested in accordance with ASTM D 3273

C. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, felt or glass-fiber mat facer on both major surfaces.
1. Aged R-value shall be as designated at mean temperatures indicated and as follows: R 5.6 at 75 deg F for 1" thick insulation board.
2. Surface Burning Characteristics: Maximum flame spread of 75.
3. Compressive Strength: 20 psi per ASTM D 1621-94 Test Method for Compressive Properties of Rigid Cellular Plastics.
4. Dimensional Stability: Less than 2.0 percent change in length, width and thickness per ASTM D 2126-94 Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

2.03 MISCELLANEOUS METAL FRAMING

A. General: Comply with ASTM C 754 for conditions indicated.

1. Steel Sheet Components: Complying with ASTM C 645 requirements for metal and with manufacturer's standard corrosion-resistant zinc coating.

B. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches, wall attachment flange of 7/8 inch, minimum bare metal thickness of 0.0179 inch, and depth required to fit insulation thickness indicated.

C. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

2.04 MISCELLANEOUS MATERIALS

A. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal roof panels by means of plastic caps or factory-applied coating.

1. Fasteners for Roof Panels: Self-drilling or self-tapping 410 stainless or zinc-alloy steel hex washer head, with EPDM or PVC washer under heads of fasteners bearing on weather side of metal roof panels.
2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

2.05 UNDERLAYMENT

A. Install self-adhering, high temperature underlayment, approved by the metal roof panel manufacturer, over entire roof.

2.06 VAPOR RETARDER

A. Polyethylene Film: ASTM D 4397, 6 mils thick, minimum, with maximum permeance rating of 0.13 perm.
   1. Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.07 STRUCTURAL STANDING-SEAM METAL ROOF PANELS

A. General: Provide factory-formed metal roof panels designed to be field assembled by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.

   1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.

B. Vertical-Rib, Seamed-Joint, Standing-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and nominally flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels, and mechanically seaming panels together.

   1. Acceptable Products:

      a. CENTRIA Architectural Systems; “SRS3.”
      b. Dimensional Metals, Inc. (DMI); “Span-Lok SL-20.”
      c. Elevate; “UC-6.”
      d. Or approved equal.

   2. Material: Aluminum-zinc alloy-coated steel sheet, 24 gage nominal thickness.

      a. Exterior Finish: Fluoropolymer.
      b. Color: Match Architect’s Charcoal Sample.

   3. Clips: Floating to accommodate thermal movement.
   4. Panel Coverage: 16 to 18 inches.
   5. Panel Height: 2.00 inches.
   6. Uplift Rating: UL 90.

2.08 ACCESSORIES

A. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including trim, copings, fasciae, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels, unless otherwise indicated.

   1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof panels.
   2. Clips: Minimum 0.0625-inch- thick, stainless-steel panel clips designed to withstand negative-load requirements.
   3. Cleats: Mechanically seamed cleats formed from minimum 0.0250-inch- thick, stainless-steel or nylon-coated aluminum sheet.
   4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.

5. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefinfoam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

B. Roof Curbs: Custom roof curbs shall be constructed of metal to match roof panels of thickness required to support the load of the equipment, with fully mitered and welded corners, integral base plates, with water diverter cricket.

1. Provide factory installed insulation.
2. Minimum height of Curb shall be 8" above finished roof.
3. Curbs shall be constructed to match slope of roof and provide a level top surface for mounting of equipment.
4. Curb flange shall be constructed to match configuration of roof panel. Side flange shall extend to the next natural seam in the roof panels and conform to seam configurations.
5. Match material and finish of other metal accessories and roof panels.

C. Flashing and Trim: Formed from 0.0179-inch- thick, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal roof panels.

D. Gutters: Formed from 24 gage, zinc-coated (galvanized) aluminum-zinc alloy-coated steel sheet prepainted with coil coating. Fabricate in minimum 96-inch- long sections, sized according to SMACNA's "Architectural Sheet Metal Manual." Furnish gutter supports spaced 36 inches o.c., fabricated from same metal as gutters. Provide bronze, copper, or aluminum wire ball strainers at outlets. Finish gutters to match metal roof panels.

E. Downspouts: Formed from 24 gage, zinc-coated (galvanized) aluminum-zinc alloy-coated steel sheet prepainted with coil coating; in 10-foot- long sections, complete with formed elbows and offsets. Finish downspouts to match metal roof panels.

F. Seam-Mounted, Bar-Type Snow and Ice Guards: Aluminum or stainless-steel rods or bars held in place by stainless-steel clamps attached to vertical ribs of standing-seam metal roof panels.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Alpine SnowGuards (Div. of Vermont Slate & Copper Services).
b. Metal Roof Innovations, Ltd.
c. Snow Management Systems, a division of Contek, Inc.
d. Or approved equal.

G. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

2.09 FABRICATION

A. General: Fabricate and finish metal roof panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Where indicated, fabricate metal roof panel joints with factory-installed captive gaskets or separator strips that provide a tight seal and prevent metal-to-metal contact, in a manner that will minimize noise from movements within panel assembly.

D. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
4. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended by metal roof panel manufacturer.

a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal roof panel manufacturer for application but not less than thickness of metal being secured.

2.10 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of work.
1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel

manufacturer.

B. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before metal roof panel installation.

3.02 DELIVERY, STORAGE AND HANDLING

A. Deliver roof system components to project site in manufacturer's unopened original containers.
B. Protect roof system components during shipment, storage, handling and erection from mechanical abuse, stains, discoloration and corrosion.
C. Provide strippable plastic film on all painted surfaces between contact areas to prevent abrasion during shipping, storage and handling.

D. Store materials off the ground, providing for drainage, under protective cover which allows for air circulation and protection from foreign material contamination, mechanical damage, cement, lime, or other corrosive materials.
E. Handle materials to prevent damage to surfaces, edges and ends of roofing components.
F. Damaged material shall be rejected and removed from site.
G. Examine materials upon delivery to jobsite. Reject and remove physically damaged,
H. stained or marred material from project site.
I. Metal roof components with strippable film must not be stored with exposure to direct sunlight.
J. Stack material to prevent damage and allow for adequate ventilation and drainage.

3.03 PREPARATION

A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.

B. Install flashings and other sheet metal to comply with requirements specified in Division 7 Section "Sheet Metal Flashing and Trim."

C. Install fasciae and copings to comply with requirements specified in Division 7 Section "Sheet Metal Flashing and Trim."

D. Miscellaneous Framing: Install subpurlins, eave angles, furring, and other miscellaneous roof panel support members and anchorage according to metal roof panel manufacturer's written recommendations.

3.04 METAL ROOF PANEL INSTALLATION, GENERAL

A. General: Provide metal roof panels of full length from eave to ridge, unless otherwise indicated or restricted by shipping limitations. Anchor metal roof panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cutting of metal roof panels by torch is not permitted.
2. Install panels perpendicular to purlins.
3. Rigidly fasten eave end of metal roof panels and allow ridge end free movement due to thermal expansion and contraction. Predrill panels.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
6. Lap metal flashing over metal roof panels to allow moisture to run over and off the material.

B. Fasteners:

1. Steel Roof Panels: Use stainless-steel fasteners for surfaces exposed to the exterior and galvanized steel fasteners for surfaces exposed to the interior.

C. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal roof panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal roof panel manufacturer.

1. Seal metal roof panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal roof panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

3.05 UNDERLAYMENT INSTALLATION

A. Install underlayment in accordance with metal panel manufacturer’s written instruction.
B. Cover complete roof area to receive metal roof panels.
C. Use ice and water underlayment at eaves, valleys, rake walls, rake edges, and around penetrations.

3.06 VAPOR-RETARDER INSTALLATION

A. Polyethylene Film: Loosely lay polyethylene-film vapor retarder in a single layer over area to receive vapor retarder, side and end lapping each sheet a minimum of 2 inches (50 mm) and 6 inches (150 mm), respectively.

1. Continuously seal side and end laps with tape.

3.07 THERMAL INSULATION INSTALLATION FOR FIELD-ASSEMBLED METAL ROOF PANELS

A. Board Insulation: Extend insulation in thickness indicated to cover entire roof. Comply with installation requirements in Division 07 Section "Building Insulation."

1. Erect insulation horizontally and hold in place with Z-shaped furring members spaced 24 inches o.c. Securely attach narrow flanges of furring members to roof deck with screws spaced 24 inches o.c.

3.08 FIELD-ASSEMBLED METAL ROOF PANEL INSTALLATION

A. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended by manufacturer.

1. Install clips to supports with self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.

B. Fascia Panels: Align bottom of panels and fasten with blind rivets, bolts, or self-tapping screws. Flash and seal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

3.09 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal roof panel assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

C. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 4 feet o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

D. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.

1. Provide elbows and splash blocks at base of downspouts to direct water away from building.
2. Tie downspouts to underground drainage system indicated.

E. Bar-Type Snow and Ice Guards: Attach bar supports to vertical ribs of standing-seam metal roof panels with clamps or set screws. Do not use fasteners that will penetrate metal roof panels.

F. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to metal roof panels as recommended by manufacturer using molded EPDM and metal collar.

3.10 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal roof panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.11 FIELD QUALITY CONTROL

A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system Manufacturer specifically to inspect installation for warranty purposes.
B. Include Manufacturer’s Inspection Report in Contractor’s Punch List provided to the Owner and Architect.
C. Perform all corrections necessary for issuance of warranty.

3.12 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.

B. Touch up minor abrasions and scratches in finish with manufacturer’s supplied Kynar touch up paint.

C. Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 4116 - METAL SOFFIT PANELS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:

1. Steel soffit panels.
2. Sub-framing and attachment systems.

B. Related Sections include the following:

1. Division 06 Section "Rough Carpentry" for plywood panel substrates.
2. Division 07 Section "Joint Sealants" for field-applied sealants not otherwise specified in this Section.

1.03 PERFORMANCE REQUIREMENTS

A. Structural Performance: Design and provide suspension system and metal soffit panels capable of withstanding exterior exposure and the effects of gravity loads and the following loads and stresses without showing permanent deformation of ceiling system components including pans and suspension system; noise or metal fatigue caused by vibration, deflection, and displacement of ceiling units; or permanent damage to fasteners and anchors.

1. Wind Load: Uniform pressure of 25 lbf/sq. ft., acting inward or outward.

B. General: Provide metal soffit panel assemblies that comply with performance requirements specified as determined by testing manufacturers' standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.

C. Thermal Movements: Provide metal soffit panel assemblies that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and night-time-sky heat loss.

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

1.04 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal soffit panel and accessory.

B. Shop Drawings: Show fabrication and installation layouts of metal soffit panels; details of edge conditions, joints, panel profiles, corners, anchorages, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work.

1. Accessories: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:

   a. Flashing and trim.

C. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:

1. Joint pattern.
2. Ceiling suspension members.

D. Samples for Verification: For each type of metal soffit panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories.

E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for the following:

1. Metal Soffit Panels: Include reports for air infiltration, water penetration, and structural performance.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Source Limitations: Obtain each type of metal soffit panels through one source from a single manufacturer.

C. Mockups: Before beginning installation of work specified in this section, for products/materials that are required to be part of the integrated exterior wall mockup panel specified in Division 01 Section “Mockups”, obtain all necessary approvals required as part of the submittal process and install required products/materials in mockup panel to demonstrate overall quality, proposed range of aesthetic effects, workmanship and general installation execution.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, metal soffit panels, and other manufactured items so as not to be damaged or deformed. Package metal soffit panels for protection during transportation and handling.

B. Unload, store, and erect metal soffit panels in a manner to prevent bending, warping, twisting, and surface damage.

1.07 PROJECT CONDITIONS

A. Field Measurements: Verify locations of soffit framing and soffit opening dimensions by field measurements before metal soffit panel fabrication and indicate measurements on Shop Drawings.

1.08 COORDINATION

A. Coordinate soffit penetrations with structural supports and Division 16 items.

1.10 WARRANTY

A. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal soffit panels 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: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 PANEL MATERIALS

A. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40; structural quality.
2. Surface: Smooth, flat finish.
3. Exposed Finishes: Apply the following coil coating, as specified or indicated on Drawings.

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

1) Fluoropolymer Three-Coat System: Manufacturer's standard three coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with physical properties and coating performance requirements of AAMA 2605, except as modified below:

4. Concealed Finish: Apply pretreatment and 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. Panel Sealants:

1. Joint Sealant: ASTM C 920; elastomeric silicone sealant; of type, grade, class, and use classifications required to seal joints in metal soffit panels and remain weathertight; and as recommended in writing by metal soffit panel manufacturer.

2.02 MISCELLANEOUS MATERIALS

A. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed

fasteners with heads matching color of metal soffit panels by means of plastic caps or factory-applied coating.

1. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
2. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.03 METAL SOFFIT PANELS

A. General: Provide factory-formed metal soffit panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.

1. Manufacturers:

a. CENTRIA Architectural Systems.
b. Dimensional Metals, Inc. (DMI)
c. Firestone Metals.
d. McElroy Metal, Inc.
e. Petersen Aluminum Corporation.
f. Or approved equal.

B. Flush-Profile Metal Soffit Panels: Perforated panels formed with vertical panel edges and flat pan between panel edges; with flush joint between panels.

1. Material: Zinc-coated (galvanized) steel sheet, 26 gage thick.

a. Exterior Finish: Fluoropolymer.
b. Color: Finish to match Architect’s sample Charcoal Finish. Match wall, roof and storefront color selection.

2. Panel Coverage: 12 inches.
3. Panel Depth: 1 inch to 1-1/2 inch.

2.04 ACCESSORIES

A. Soffit Panel Accessories: Provide components required for a complete metal soffit panel assembly including trim, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels, unless otherwise indicated.

B. Flashing and Trim: Formed from 0.0179-inch- thick, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating. Provide flashing and trim as required to seal against weather and to provide finished appearance.

1. Provide expansion flashing at juncture of canopy with building wall.

2.05 METAL FRAMING/SUSPENSION SYSTEMS

A. Sub-framing Systems: Provide secondary framing, including hat or zee furring channels to attach soffit system to canopy or eave substrate, complete with connector clips, alignment clips, leveling clips, fixture adapters, and other components required to support

soffit units and other ceiling-supported construction.

1. Hot-Dip Galvanized Steel: ASTM A 653/A 653M, not less than G60 zinc coating.

B. Attachment Devices: Size for 5 times the design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated.

C. Edge Moldings and Trim: Provide exposed members as indicated or required to conceal edges of penetrations through ceiling, to conceal ends of pans and carriers, for fixture trim and adapters, for fasciae at changes in ceiling height, and for other conditions; of metal and finish matching linear metal pans or extruded plastic, unless otherwise indicated.

2.06 FABRICATION

A. General: Fabricate and finish metal soffit panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.

1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
2. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.

2.07 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal soffit panel supports, and other conditions affecting performance of work.

B. Examine roughing-in for components and systems penetrating metal soffit panels to verify actual locations of penetrations relative to seam locations of metal soffit panels before metal soffit panel installation.

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

3.02 PREPARATION

A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.

B. Install flashings and other sheet metal to comply with requirements specified in Division 07 Section "Sheet Metal Flashing and Trim."

C. Install fasciae and to comply with requirements specified in Division 07 Section "Metal Roof Panels."

D. Miscellaneous Framing: Install subpurlins, eave angles, furring, and other miscellaneous soffit panel support members and anchorage according to metal soffit panel manufacturer's written recommendations.

1. Soffit Framing: Wire-tie furring channels to supports, as required to comply with requirements for assemblies indicated.

3.03 INSTALLATION

A. General: Install metal soffit panels to comply with ASTM C 636 for soffits, per manufacturer's written instructions and CISCA's "Soffit Systems Handbook."

B. Install edge moldings and trim of type indicated at perimeter of linear metal soffit area and where necessary to conceal edges and ends of linear metal pans.

C. Install sub-framing system carriers so they are aligned and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

D. Cut linear metal pans for accurate fit at borders and at interruptions and penetrations by other work through soffits. Stiffen edges of cut units as required to eliminate evidence of buckling or variations in flatness exceeding referenced standards for stretcher-leveled metal sheet.

E. Install linear metal pans in coordination with suspension system and exposed moldings and trim.

1. Align joints in adjacent courses to form uniform, straight joints parallel to canopy axis in both directions, unless otherwise indicated.
2. Fit adjoining units to form flush, tight joints. Scribe and cut units for accurate fit at borders and around construction penetrating soffit.
3. At canopy soffits, install pans with butt joints using internal pan splices and in random configuration.

F. Fasteners: Use stainless-steel fasteners for surfaces exposed to the exterior and galvanized steel fasteners for protected surfaces.

G. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal soffit panel manufacturer.

H. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof soffit performance of metal soffit panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal soffit panel manufacturer.

1. Seal metal soffit panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal soffit panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

3.04 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal soffit panel assembly including trim, flashings, sealants, gaskets, fillers, closure strips, and similar items.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Expansion Provisions: Provide for thermal expansion. Space movement joints at manufacturer’s recommended maximum spacing.

C. Penetration Flashing: Form flashing around penetrations. Fasten and seal to metal soffit panels as recommended by manufacturer.

3.05 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal soffit panel units within installed tolerance of 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.06 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal soffit panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal soffit panel installation, clean finished surfaces as recommended by metal soffit panel manufacturer. Maintain in a clean condition during construction.

B. Replace metal soffit panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

GENERAL

1.1 RELATED DOCUMENTS

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. Resilient base.
2. Resilient molding accessories.

B. Related Sections:

1. Section 096519 "Resilient Tile Flooring" for resilient floor tile.
2. Section 096813 "Tile Carpeting" for tile carpeting.

1.3 ACTION SUBMITTALS

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

B. Samples for Initial Selection: For each type of product indicated.

C. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches long, of each resilient product color, texture, and pattern required.

D. Product Schedule: For resilient products.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish one unopened box of each type, color, pattern, and size of resilient product installed.

1.5 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.7 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following time periods:

1. 48 hours before installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 VINYL BASE

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

1. Tarkett USA Inc. Millwork Wall Finishing System – Mandalay 6” Wall Base.
2. Or approved equal.

B. Product Standard: ASTM F 1861, Type TP (Thermoplastic)

1. Group: I (solid, homogeneous).
2. Style: Mandalay

C. Minimum Thickness: 3/8 inch.

D. Height: As follows:

1. 6 inch wall base.

E. Lengths: Manufacturer's standard length, but not less than 8 feet.

F. Colors and Patterns: As selected by Architect from full range of industry colors.

2.2 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), except that adhesive for rubber stair treads shall have a VOC content of 60 g/L or less.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

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

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates for Resilient Stair Treads and Accessories: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
4. Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until they are same temperature as the space where they are to be installed.

1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Job-Formed Corners:

1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.

a. Resilient base shall not be stretched around corners to the extent that it exposes flooring raw edges and subfloor normally hidden beneath cove base toe. This condition is unacceptable and will be rejected, to be corrected before final acceptance of the Work.

2. Inside Corners: Use straight pieces of maximum lengths possible.

3.4 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of carpet or resilient floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.

B. Perform the following operations immediately after completing resilient product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Cover resilient products until Substantial Completion.

END OF SECTION 096513

SECTION 096813 - TILE CARPETING

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 modular, tufted and hobnail thermal bonded carpet tile.

B. Related Requirements:

1. Division 09 Section "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet tile.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at project site.

1. Convene one (1) week prior to commencing work of this section.

2. Require attendance of manufacturer, installer, contractor, architect and other parties directly affecting the work of this section.

3. Review methods and procedures related to carpet tile installation including, but not limited to, the following:

a. Review delivery, storage, and handling procedures.
b. Review ambient conditions and ventilation procedures.
c. Review subfloor preparation procedures.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
2. Include installation recommendations for each type of substrate.

B. Shop Drawings: Show the following:

1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
2. Carpet tile seams, including all seams of 24 inch by 24 inch modular grid.
3. Carpet tile type, color, and dye lot.
4. Type of subfloor.
5. Type of installation.
6. Pattern of installation.
7. Pattern type, location, and direction.
8. Pile direction.

9. Type, color, and location of insets and borders.
10. Type, color, and location of edge, transition, and other accessory strips.
11. Transition details to other flooring materials.

C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet Tile: Full-size Sample.
2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- (300-mm-) long Samples.

D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer/Carpet Contractor.

B. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.

C. Sample Warranty: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:

1. Methods for maintaining carpet tile, including recommended cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

B. Installation Instructions: For carpet tiles to include in maintenance manuals. Include the following:

1. Include detailed modular replacement procedures. Include modular installation procedures, adhesive types, trowel sizes, spread rates, open times, and Material Safety data sheets (MSDS) for all modular adhesives.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd. (8.3 sq. m).

1.8 QUALITY ASSURANCE

A. Installer/Carpet Contractor Qualifications:

1. All work shall be done by installation firms specializing in commercial carpet installation. It is required, that the firm or individual shall be a member of the Floor Covering Installation Contractors Association (FCICA) and/or certified by the Certified Floorcovering Installers Association (CFI). Flooring contractor to be specialty contractor normally engaged in this type of work and shall have three (3) years minimum documented experience in commercial installation of these materials and participation in manufacturer’s environmental program including responsible carpet removal, recycling, and installation.

2. Flooring contractor will be responsible for the proper product installation, including floor preparation in all the areas indicated in the drawings to receive carpet. The carpet installation standard will be as listed in The Carpet and Rug Institute (CRI) Carpet Installation, 2011, the standard that establishes the minimum installation procedures.
3. Carpet Contractor to provide references at the request of the owner.

B. Carpet manufacturer to provide field service experts to assist in project start-up as required by the job. Manufacturer will notify owner, architect, general contractor, or another designated contact if any installation instructions are not followed.

C. Fire-Test-Response Ratings: Where indicated, provide carpet tile identical to those of assemblies tested for fire response according to NFPA 253 by a qualified testing agency.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI Carpet Installation Standard, 2011, First Edition.

1.10 FIELD CONDITIONS

A. Comply with CRI Carpet Installation Standard for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.

C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.11 WARRANTY

A. Special Warranty for Tile Carpeting: Installer and Manufacturer warranties for specified warranty period:

1. Carpet Installer shall provide owner a written warranty that guarantees the completed installation be free from defects in workmanship for a period of two (2) years after job completion.
2. Carpet Manufacturer shall provide standard published written performance warranties for the following:

    a. Modular Carpet: Minimum 15 year warranty period, non-prorated.

PART 2 - PRODUCTS

2.1 MODULAR CARPET TILE:

A. Subject to compliance with requirements, provide the following products, or Approved Equal. Equal products must be approved by Architect prior to bid opening:

1. CPT-1: Interface – Modular Carpet Tile

    a. Manufacturer: InterfaceFLOR, LLC
    b. Pattern: Skylights

c. Colors: Onyx 103486.
d. Installation Method: Ashlar

2. CPT-2: Interface – Modular Carpet Tile

a. Manufacturer: InterfaceFLOR, LLC
b. Pattern: Skylights
c. Colors: Lead 103490.
d. Installation Method: Ashlar

3. CPT-3: Interface – Modular Carpet Tile

a. Manufacturer: InterfaceFLOR, LLC
b. Pattern: SR899 Walk-Off
c. Colors: Onyx 104941.
d. Installation Method: Ashlar
e. Provide National Guard Logo cut into field tile using FLOR Industrious Iron wotj CQuest Bio Backing.

2.2 MODULAR CARPET TILE CONSTRUCTION:

A. All yarn and other carpet materials shall be manufacturer's first quality.

B. Modular backing composite shall be constructed in the following manner:

1. Backing Material/Composition:

a. Primary – Reinforced synthetic – non woven
b. Bonding Agent – Premium vinyl composite polymer
c. Secondary – Fiberglass reinforced vinyl composite polymer

2. Total Backing Weight: Minimum of 110 ounces per square yard

2.3 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.

1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

C. Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:

1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.
2. Subfloor finishes comply with requirements specified in Division 03 Section "Cast-in-Place Concrete" for slabs receiving carpet tile.
3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.

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

3.2 PREPARATION

A. General: Comply with CRI Carpet Installation Standard 2011, Section 7.3 "Substrates; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider and protrusions more than 1/32 inch (0.8 mm) unless more stringent requirements are required by manufacturer's written instructions.

C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.]

1. Existing concrete slab substrates: Remove old adhesives using mechanical methods.

D. Clean metal substrates of grease, oil, soil and rust, and prime if directed by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.

E. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

F. Preheat areas to receive modular carpet to a minimum temperature of 68^{o} F for 72 hours prior to installation, with a relative humidity of not more than 65 percent. Maintain minimum temperature of 50^{o} F thereafter. Modular carpet and adhesive must be stored at a minimum temperature of 68^{o} F, for 72 hours prior to installation.

G. Store carpet tile adhesive and other liquid materials in same atmospheric conditions as carpet, 68^{o} F for at least 72 hours.

3.3 INSTALLATION

A. General: Comply with Carpet Installation Standard 2011, Section 18, "Modular Carpet," and with carpet tile manufacturer's written installation instructions.

B. Installation Method: Install modular carpet in accordance with manufacturer’s written instructions.

C. Maintain dye lot integrity. Do not mix dye lots in same area.

D. Perform cutting in accordance with manufacturer's recommendation using tools designed for modular carpet being installed. Verify modular carpet patterns and colors before cutting to insure minimal variation between dye lots.

E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

H. Install modular carpet according to manufacturer's instructions. Depending on the product specification, install either monolithically, quarter turned, Ashlar, or random. Installation requirements will be spelled out in the architectural drawings for the recommended method to be employed.

I. Install edging guards at openings and doors wherever modular carpet terminates, unless indicated otherwise.

J. Use leveling compound where necessary. Feather floor leveling compounds minimum of 4 ft.

3.4 CLEANING AND PROTECTION

A. Perform the following operations immediately after installing carpet tile:

1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
2. Remove yarns that protrude from carpet tile surface.
3. Vacuum carpet tile using commercial machine with face-beater element.

B. Protect installed carpet tile to comply with CRI Carpet Installation Standard 2011, Section 20, "Protecting Indoor Installations."

1. Restrict traffic over installed carpet tile for a minimum of 24-48 hours after installation to allow adhesives to cure properly.
2. Restrict carpet exposure to water from cleaning or other sources for a minimum of 30 days after installation.
3. If other on-site work is continuing, use protective covering over finished floor to protect flooring from damage by soil, paint, or the work of other trades:

    a. Cover finished flooring with plain, undyed kraft paper:

        1) Kraft Shield or approved equal.

    b. Seam multiple pieces together with tape for larger areas.
    c. Do not adhere tape directly to floors.
    d. When finished, roll up protective covering and discard.

4. Protect carpet tile against damage from construction operations and placement of heavy equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 096813

SECTION 12 35 30 - CASEWORK

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. Related Sections:

1. Section 06 10 00 – Rough Carpentry

1.3 DEFINITIONS

A. MDF: Medium-density fiberboard.

B. Exposed Surfaces of Cabinets: Surfaces visible when doors and drawers are closed, including visible surfaces in open cabinets or behind glass doors.

C. Semiexposed Surfaces of Cabinets: Surfaces behind opaque doors or drawer fronts, including interior faces of doors, interiors and sides of drawers, and bottoms of wall cabinets.

D. Concealed Surfaces of Cabinets: Surfaces not usually visible after installation, including sleepers, web frames, dust panels, bottoms of drawers, ends of cabinets installed directly against and completely concealed by walls or other cabinets, and tops of wall cabinets and utility cabinets.

1.4 REFERENCES

A. American National Standards Institute
1. ANSI/BHMA A156.9 American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association.
2. ANSI/KCMA A161.1 - Performance and Construction Standard for Kitchen and Vanity Cabinets; Kitchen Cabinet Manufacturers Association; 2012 (ANSI/KCMA A161.1).

B. EPA TSCA Title VI / CARB P2 / Health Canada Compliant for formaldehyde.

C. Builders Hardware Manufacturers Association (BHMA).

D. Kitchen Cabinet Manufacturers Association (KCMA).

1.5 ACTION SUBMITTALS

A. Product Data: For the following:

1. Cabinets.
2. Cabinet hardware.

B. Shop Drawings: Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, and hardware.

C. Samples for Initial Selection: For cabinet finishes.

D. Samples for Verification: 8-by-10-inch (200-by-250-mm) Samples for each type of finish and the following:

1. Exposed hardware, for each type of item.
2. One full-size, 12 inches (304 mm) wide finished wall cabinet complete with hardware, doors, and adjustable shelves.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer that is certified for chain of custody by an FSC-accredited certification body.

B. Manufacturer Qualifications: 20+ years experience manufacturing similar products.

C. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.

D. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet work is complete and dry, and temporary HVAC system is operating and maintaining temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Established Dimensions: Where casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Provide fillers and scribes to allow for trimming and fitting.

C. Field Measurements: Where casework is indicated to fit to existing construction, verify dimensions of existing construction by field measurements before fabrication and indicate measurements on Shop Drawings. Provide fillers and scribes to allow for trimming and fitting.

1.8 COORDINATION

A. Coordinate layout and installation of blocking and reinforcement in partitions for support of casework.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store and handle in strict compliance with manufacturer's written instructions and recommendations.

B. Protect from damage due to weather, excessive temperature, and construction operations.

1.10 PROJECT CONDITIONS

A. A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.11 WARRANTY

A. Manufacturer's Warranty: Provide manufacturer's material and workmanship warranty.
1. Limited Warranty Duration: 1 year

PART 2 - PRODUCTS

2.1 METAL LABORATORY CABINETS – **ABI 6 0NLY**

A. Manufacturers:
1. JW Metal Cabinets.
2. LOC Scientific.
3. Metal Arc, Inc.
4. Prime Aire.
5. Or approved equal

B. Construction:
1. Cabinets shall be constructed of prime 18-gauge steel for the sides, backs, and toe space.
1" X 18-gauge steel tubing shall be used for the top front and back rails. Each front joint is to be welded and ground flush to provide a smooth surface. A 4' high X 3' deep toe space shall be standard. Four corners are to be fitted with a stamped and welded 14-gauge leveling gusset plate, and a plated leveling screw. Leveling screws are provided with a slot for easy adjustment, and non-marking nylon glides. Removable back panels shall be furnished on all cabinets. Cabinet bottom will be panned up to contain spills and removable for easy cleaning and maintenance.

2. Doors – Base Cabinet Doors:
Doors shall be double pan construction, with insulating material fastened to the inside for sound deadening, and strength, to prevent panning and bending. Hinges are five knuckle gauge stainless steel, fastened to both the door and cabinet frame with zinc plated steel screws. Door catches plated, friction roller type. Door closes onto nylon bumpers for noise dampening, and over nylon spacers for alignment.

3. Drawers:
Drawer bodies shall be one piece 20-gauge construction, fully coved on all four sides horizontally and formed out of one sheet of steal.

4. Drawer Suspension:
5. Drawers shall operate on full extension, ball bearing, zinc plated, drawer suspension rated to withstand 10,000 cycles at 100 lbs.

6. Shelves:
Shelves shall be constructed of 18-gauge steel, with channels formed on both the front and back edges. K & V shelf clips are made from 14 gauge steel, and are to be adjustable vertically in 1" increments. Sliding shelves shall use the same ball bearing slides as drawer units.

7. Fabricated Accessories:
All accessories required for specific installations shall be fabricated and finished to the same material and quality standards as the base units they will be made to compliment.

8. Finish:
All surfaces shall be painted or plated, whether they are exposed or not. Paint is to be chemically resistant baked on epoxy powder coat enamel

2.2 LAMINATE CABINETS – Base Bid & ABI 1

1. Cabinet Cases

A. Top, Base and Side Panels

1) Commercial grade (MS) furniture board: 3/4 inch thick
2) Interior Finish: White Melamine
3) Exterior Finish: High Pressure Laminate as scheduled where exposed to view

B. Back Panel:
1) Commercial grade 3/4" 45 lb Density Particle Board.

C. Toe kicks:
1) 4" Height
2) 3" Depth
3) Surface Finish: High Pressure Laminate

2. Shelves:
A. Commercial Grade (MS) Furniture Board: 3/4 inch (18 mm). In white high pressure laminate and edge banded with .0.5mm thick white thermoplastic edge banding
B. Surface finish: White with high pressure laminate
C. Front edge finish: 0.5mm thick white thermoplastic edge banding

3. Drawer Box:
A. Polypropylene wrapped miterfold drawer box: 1/2 inch thick commercial grade (MS) furniture board. (13 mm)
B. Drawer Bottom: 1/2 inch thick commercial grade (MS) furniture board. (13 mm)
1) Single sided laminated using white high quality laminate

4. Slab Drawer Front:
A. Moisture resistant MDF: 19mm thick
B. Interior and Exterior Finish: High Pressure laminate

5. Drawer Slide: Box drawer slides, full extension soft close 75lb capacity.

6. Slab Drawer Front:
A. Moisture resistant MDF: 19mm thick
B. Hinges: Six-way Soft-close
C. Interior and Exterior Finish: High Pressure laminate

7. Pulls
A. Richelieu Modern Steel Pull 305 in Brushed Nickel

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcements, and other conditions affecting performance of casework.

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

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.

B. Install cabinets with no variations in flushness of adjoining surfaces; use concealed shims. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match cabinet face.

C. Install cabinets without distortion so doors and drawers fit the openings, are aligned, and are uniformly spaced. Complete installation of hardware and accessories as indicated.

D. Install cabinets level and plumb to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m).

E. Fasten cabinets to adjacent units and to backing.

1. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with fasteners recommended by manufacturer.

3.4 ADJUSTING AND CLEANING

A. Adjust cabinets and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

B. Clean casework on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

END OF SECTION 123530

SECTION 236423.13 - AIR-COOLED SCROLL WATER CHILLERS

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 packaged, air-cooled, electric-motor-driven, scroll water chillers.

1.3 DEFINITIONS

A. BAS: Building automation system.

B. COP: Coefficient of performance. The ratio of the rate of heat removal to the rate of energy input using consistent units for any given set of rating conditions.

C. DDC: Direct digital control.

D. EER: Energy-efficiency ratio. The ratio of the cooling capacity given in Btu/h to the total power input given in watts at any given set of rating conditions.

E. GFI: Ground fault interrupt.

F. IPLV: Integrated part-load value. A single-number part-load efficiency figure of merit for a single chiller calculated per the method defined by AHRI 550/590 and referenced to AHRI standard rating conditions.

G. I/O: Input/output.

H. kW/Ton: The ratio of total power input of the chiller in kilowatts to the net refrigerating capacity in tons at any given set of rating conditions.

I. NPLV: Nonstandard part-load value. A single number part-load efficiency figure of merit for a single chiller calculated per the method defined by AHRI 550/590 and intended for operating conditions other than the AHRI standard rating conditions.

J. SCCR: Short-circuit current rating.

K. TEAO: Totally enclosed air over.

L. TENV: Totally enclosed nonventilating.

1.4 BUY AMERICAN ACT

A. The Contractor covenants and agrees that it will not expend any funds appropriated by Congress with complying with The Buy American Act (41 U.S.C. 10 et seq.). The Buy American Act gives preference to domestic end products and domestic construction material. In addition, the Memorandum of Understanding between the United States of America and the European Economic Community (EEC) on Government Procurement, and the North American Free Trade Agreement (NAFTA), provide that EEC

and NAFTA end products and construction materials are exempted from application of The Buy American Act.

B. Refer to the front-end document of the Project Manual for all requirements.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include refrigerant, rated capacities, operating characteristics, furnished specialties, and accessories.

1. Performance at ARI standard conditions and at conditions indicated.
2. Performance at ARI standard unloading conditions.
3. Minimum evaporator flow rate.
4. Refrigerant capacity of chiller and refrigerant type.
5. Oil capacity of chiller.
6. Fluid capacity of evaporator.
7. Characteristics of safety relief valves.
8. Minimum entering condenser-air temperature.
9. Maximum entering condenser-air temperature.
10. Performance at varying capacities with constant-design entering condenser-air temperature. Repeat performance at varying capacities for different entering condenser-air temperatures from design to minimum in 10 deg. F increments.
11. Flow switch requirements.
12. Short circuit withstand rating in amperes.
13. Wiring diagrams indicating factory and field wiring for power and control wiring.
14. Starter type with maximum in-rush current.
15. Acoustic performance and characteristics of sound attenuation measures.
16. Accessory characteristics (hail guards, vibration isolation) as scheduled or specified.
17. Minimum required system volume for stable operation without short cycling.

B. Shop Drawings: Complete set of manufacturer's prints of water chiller assemblies, control panels, sections and elevations, and unit isolation. Include the following:

1. Assembled unit dimensions.
2. Weight and load distribution.
3. Required clearances for maintenance and operation.
4. Size and location of piping and wiring connections.
5. Diagrams for power, signal, and control wiring.

1.6 INFORMATIONAL SUBMITTALS

A. Coordination Drawings:

1. Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

    a. Structural supports.
    b. Piping roughing-in requirements.
    c. Wiring roughing-in requirements, including spaces reserved for electrical equipment.
    d. Access requirements, including working clearances for mechanical controls and electrical equipment, and tube pull and service clearances.

2. Coordination drawings showing plan, section and elevation views, drawn to ¼”=1’-0”
3. Each view to show screened background with the following:

    a. Column grids, beams, columns, and concrete housekeeping pads.
    b. Layout with walls, floors, and roofs, including each room name and number.

c. Equipment and products of other trades that are located in vicinity of chillers and part of final installation, such as plumbing systems.

B. Certificates: For certification required in "Quality Assurance" Article.

C. Seismic Qualification Data: Certificates, for water chillers, accessories, and components, from manufacturers.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

D. Installation instructions.

E. Source quality-control reports.

F. Startup service reports.

G. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each water chiller to include in emergency, operation, and maintenance manuals.

B. Spare Parts List: Recommended spare parts list with quantity for each.

C. Touchup Paint Description: Detailed description of paint used in application of finish coat to allow for procurement of a matching paint.

D. Instructional Videos: Including those that are prerecorded and those that are recorded during training.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Tool kit to include the following:

1. A tool kit specially designed by chiller manufacturer for use in servicing chiller(s) furnished.
2. Special tools required to service chiller components not readily available to Owner service personnel in performing routine maintenance.
3. Lockable case with hinged cover, marked with large and permanent text to indicate the special purpose of tool kit, such as "Chiller Tool Kit." Text size shall be at least 1 inch (25 mm) high.
4. A list of each tool furnished. Permanently attach the list to underside of case cover. Text size shall be at least 1/2 inch (13 mm) high.

B. Touchup Paint: 32 oz. (1 L) container of paint used for finish coat. Label outside of container with detailed description of paint to allow for procurement of a matching paint in the future.

1.9 QUALITY ASSURANCE

A. AHRI Certification: Certify chiller according to AHRI 590 certification program.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Ship water chillers from the factory fully charged with refrigerant and filled with oil.

B. Package water chiller for export shipping.

1.11 WARRANTY

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

1. Extended warranties include, but are not limited to, the following:

a. Complete chiller including refrigerant and oil charge.
b. Complete compressor and drive assembly including refrigerant and oil charge.
c. Refrigerant and oil charge.

1) Loss of refrigerant charge for any reason due to manufacturer's product defect and product installation.

d. Parts and labor.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Scroll water chillers shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

B. Site Altitude: Chiller shall be suitable for altitude at which installed without affecting performance indicated. Make adjustments to affected chiller components to account for site altitude.

C. Performance Tolerance: Comply with the following in lieu of AHRI 550/590:

1. Allowable Capacity Tolerance: Zero percent.
2. Allowable Full-Load Energy Efficiency Tolerance: Zero percent.
3. Allowable Part-Load Energy Efficiency Tolerance: Zero percent.

D. AHRI Rating: Rate water chiller performance according to requirements in AHRI 550/590.

E. ASHRAE Compliance: ASHRAE 15 for safety code for mechanical refrigeration.

F. ASHRAE/IES 90.1 Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."

G. ASME Compliance: Fabricate and stamp water chiller heat exchangers to comply with ASME Boiler and Pressure Vessel Code.

H. Comply with NFPA 70.

I. Comply with requirements of UL 1995, "Heating and Cooling Equipment," and include label by a qualified testing agency showing compliance.

J. Operation Following Loss of Normal Power:

1. Equipment, associated factory- and field-installed controls, and associated electrical equipment and power supply connected to backup power system shall automatically return equipment and associated controls to the operating state occurring immediately before loss of normal power without need for manual intervention by an operator when power is restored either through a backup power source, or through normal power if restored before backup power is brought on-line.
2. See drawings for equipment served by backup power systems.
3. Provide means and methods required to satisfy requirement even if not explicitly indicated.

2.2 MANUFACTURERS

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

1. Carrier.
2. Quantech.
3. Trane.
4. York.

2.3 MANUFACTURED UNITS

A. Description: Factory-assembled and run-tested water chiller complete with compressor(s), compressor motors and motor controllers, evaporator, condenser with fans, electrical power, controls, and indicated accessories.

B. Fabricate frame and water chiller mounting base with reinforcement strong enough to resist water chiller movement during a seismic event when water chiller is anchored to field support structure.

C. Sound-reduction package shall have the following:

1. Acoustic enclosure around compressors.
2. Reduced-speed fans with acoustic treatment.
3. Designed to reduce sound level without affecting performance.
4. Low Sound Fans

D. Security Package: Security louvered panels with fasteners for additional protection of compressors, evaporator, and condenser coils. Grilles shall be coated for corrosion resistance and shall be removable for service access.

2.4 CABINET

A. Base: Galvanized-steel base extending the perimeter of water chiller. Secure frame, compressors, and evaporator to base to provide a single-piece unit.

B. Frame: Rigid galvanized-steel frame secured to base and designed to support cabinet, condenser, control panel, and other chiller components not directly supported from base.

C. Casing: Galvanized steel.

D. Finish: Coat base, frame, baked powder paint and casing with a corrosion-resistant coating capable of withstanding a 500-hour salt-spray test according to ASTM B 117.

2.5 COMPRESSOR-DRIVE ASSEMBLIES

A. Compressors:

1. Description: Positive-displacement direct drive with hermetically sealed casing.
2. Each compressor provided with suction and discharge service valves, crankcase oil heater, and suction strainer.

    a. For multiple compressor assemblies, it is acceptable to isolate each compressor assembly in lieu of each compressor.

3. Capacity Control: On-off compressor cycling.

    a. Digital compressor unloading is an acceptable alternative to achieve capacity control.
    b. Maintain stable operation throughout range of operation. Configure to achieve most energy efficient operation possible.
    c. Operating range from 100 to 15 percent of design capacity.
    d. Condenser-air unloading requirements over operating range: Drop in entering condenser air temperature of 5 deg F drop for each 10 percent in capacity reduction.
    e. For units equipped with a variable frequency controller, capacity control shall be both "valve-less" and "step-less," requiring no slide valve or capacity-control valve(s) to operate at reduced capacity.

4. Oil Lubrication System: Automatic pump with strainer, sight glass, filling connection, filter with magnetic plug or removable magnet in sump, and initial oil charge.

    a. Manufacturer's other standard methods of providing positive lubrication are acceptable in lieu of an automatic pump.

5. Vibration Isolation: Mount individual compressors on vibration isolators.

    a. For multiple compressor assemblies, it is acceptable to isolate each compressor assembly in lieu of each compressor.

B. Compressor Motors:

1. Hermetically sealed and cooled by refrigerant suction gas.
2. High-torque, two-pole induction type with inherent thermal-overload protection on each phase.

C. Compressor Motor Controllers:

1. Across the Line: NEMA ICS 2, Class A, full voltage, nonreversing.
2. Variable frequency controller:

    a. Motor controller shall be factory mounted and wired on the chiller to provide a single-point, field-power termination to the chiller and its auxiliaries.
    b. Description: NEMA ICS 2; listed and labeled as a complete unit and arranged to provide variable speed by adjusting output voltage and frequency.
    c. Enclosure: Unit mounted, NEMA 250, Type 3R, with hinged full-front access door with lock and key.
    d. Integral disconnecting means: Door-interlocked, NEMA AB 1, instantaneous-trip circuit breaker with lockable handle. Minimum withstand rating shall be as required by electrical power distribution system, but not less than 65,000 A.
    e. Technology: Pulse width modulated (PWM) output suitable for constant or variable torque loads.
    f. Motor current at start shall not exceed the rated load amperes, providing no electrical inrush.

2.6 REFRIGERATION

A. Refrigerant: Type as indicated on Drawings.

B. Refrigerant Compatibility: Parts exposed to refrigerants shall be fully compatible with refrigerants, and pressure components shall be rated for refrigerant pressures.

C. Refrigerant Circuit: Each circuit shall include an electronic or a thermal-expansion valve, refrigerant charging connections, a hot-gas muffler, compressor suction and discharge shutoff valves, a liquid-line shutoff valve, a replaceable-core filter-dryer, a sight glass with moisture indicator, a liquid-line solenoid valve, and an insulated suction line.

D. Refrigerant Isolation: Factory install positive shutoff isolation valves in the compressor discharge line and the refrigerant liquid-line to allow the isolation and storage of the refrigerant charge in the chiller condenser.

1. For multiple compressor assemblies, it is acceptable to isolate each compressor assembly in each circuit in lieu of each compressor.

E. Pressure Relief Device:

1. Comply with requirements in ASHRAE 15, ASHRAE 147, and applicable portions of ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.
2. Select and configure pressure relief devices to protect against corrosion and inadvertent release of refrigerant.
3. ASME-rated, spring-loaded, pressure relief valve; single- or multiple-reseating type. Pressure relief valve(s) shall be provided for each heat exchanger.

F. field installation.

2.7 EVAPORATOR

A. Brazed-plate design, as indicated.

B. Brazed Plate:

1. Direct-expansion, single-pass, brazed-plate design.
2. Type 304 or 316 stainless-steel construction.
3. Code Compliance: Tested according to ASME Boiler and Pressure Vessel Code.
4. Fluid Nozzles: Terminate with mechanical coupling or flanged end connections for connection to field piping.
5. Inlet Strainer: Factory-furnished, 20 mesh strainer for field installation in supply piping to evaporator. Manufacturer has option to factory install strainer.

C. Flow Switch: Factory-furnished and -installed, thermal-type flow switch wired to chiller operating controls.

D. Heater: Factory-installed and -wired electric heater with integral controls designed to protect the evaporator to minus 20 deg F.

E. Remote-Mounting Kit: Designed for remote field mounting where indicated. Provide kit for field installation.

2.8 AIR-COOLED CONDENSER

A. Coil(s) with integral subcooling on each circuit.

B. Copper Tube with Plate Fin Coils:

1. Construct coils of copper tubes mechanically bonded to aluminum fins.

C. Aluminum Microchannel Coils:

1. Series of flat tubes containing a series of multiple, parallel-flow microchannels layered between refrigerant header manifolds.
2. Single- or multiple-pass arrangement.
3. Construct fins, tubes, and header manifolds of aluminum alloy treated with a corrosion-resistant coating.

D. Hail Protection: Provide condenser coils with louvers, baffles, or hoods to protect against hail damage.

E. Fans: Direct-drive propeller type with statically and dynamically balanced fan blades, arranged for vertical air discharge.

F. Fan Motors: TENV or TEAO enclosure, with sealed and permanently lubricated bearings, and having built-in overcurrent- and thermal-overload protection.

1. Overcurrent- and thermal-overload protection not integral to motor is acceptable if provided with chiller electrical power package.

G. Fan Guards: Removable steel safety guards with corrosion-resistant coating.

2.9 HEAT RECOVERY CONDENSER

A. Brazed plate, or shell and tube; as indicated, capable of heat recovery.

B. Brazed Plate:

1. Type 316 stainless-steel construction.
2. Code Compliance: Tested according to ASME Boiler and Pressure Vessel Code.
3. Fluid Nozzles: Terminate with mechanical-coupling end connections for connection to field piping.
4. Inlet Strainer: Factory-furnished, 20-mesh strainer for field installation in supply piping to condenser. Manufacturer has option to factory install strainer.

C. Heater: Factory-installed and -wired electric heater with integral controls designed to protect the heat recovery condenser to minus 20 deg F.

D. Insulation: Insulation on heat recovery condenser shall match evaporator.

E. Controls: Integral to chiller control package.

2.10 INSULATION

A. Closed-cell, flexible, elastomeric thermal insulation complying with ASTM C534/C534M, Type I for tubular materials and Type II for sheet materials.

1. Thickness: 3/4 inches

B. Adhesive: As recommended by insulation manufacturer.

C. Factory-applied insulation over all cold surfaces of chiller capable of forming condensation. Components shall include, but not be limited to, evaporator, evaporator water boxes including nozzles, refrigerant suction pipe from evaporator to compressor, cold surfaces of compressor, refrigerant-cooled motor, and auxiliary piping.

1. Apply adhesive to 100 percent of insulation contact surface.
2. Before insulating steel surfaces, prepare surfaces for paint, and prime and paint as indicated for other painted components. Do not insulate unpainted steel surfaces.
3. Seal seams and joints to provide a vapor barrier.
4. After adhesive has fully cured, paint exposed surfaces of insulation to match other painted parts.
5. Manufacturer has option to factory or field insulate chiller components to reduce potential for damage during installation.
6. Field-Applied Insulation:

    a. Components that are not factory insulated shall be field insulated to comply with requirements indicated.
    b. Manufacturer shall be responsible for chiller insulation whether factory or field installed to ensure that manufacturer is the single point of responsibility for chillers.
    c. Manufacturer's factory-authorized service representative shall instruct and supervise installation of field-applied insulation.
    d. After field-applied insulation is complete, paint insulation to match factory-applied finish.

2.11 ELECTRICAL

A. Factory installed and wired, and functionally tested at factory before shipment.

B. Factory-installed and -wired switches, motor controllers, transformers, and other electrical devices necessary shall provide a single-point field power connection to water chiller.

C. House in a unit-mounted, NEMA 250, Type 4 enclosure with hinged access door with lock and key or padlock and key.

D. Wiring shall be numbered and color-coded to match wiring diagram.

E. Factory wiring shall be located outside of an enclosure in a raceway. Terminal connections shall be made with not more than a 24-inch length of liquidtight or flexible metallic conduit.

F. Field power interface shall be to wire lugs, NEMA KS 1, heavy-duty, nonfused disconnect switch. Minimum SCCR according to UL 508 shall be as required by electrical power distribution system, but not less than 65,000 A.

G. Each motor shall have branch power circuit and controls with one of the following disconnecting means having SCCR to match main disconnecting means:

    1. NEMA KS 1, heavy-duty, fusible switch with rejection-type fuse clips rated for fuses. Select and size fuses to provide Type 2 protection according to IEC 60947-4-1.
    2. NEMA KS 1, heavy-duty, nonfusible switch.
    3. UL 489, motor-circuit protector (circuit breaker) with field-adjustable, short-circuit trip coordinated with motor locked-rotor amperes.

H. Each motor shall have overcurrent protection.

I. Overload relay sized according to UL 1995, or an integral component of water chiller control microprocessor.

J. Phase-Failure and Undervoltage: Solid-state sensing with adjustable settings.

K. Power Factor Correction: Capacitors to correct power factor to 0.95 at full load.

L. Controls Transformer: Unit-mounted transformer with primary and secondary fuses and sized with enough capacity to operate electrical load plus spare capacity.

    1. Power unit-mounted, ground fault interrupt (GFI) duplex receptacle.

M. Control Relays: Auxiliary and adjustable time-delay relays, or an integral to water chiller microprocessor.

N. Service Receptacle:

1. Unit-mounted, 120-V GFI duplex receptacle.
2. Power receptacle from chiller internal electrical power wiring.

O. Indicate the following for water chiller electrical power supply:

1. Current, phase to phase, for all three phases.
2. Voltage, phase to phase and phase to neutral for all three phases.
3. Three-phase real power (kilowatts).
4. Three-phase reactive power (kilovolt amperes reactive).
5. Power factor.
6. Running log of total power versus time (kilowatt hours).
7. Fault log, with time and date of each.

2.12 CONTROLS

A. Factory installed and wired, and functionally tested at factory before shipment.

B. Standalone, microprocessor based, with all memory stored in nonvolatile memory so that reprogramming is not required on loss of electrical power.

C. Enclosure: Share enclosure with electrical power devices or provide a separate enclosure of matching construction.

D. Operator Interface: Keypad or pressure-sensitive touch screen. Multiple-character, digital display. Display the following:

1. Date and time.
2. Operating or alarm status.
3. Operating hours.
4. Outside-air temperature if required for chilled-water reset.
5. Temperature and pressure of operating set points.
6. Chilled-water entering and leaving temperatures.
7. Refrigerant pressures in evaporator and condenser.
8. Saturation temperature in evaporator and condenser.
9. No cooling load condition.
10. Elapsed time meter (compressor run status).
11. Pump status.
12. Antirecycling timer status.
13. Percent of maximum motor amperage.
14. Current-limit set point.
15. Number of compressor starts.
16. Alarm history with retention of operational data before unit shutdown.
17. Superheat.

E. Control Functions:

1. Manual or automatic startup and shutdown time schedule.
2. Capacity control based on evaporator leaving-fluid temperature.
3. Capacity control compensated by rate of change of evaporator entering-fluid temperature.
4. Chilled-water entering and leaving temperatures, control set points, and motor load limit. Chilled-water leaving temperature shall be reset based on return-water or outside-air temperature.
5. Current limit and demand limit.
6. Condenser-water temperature.
7. External water chiller emergency stop.
8. Antirecycling timer.

9. Automatic lead-lag switching.
10. Ice-building mode.

F. Manual-Reset Safety Controls: The following conditions shall shut down water chiller and require manual reset:

1. Low evaporator pressure or high condenser pressure.
2. Low chilled-water temperature.
3. Refrigerant high pressure.
4. High or low oil pressure.
5. High oil temperature.
6. Loss of chilled-water flow.
7. Loss of condenser-water flow.
8. Control device failure.

G. BAS System Interface: Factory-install hardware and software to enable system to monitor, control, and display chiller status and alarms.

1. Hardwired I/O Points:

a. Refer to temperature control schematics for a complete list of points.
b. Monitoring: On/off status, common trouble alarm, electrical power demand (kilowatts)], electrical power consumption (kilowatt hours).
c. Control: On/off operation, chilled-water discharge temperature set-point adjustment.

2. Communication Interface: ASHRAE 135 (BACnet) communication interface shall enable control system operator to remotely control and monitor the water chiller from an operator workstation. Control features and monitoring points displayed locally at water chiller control panel shall be available through DDC system for HVAC.

H. Factory-installed wiring outside of enclosures shall be in NFPA 70-complaint raceway. Make terminal connections with liquidtight or flexible metallic conduit.

2.13 ACCESSORIES

A. Hail Guards to be provided by chiller manufacturer.
1. Protective Chiller Panels: Louver/wire panels: Louvered steel panels on external condenser coils painter as per remainder of the units cabinet. Heavy gauge, welded wire-mesh coated to resist corrosion, around base of machine to restrict unauthorized access.

B. Factory-furnished neoprene isolators for field installation.

C. Low ambient control – permits unit to operate to -10°F ambient.
1. High Ambient Control – permits unit to operate above 115°F ambient.

2.14 SOURCE QUALITY CONTROL

A. Perform functional test of water chillers before shipping.

B. Factory performance test water chillers, before shipping, according to AHRI 550/590.

1. Test the following conditions:

a. Design conditions indicated.
b. AHRI 550/590 part-load points.

C. For water chillers located outdoors, rate sound power level according to AHRI 370 procedure.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Before water chiller installation, examine roughing-in for equipment support, anchor-bolt sizes and locations, piping, controls, and electrical connections to verify actual locations, sizes, and other conditions affecting water chiller performance, maintenance, and operations.

1. Water chiller locations indicated on Drawings are approximate. Determine exact locations before roughing-in for piping, controls, and electrical connections.

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

3.2 WATER CHILLER INSTALLATION

A. Coordinate sizes and locations of bases with actual equipment provided. Cast anchor-bolt inserts into concrete bases.

B. Coordinate sizes, locations, and anchoring attachments of structural-steel support structures with actual equipment provided.

C. Install water chillers on support structure indicated.

D. Equipment Mounting:

1. Install water chillers on cast-in-place concrete equipment bases using elastomeric pads. Comply with requirements for equipment bases and foundations specified in Division 3.
2. Comply with requirements for vibration isolation and seismic-control devices specified in Section 230548 "Vibration and Seismic Controls for HVAC or 230548.13 "Vibration Controls for HVAC."

E. Maintain manufacturer's recommended clearances for service and maintenance.

F. Maintain clearances required by governing code.

G. Chiller manufacturer's factory-trained service personnel shall charge water chiller with refrigerant if not factory charged and fill with oil if not factory installed.

H. Install separate devices furnished by manufacturer and not factory installed.

1. Chillers shipped in multiple major assemblies shall be field assembled by chiller manufacturer's factory-trained service personnel.

3.3 PIPING CONNECTIONS

A. Comply with requirements in Section 232113 "Hydronic Piping" and Section 232116 "Hydronic Piping Specialties." Drawings indicate general arrangement of piping, fittings, and specialties.

B. Comply with requirements in Section 232300 "Refrigerant Piping." Drawings indicate general arrangement of piping, fittings, and specialties.

C. Where installing piping adjacent to chillers, allow space for service and maintenance.

D. Evaporator Fluid Connections:

1. Connect to evaporator inlet with shutoff valve, strainer, flexible connector as required, thermometer, and plugged tee with pressure gage.
2. Connect to evaporator outlet with shutoff valve, balancing valve, flexible connector as required, flow switch, thermometer, plugged tee with pressure gage, flow meter, and drain connection with valve.
3. Make connections to water chiller with a flange or mechanical coupling.

E. Connect each drain connection with a drain valve, full size of drain connection. Connect drain pipe to drain valve with union and extend drain pipe to terminate over floor drain.

F. Connect each chiller vent connection with an automatic or a manual vent, full size of vent connection.

3.4 ELECTRICAL POWER CONNECTIONS

A. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

B. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

C. Provide nameplate for each electrical connection indicating electrical equipment designation and circuit number feeding connection. Nameplate shall be laminated phenolic layers of black with engraved white letters at least 1/2 inch high. Locate nameplate where easily visible.

3.5 CONTROLS CONNECTIONS

A. Install control and electrical power wiring to field-mounted control devices.

B. Connect control wiring between chillers and other equipment to interlock operation as required to provide a complete and functioning system.

C. Connect control wiring between chiller control interface and DDC system for remote monitoring and control of chillers. Comply with requirements in Section 230923 "Direct Digital Control (DDC) System for HVAC."

D. Provide nameplate on face of chiller control panel indicating control equipment designation serving chiller and the I/O point designation for each control connection. Nameplate shall be laminated phenolic layers of black with engraved white letters at least 1/2 inch high.

3.6 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

B. Inspect field-assembled components, equipment installation, and piping and electrical connections for proper assemblies, installations, and connections.

C. Complete installation and startup checks according to manufacturer's written instructions and perform the following:

1. Verify that refrigerant charge is sufficient and water chiller has been leak tested.
2. Verify that pumps are installed and functional.
3. Verify that thermometers and gages are installed.
4. Operate water chiller for run-in period.
5. Check bearing lubrication and oil levels.
6. Verify that refrigerant pressure relief device for chillers installed indoors is vented outside.
7. Verify proper motor rotation.
8. Verify static deflection of vibration isolators, including deflection during water chiller startup and shutdown.
9. Verify and record performance of chilled-water (and heat recovery condenser if applicable) flow and low-temperature interlocks.

10. Verify and record performance of water chiller protection devices.
11. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment.

D. Visually inspect chiller for damage before starting. Repair or replace damaged components, including insulation. Do not start chiller until damage that is detrimental to operation has been corrected.

E. Prepare a written startup report that records results of tests and inspections.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain water chillers. Video record the training sessions and provide electronic copy to Owner.

1. Instructor shall be factory trained and certified.
2. Train personnel in operation and maintenance and to obtain maximum efficiency in plant operation.
3. Provide instructional videos showing general operation and maintenance that are coordinated with operation and maintenance manuals.
4. Obtain Owner sign-off that training is complete.
5. Owner training shall be held at Project site.

END OF SECTION 236423.21

SECTION 237313.10 - MODULAR CENTRAL-STATION AIR-HANDLING UNITS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Modular outdoor central station air handling units.

2. Section applies to AHU-1 and DOAS-1.

1.2 PERFORMANCE REQUIREMENTS

1. Structural Performance: Case panels shall be self-supporting and capable of withstanding 133 percent of internal static pressures indicated, without panel joints exceeding of deflection L/200 where “L” is the unsupported span length within completed casings.

1.3 BUY AMERICAN ACT

A. The Contractor covenants and agrees that it will not expend any funds appropriated by Congress with complying with The Buy American Act (41 U.S.C. 10 et seq.). The Buy American Act gives preference to domestic end products and domestic construction material. In addition, the Memorandum of Understanding between the United States of America and the European Economic Community (EEC) on Government Procurement, and the North American Free Trade Agreement (NAFTA), provide that EEC and NAFTA end products and construction materials are exempted from application of The Buy American Act.

B. Refer to the front-end document of the Project Manual for all requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For each air-handling unit indicated.

1. Unit dimensions and weight.
2. Cabinet material, metal thickness, finishes, insulation, and accessories.
3. Fans:

    a. Certified fan-performance curves with system operating conditions indicated.
    b. Certified fan-sound power ratings.
    c. Fan construction and accessories.
    d. Motor ratings, electrical characteristics, and motor accessories.

4. Certified coil-performance ratings with system operating conditions indicated.
5. Dampers, including housings and linkages if applicable.
6. Filters with performance characteristics.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Floor plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from the installers of the items involved:

1. Mechanical-room layout and relationships between components and adjacent structural and mechanical elements.
2. Support location, type, and weight.
3. Field measurements.

B. Source quality-control reports.

C. Field quality-control reports

1.6 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.7 QUALITY ASSURANCE

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.

B. NFPA Compliance: Comply with NFPA 90A for design, fabrication, and installation of air-handling units and components.

C. ARI Certification: Air-handling units and their components shall be factory tested according to ARI 430, "Central-Station Air-Handling Units," and shall be listed and labeled by ARI.

D. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

E. ASHRAE/IESNA 90.1 Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."

F. Comply with NFPA 70.

1.8 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Pre-Filters: Provide Two complete sets of pre-filters. Refer to this specification section and/or drawings for efficiencies. One to be installed after construction and the other to be turned over to the owner.
2. Final Filters: Provide one complete set of extra final filters. Refer to this specification section and/or drawings for efficiencies.
3. Fan Belts: Two sets for each belt driven fan. Field installed and sized by the Testing, Adjusting, and Balancing Contractor.
4. Final Fan Sheave: One set for each belt driven fan. Field installed and sized by the Testing, Adjusting, and Balancing Contractor and sized to deliver the required airflow through the system.
5. Door gaskets: Provide one set of extra door gaskets per each size door per unit.
6. One replacement cylinder or ionic bed for each humidifier.
7. Paint: Minimum of one quart of touch up paint for each unit.

1.9 COORDINATION

A. Coordinate sizes and locations of concrete bases with actual equipment provided.

B. Coordinate sizes and locations of structural-steel support members, if any, with actual equipment provided.

C. Coordinate with contractor to determine shipping splits required to locate AHU as shown on plans.

1.10 Warranty

1. Unit will be covered by a limited part (18 months (12 months from startup)) warranty from date of shipment. Warranty will covere manufacturer defects.
2. Include factory-provided controls in the parts warranties.
3. Parts associated with routine maintenance, such as belts or air filters will be excluded.
4. Roof System will be warranted by manufacturer against water penetration for a period of 10 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Trane
2. Daikin
3. York
4. Pace

2.2 UNIT CASINGS

A. General Fabrication Requirements for Casings:

1. Forming: Form walls, roofs, and floors with at least two breaks at each joint. 2” foam injected R-13 with thermal break.
2. All walls shall be 2” solid double wall.

a. Interior panels shall be galvanized steel, with exception of the cooling coil section, which shall be 304 Stainless Steel interior.

b. Floor construction shall be 22 Ga. G90 galvanized steel with an aluminum tread plate liner, with the exception of the cooling coil section which shall be 304 Stainless Steel with aluminum treadplate.

c. Exterior Units:

1) Exterior panels shall be galvanized steel with standing seam interlocks. Roof shall slope and shall overhang walls by a minimum of 1”. Rain gutters shall be provided over door entries.

a) Galvanized steel with factory-painted finish, with pitched roof panels and knockouts with grommet seals for electrical and piping connections and lifting lugs.

2) Roof system outer layer:
a) Zero points of penetration.
b) Will use no: Fasteners, metal to metal seem joints, use or require caulking.

3) Factory Finish for Galvanized-Steel Casings:

a) Factory painted unit with UV resistant water based polyurethane paint.

4) Unit to be provided with piping vestibules construction as same material as cabinet. Doors are to be provided for access. See plans for sizes.

5) Corrosion Protection: 500 hours' salt spray test according to ASTM B 117.

a) Means scribe creepage of at least 6 per ASTM D1654 procedure A.
b) Blister size no larger than #6, density no greater than medium per ASTM D714
c) No onset of red dust

3. Casing Joints: Sheet metal screws or pop rivets.
4. Sealing: Seal all joints with water-resistant sealant.
5. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
6. Base frame: 6” or 8” integral base frame (per plans and sections).
7. Casing for Pipe Chases to be same material of construction as the remainder of the unit
   a. 18 Ga G-90 Galvanized Exterior
   b. 20 Ga G-90 Galvanized Interior
   c. 2" Foam Insulation

B. Casing Insulation and Adhesive:

1. Materials: ASTM C 1071, Type I.
2. Location and Application: Factory applied with adhesive and mechanical fasteners to the internal surface of section panels downstream from, and including, the cooling-coil section.

   a. Liner Adhesive: Comply with ASTM C 916, Type I.
   b. Mechanical Fasteners: Galvanized steel, suitable for adhesive attachment, mechanical attachment, or welding attachment to duct without damaging liner when applied as recommended by manufacturer and without causing leakage in cabinet.
   c. Liner materials applied in this location shall have air-stream surface coated with a temperature-resistant coating or faced with a plain or coated fibrous mat or fabric depending on service-air velocity.

3. Location and Application: Encased between outside and inside casing.

C. Inspection and Access Panels and Access Doors:

1. Panel and Door Fabrication: Formed and reinforced, single- or double-wall and insulated panels of same materials and thicknesses as casing.
2. Inspection and Access Panels:

   a. Fasteners: Two or more camlock type for panel lift-out operation. Arrangement shall allow panels to be opened against air-pressure differential.
   b. Gasket: Neoprene, applied around entire perimeters of panel frames.
   c. Size: Large enough to allow inspection and maintenance of air-handling unit's internal components (if not noted on plans).

3. Access Doors:

   a. Hinges: A minimum of two ball-bearing hinges or stainless-steel piano hinge and two wedge-lever-type latches, operable from inside and outside. Arrange doors to be opened against air-pressure differential.
   b. Gasket: Neoprene, applied around entire perimeters of panel frames.
   c. Size: width per plans. Height shall be full height of unit casing up to a maximum height of 60 inches.
   d. All doors shall be provided with test ports.

D. Condensate Drain Pans:

1. Fabricated with one percent slope in at least two planes to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends) and from humidifiers and to direct water toward drain connection.

a. Length: Extend drain pan downstream from leaving face to comply with ASHRAE 62.1.
b. Depth: A minimum of 2 inches deep.
c. Drain pan shall be insulated.

2. Formed sections.
3. Double-wall, 304 stainless steel sheet
4. Drain Connection: Located at lowest point of pan and sized to prevent overflow. Terminate with threaded nipple on both ends of pan.

a. Minimum Connection Size: NPS 1.

5. Units with stacked coils shall have an intermediate drain pan to collect condensate from top coil and gutters to route the condensate to the lower drain pan.

E. Air-Handling-Unit Mounting Frame: Formed galvanized-steel channel or structural channel supports, designed for low deflection, welded with integral lifting lugs.

2.3 FAN, DRIVE, AND MOTOR SECTION

A. Fan and Drive Assemblies: Statically and dynamically balanced and designed for continuous operation at maximum-rated fan speed and motor horsepower.

1. Shafts: Designed for continuous operation at maximum-rated fan speed and motor horsepower, and with field-adjustable alignment.

a. Turned, ground, and polished hot-rolled steel with keyway. Ship with a protective coating of lubricating oil.
b. Designed to operate at no more than 70 percent of first critical speed at top of fan's speed range.

B. Plenum Fan Housings: Steel frame and panel; fabricated without fan scroll and volute housing.

C. Aluminum Backward-Inclined, Centrifugal Fan Wheels: Single-width-single-inlet and double-width-double-inlet construction with curved inlet flange, backplate, backward-inclined blades welded or riveted to flange and backplate; cast-iron or cast-steel hub riveted to backplate and fastened to shaft with set screws.

D. Fan Shaft Bearings:

1. Bearings shall have L-10 life of 250,000 hours per ABMA. Bearings shall adhere to one of the following:

a. Prelubricated and Sealed, Ball Bearings: Self-aligning, pillow-block type.
b. Grease-Lubricated, Tapered-Roller Bearings: Self-aligning, pillow-block type with double-locking collars and 2-piece, cast-iron housing with grease lines extended to outside unit.
c. Grease-Lubricated Bearings: Self-aligning, pillow-block-type, ball or roller bearings with adapter mount and two-piece, cast-iron housing with grease lines extended to outside unit.

E. Internal Vibration Isolation: Fans shall be factory mounted with manufacturer's standard vibration isolation mounting devices having a minimum static deflection of 2 inch.

F. Motor: Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Section 230513 "Common Motor Requirements for HVAC Equipment."

1. Enclosure Type: Open Drip Proof
2. NEMA Premium (TM) efficient motors as defined in NEMA MG 1.
3. Motor Sizes: Minimum size as indicated. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

4. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in electrical Sections.
5. All electrical circuit connections require factory mounted disconnects. Mount unit-mounted fused disconnect switches on exterior of unit Division 26 for “Disconnects”
6. ABB VFD provided by others.
7. Provide electrical circuiting as indicated on plan and schedule notes.

G. Provide fall protection grating over each floor opening, capable of supporting a 300 lb. point load. Static pressure drop shall be included in the internal static pressure drop of the air hander.

2.4 COIL SECTION

A. General Requirements for Coil Section:

1. Comply with ARI 410.
2. Fabricate coil section to allow removal and replacement of coil for maintenance and to allow in-place access for service and maintenance of coil(s).
3. Coils shall not act as structural component of unit.

B. Heating and chilled water coils

1. Heating coils: Aluminum fin and seamless copper tube in steel casing.
2. Coiling coils: Aluminum fin and seamless copper tube in stainless steel casing.
3. Galvanized Steel Bulkhead with Galvanized Steel Coil Supports.
4. Minimum tube wall thickness of 0.025 inches.
5. Minimum fin thickness of 0.075”.
6. Headers, coil, and coil return bends shall be enclosed inside unit.
7. Test complete coil assembly at 300 psi air under water.

2.5 AIR FILTRATION SECTION

A. General Requirements for Air Filtration Section:

1. Comply with NFPA 90A.
2. Provide minimum arrestance according to ASHRAE 52.1, and a minimum efficiency reporting value (MERV) according to ASHRAE 52.2.
3. Provide filter holding frames arranged for flat or angular orientation, with access doors on both sides of unit. Filters shall be removable from one side or lifted out from access plenum.

B. Disposable Panel Filters (only provide where called for on drawings):

1. Factory-fabricated, viscous-coated, flat-panel type.
2. Thickness: 2 inch
3. MERV 8
4. Media: Fibrous material formed into deep-V shaped pleats and held by self-supporting wire grid.
5. Frame: Galvanized steel, with metal grid on outlet side, steel rod grid on inlet side, hinged, and with pull and retaining handles.

C. Filter Pressure Gauge:

1. Units shall be provided with differential pressure gauge to be installed over the final filter bank. Gauge shall allow for a pressure taps to provide a filter pressure switch (pressure switch provided by Section 23 09 00). Setpoint shall be field adjustable setpoint, initial setpoint shall be 0.95” WC. Coordinate with Section 23 09 00 to allow for signal to be imported to the front end.

2.6 DAMPERS

A. General Requirements for Dampers: Leakage rate, according to AMCA 500, "Laboratory Methods for Testing Dampers for Rating," shall not exceed 2 percent of air quantity at 2000-fpm face velocity through damper and 4-inch wg pressure differential.

B. Outdoor- and Return-Air Mixing Dampers: Parallel-blade, extruded-aluminum dampers.

C. Dampers are to be provided with a jackshaft.

2.7 SOURCE QUALITY CONTROL

A. Fan Sound-Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings from Laboratory Test Data." Test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Fans shall bear AMCA-certified sound ratings seal.

B. Fan Performance Rating: Factory test fan performance for airflow, pressure, power, air density, rotation speed, and efficiency. Rate performance according to AMCA 210, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating."

C. Water Coils: Factory tested to 300 psig according to ARI 410 and ASHRAE 33.

2.8 MARINE LIGHTS

A. Provide LED marine lights in each section requiring access. Provide for all air handlers. If not otherwise mentioned, provide a separate dedicated internal lighting circuit.

B. Factory will wire all light fixtures to a common 120v switch located on the supply fan section.

2.9 OUTDOOR ROOF CURB

A. Roof curbs shall be manufactured from 12 gauge galvanized steel and sections shall be designed to be bolted together.

B. Roof curbs shall be 14” taller than surrounding roof membrane unless noted otherwise on plans.

C. Roof curb perimeter shall match that of the unit and piping vestibule.

D. A 2 x 4 pressure treated nailing strip shall be provided around the entire perimeter.

E. Interior of the curb shall be insulated with 2” of 1.5 lb. neoprene coated fiberglass insulation.

F. Roofcurb skirt shall be minimum 18 gauge painted flashing supplied by unit manufacturer and installed by others.

2.10 LOUVERS

A. Louvers blades shall be fixed on a 45° angle, and on 4” centers extruded aluminum construction – see plans for where to provide.

B. Frames shall be equal to extruded aluminum, minimum 4” wide.

C. Bird screen shall be galvanized mesh with 0.5” x 0.5” openings and shall be fixed to the rear with cadmium plated screws.

D. Finish shall be natural mill finish.

2.11 HOODS

A. Provide only where called for in plans: Fresh air (and exhaust air) hoods shall be provided complete with 0.5” x 0.5” birdscreen and finished to match the units.

B. Provide metal washable roughing filter adjacent to the birdscreen on the outdoor air intake. Filters shall have a minimum initial dust arrestance of 30% and an initial maximum air pressure drop of 0.025”; both quantities measured at 350 FPM.

C. Hoods shall be 16 gauge galvanized steel construction, finished to match the unit.

D. Provide continuous rain gutters around the perimeter of the hood with drain connections.

E. Hoods shall be sized for maximum of 500 fpm on the free area of the inlet.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Equipment Mounting:

1. Install air-handling units per details. Indicate vibration isolation and seismic-control device type and minimum deflection in supported equipment schedule on Drawings.
2. Comply with requirements for vibration isolation devices specified in Section 230548.13 "Vibration Controls for HVAC."

B. Arrange installation of units to provide access space around air-handling units for service and maintenance.

C. Do not operate fan system until filters (temporary or permanent) are in place. Replace temporary filters used during construction and testing, with new, clean filters.

D. Comply with requirements for piping specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

E. Install piping adjacent to air-handling unit to allow service and maintenance.

F. Connect piping to air-handling units mounted on vibration isolators with flexible connectors.

G. Hot- and Chilled-Water Piping: Comply with applicable requirements in Section 232113 "Hydronic Piping" and Section 232116 "Hydronic Piping Specialties."

H. Connect duct to air-handling units with flexible connections. Comply with requirements in Section 233300 "Air Duct Accessories."

3.1 OPERATION DURING CONSTRUCTION

A. Operation of air-handling units for temporary cooling, heating, dehumidifying, and ventilation is permitted without Owner & Engineer’s authorization.

1. If unit is used for temporary cooling, heating, dehumidifying, and ventilation during and before interior finish work is complete the mechanical contractor is responsible for the following minimum steps:

a. Supply 100% outdoor air (no return air); blank off return duct openings with solid material.

b. Provide a method for pressure relief, i.e. window(s) or door(s), but not limited to.
c. Provide final level of filtration in the air-handling units in addition to those required by this specification.
d. Cover supply duct openings when air-handling units are off.
e. Provide prefilters over outdoor air intakes.
f. Interior components, interior, and exterior of air-handling units shall be cleaned to a factory-cleaned condition.
g. Operate AHUs only if safety devices and sequences are in place and operational.
h. Prior to starting and operating any ventilation systems from the time testing, adjusting, and balancing work is taking place to the completion of the project, isolate construction activities that produce dust and debris from the ventilation systems.

B. Filtration during Temporary Use:

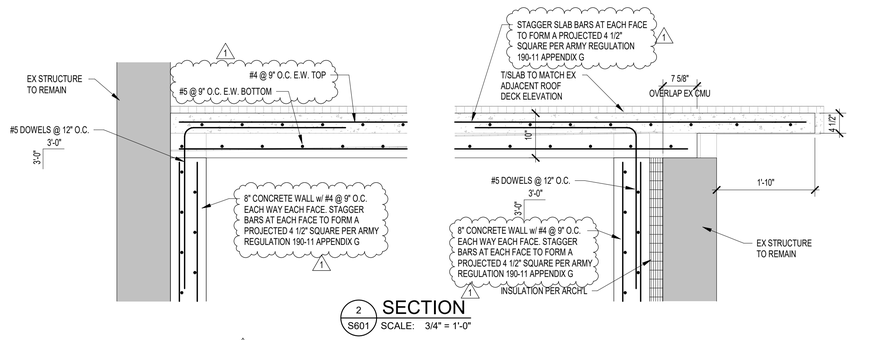
1. Protect air-handling system ducts (exhaust air, outdoor air, and return air) with temporary filters installed and supported to prevent filter media from collapse and bypass of unfiltered air. Temporary media shall be installed at each inlet and shall have a published filtration efficiency of MERV 8 in accordance with ASHRAE 52.2.
2. Protect air-handling units with open inlets that are not ducted with temporary filters installed and supported to prevent filter media from collapse and by-pass of unfiltered air. Temporary media shall be installed at each inlet and shall have a published filtration efficiency of MERV 8 in accordance with ASHRAE 52.2.
3. Do not operate air-handling units until both temporary and scheduled permanent air-handling unit particulate filters are in place. Temporary filters must be installed upstream of permanent filters while units are operating.
4. Replace temporary and permanent filters used during construction when dirty. After end of temporary use, replace permanent filters with new, clean filters before beginning testing, adjusting and balancing.

C. Comply with SMACNA 008, "IAQ Guidelines for Occupied Buildings under Construction," for procedures to protect HVAC system.

3.2 DEMONSTRATION

A. Train Owner’s maintenance personnel to adjust, operate, and maintain modular central station air handling units.

END OF SECTION 237313.10



2 / S601 SECTION
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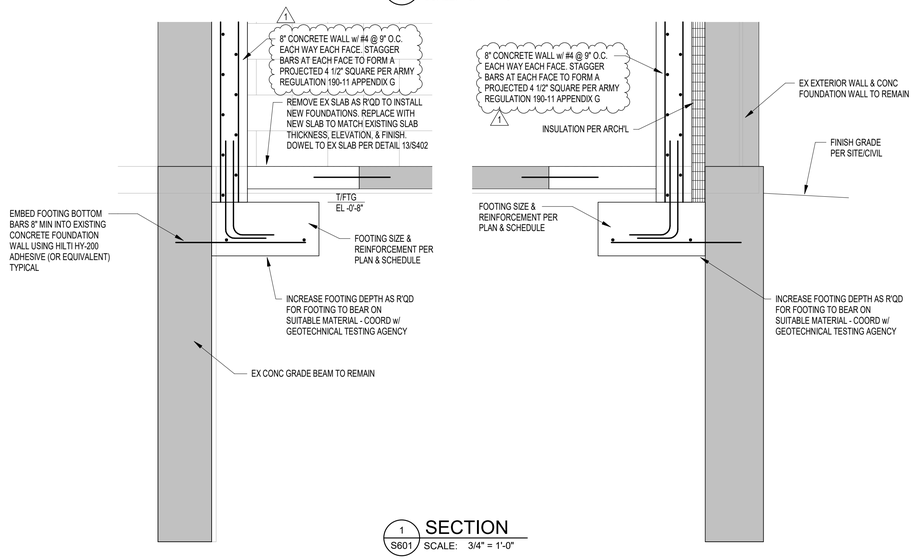

1 / S601 SECTION
SCALE: 3/4" = 1'-0"

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FOUNDATION & FRAMING SECTIONS

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JULY 31, 2026

BID DOCUMENTS

REVISIONS
1 ADDENDUM 1 07-14-26

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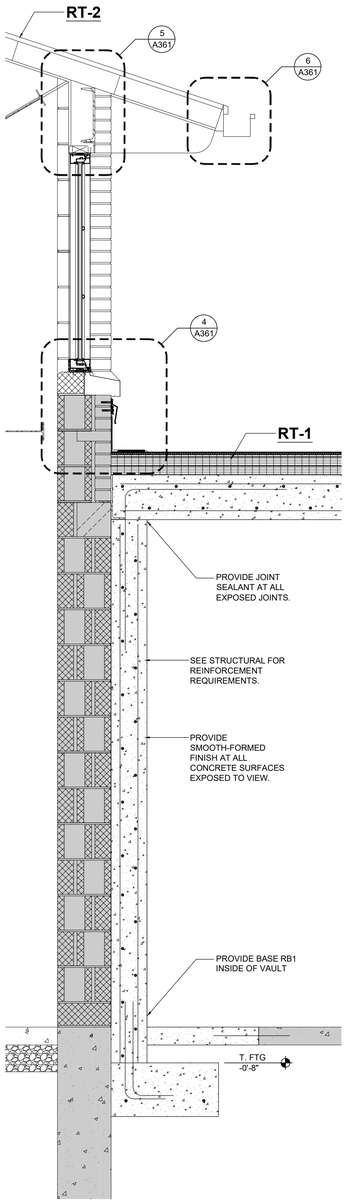
S601



8 WALL SECTION
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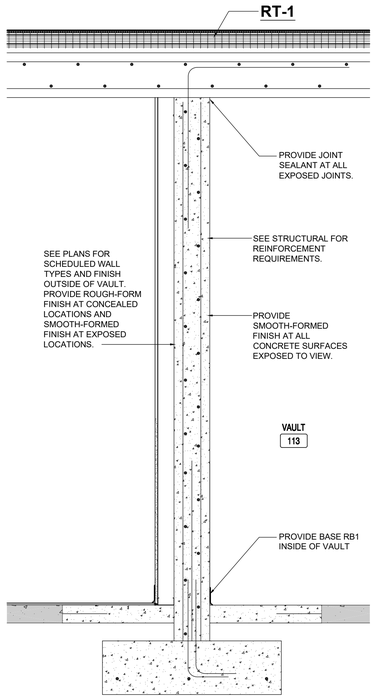

7 WALL TYPE 7A - TYPICAL SECTION
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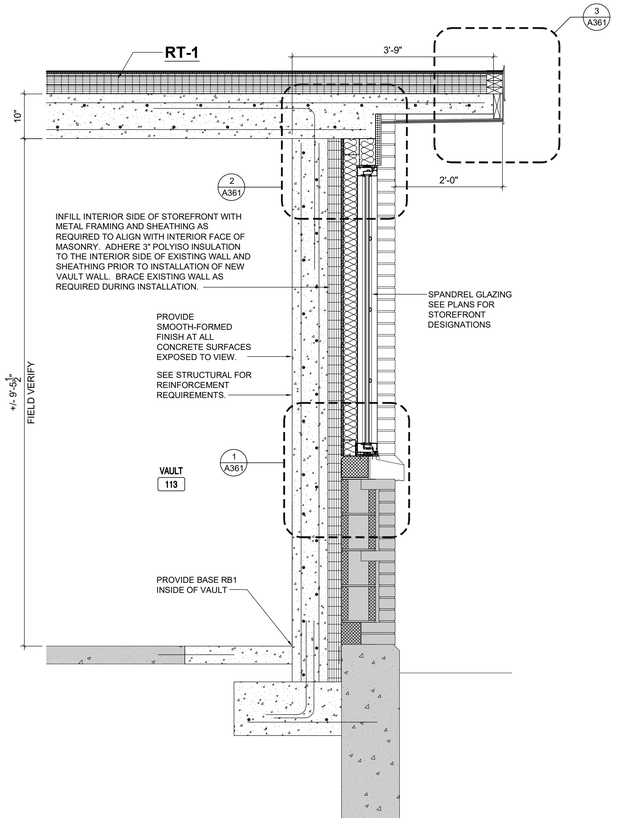

6 WALL SECTION
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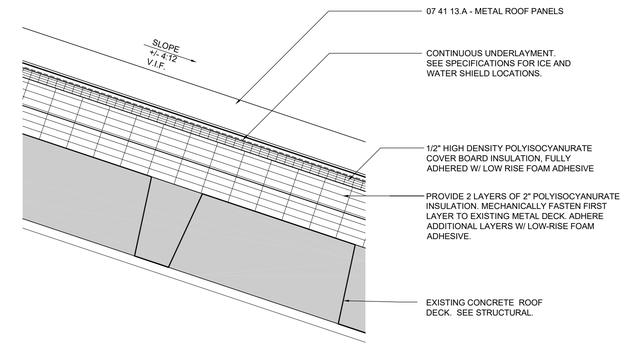
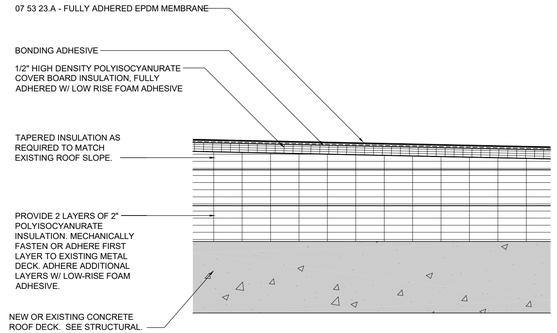


5 ROOF TYPE 1 (RT-2) TYPICAL METAL ROOF CONSTRUCTION
SCALE: 3" = 1'-0"



4 ROOF TYPE 1 (RT-1) TYPICAL EPDM ROOF CONSTRUCTION (@CONCRETE DECK)
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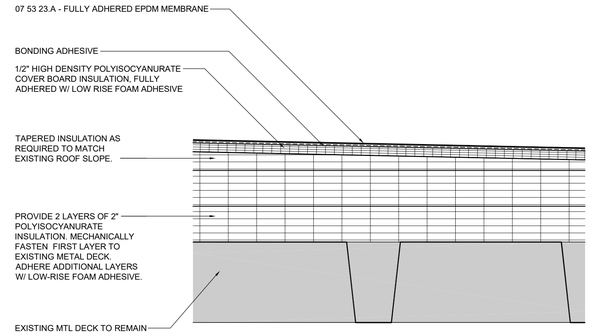

3 ROOF TYPE 1 (RT-1) TYPICAL EPDM ROOF CONSTRUCTION (@METAL DECK)
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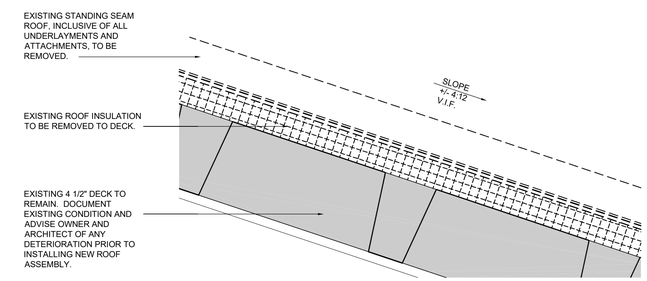

2 EXISTING DRILL HALL ROOF CONSTRUCTION
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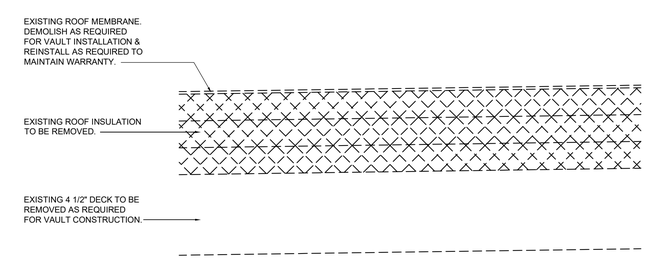

1 EXISTING LOW ROOF CONSTRUCTION
SCALE: 3" = 1'-0"

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WALL & ROOF ASSEMBLIES

0917-18

JULY 31, 2026

BID DOCUMENTS

REVISIONS
1 Addendum #1 08/20/2026

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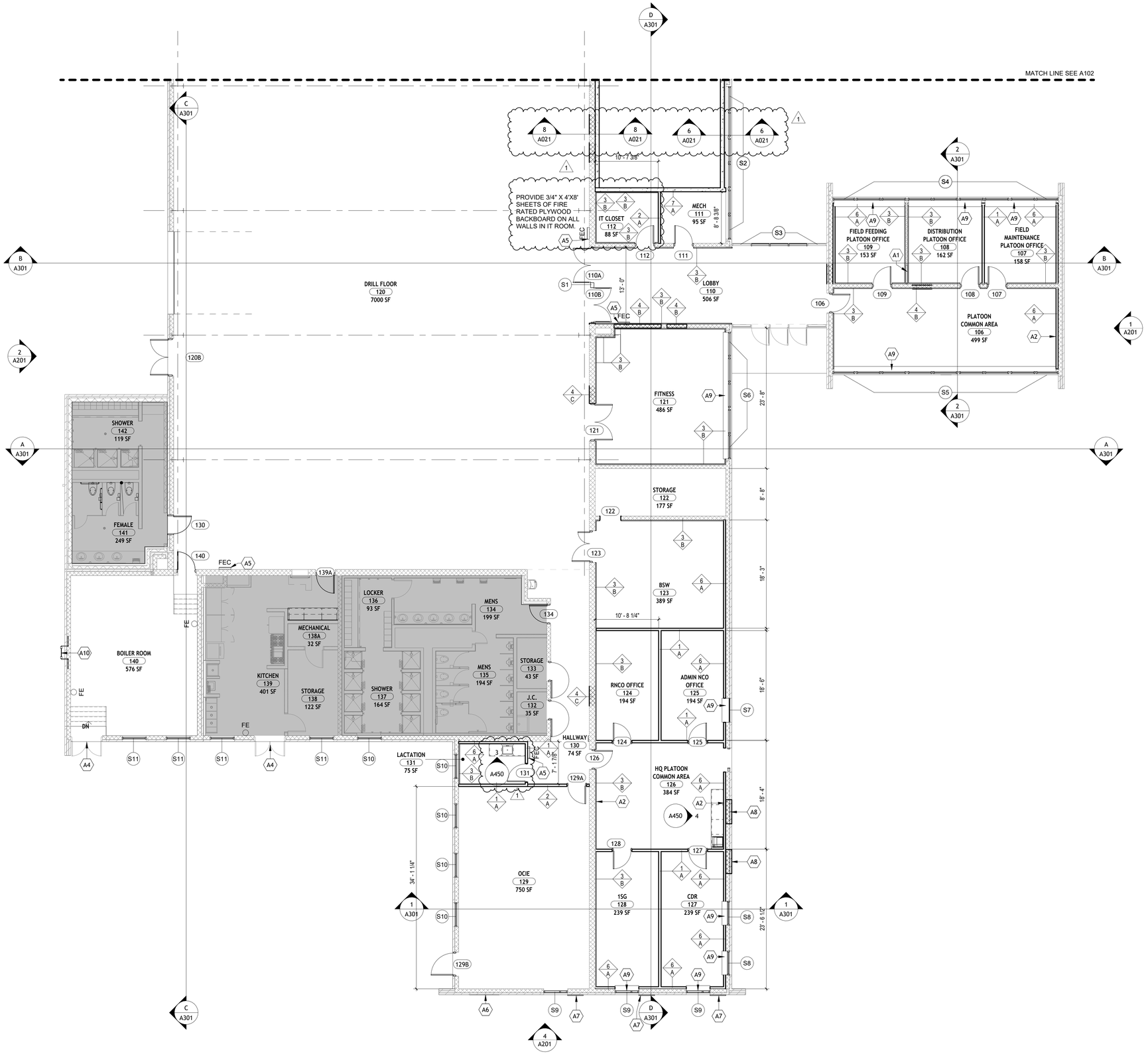
1
A021



SOUTH FIRST FLOOR PLAN

1/8" = 1'-0"

GENERAL PLAN NOTES

1. ALL DIMENSIONS ARE FROM FINISH FACE OF EXISTING CONSTRUCTION. NEW FACE OF MASONRY OR FACE OF STUD UNLESS OTHERWISE NOTED.
2. GENERAL CONTRACTOR IS RESPONSIBLE FOR VISITING THE SITE AND REVIEWING EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ADJUST PLAN DIMENSIONS FOR MINOR DISCREPANCIES FROM ACTUAL CONDITIONS ENCOUNTERED. NOTIFY ARCHITECT OF CONFLICTS BETWEEN PLAN AS DRAWN AND ACTUAL CONDITIONS.
3. GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE WORK OF ALL SUBCONTRACTORS, TRADES AND SUPPLIERS PRIOR TO THE START OF CONSTRUCTION.
4. ALL EXISTING CONSTRUCTION DAMAGED BY NEW WORK TO BE REPAIRED TO LIKE NEW CONDITION.
5. VERIFY MOUNTING HEIGHTS OF ACCESSORIES, EQUIPMENT, DOOR HARDWARE, CASEWORK, ETC. AND PROVIDE BLOCKING AS REQUIRED TO SUPPORT WEIGHT AND USE OF ITEMS.
6. PROVIDE CONTINUOUS SEALANT PER 07 92 00 BETWEEN DISSIMILAR MATERIALS INCLUDING, BUT NOT LIMITED TO, BETWEEN MASONRY AND GYPSUM BOARD, PLUMBING FIXTURES AND WALLS, ETC.
7. TOOTH IN MASONRY AT ALL MASONRY INFILL LOCATIONS.

SHEET LEGEND

- ALL WALLS, FIXTURES AND FINISHES WITHIN HATCHED AREA ARE EXISTING TO REMAIN. PROTECT THROUGHOUT CONSTRUCTION. CUT AND PATCH AS REQUIRED FOR MECHANICAL SCOPE.
- ROOM # — ROOM TAG
- B / A C D — INTERIOR ELEVATION DESIGNATION
- W 1 / EW 1 — ASSEMBLY TYPES
- 1 / A101 — BUILDING ELEVATION DESIGNATION
- 1 / A101 — ENLARGED PLAN DESIGNATION
- 1 / A101 — BUILDING SECTION DESIGNATION
- 100 A — DOOR NUMBER - SEE DOOR SCHEDULE
- A — STOREFRONT DESIGNATION
- 1 — REVISION TAG
- A1 — KEYED NOTE

SHEET NOTES

- A1 PROVIDE 3 5/8" MTL STUD WALL AND TRACK BETWEEN FURRING WALLS. AFFIX FURRING CHANNELS HORIZONTALLY.
- A2 PROVIDE BLOCKING AND AV BOX FOR TV AT ALL LOCATIONS. SEE FURNITURE PLAN FOR APPROXIMATE LOCATION.
- A4 PAINT EXISTING HOLLOW METAL DOOR AND HARDWARE. SEE FINISH PLANS.
- A5 SURFACE MOUNTED FIRE EXTINGUISHER CABINET.
- A6 CARVED LIMESTONE SIGN CENTERED IN MASONRY WALL. SEE ELEVATIONS.
- A7 METAL WALL PANELS INSTALLED OVER EXISTING WALL. SEE ELEVATIONS.
- A8 INFILL EXISTING WINDOW OPENING WITH 12" CMU.
- A9 SOLID SURFACE WINDOW SILL AND ROLLER SHADE.
- A10 COORDINATE EXACT LOCATION OF ROOF ACCESS LADDER WITHIN MECHANICAL ENCLOSURE WITH OWNER.

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FIRST FLOOR PLAN - SOUTH

0917-18

JULY 31, 2026

BID DOCUMENTS

REVISIONS

1 Addendum #1 08/19/2026

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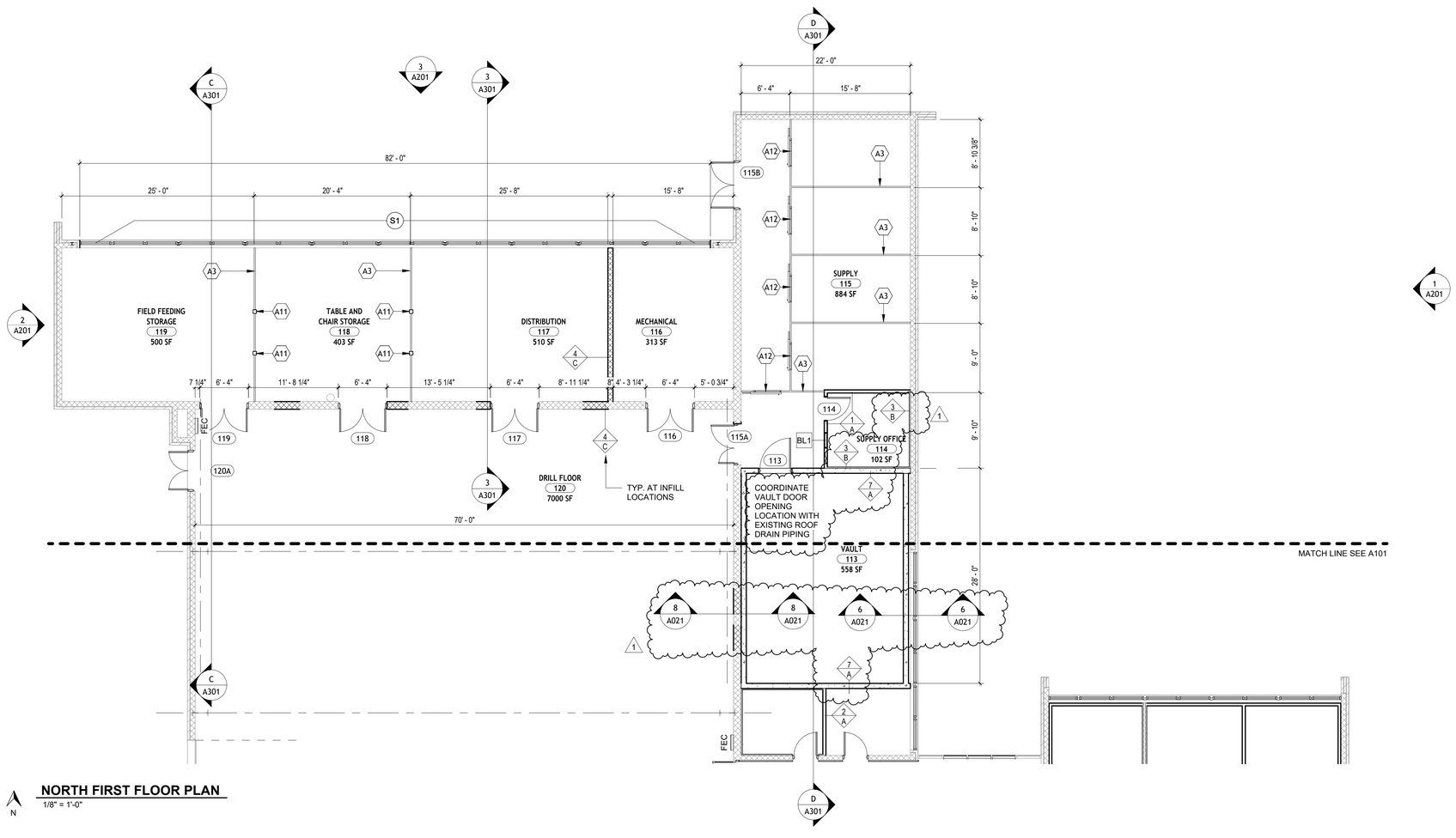

NORTH FIRST FLOOR PLAN
1/8" = 1'-0"

N

GENERAL PLAN NOTES

1. ALL DIMENSIONS ARE FROM FINISH FACE OF EXISTING CONSTRUCTION. NEW FACE OF MASONRY OR FACE OF STUD UNLESS OTHERWISE NOTED.
2. GENERAL CONTRACTOR IS RESPONSIBLE FOR VISITING THE SITE AND REVIEWING EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ADJUST PLAN DIMENSIONS FOR MINOR DISCREPANCIES FROM ACTUAL CONDITIONS ENCOUNTERED. NOTIFY ARCHITECT OF CONFLICTS BETWEEN PLAN AS DRAWN AND ACTUAL CONDITIONS.
3. GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE WORK OF ALL SUBCONTRACTORS, TRADES AND SUPPLIERS PRIOR TO THE START OF CONSTRUCTION.
4. ALL EXISTING CONSTRUCTION DAMAGED BY NEW WORK TO BE REPAIRED TO LIKE NEW CONDITION.
5. VERIFY MOUNTING HEIGHTS OF ACCESSORIES, EQUIPMENT, DOOR HARDWARE, CASEWORK, ETC. AND PROVIDE BLOCKING AS REQUIRED TO SUPPORT WEIGHT AND USE OF ITEMS.
6. PROVIDE CONTINUOUS SEALANT PER 07 92 00 BETWEEN DISSIMILAR MATERIALS INCLUDING, BUT NOT LIMITED TO, BETWEEN MASONRY AND GYPSUM BOARD, PLUMBING FIXTURES AND WALLS, ETC.
7. TOOTH IN MASONRY AT ALL MASONRY INFILL LOCATIONS.

SHEET LEGEND

ALL WALLS, FIXTURES AND FINISHES WITHIN HATCHED AREA ARE EXISTING TO REMAIN. PROTECT THROUGHOUT CONSTRUCTION. CUT AND PATCH AS REQUIRED FOR MECHANICAL SCOPE.

ROOM / # — ROOM TAG

B / A C D — INTERIOR ELEVATION DESIGNATION

W 1 / EW 1 — ASSEMBLY TYPES

1 / A101 — BUILDING ELEVATION DESIGNATION

1 / A101 — ENLARGED PLAN DESIGNATION

1 / A101 — BUILDING SECTION DESIGNATION

100 A — DOOR NUMBER - SEE DOOR SCHEDULE

A — STOREFRONT DESIGNATION

1 — REVISION TAG

A1 — KEYED NOTE

SHEET NOTES

A3 WIRE MESH PARTITIONS. REFER TO SPECIFICATION SECTION 10 22 13.

A11 PROVIDE STEEL COLUMNS FOR MECHANICAL SUPPPORT - SEE STRUCTURAL. WIRE MESH PARTITIONS TO ALIGN WITH COLUMNS.

A12 SLIDING PARTITION DOOR. REFER TO SPECIFICATIONS FOR REQUIREMENTS.

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FIRST FLOOR PLAN - NORTH

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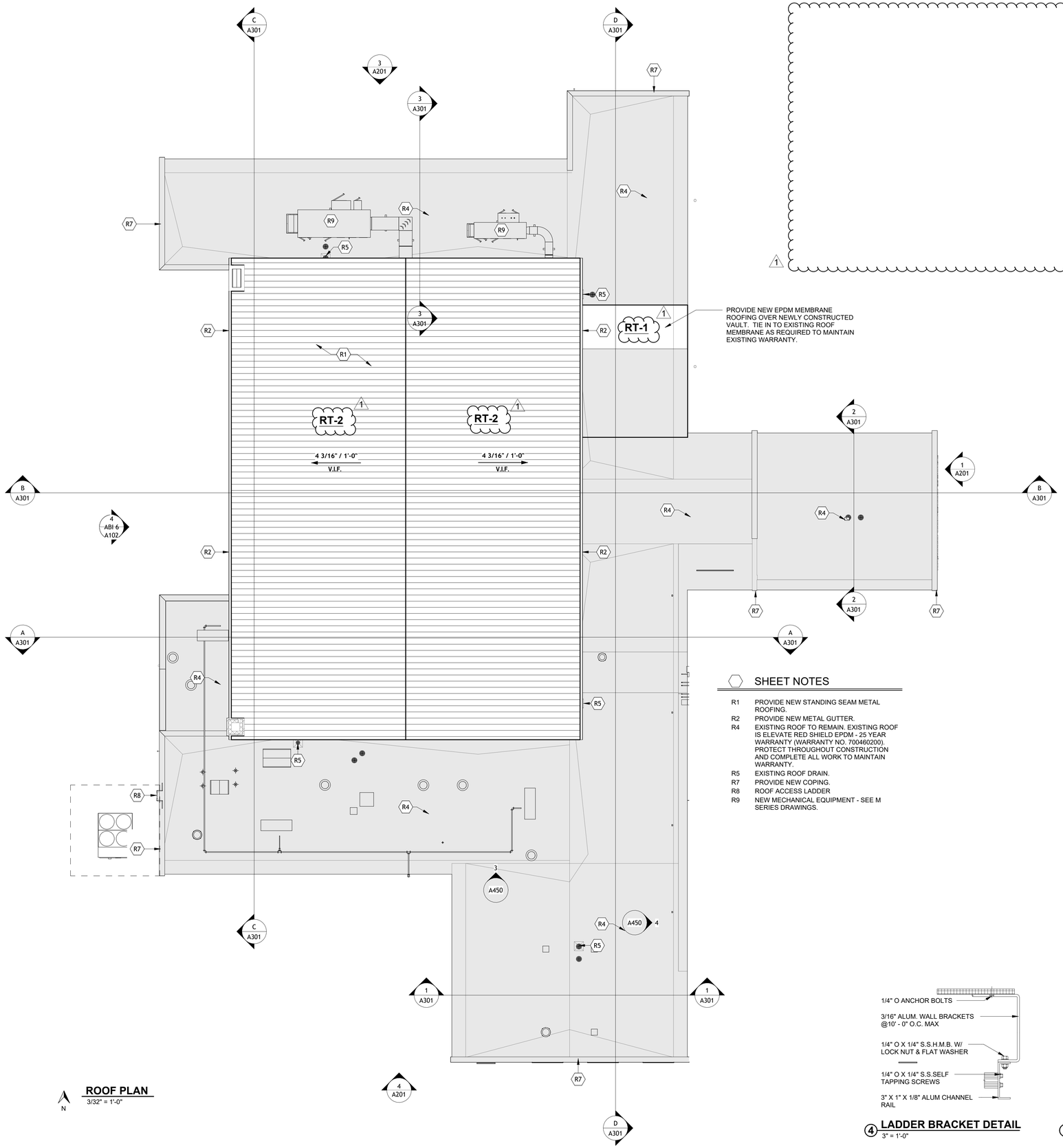


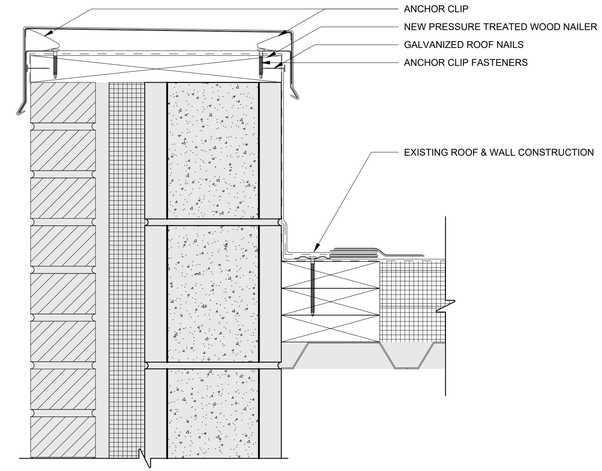
ROOF PLAN
3/32" = 1'-0"

SHEET NOTES

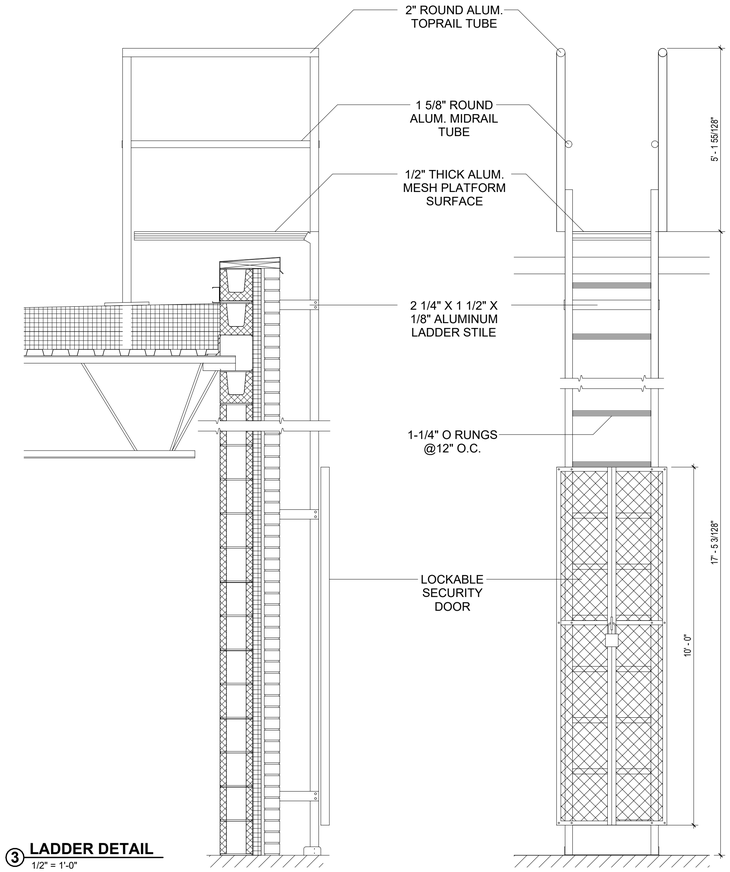
R1 PROVIDE NEW STANDING SEAM METAL ROOFING.
R2 PROVIDE NEW METAL GUTTER.
R4 EXISTING ROOF TO REMAIN. EXISTING ROOF IS ELEVATE RED SHIELD EPDM - 25 YEAR WARRANTY (WARRANTY NO. 700460200). PROTECT THROUGHOUT CONSTRUCTION AND COMPLETE ALL WORK TO MAINTAIN WARRANTY.
R5 EXISTING ROOF DRAIN.
R7 PROVIDE NEW COPING.
R8 ROOF ACCESS LADDER
R9 NEW MECHANICAL EQUIPMENT - SEE M SERIES DRAWINGS.

GENERAL PLAN NOTES

1. PROTECT EXISTING EQUIPMENT TO REMAIN.
2. EXISTING EPDM ROOFING WAS INSTALLED IN 2017. ALL DEMOLITION AND NEW WORK TO BE COMPLETED AS REQUIRED TO MAINTAIN THE EXISTING WARRANTY.
3. REMOVE ALL UNUSED EXTERIOR CONDUIT, MOUNTING BOLTS, SUPPORTS, BRACKETS, ETC. FROM THE ROOF. PATCH AS REQUIRED TO MAINTAIN ROOF WARRANTY.



2 PARAPET COPING DETAIL
3" = 1'-0"



4 LADDER BRACKET DETAIL
3" = 1'-0"

3 LADDER DETAIL
1/2" = 1'-0"

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ROOF PLAN

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GENERAL FINISH NOTES

1. ALL FINISH MATERIALS SCHEDULE ARE BASIS OF DESIGN SELECTIONS. ALTERNATES MAY BE SUBMITTED DURING BIDDING.
2. ALL DRYWALL CEILINGS SHALL BE PAINTED CEILING WHITE UNLESS NOTED OTHERWISE IN DOCUMENTS.
3. ALL EXPOSED WALL PANELS, GRILLES, ETC. ARE TO BE PAINTED TO MATCH ADJACENT WALL FINISH, U.N.O.
4. SEE REFLECTED CEILING PLANS FOR ADDITIONAL CEILING MATERIAL LOCATIONS.
5. SEE INTERIOR ELEVATIONS ON A801 FOR ADDITIONAL FINISH INFORMATION.
6. ALL HOLLOW METAL DOORS AND FRAMES IN EXISTING CORRIDORS SHALL MATCH EXISTING FRAME COLOR. FINISH TO BE SEMI-GLOSS.
7. PAINT FINISH TO BE EGGSHELL FOR ALL WALLS, SEMI-GLOSS FOR ALL BLOCK & METAL, AND FLAT FOR ALL CEILINGS.
8. ALL FLOORING TRANSITIONS SHOULD BE DETAILED ZERO TRANSITION (FROM DISSIMILAR MATERIALS) UNLESS NOTED OTHERWISE. WHERE FINISH MATERIAL TRANSITIONS OCCUR AT DOORWAYS, THE TRANSITION SHALL OCCUR UNDER THE DOOR WHEN THE DOOR IS IN THE CLOSED POSITION.
9. ALL FILLER PANELS AND COUNTERTOP OVERHANGS TO BE 1 1/2" U.N.O.
10. PROVIDE FINISHES AS SCHEDULED UNLESS NOTED OTHERWISE

FINISH LEGEND

ALL WALLS, FIXTURES AND FINISHES WITHIN HATCHED AREA ARE EXISTING TO REMAIN. PROTECT THROUGHOUT CONSTRUCTION. CUT AND PATCH AS REQUIRED FOR MECHANICAL SCOPE.

FLOOR COVERINGS

SC — EXISTING CONCRETE - GRIND & SEAL

PC 1 — POLISHED CONCRETE
PATTERN: CLASS B
COLOR: MATTE
LOCATION: DRILL FLOOR, STORAGE ROOMS, ENTRY HALL

CPT 1 — CARPET
MFG: INTERFACE
PATTERN: SKYLIGHTS
COLOR: ONYX 103486
INSTALL: ASHLAR
LOCATION: CLASSROOM, COMMON AREAS

CPT 2 — CARPET
MFG: INTERFACE
PATTERN: SKYLIGHTS
COLOR: LEAD 103490
INSTALL: ASHLAR
LOCATION: OFFICES

CPT 3 — CARPET
MFG: INTERFACE
PATTERN: SR899 WALK OFF
COLOR: ONYX 104941
INSTALL: MONOLITHIC
LOCATION: VESTIBULE

CPT4 — CARPET (INNG LOGO)
MFG: INTERFACE
PATTERN: INDUSTRIOUS
COLOR: IRON
LOCATION: VESTIBULE

RAF 1 — RESILIENT ATHLETIC FLOORING
MFG: MONDO
PATTERN: SPORT IMPACT 10mm
COLOR: S018 DARK GREY
INSTALL: QUARTER TURN
LOCATION: FITNESS ROOM

LVT 1 — LUXURY VINYL TILE
MFG: MANNINGTON
PATTERN: SPACIA STONE
COLOR: BLACK MARBLE
INSTALL: QUARTER TURN
LOCATION: LACTATION

TZ 1 — TERRAZZO TILE
MFG: DANCER
PATTERN: CUSTOM BLEND
COLOR: GREY - WHITE/BLACK/GREY
LOCATION: ENTRY HALL

TZ 2 — TERRAZZO TILE
MFG: DANCER
PATTERN: CUSTOM BLEND
COLOR: WHITE - WHITE/BEIGE/GREY
LOCATION: ENTRY HALL

BASE

B1 — PAINTED BASE
COLOR: CHARCOAL
SIZE: FIRST BLOCK COURSE
LOCATION: EXPOSED, GLAZED BLOCK AREAS

RB1 — RUBBER BASE
MFG: MILLWORK
STYLE: MANDALAY
COLOR: WHITE
SIZE: 4.5" MW-XX-H
LOCATION: OFFICES

TB — TILE BASE
MFG: DALTILE
PATTERN: HAUT MONDE
COLOR: ELITE GREY HM05
FINISH: LIGHT POLISHED
LOCATION: LOBBY, KITCHEN

WALL FINISHES

ETR — EXISTING TO REMAIN

P1 — ACRYLIC LATEX PAINT
MFG: SHERWIN WILLIAMS
COLOR: CEILING BRIGHT WHITE
FINISH: EGGSHELL
LOCATION: CEILINGS

P2 — ACRYLIC LATEX PAINT
MFG: SHERWIN WILLIAMS
COLOR: BLACK
FINISH: EGGSHELL
LOCATION: CEILINGS

P3 — ACRYLIC LATEX PAINT
MFG: SHERWIN WILLIAMS
COLOR: TBD
FINISH: EGGSHELL
LOCATION: GENERAL CORRIDOR

P4 — ACRYLIC LATEX PAINT
MFG: SHERWIN WILLIAMS
COLOR: TBD
FINISH: EGGSHELL
LOCATION: OFFICES AND DRILL FLOOR

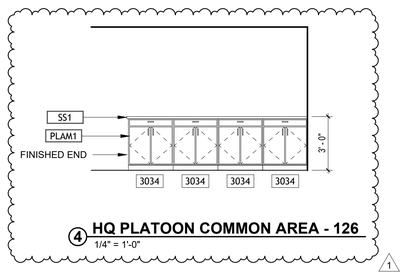
P5 — ACRYLIC LATEX PAINT
MFG: SHERWIN WILLIAMS
COLOR: TBD
FINISH: EGGSHELL
LOCATION: ACCENT PAINT

WG 1 — WOODEN GRILLE PANELS
MFG: ARMSTRONG
PATTERN: WOODWORKS GRILLE
COLOR: NATURAL WALNUT
SIZE: 2 1/4" SLAT HEIGHT
4 SLATS PER PANEL
LOCATION: ENTRY HALL & CLASSROOM

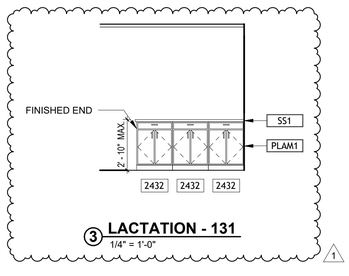
CASEWORK

SS1 — SOLID SURFACE COUNTERTOP
MFG: CORIAN
MATERIAL: SOLID SURFACE
COLOR: NEUTRAL CONCRETE
LOCATION: LACTATION ROOM

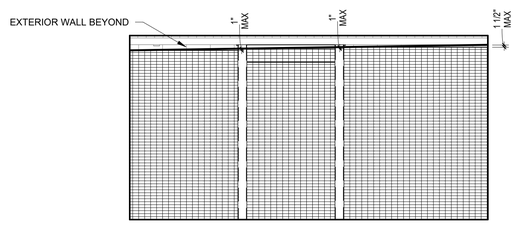
PLAM 1 — HIGH PRESSURE LAMINATE
MFG: FORMICA
PATTERN: 5782
LOCATION: CLASSROOM



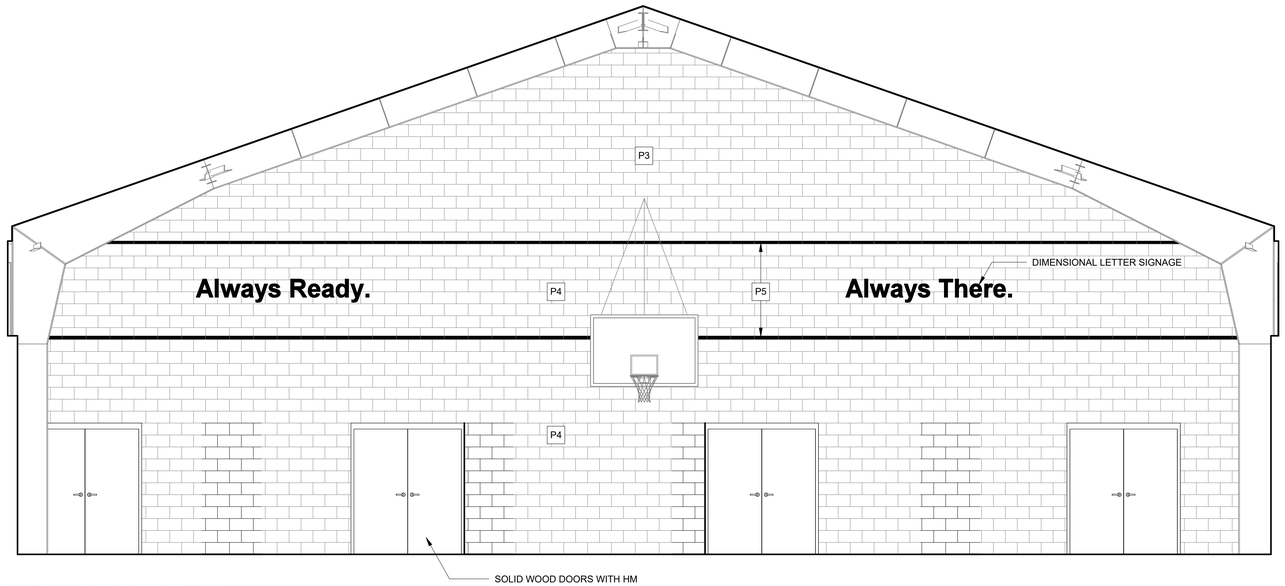
④ **HQ PLATOON COMMON AREA - 126**
1/4" = 1'-0"



③ **LACTATION - 131**
1/4" = 1'-0"



② **TYPICAL WIRE CAGING**
1/4" = 1'-0"



① **DRILL FLOOR ELEVATION - 120**
1/4" = 1'-0"

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INTERIOR ELEVATIONS

0917-18

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1 Addendum #1 08/20/2026

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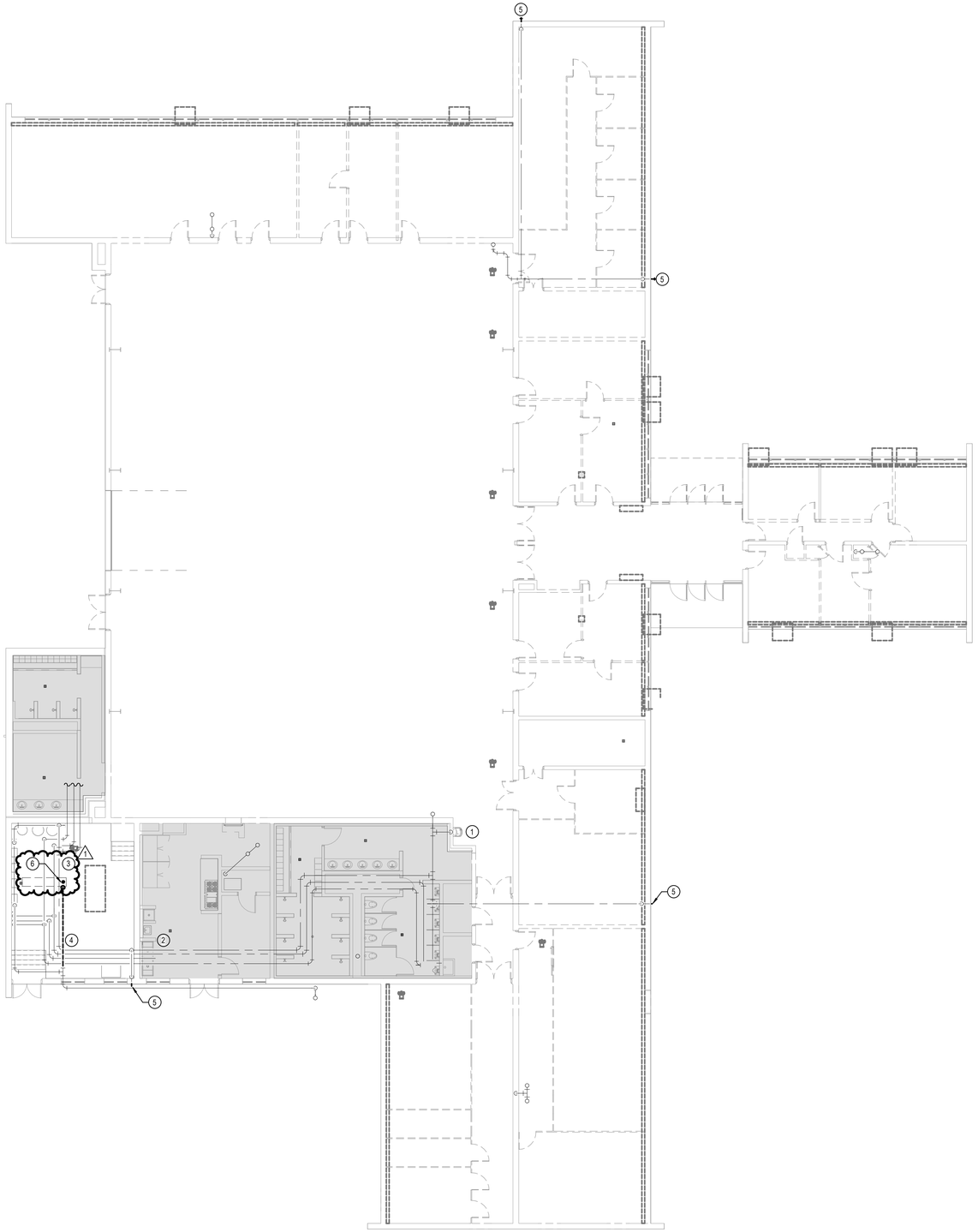
GENERAL NOTES

A REMOVE PIPING SHOWN HEAVY DASHED (UNLESS OTHERWISE NOTED)
B SAW-CUT FLOOR TO REMOVE PIPE AND/OR CAP PIPE.
C DEAD LEGS TO BE NO LONGER THAN 2 FEET. DISCONNECT AND CAP PIPE ACCORDINGLY.
D ANY UNDERGROUND PIPE BEING ABANDONED IN PLACE TO BE FILLED WITH FLOWABLE FILL AND ANY OPEN ENDS CAPPED BELOW FLOOR.
E BACKFILL AND PATCH FLOOR. SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS.SPECIFICATIONS FOR PATCHING INSTRUCTIONS.

SHEET KEYNOTES

1 REMOVE DRINKING FOUNTAIN. CAP PIPING AND PREPARE FOR NEW CONNECTION.
2 REMOVE PREP SINK. CAP PIPING AND PREPARE FOR NEW CONNECTION.
3 REMOVE MAKE-UP WATER LINE TO DEMO'D MECHANICAL EQUIPMENT BACK TO VALVE. CAP AND PREPARE FOR NEW CONNECTION.
4 REMOVE GAS SUPPLY LINE TO DEMO'D MECHANICAL EQUIPMENT BACK TO MAIN. CAP AND PREPARE FOR NEW CONNECTION.
5 REMOVE OLD WALL HYDRANT. PREPARE PIPING FOR NEW CONNECTION.
6 REMOVE FLOOR DRAIN NEXT TO MECHANICAL EQUIPMENT TO MAKE SPACE FOR NEW CONCRETE PAD. SAW CUT FLOOR WHERE SHOWN TO REMOVE PIPING TO MAIN AND PREPARE FOR NEW FLOOR DRAIN LOCATION. CONTRACTOR TO FIELD VERIFY EXISTING PIPE ROUTING BELOW FLOOR AND ADJUST SAW CUTTING PLAN ACCORDINGLY.



N

FIRST FLOOR PLUMBING DEMOLITION PLAN
3/32" = 1'-0"

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FIRST FLOOR PLUMBING DEMOLITION PLAN

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KBSO #25107
MAURICIO GODINEZ MEDINA
REGISTERED
No. 12500767
STATE OF
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PROFESSIONAL ENGINEER
07/31/2026

PD100

GENERAL NOTES

A REFER TO DRAWING P-000 FOR PLUMBING AND FIRE PROTECTION SYMBOLS AND ABBREVIATIONS.

B REFER TO DRAWING P-500 SERIES FOR PLUMBING DETAILS.

C REFER TO DRAWING P-600 SERIES FOR PLUMBING SCHEDULES.

D AVOID ALL CONFLICTS BETWEEN PLUMBING SYSTEMS, AND CONDUIT, DUCT, EQUIPMENT, PIPING, STRUCTURAL MEMBERS, AND ANY OTHER OBSTRUCTIONS ENCOUNTERED. PIPING LAYOUTS ARE DIAGRAMMATIC AND SHOW SYSTEM INTENT. PIPING MAY REQUIRE ADDITIONAL OFFSETS, DROPS, RISERS, AND FITTINGS, ETC.

E REFER TO THE 'PLUMBING FIXTURE ROUGH-IN SCHEDULE' TO SIZE BRANCH LINES SERVING INDIVIDUAL PLUMBING FIXTURES.

F PROVIDE AN ACCESS PANEL WHERE SHUT-OFF VALVES ARE LOCATED ABOVE INACCESSIBLE CEILINGS.

G PRIME AND PAINT GAS PIPING OUTSIDE THE BUILDING TO PREVENT RUSTING. APPLY TWO COATS OF RUST-INHIBITING PRIMER AND TWO COATS OF 'YELLOW' ENAMEL PAINT FORMULATED FOR EXTERIOR USE.

H ALL MATERIALS WITHIN PLENUMS SHALL BE NONCOMBUSTIBLE OR SHALL BE LISTED AND LABELED AS HAVING A FLAMESPREAD INDEX OF NOT MORE THAN 235 AND A SMOKE-DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84 OR UL 723.

SHEET KEYNOTES

1 EXISTING PIPING TO REMAIN.

2 EXISTING WATER HEATERS AND WATER SOFTENERS TO REMAIN.

3 1"G TO MECHANICAL EQUPMENT. 7-14"w.c., 1500 MBH. PROVIDE DIRT LEG, SHUT-OFF VALVE, PRESSURE REGULATOR, AND REGULATOR VENT FOR EACH PIECE OF EQUIPMENT FED WITH GAS. INSTALL REGULATOR PER MANUFACTURER'S INSTALLATION GUIDELINES, PROVIDING STRAIGHT RUNS AS NECESSARY ON THE INLET AND OUTLET OF THE REGULATOR.

4 GAS VENT - SIZE ACCORDING TO GAS PRESSURE REGULATOR MANUFACTURER'S INSTALATION MANUAL.

5 TERMINATE GAS VENT THROUGH EXTERIOR WALL IN ACCORDANCE WITH INDIANA GAS CODE.

6 3/4"CSW TO MECHANICAL EQUIPMENT FOR MAKE-UP WATER SUPPLY. REFER TO MECHANICAL ENGINEERING DRAWINGS FOR MAKE-UP WATER CONNECTION LOCATIONS.

7 INSTALL NEW DRINKING FOUNTAIN. CONNECT TO EXISTING CW & SANITARY PIPING.

8 1/2"CW & 1/2"HW DOWN TO NEW LAVATORY. ROUTE SANITARY THROUGH CASEWORK AND WALL TO TIE INTO SANITARY SERVING URINALS.

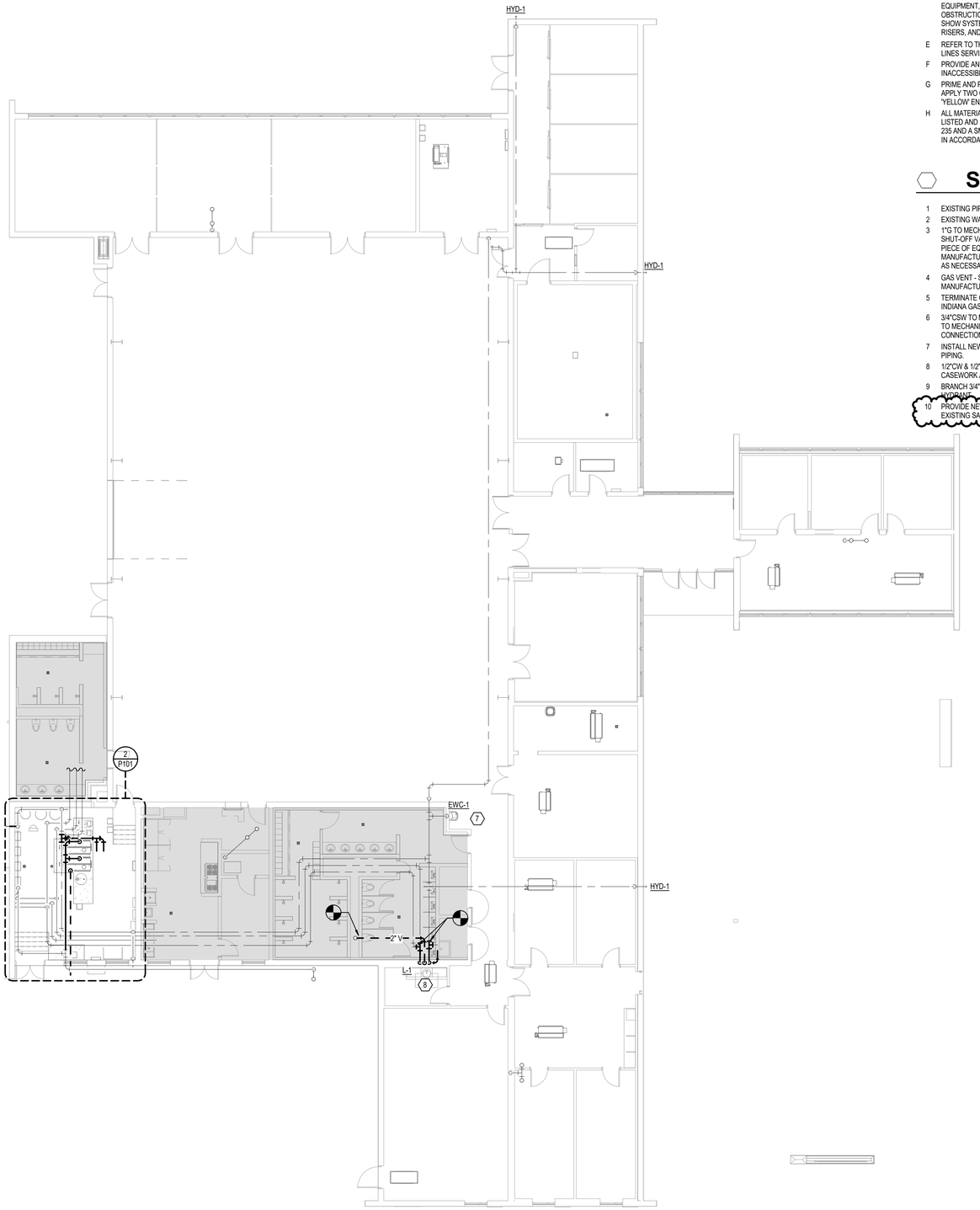
9 BRANCH 3/4"CW OFF OF MAIN AND ROUTE THROUGH WALL TO SERVE WALL HYDRANT.

10 PROVIDE NEW FLOOR DRAIN NEXT TO CONCRETE PAD. TIE NEW DRAIN INTO EXISTING SANITARY LINE.

N

MECHANICAL ROOM ENLARGED PLAN

3/16" = 1'-0"



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FIRST FLOOR PLUMBING PLAN

3/32" = 1'-0"

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P101

DOMESTIC WATER PIPE MATERIAL SCHEDULE

PIPE		JOINT CONSTRUCTION			LOCATION			
MATERIAL	SIZE	GROOVED MECHANICAL COUPLINGS (VICTAULIC)	PRESS CONNECT SEALING ELEMENT (VIEGA)	SOLDER	ABOVE GROUND	WATER ROOM	DISTRIBUTION MAINS	NOTES
COPPER - TYPE K	ALL		X	X				
COPPER - TYPE L	ALL	X	X	X	X	X	X	
DUCTILE-IRON	ALL	X						

NOTES:

PLUMBING VALVE SCHEDULE

SYSTEM	PIPE SIZE	CONNECTION		VALVE					NATURAL GAS	
		THREADED	FLANGED	BALL VALVE BRONZE, 2-PIECE [NIBCO T-585-66-LF OR EQUAL]	GATE BRONZE, NRS [NIBCO T-113-LF OR EQUAL]	BUTTERFLY IRON, LEVER [NIBCO LD-2000-3 OR EQUAL]	CHECK VALVE BRONZE, SWING [NIBCO T-413-Y-LF OR EQUAL]	CHECK VALVE IRON, SWING [NIBCO F-938-33 OR EQUAL]	BALL VALVE BRONZE, 2-PIECE [NIBCO T-585-70-UL OR EQUAL]	PLUG VALVE [HOMESTEAD 300 SERIES]
DOMESTIC COLD & HOT WATER	2" & SMALLER	X		X	X		X			
	2-1/2" & LARGER		X			X		X		
NATURAL GAS	2" & SMALLER	X		X	X		X	X	X	X
	2-1/2" & LARGER		X							X

NOTES:
1. BALL VALVES, GATE VALVES: HAMMOND, MILWAUKEE, NIBCO, VIEGA, JOMAR

PLUMBING INSULATION SCHEDULE

SYSTEM	PIPE SIZE	INSULATION					NOTES
		THICKNESS	PREFORMED	FIBERGLASS ASJ JACKET	PVJ JACKETED FITTINGS	FLEXIBLE ELASTOMERIC CLOSED CELL	
DOMESTIC WATER - COPPER	ALL	X	X	X	X	X	1, 2, 4, 8
SANITARY WASTE & VENT	1/2" - 2-1/2"	X	X	X	X	X	1, 2, 3, 4, 8
SANITARY WASTE & VENT	3" & LARGER	X	X	X	X	X	4, 5, 6, 8
STORM DRAINAGE	3" & LARGER	X	X	X	X	X	4, 5, 6, 7, 8

NOTES:
1. APPROVED MANUFACTURERS: KNAUF, OWENS-CORNING, JOHNS-MANVILLE, ARMSTRONG.
2. COMPLY WITH CURRENT ENERGY CODE REQUIREMENTS.
3. ANY EXPOSED PIPE REQUIRING INSULATION TO BE FIBERGLASS WITH ASJ JACKET AND PVC JACKETED FITTINGS.
4. ALL BRANCH WASTE PIPING RECEIVING CONDENSATE FROM COOLING COILS AND ELECTRIC WATER COOLERS TO BE INSULATED TO CONJUNCTION WITH TEMPERED WASTE FROM BUILDING.
5. ANY PLASTIC PIPING OR PORTION OF PLASTIC PIPING LOCATED WITHIN THE RETURN AIR PLENUM SHALL BE WRAPPED WITH NON-COMBUSTIBLE INSULATION LISTED AND LABELED AS HAVING A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E 84 OR UL 723.
6. INSULATE ALL WASTE STACKS/RISERS WHERE REQUIRED TO REDUCE SOUND IN SOUND SENSITIVE AREAS.
7. ALL EXPOSED PIPING WILL BE PAINTED. WHERE REQUIRED, INSULATE WITH FIBERGLASS AND PAPER JACKET WITH PVC JACKETED FITTINGS.

STORM PIPE MATERIAL SCHEDULE

PIPE		JOINT CONSTRUCTION		LOCATION		NOTES
MATERIAL	SIZE	HUB & SPIGOT	NO-HUB COUPLINGS HEAVY DUTY	BELOW GROUND	ABOVE GROUND	
CAST - IRON	2" AND LARGER	X		X		1, 2, 4, 5
CAST - IRON	1-1/2" AND LARGER		X		X	1, 2, 3, 4, 5

NOTES:
1. PIPE AND FITTINGS SHALL BE MADE IN THE USA.
2. CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND LISTED BY NSF INTERNATIONAL.
3. INSTALL AND RESTRAIN CAST IRON SOIL PIPING. ACCORDING TO CISPI STANDARD.
4. MANUFACTURER: CHARLOTTE OR APPROVED EQUAL.
5. SEE SPECIFICATION SECTION 22 14 13 FOR MORE INFORMATION.

SANITARY WASTE & VENT PIPE MATERIAL SCHEDULE

PIPE		JOINT CONSTRUCTION		LOCATION		NOTES
MATERIAL	SIZE	HUBLESS COUPLING JOINTS	PVC SOCKET W/SOLVENT-CEMENT	BELOW GROUND	ABOVE GROUND	
PVC - SCHEDULE 40, SOLID WALL	2" & LARGER		X	X		1, 2, 4
PVC - SCHEDULE 40, SOLID WALL	1-1/2" & LARGER		X		X	1, 2, 3

NOTES:
1. INSTALL UNDERGROUND PVC PIPING ACCORDING TO ASTM D 2321.
2. COMPLY WITH ASTM D 2665 AND ASTM D 3311.
3. INSULATE ANY AND ALL PORTIONS OF PVC PIPE AND FITTINGS LOCATED WITHIN RETURN AIR PLENUMS - REFER TO PIPE INSULATION SCHEDULE.
4. MANUFACTURER: CHARLOTTE; OR APPROVED EQUAL.

PLUMBING FIXTURE SCHEDULE

UNIT ID	DESCRIPTION	FIXTURE	TRIM AND ACCESSORIES
L-1	LAVATORY: 18 GAUGE 304 STAINLESS STEEL, RECTANGULAR 21-1/2" x 18-1/2" x 5-3/8", SINGLE BOWL UNDERMOUNT, REAR CENTER DRAIN, ADA COMPLIANT. FAUCET: SINGLE HOLE DECK MOUNT, GOOSENECK WITH PULL-DOWN SPOUT, 1.5 GPM, BRASS CAST CONSTRUCTION, CERAMIC CARTRIDGE WITH COLUME CONTROL AND HOT WATER LIMIT STOP, ADA COMPLIANT. DRAIN/TAILPIECE: HEAVY CAST BRASS, OFFSET, 1-1/4" DIA., 17 GAUGE, SEAMLESS BRASS, BRASS LOCKNUT, HEAVY RUBBER BASIN WASHER, FIBER FRICTION WASHER, CHROME PLATED. P-TRAP: HAVEY CAST BRASS, 1-1/4"x1-1/2", ADJUSTABLE CLEANOUT PLUG, SLIP NUTS, 17 GAUGE TUBULAR WALL BEND, STEEL SHALLOW FLANGE, CHROME PLATED. SUPPLIES: QUARTER TURN BALL VALVES, 1/2" IPS x 3/8" OD, COPPER FLEXIBLE RISERS, STEEL SHALLOW FLANGES, CHROME PLATED. CARRIER: FLOOR MOUNTD CONCEALED ARM LAVATORY CARRIER WITH HEAVY GAUGE STEEL UPRIGHTS WITH INTEGRAL WELDED FEET, ADJUSTABLE EPOXY COATED CAST IRON ARMS WITH LEVELING SCREWS AND BASIN LOCKING DEVICE, UPPER TIE ROD, AND PLATED HARDWARE.	LAVATORY: ELKAY ELUHAD191655PD	FAUCET: CHICAGO FAUCETS 434-ABCP DRAIN/TAILPIECE: McGUIRE 155WC P-TRAP: McGUIRE 8902C SUPPLIES: McGUIRE LFBV2165 CARRIER: WATTS CA-411
HYD-1	WALL HYDRANT: ANTI-SIPHON VACUUM BREAKER, 3/4" MALE HOSE THREAD, DRAINS AWAY FROM NOZZLE, COPPER TUBE CASING, SOLDER JOINTS, STAINLESS STEEL STEM, LOOSE TEE KEY, CHROME FINISH BOX AND DOOR.	WALL HYDRANT: WOODFORD MFG B65	
EWC-1	ELECTRIC WATER COOLER: BOTTLE FILLING STATION & BI-LEVEL ADA COOLER, FILTERED, REFRIGERATED, CHILLING CAPACITY OF 8.0 GPH OF 50°F DRINKING WATER, BASED ON 80°F INLET WATED AND 90°F AMBIENT, ANTIMICROBIAL, GREEN TICKER, HANDS FREE, LAMINAR FLOW, FLEXI-GUARD SAFETY BUBBLER, ELECTRONIC BOTTLE FILLER SENSOR ACTIVATION, WALL-MOUNTED, IN-WALL CARRIER.	WATER COOLER: ELKAY LZSTL8WSSK	WALL CARRIER: ELKAY MLP100

PLUMBING FIXTURE ROUGH-IN SCHEDULE

UNIT ID	DESCRIPTION	HW	CW	TRAP SIZE	W	V	MOUNTING HEIGHT
L-1	LAVATORY - UNDERMOUNT	1/2"	1/2"	1-1/2"	2"	2"	REFER TO ARCHITECTURAL DRAWINGS
HYD-1	WALL HYDRANT - FREEZELESS	-	3/4"	-	-	-	18" A.F.G.
EWC-1	ELECTRIC WATER COOLER	-	1/2"	1-1/2"	2"	2"	32-7/8" A.F.F. TO BUBBLER ORIFICE (ADA) 38-3/8" A.F.F. TO BUBBLER ORIFICE (STANDARD)

1

PLUMBING DRAINAGE FITTING SCHEDULE

UNIT ID	DESCRIPTION	MANUFACTURER WITH MODEL NUMBER
FD-1	FLOOR DRAIN: EPOXY COATED, CAST IRON FLOOR DRAIN WITH ANCHOR FLANGE, REVERSING CLAMPING COLLAR, NO-HUB OUTLET. STRAINER: 6" ROUND, ADJUSTABLE, HEEL-PROOF, NICKEL BRONZE. TRAP SEALER: HDPE HOUSING WITH HEAVY-DUTY PROPRIETARY SILICONE DIAPHRAGM AND SOFT EPDM RUBBER SEALING GASKET, ASSE 1072 AF GW.	FLOOR DRAIN: WATTS FD-100-B-#-NH-B8 (# - INDICATES OUTLET SIZE, SHOWN ON PLANS) TRAP SEALER: SURESEAL SS#009V (# - INDICATES SIZE)

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PLUMBING SCHEDULES

0917-18

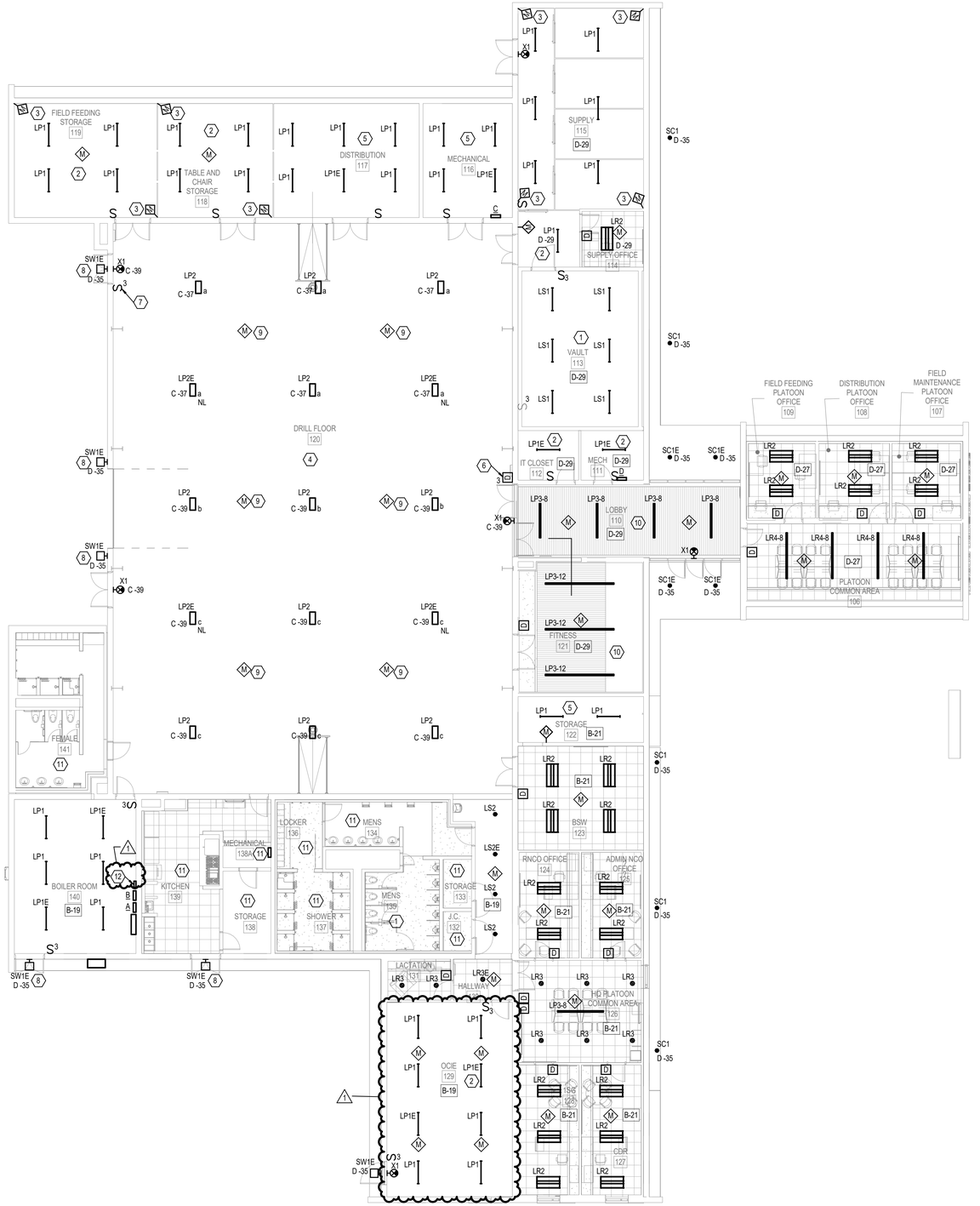
JULY 31, 2026

BID DOCUMENTS

REVISIONS
1 ADD. #1 8/14/2026

KBSO #25197
MAURICIO GODINEZ MEDINA
REGISTERED
No. 12500767
STATE OF
INDIANA
PROFESSIONAL ENGINEER
07/31/2026

P601



N

1 FIRST FLOOR LIGHTING PLAN

3/32" = 1'-0"

GENERAL NOTES

A REFER TO SHEET E000 FOR GENERAL ELECTRICAL NOTES, SYMBOLS AND ABBREVIATIONS.

B REFER TO E600 SERIES SHEETS FOR LIGHT FIXTURE SCHEDULES. REFER TO E610 AND E620 FOR PANEL SCHEDULES AND CIRCUITING.

C LABEL ALL RELAYS AND POWER SUPPLIES (ON THE DEVICE OR BOX THEY ARE CONNECTED TO) WITH THE AREA THE DEVICE SERVES.

D MOUNT EXIT SIGNS ON WALL NOT OVER DOOR +7'-6" AFF. EXIT SIGNS OVER DOOR TO BE +0'-6" ABOVE TOP EDGE OF DOOR FRAME.

E 'NL' SYMBOL REPRESENTS NIGH LIGHT AND INDICATES LIGHT WILL REMAIN ON 24/7.

F COORDINATE INSTALLATION OF LIGHTING FIXTURES WITH ARCHITECTURAL REFLECTED CEILING PLANS, ARCHITECTURAL ELEVATIONS, MECHANICAL EQUIPMENT, DIFFUSERS, SUPPORTS, PIPING, DUCTWORK AND STRUCTURAL PLANS PRIOR TO ROUGH-IN AND INSTALLATION OF LIGHTS.

G LOCATE CEILING MOUNTED OCCUPANCY SENSORS TO PROVIDE COMPLETE COVERAGE OF THE SPACE THEY ARE INSTALLED IN. ADDITIONAL SENSORS REQUIRED DUE TO LACK OF COVERAGE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND THE MANUFACTURER. SENSORS SHALL INCLUDE ALL POWER SUPPLIES AND RELAYS NECESSARY FOR PROPER OPERATION.

H ALL MOUNTING HEIGHTS NOTED ON THE PLANS ARE TO THE BOTTOM OF THE FIXTURES UNLESS NOTED OTHERWISE.

I THE EC IS RESPONSIBLE FOR VERIFYING (FIELD VERIFICATION IF NECESSARY) ALL LINEAR PRODUCT LENGTHS INCLUDING ANY DOWNLIGHTS, WALL SLOTS, PENDANTS, OR ACCENT LIGHTS.

J ALL EXTERIOR EQUIPMENT AND DEVICES SHALL BE WEATHERPROOF AND RAIN TIGHT.

K WHERE MULTIPLE SWITCHES ARE SHOWN ADJACENT TO EACH OTHER, GANG TOGETHER IN SINGLE FACEPLACE WITH MULTIPLE SWITCH OUTLET.

L CONTRACTOR IS RESPONSIBLE FOR VERIFYING COMPATIBILITY OF LIGHT FIXTURES WITH CEILING MATERIALS, ADJACENT FINISHES AND CONSTRUCTION MATERIALS. NOTIFY ARCHITECT OF ANY CONFLICTS PRIOR TO INSTALLATION OF FIXTURE.

M REFER TO ARCHIECTURAL DRAWINGS FOR DIMENSIONS, ROOM AND AREA FINISHES, CEILING PLANS, DOOR SWINGS, FIRE RATED PARTITIONS AND CEILINGS, CABINET, CASEWORK AND BUILT-IN DETAILS.

N SPACES AND ROOMS WITH EXPOSED CEILINGS WILL HAVE EXPOSED CONDUIT. ALL EXPOSED CONDUIT IS TO BE LOCATED TIGHT TO STRUCTURE AND PAINTED TO MATCH ADJACENT EXPOSED DECK/WALL. REFER TO INTERIOR DESIGN DRAWINGS FOR EXACT COLOR/FINISH.

SHEET KEYNOTES

1 LIGHT FIXTURES WITHIN THIS ROOM ARE TO BE SURFACE MOUNTED UNLESS NOTED OTHERWISE.

2 SUSPEND LIGHT FIXTURE AT 8'-0" AFF TO BOTTOM OF LIGHT FIXTURE.

3 MOUNT OCCUPANCY SENSOR DEVICE AT 8'-0" AFF TO BOTTOM OF DEVICE.

4 MOUNT LIGHT FIXTURES AT APPROXIMATELY 18" AFF TO BOTTOM OF LIGHT FIXTURE. COORDINATE EXACT MOUNTING HEIGHT WITH ARCHITECTURAL ELEVATIONS.

5 SUSPEND LIGHT FIXTURE AT 8'-0" AFF TO BOTTOM OF LIGHT FIXTURE. COORDINATE EXACT MOUNTING HEIGHT OF LIGHT FIXTURES WITH MECHANICAL, ELECTRICAL AND PLUMBING EQUIPMENT, DUCT, CONDUIT, PIPING, ETC. IN THIS ROOM.

6 PROVIDE WALL MOUNT MULTI-SCENE LIGHT CONTROL FOR DRILL HALL HIGH-BAY LIGHTING.

7 PROVIDE ON/OFF SNAP SWITCH FOR DRILL HALL HIGH-BAY LIGHTING.

8 LIGHT FIXTURE TO BE MOUNTED IN EXACT LOCATION AS EXISTING LIGHT FIXTURE. REUSE EXISTING BACKBOX IF POSSIBLE.

9 SUSPEND HIGH-BAY OCCUPANCY SENSOR VIA RIGID STEM AT 18'-0" AFF. THE ELEVATION OF THE OCCUPANCY SENSOR IS TO BE FLUSH WITH THE LIGHT FIXTURES.

10 INSTALL AND SUSPEND THE LIGHT FIXTUR SUCH THAT THE BOTTOM OF THE LIGHT FIXTURE IS ALIGNED FLUSH WITH THE FINISHED SURFACE OF THE WOOD SLAT CEILING.

11 EXISTING LIGHTING AND LIGHTING CONTROLS ARE TO REMAIN IN THIS ROOM. PROTECT DURING CONSTRUCTION.

12 PROVIDE ASTONOMICAL TIMECLOCK FOR CONTROL OF EXTERIOR LIGHTING. REFER TO LIGHTING CONTROL INTENT SCHEDULE ON SHEET E601.

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REGISTERED
No. 12500767
STATE OF INDIANA
PROFESSIONAL ENGINEER
KBSO #25197
07/31/2026

EL101

LIGHTING FIXTURE SCHEDULE - INTERIOR BASE BID

NOTES:

1. EQUAL MANUFACTURERS MUST MEET OR EXCEED PERFORMANCE, AESTHETICS AND FABRICATION OF BASE MANUFACTURER.
2. CONTRACTOR IS RESPONSIBLE FOR ALL MISCELLANEOUS HARDWARE NECESSARY TO INSTALL AND OPERATE LIGHT FIXTURES IN NORMAL AND EMERGENCY FUNCTION.
3. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR CEILING TYPE AND HEIGHT.
4. CONTRACTOR TO VERIFY COMPATIBILITY OF CEILING WITH LIGHT FIXTURES PRIOR TO SHOP DRAWING SUBMITTALS AND NOTIFY ARCHITECT/ENGINEER OF ANY ISSUES WITH PROPOSED INSTALLATION.
5. ALL LIGHT FIXTURES SHALL BE 'BUY AMERICAN ACT' (BAA) AND/OR 'TRADE AGREEMENT ACT' (TAA) COMPLIANT.

UNIT ID	BASE MANUFACTURER	EQUAL MANUFACTURER	LAMP	VOLTS	WATTS	UNITS	LUMENS	UNITS	CCT	LOCATION(S)	MOUNT	DESCRIPTION
LP1	COLUMBIA: MPS4-40-HL-C-W-U	METALUX: 'SNX' SERIES LITHONIA: 'ZL1D' SERIES DAYBRITE: 'FSS' SERIES	LED	120 V	42 W	/FIXTURE	5500 LM	/FIXTURE	4000K	EQUIP/STORAGE	SUSPENDED	4' L SURFACE MOUNT/SUSPENDED STRIP FIXTURE WITH CURVED ACRYLIC LENS AND WIDE DISTRIBUTION.
LP1E	COLUMBIA: MPS4-40-HL-C-W-U-ELL14	METALUX: 'SNX' SERIES LITHONIA: 'ZL1D' SERIES DAYBRITE: 'FSS' SERIES	LED	120 V	42 W	/FIXTURE	5500 LM	/FIXTURE	4000K	EQUIP	SUSPENDED	SAME AS TYPE LP1 WITH INTEGRAL EMERGENCY BATTERY.
LP2	ILP: EDV-18L-U-40-FRL-BLK-X-X	STARTEK: 'AVND' SERIES LITHONIA: 'IBG' SERIES DAYBRITE: 'FBZ' SERIES	LED	120 V	131 W	/FIXTURE	18000 LM	/FIXTURE	4000K	DRILL HALL	RIGID STEM	25"L X 16"W X 4"H SUSPENDED HIGH BAY WITH IMPACT RESISTANT LENS AND 0-10V DIM. PROVIDE WITH BLACK FINISH.
LP2E	ILP: EDV-18L-U-35-FRL-BLK-X-X-EM25	STARTEK: 'AVND' SERIES LITHONIA: 'IBG' SERIES DAYBRITE: 'FBZ' SERIES	LED	120 V	131 W	/FIXTURE	18000 LM	/FIXTURE	4000K	DRILL HALL	RIGID STEM	SAME AS TYPE 'L4' WITH INTEGRATED EMERGENCY BATTERY.
LP3-8	NULITE: RP24-D-ST-F-06-L-35-UNV-D-X-1-1-X-WH-TX-X-X-8	FOCAL POINT: 'SEEMZ' SERIES MARK: 'S2PD' SERIES FINELITE: 'HP2' SERIES	LED	120 V	10 W	/LFT	750 LM	/LFT	4000K	GENERAL	SUSPENDED	2.5" WIDE X 4" DEEP STEM MOUNT LINEAR WITH DIFFUSE FLUSH LENS AND 0-10V DIMMING.
LP3-12	NULITE: RP24-D-ST-F-06-L-40-UNV-D-X-1-1-X-WH-TX-X-X-12	FOCAL POINT: 'SEEMZ' SERIES MARK: 'S2PD' SERIES FINELITE: 'HP2' SERIES	LED	120 V	10 W	/LFT	750 LM	/LFT	4000K	CLASSROOM	SUSPENDED	2.5" WIDE X 4" DEEP STEM MOUNT LINEAR WITH DIFFUSE FLUSH LENS AND 0-10V DIMMING.
LR2	COLUMBIA: LCAT24-40-HL-G-ED-U	METALUX: '2ACZ2' SERIES LITHONIA: 'BLT24' SERIES DAYBRITE: 'FGX' SERIES	LED	120 V	50 W	/FIXTURE	5500 LM	/FIXTURE	4000K	OFFICES	RECESSED GRID	2' X 4' RECESSED ARCHITECTURAL TROFFER WITH CURVED CENTER ACRYLIC FROSTED LENS AND 0-10V DIMMING.
LR3	VANTAGE: VIC40FCR-U-15-40K-F4060-SGC-SDM	PORTFOLIO: 'LD4C' SERIES GOTHAM: 'EVO4' SERIES LIGHTOLIER: 'P4R' SERIES	LED	120 V	21 W	/FIXTURE	1500 LM	/FIXTURE	4000K	GENERAL	RECESSED	4" RECESSED DOWNLIGHT WITH MEDIUM DISTRIBUTION AND 0-10V DIMMING.
LR3E	VANTAGE: VIC40FCR-U-15-40K-F4060-SGC-SDM-EM	PORTFOLIO: 'LD4C' SERIES GOTHAM: 'EVO4' SERIES LIGHTOLIER: 'P4R' SERIES	LED	120 V	21 W	/FIXTURE	1500 LM	/FIXTURE	4000K	GENERAL	RECESSED	SAME AS TYPE 'L3E' WITH INTEGRAL EMERGENCY BATTERY
LR4-8	NULITE: RG2-D-ST-F-09-L-40-UNV-D-X-1-1-X-8	FOCAL POINT: 'SEEMZ' SERIES MARK: 'S2PD' SERIES FINELITE: 'HP2R' SERIES	LED	120 V	8 W	/LFT	750 LM	/LFT	4000K	GENERAL	RECESSED	2.5" WIDE X 4" DEEP RECESSED LINEAR WITH DIFFUSE FLUSH LENS AND 0-10V DIMMING.
LS1	COLUMBIA: MPS4-40-HL-C-W-U	METALUX: 'SNX' SERIES LITHONIA: 'ZL1D' SERIES DAYBRITE: 'FSS' SERIES	LED	120 V	42 W	/FIXTURE	5500 LM	/FIXTURE	4000K	STORAGE	SURFACE	4' L SURFACE MOUNT/SUSPENDED STRIP FIXTURE WITH CURVED ACRYLIC LENS AND WIDE DISTRIBUTION.
LS2	GREEN CREATIVE: PXCYL-4-SM-LEM-90-40-X-MD-X-CC	FC: 'FC400' SERIES GOTHAM: 'EVO4SC' SERIES SPECTRUM: 'GAMMA' SERIES	LED	120 V	20 W	FIXTURE	1500 LM	/FIXTURE	4000K	DRILL PASSAGE	SURFACE	4" X 9"H ROUND SURFACE MOUNT CYLINDER WITH CONDUIT CANOPY.
LS2E	GREEN CREATIVE: PXCYL-4-SM-LEM-90-40-X-MD-X-CC-EM	FC: 'FC400' SERIES GOTHAM: 'EVO4SC' SERIES SPECTRUM: 'GAMMA' SERIES	LED	120 V	20 W	FIXTURE	1500 LM	/FIXTURE	4000K	DRILL PASSAGE	SURFACE	SAME AS TYPE 'LS2' WITH INTEGRAL EMERGENCY BATTERY.
X1	BEGHELLI: FORMA	EVENLITE: 'CCDS' SERIES ISOLITE: 'LPDC' SERIES EXTRONIX: '400EX' SERIES	LED	120 V	2 W	FIXTURE		/FIXTURE		EGRESS	WALL	SINGLE FACE WALL MOUNT EXIT SIGN WITH INTEGRATED EMERGENCY BATTERY, SELF DIAGNOSTICS AND RED LETTERING AND SELF-DIAGNOSTICS.

LIGHTING CONTROL SEQUENCE

NOTES:

1. LIGHTING CONTROLS SHALL COMPLY WITH THE FOLLOWING CODES AND STANDARDS: NATIONAL ELECTRICAL CODE (NEC), ILLUMINATING ENGINEERING SOCIETY (IES) RECOMMENDATIONS, AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), INDIANAN BUILDING CODE (IBC), ASHRAE 90.1-2007, UNIFIED FACILITIES CRITERIA (UFC), TOWN OF CRAWFORDSVILLE EXTERIOR LIGHTING ORDINANCES.
2. UNLESS NOTED OTHERWISE ON LIGHTING PLAN, ALL OCCUPANCY SENSORS TO BE PROVIDED WITH AN ADDITIONAL RELAY FOR INTERFACE WITH HVAC SYSTEM.

CONTROL DESIGNATION	SPACE/AREA TYPE	CONTROL INTENT	COMPONENTS	EMERGENCY	CEILING HEIGHT>12'-0"	NOTES
LC01	VESTIBULE	FIXTURES TURN TO FULL ON WHEN OCCUPANCY IS DETECTED AND TURN OFF WHEN OCCUPANCY HAS NOT BEEN DETECTED FOR 20 MINUTES.	CEILING MOUNT/RIGID PENDANT MOUNT DUAL TECH OCCUPANCY SENSOR(S)	EMERGENCY FIXTURES FORCED ON VIA INTEGRAL EMERGENCY BATTERY BACKUP.		
LC02	CORRIDORS	FIXTURES TURN TO FULL ON WHEN OCCUPANCY IS DETECTED AND TURN OFF WHEN OCCUPANCY HAS NOT BEEN DETECTED FOR 20 MINUTES.	CEILING MOUNT/RIGID PENDANT MOUNT DUAL TECH OCCUPANCY SENSOR(S)	EMERGENCY FIXTURES FORCED ON VIA INTEGRAL EMERGENCY BATTERY BACKUP.		
LC03	LOBBY	FIXTURES TURN TO FULL ON WHEN OCCUPANCY IS DETECTED AND TURN OFF WHEN OCCUPANCY HAS NOT BEEN DETECTED FOR 20 MINUTES.	CEILING MOUNT/RIGID PENDANT MOUNT DUAL TECH OCCUPANCY SENSOR(S)	EMERGENCY FIXTURES FORCED ON VIA INTEGRAL EMERGENCY BATTERY BACKUP.		
LC04	PRIVATE OFFICES	FIXTURES TURN TO FULL ON WHEN OCCUPANCY IS DETECTED AND TURN OFF WHEN OCCUPANCY HAS NOT BEEN DETECTED FOR 20 MINUTES. LIGHT INTESITY ADJUSTED VIA WALL BOX DIMMER.	CEILING MOUNT DUAL TECH OCCUPANCY SENSOR(S), WALL MOUNT DIMMER SWITCH	N/A		
LC05	OPEN OFFICES	FIXTURES TURN TO FULL ON WHEN OCCUPANCY IS DETECTED AND TURN OFF WHEN OCCUPANCY HAS NOT BEEN DETECTED FOR 20 MINUTES. LIGHT INTESITY ADJUSTED VIA WALL BOX DIMMER.	CEILING MOUNT DUAL TECH OCCUPANCY SENSOR(S), WALL MOUNT DIMMER SWITCH	N/A		
LC06	CONFERENCE ROOMS	FIXTURES TURN TO FULL ON WHEN OCCUPANCY IS DETECTED AND TURN OFF WHEN OCCUPANCY HAS NOT BEEN DETECTED FOR 20 MINUTES. LIGHT INTESITY ADJUSTED VIA WALL BOX DIMMER.	CEILING MOUNT DUAL TECH OCCUPANCY SENSOR(S), WALL MOUNT DIMMER SWITCH	N/A		REFER TO LIGHTING PLANS FOR SWITCHLEG CONFIGURATION
LC07	CLASSROOMS	FIXTURES TURN TO FULL ON WHEN OCCUPANCY IS DETECTED AND TURN OFF WHEN OCCUPANCY HAS NOT BEEN DETECTED FOR 20 MINUTES. LIGHT INTESITY ADJUSTED VIA WALL BOX DIMMER.	CEILING MOUNT DUAL TECH OCCUPANCY SENSOR(S), WALL MOUNT DIMMER SWITCH	N/A		
LC08	DRILL HALL	FIXTURES TURN ON MANUALLY AND TURN OFF WHEN OCCUPANCY HAS NOT BEEN DETECTED FOR 20 MINUTES. REFER TO ZONE DESIGNATIONS ON LIGHTING PLANS.	RIGID PENDANT MOUNT HIGH BAY OCCUPANCY SENSORS (VACANCY SENSING ONLY), WALL MOUNT SCENE CONTROL.	EMERGENCY FIXTURES FORCED ON VIA INTEGRAL EMERGENCY BATTERY BACKUP.	YES	REFER TO LIGHTING PLANS FOR SWITCHLEG CONFIGURATION
LC09	EQUIPMENT	FIXTURES TURN ON/OFF MANUALLY.	LOCAL SNAP SWITCH.	EMERGENCY FIXTURES FORCED ON VIA INTEGRAL EMERGENCY BATTERY BACKUP.		
LC10	STORAGE	FIXTURES TURN TO FULL ON WHEN OCCUPANCY IS DETECTED AND TURN OFF WHEN OCCUPANCY HAS NOT BEEN DETECTED FOR 10 MINUTES.	CEILING MOUNT/WALL MOUNT DUAL TECH OCCUPANCY SENSOR(S).	N/A		
LC11	RECRUITING	FIXTURES TURN TO FULL ON WHEN OCCUPANCY IS DETECTED AND TURN OFF WHEN OCCUPANCY HAS NOT BEEN DETECTED FOR 20 MINUTES. LIGHT INTESITY ADJUSTED VIA WALL BOX DIMMER.	CEILING MOUNT/RIGID PENDANT MOUNT DUAL TECH OCCUPANCY SENSOR(S), WALL MOUNT DIMMER SWITCH.	N/A		
LC12	FITNESS	FIXTURES TURN TO FULL ON WHEN OCCUPANCY IS DETECTED AND TURN OFF WHEN OCCUPANCY HAS NOT BEEN DETECTED FOR 20 MINUTES. LIGHT INTESITY ADJUSTED VIA WALL BOX DIMMER.	CEILING MOUNT DUAL TECH OCCUPANCY SENSOR(S)	N/A		
LC13	EXTERIOR BUILDING MOUNT	ON AT DUSK/OFF AT DAWN	PHOTOCELL WITH TIMECLOCK BACKUP.	EMERGENCY FIXTURES FORCED ON VIA INTEGRAL EMERGENCY BATTERY BACKUP.		COORDINATE FINAL PROGRAMMING WITH OWNER.
LC14	EXTERIOR SIGN	ON AT DUSK/OFF AT DAWN	PHOTOCELL WITH TIMECLOCK BACKUP.	N/A		COORDINATE FINAL PROGRAMMING WITH OWNER.

LIGHTING FIXTURE SCHEDULE - EXTERIOR BASE BID

NOTES:

1. EQUAL MANUFACTURERS MUST MEET OR EXCEED PERFORMANCE, AESTHETICS AND FABRICATION OF BASE MANUFACTURER.
2. CONTRACTOR IS RESPONSIBLE FOR ALL MISCELLANEOUS HARDWARE NECESSARY TO INSTALL AND OPERATE LIGHT FIXTURES IN NORMAL AND EMERGENCY FUNCTION.
3. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR CEILING TYPE AND HEIGHT.
4. CONTRACTOR TO VERIFY COMPATIBILITY OF CEILING WITH LIGHT FIXTURES PRIOR TO SHOP DRAWING SUBMITTALS AND NOTIFY ARCHITECT/ENGINEER OF ANY ISSUES WITH PROPOSED INSTALLATION.
5. ALL LIGHT FIXTURES SHALL BE 'BUY AMERICAN ACT' (BAA) AND/OR 'TRADE AGREEMENT ACT' (TAA) COMPLIANT.

UNIT ID	BASE MANUFACTURER	EQUAL MANUFACTURER	LAMP	VOLTS	WATTS	UNITS	LUMENS	UNITS	CCT	LOCATION(S)	MOUNT	DESCRIPTION
SC1	LITON: DL360B-B45-L15-X-X	FC: 'FC600' SERIES GOTHAM: 'EVO6SC' SERIES SPECTRUM: 'GAMMA' SERIES	LED	120 V	15 W	FIXTURE	1500 LM	/FIXTURE	4000K	CANOPY	SURFACE	6" ROUND SURFACE MOUNT CYLINDER WITH BLACK FINISH, LISTED FOR WET LOCATIONS.
SC1E	LITON: DL360B-B45-L15-X-X-EMA	FC: 'FC600' SERIES GOTHAM: 'EVO6SC' SERIES SPECTRUM: 'GAMMA' SERIES	LED	120 V	15 W	FIXTURE	1500 LM	/FIXTURE	4000K	CANOPY	SURFACE	SAME AS TYPE 'SC1' WITH EMERGENCY BATTERY IN CANOPY.
SW1E	BEACON: TRP2-160L-25-4K7-3-UNV-BLT-EH	MCGRAW-EDISON: 'ISC' SERIES LITHONIA: 'WSTLED' SERIES GARDCO: '101L' SERIES	LED	120 V	25 W	FIXTURE	2500 LM	/FIXTURE	4000K	BUILDING	WALL	EXTERIOR WALL PACK WITH TYPE 3 DISTRIBUTION, INTEGRAL EMERGENCY BATTERY AND BLACK FINISH.

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LIGHTING SCHEDULES

0917-18

JULY 31, 2026

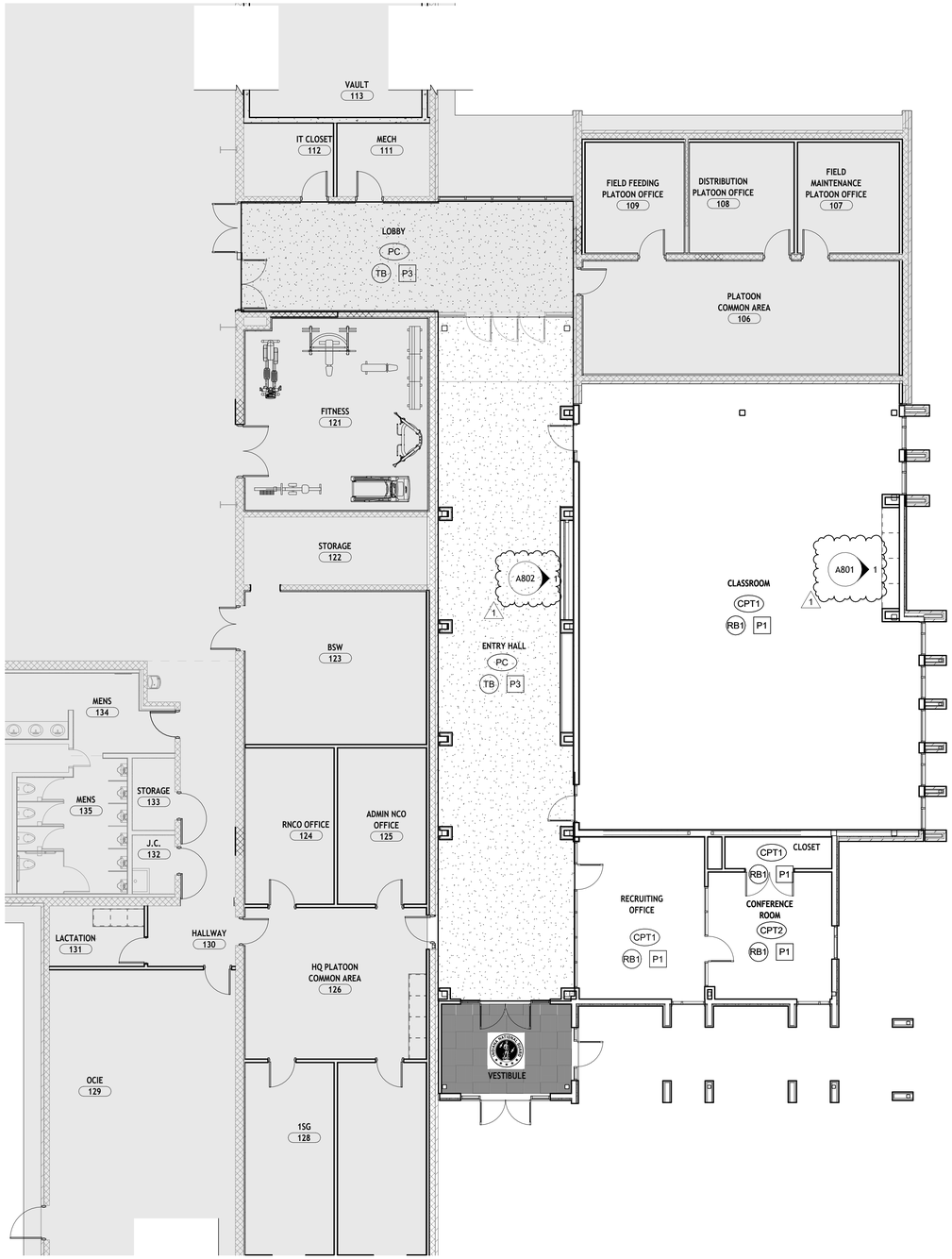
BID DOCUMENTS

REVISIONS

1 ADD. #1 8/14/2026

MAURICIO GODINEZ MEDINA
REGISTERED
No. 12500767
STATE OF
INDIANA
PROFESSIONAL ENGINEER
KBSO #25107
07/31/2026

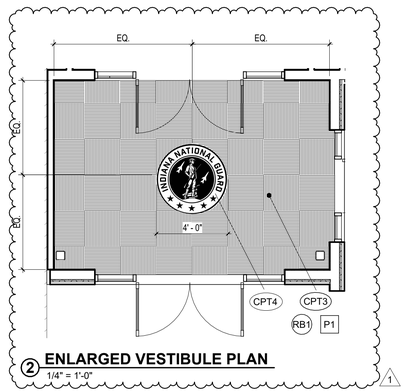
E601



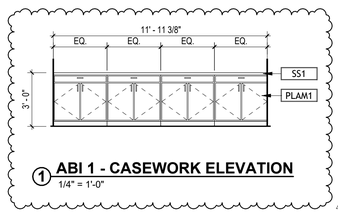
ABI 1 - FIRST FLOOR FINISH PLAN
1/8" = 1'-0"

GENERAL FINISH NOTES

1. ALL FINISH MATERIALS SCHEDULE ARE BASIS OF DESIGN SELECTIONS. ALTERNATES MAY BE SUBMITTED DURING BIDDING.
2. ALL DRYWALL CEILINGS SHALL BE PAINTED CEILING WHITE UNLESS NOTED OTHERWISE IN DOCUMENTS.
3. ALL EXPOSED WALL PANELS, GRILLES, ETC. ARE TO BE PAINTED TO MATCH ADJACENT WALL FINISH, U.N.O.
4. SEE REFLECTED CEILING PLANS FOR ADDITIONAL CEILING MATERIAL LOCATIONS.
5. SEE INTERIOR ELEVATIONS ON A801 FOR ADDITIONAL FINISH INFORMATION.
6. ALL HOLLOW METAL DOORS AND FRAMES IN EXISTING CORRIDORS SHALL MATCH EXISTING FRAME COLOR. FINISH TO BE SEMI-GLOSS.
7. PAINT FINISH TO BE EGGSHELL FOR ALL WALLS, SEMI-GLOSS FOR ALL BLOCK & METAL, AND FLAT FOR ALL CEILINGS.
8. ALL FLOORING TRANSITIONS SHOULD BE DETAILED ZERO TRANSITION (FROM DISSIMILAR MATERIALS) UNLESS NOTED OTHERWISE. WHERE FINISH MATERIAL TRANSITIONS OCCUR AT DOORWAYS, THE TRANSITION SHALL OCCUR UNDER THE DOOR WHEN THE DOOR IS IN THE CLOSED POSITION.
9. ALL FILLER PANELS AND COUNTERTOP OVERHANGS TO BE 1 1/2" U.N.O.
10. PROVIDE FINISHES AS SCHEDULED UNLESS NOTED OTHERWISE



② ENLARGED VESTIBULE PLAN
1/4" = 1'-0"



① ABI 1 - CASEWORK ELEVATION
1/4" = 1'-0"

FINISH LEGEND

ALL WALLS, FIXTURES AND FINISHES WITHIN HATCHED AREA ARE EXISTING TO REMAIN. PROTECT THROUGHOUT CONSTRUCTION. CUT AND PATCH AS REQUIRED FOR MECHANICAL SCOPE.

FLOOR COVERINGS

SC — EXISTING CONCRETE - GRIND & SEAL

PC 1 — POLISHED CONCRETE
PATTERN: CLASS B
COLOR: MATTE
LOCATION: DRILL FLOOR, STORAGE ROOMS, ENTRY HALL

CPT 1 — CARPET
MFG: INTERFACE
PATTERN: SKYLIGHTS
COLOR: ONYX 103486
INSTALL: ASHLAR
LOCATION: CLASSROOM, COMMON AREAS

CPT 2 — CARPET
MFG: INTERFACE
PATTERN: SKYLIGHTS
COLOR: LEAD 103490
INSTALL: ASHLAR
LOCATION: OFFICES

CPT 3 — CARPET
MFG: INTERFACE
PATTERN: SR899 WALK OFF
COLOR: ONYX 104941
INSTALL: MONOLITHIC
LOCATION: VESTIBULE

CPT4 — CARPET (INNG LOGO)
MFG: INTERFACE
PATTERN: INDUSTRIOUS
COLOR: IRON
LOCATION: VESTIBULE 1

RAF 1 — RESILIENT ATHLETIC FLOORING
MFG: MONDO
PATTERN: SPORT IMPACT 10mm
COLOR: S018 DARK GREY
INSTALL: QUARTER TURN
LOCATION: FITNESS ROOM

LVT 1 — LUXURY VINYL TILE
MFG: MANNINGTON
PATTERN: SPACIA STONE
COLOR: BLACK MARBLE
INSTALL: QUARTER TURN
LOCATION: LACTATION

TZ 1 — TERRAZZO TILE
MFG: DANCER
PATTERN: CUSTOM BLEND
COLOR: GREY - WHITE/BLACK/GREY
LOCATION: ENTRY HALL

TZ 2 — TERRAZZO TILE
MFG: DANCER
PATTERN: CUSTOM BLEND
COLOR: WHITE - WHITE/BEIGE/GREY
LOCATION: ENTRY HALL

BASE

B1 — PAINTED BASE
COLOR: CHARCOAL
SIZE: FIRST BLOCK COURSE
LOCATION: EXPOSED, GLAZED BLOCK AREAS

RB1 — RUBBER BASE
MFG: MILLWORK
STYLE: MANDALAY
COLOR: WHITE
SIZE: 4.5" MW-XX-H
LOCATION: OFFICES

TB — TILE BASE
MFG: DALTILE
PATTERN: HAUT MONDE
COLOR: ELITE GREY HM05
FINISH: LIGHT POLISHED
LOCATION: LOBBY, KITCHEN

WALL FINISHES

ETR — EXISTING TO REMAIN

P1 — ACRYLIC LATEX PAINT
MFG: SHERWIN WILLIAMS
COLOR: CEILING BRIGHT WHITE
FINISH: EGGSHELL
LOCATION: CEILINGS

P2 — ACRYLIC LATEX PAINT
MFG: SHERWIN WILLIAMS
COLOR: BLACK
FINISH: EGGSHELL
LOCATION: CEILINGS

P3 — ACRYLIC LATEX PAINT
MFG: SHERWIN WILLIAMS
COLOR: TBD
FINISH: EGGSHELL
LOCATION: GENERAL CORRIDOR

P4 — ACRYLIC LATEX PAINT
MFG: SHERWIN WILLIAMS
COLOR: TBD
FINISH: EGGSHELL
LOCATION: OFFICES AND DRILL FLOOR

P5 — ACRYLIC LATEX PAINT
MFG: SHERWIN WILLIAMS
COLOR: TBD
FINISH: EGGSHELL
LOCATION: ACCENT PAINT

WG 1 — WOODEN GRILLE PANELS
MFG: ARMSTRONG
PATTERN: WOODWORKS GRILLE
COLOR: NATURAL WALNUT
SIZE: 2 1/4" SLAT HEIGHT
4 SLATS PER PANEL
LOCATION: ENTRY HALL & CLASSROOM 1

CASEWORK

SS1 — SOLID SURFACE COUNTERTOP
MFG: CORIAN
MATERIAL: SOLID SURFACE
COLOR: NEUTRAL CONCRETE
LOCATION: LACTATION ROOM

PLAM 1 — HIGH PRESSURE LAMINATE
MFG: FORMICA
PATTERN: 5782
LOCATION: CLASSROOM 1

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MD-SAB-26-B-013

ABI 1
FINISH PLANS

0917-18

JULY 31, 2026

BID DOCUMENTS

REVISIONS
1 Addendum #1 08/20/2026

JOSEPH L. DOWDLE
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No. 19300053
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INDIANA
ARCHITECT

ABI 1
A801

GENERAL FINISH NOTES

1. ALL FINISH MATERIALS SCHEDULE ARE BASIS OF DESIGN SELECTIONS. ALTERNATES MAY BE SUBMITTED DURING BIDDING.

SHEET NOTES

A13 REINSTALL ALL EQUIPMENT AND SHELVING ONCE FLOOR INSTALLATION IS COMPLETE. RECONNECT AND TEST ALL SERVICE CONNECTIONS.

A14 PROVIDE ADA COMPLIANT STAINLESS STEEL SADDLE THRESHOLD.

A15 UNDERCUT EXISTING DOOR SLAB AS NEEDED TO ACCOMMODATE NEW CONSTRUCTION.

D30 REMOVE EXISING EPOXY FLOORING AND BASE. DISCONNECT ALL EQUIPMENT AND SHELVING. RELOCATE AND PROTECT THROUGHOUT FLOORING DEMOLITION AND NEW FLOORING INSTALLATION. PROTECT ALL EXISTING FLOOR DRAINS. EXISTING FLOOR DRAINS TO REMAIN. ADJUST FLOOR DRAINS TO BE FLUSH WITH NEW FLOOR FINISH.

D31 EXISTING STAINLESS STEEL TABLE TOBE RELOCATED AS DIRECTED BY THE OWNER.

D32 REMOVE EXISTING THRESHOLD. UNDERCUT DOOR AS REQUIRED TO ALLOW FOR INSTALLATION OF NEW TILE & THRESHOLD.

FINISH LEGEND

ALL WALLS, FIXTURES AND FINISHES WITHIN HATCHED AREA ARE EXISTING TO REMAIN. PROTECT THROUGHOUT CONSTRUCTION. CUT AND PATCH AS REQUIRED FOR MECHANICAL SCOPE.

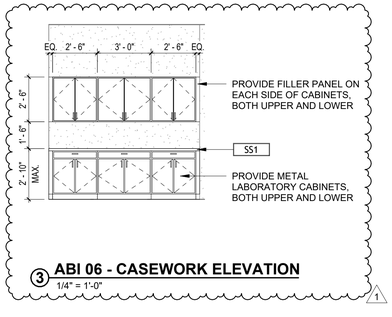
FLOOR COVERINGS

QT1 QUARRY TILE
MFG: METROPOLITAN CERAMICS
SIZE: 6x6
LOCATION: KITCHEN - ABI 06 ONLY

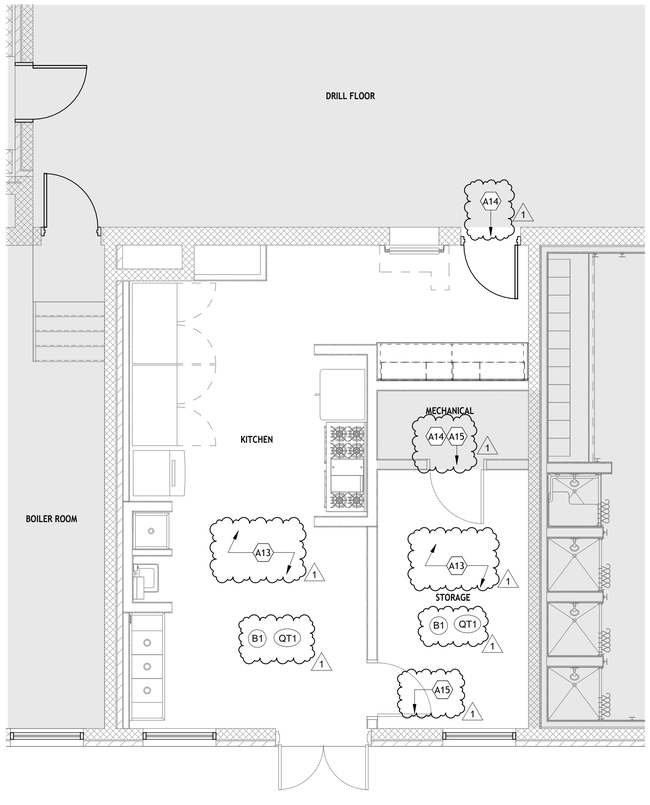
BASE

B1 QUARRY TILE
MFG: METROPOLITAN CERAMICS
SIZE: 6x6 COVE
LOCATION: KITCHEN - ABI 06 ONLY

1



3 ABI 06 - CASEWORK ELEVATION
1/4" = 1'-0"



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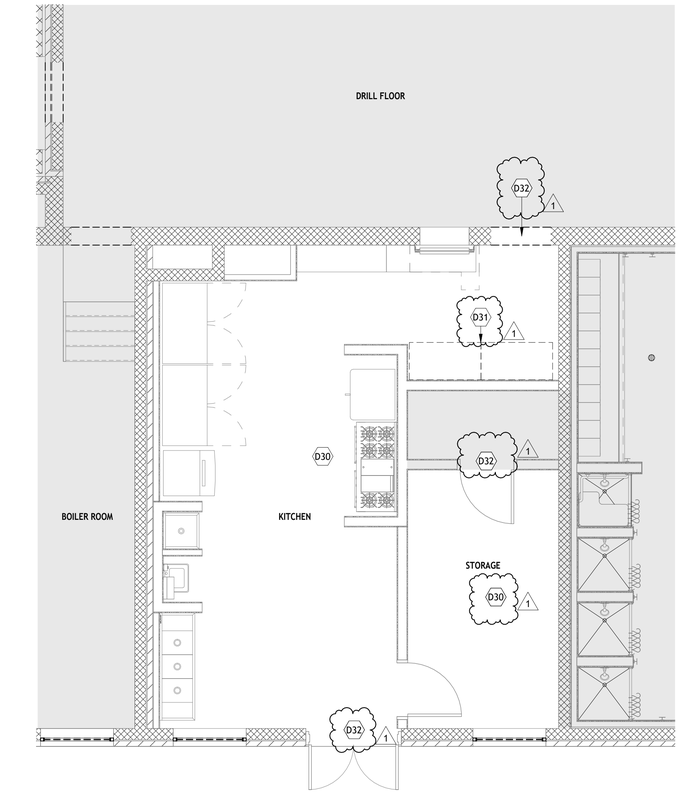
ABI 6 - FIRST FLOOR PLAN
1/4" = 1'-0"



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ABI 6 - FIRST FLOOR DEMO PLAN
1/4" = 1'-0"

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ABI 6
FIRST FLOOR
KITCHEN PLAN

0917-18

JULY 31, 2026

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