



ADDENDUM NO. 4:

Date: September 15, 2026
Project: Douglas High School Competition Gymnasium
Addition and Renovation
DCM# 2023777
Owner: Marshall County School District
Architect: Ward Scott Morris Architecture, Inc.
BID DATE: September 22, 2026
BID TIME: 2:00 PM CST (local time)
PHYSICAL BID LOCATION: Board Room at the Marshall County Board of Education,
12380 U.S. HWY 431 S. Guntersville, Alabama 35976.

This Addendum forms a part of the Contract Documents and modifies the original Bid Documents as noted below. Acknowledge receipt of this Addendum in the location provided on the Bid Proposal Form. Further instruction, including requested approved equals to follow in subsequent addenda.

1.1 GENERAL

A. N/A

1.2 DRAWINGS

- A. Sheet 1-A002
1. Storefront opening schedule corrected to removed reference to HM.

1.3 SPECIFICATIONS

- A. Unit Prices Form
1. Unit Price #6 Mass Rock Removal has been added.
- B. Section 012100 – Allowances
1. Allowance No. 2 (Unit Price #2) has been updated to cover Trench Rock Removal.
2. Allowance No. 14 (Unit Price #6) has been added to cover Mass Rock Removal.
- C. Section 012200 – Unit Prices
1. Unit Price #6 has been added to cover Mass Rock Removal.
- D. Section 015000 – Temporary Facilities and Controls
1. Language in Part 1.3 has been revised to clarify contractors are responsible for utility costs associated with the project construction.
2. Language referencing Section 011200 has been removed.
- E. Section 064000 – Expanded Cellular PVC Columns
1. Added
- F. Section 074213 – Form Metal Wall Panels
1. Added
- G. Section 114000 – Food Service Equipment

1. Part 2.5: Added refrigerator to food service equipment schedule.
- H. Section 116623 – Gymnasium Equipment
 1. Part 2.3: Added specification description for portable basketball goals.
- I. Section 133419 – Metal Building Systems
 1. Blacksher Metals is an approved manufacturer.
 2. Vulcan Steel Structure is an approved manufacturer.
 3. ACI Building Systems LLC is an approved manufacturer.
 4. Part 2.6 Metal Wall Panels has been revised to tell the contractor to refer to Section 074213 for metal wall panel description.

1.4 ATTACHED TO ADDENDUM

- A. Bidder Questions Addendum 4
- B. Architectural Sheets
 1. 1-A002 – Opening Schedules; Revised
- C. Specifications
 1. Unit Prices Form
 2. Section 012100 – Allowances; Revised
 3. Section 012200 – Unit Prices; Revised
 4. Section 015000 – Temporary Facilities and Controls; Revised
 5. Section 064000 – Expanded Cellular PVC Columns; Added
 6. Section 074213 – Formed Metal Wall Panels; Added
 7. Section 114000 – Food Service Equipment; Revised
 8. Section 116623 – Gymnasium Equipment; Revised
 9. Section 133418 – Metal Building Systems

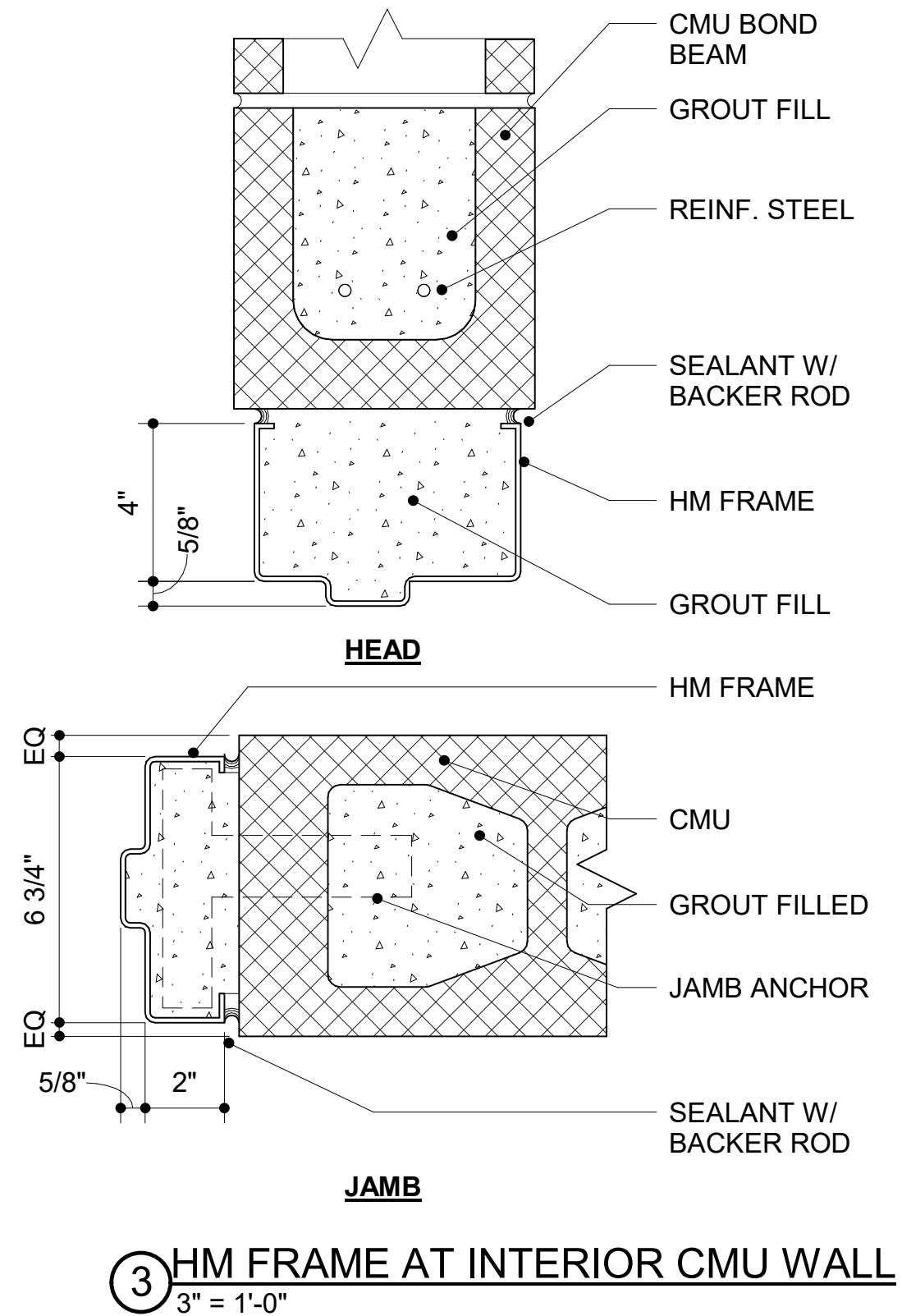
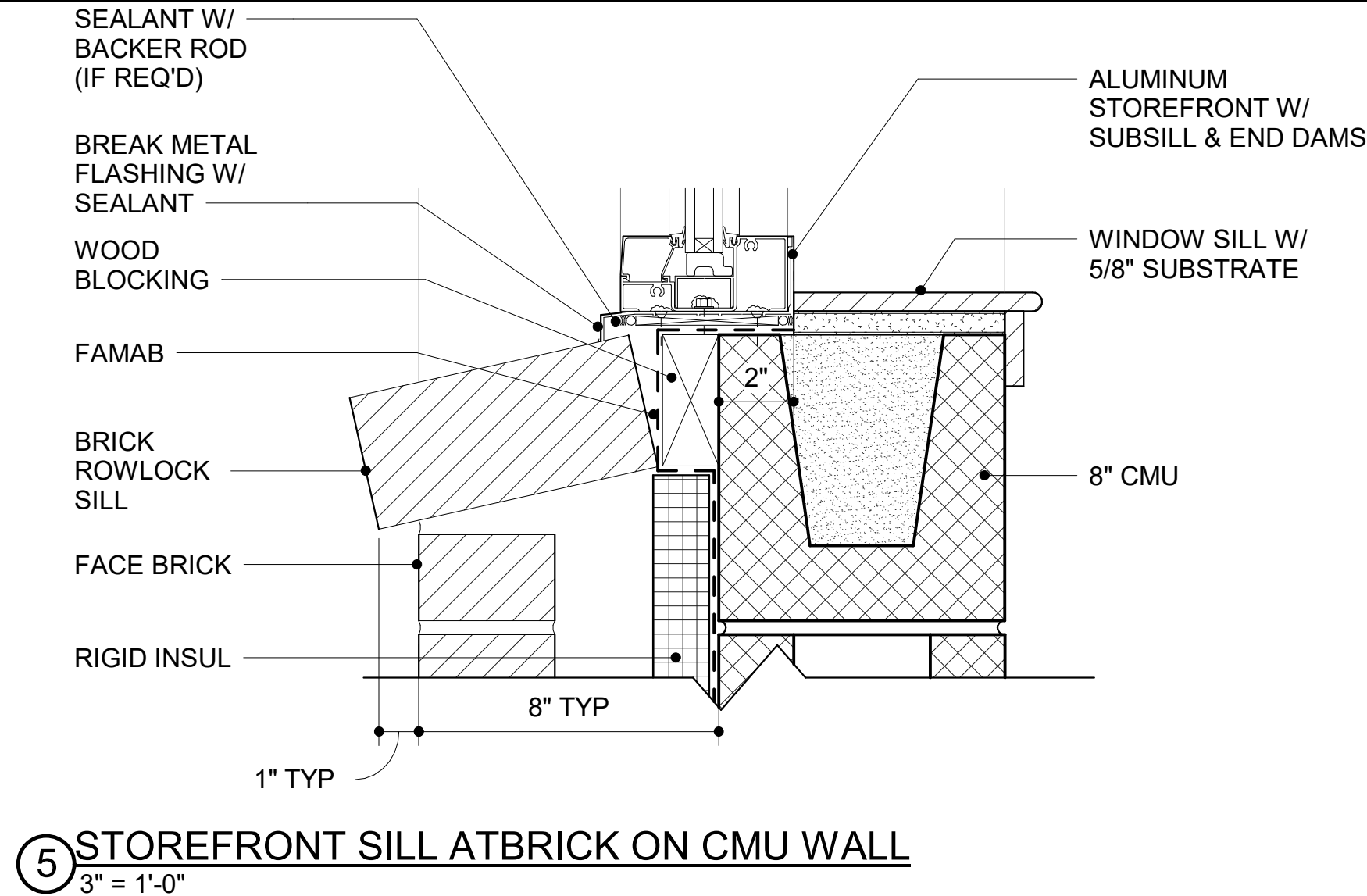
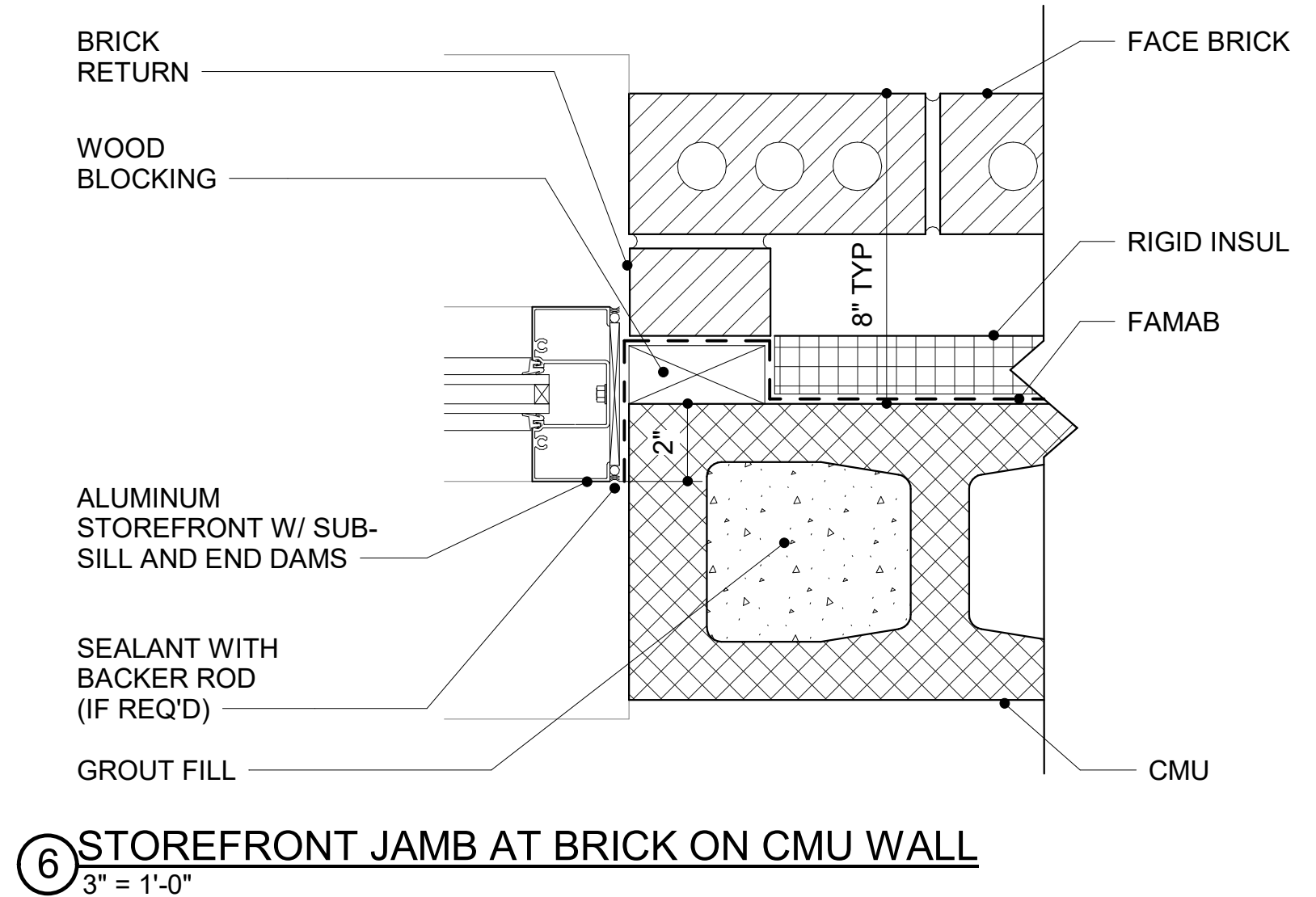
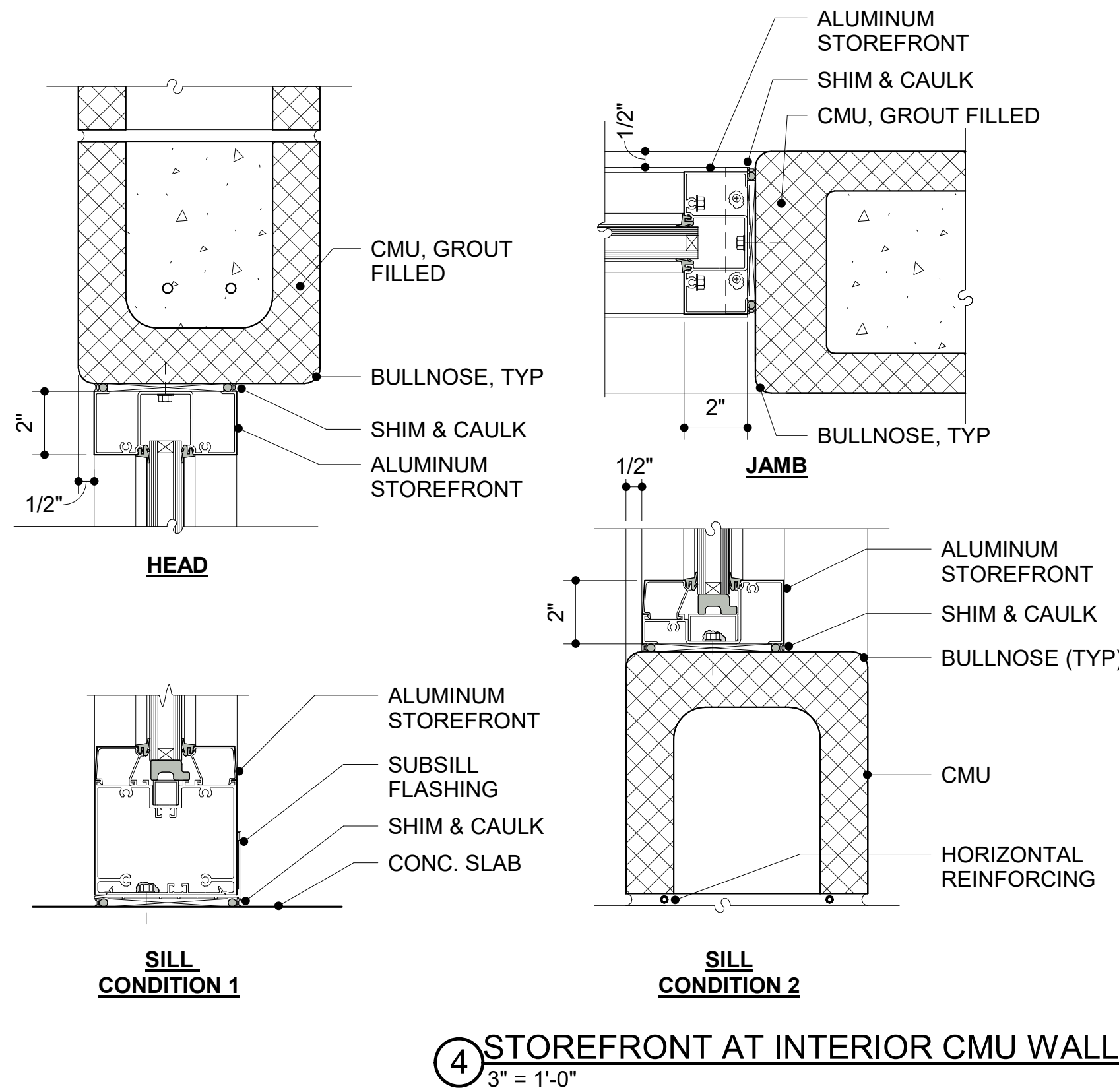
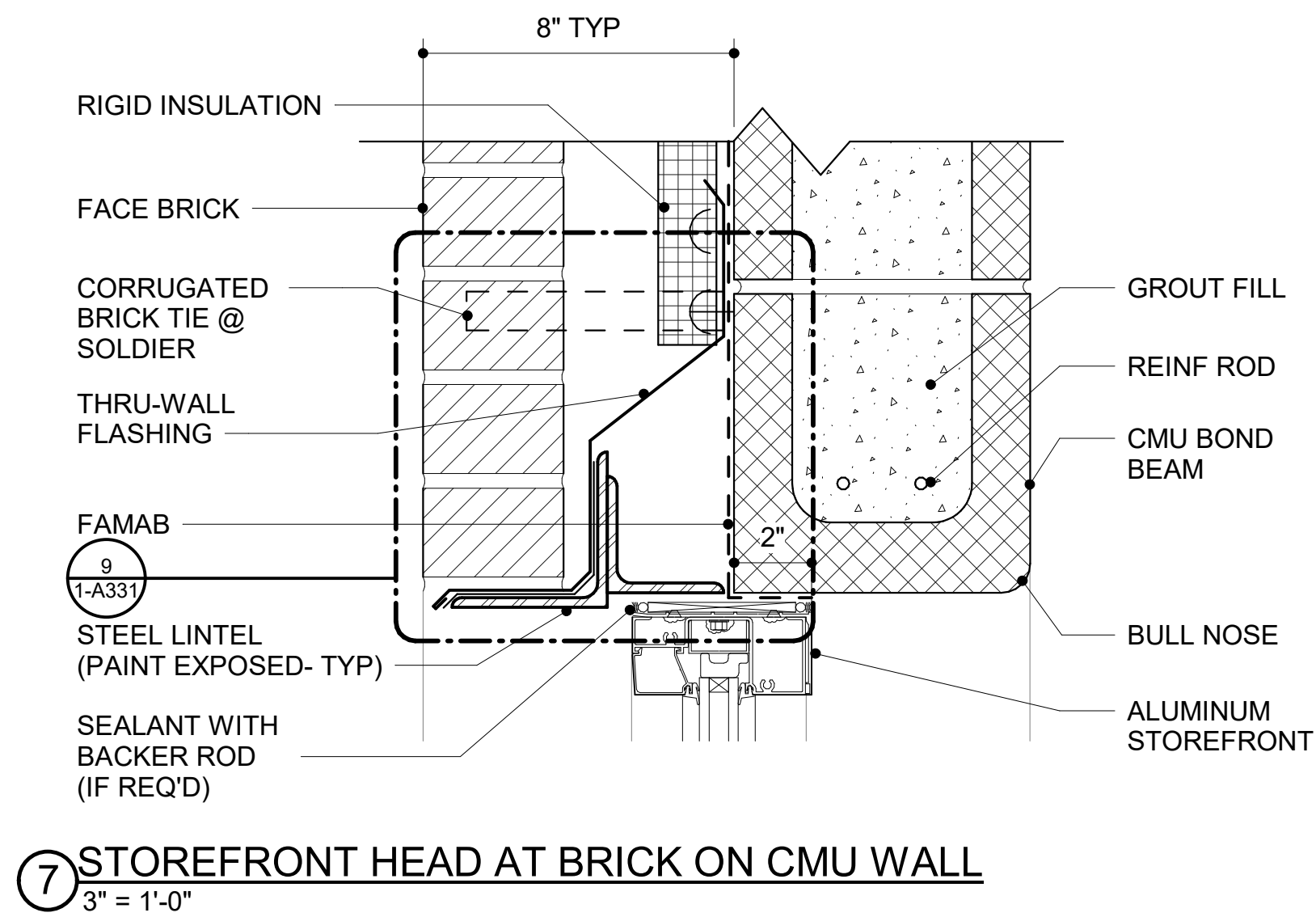
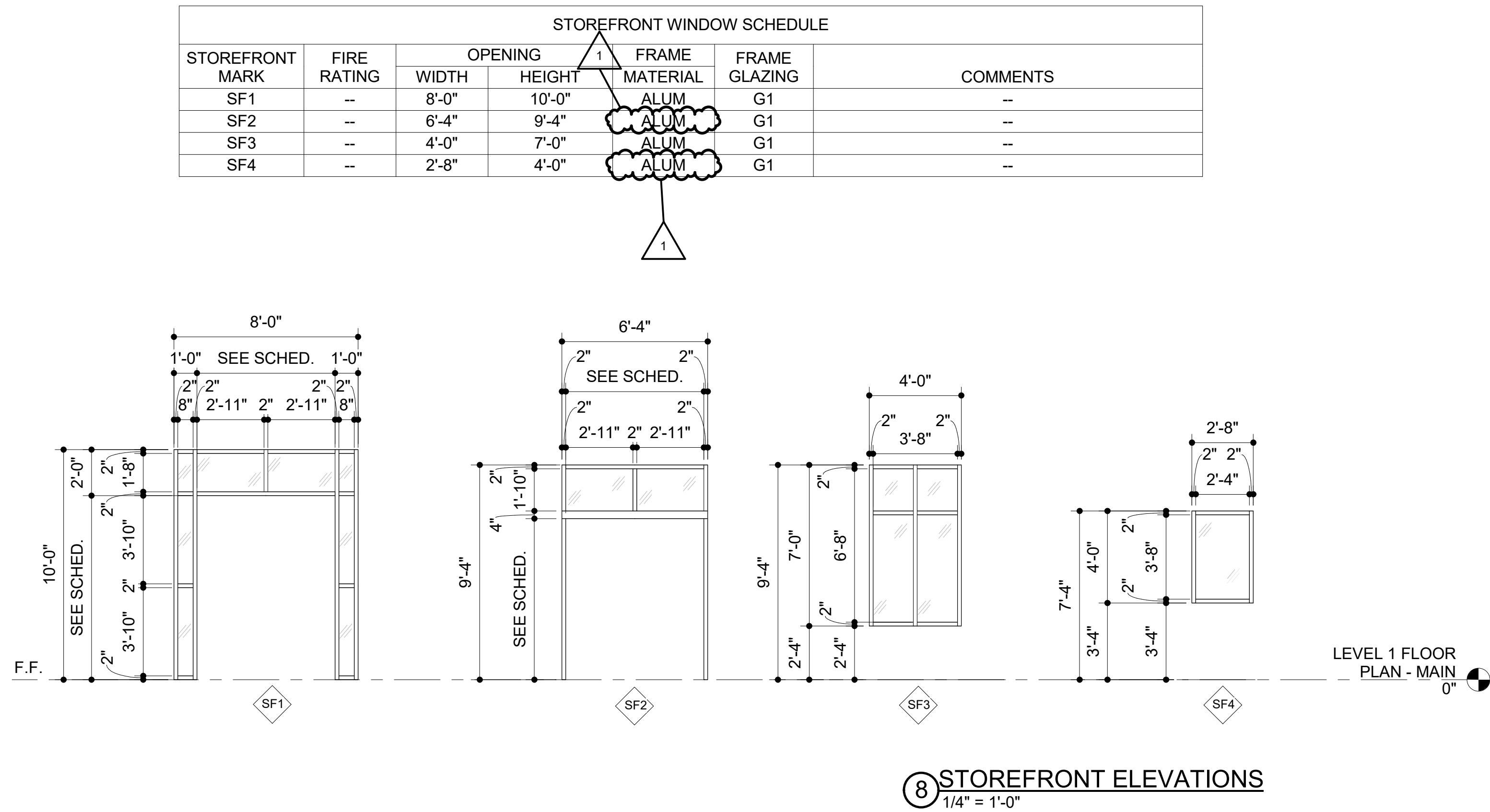
END OF ADDENDUM



BIDDER QUESTIONS Addendum 4:

- A. Specification Section 012000 Unit Prices, Part 3.1B: please clarify this Unit Price is for mass rock excavation. There is a big difference in cost between Mass Rock Excavation and Trench Rock Excavation.
 - 1. After reviewing the geotechnical report, the rock excavation is expected to be Trench Rock Excavation. Allowance No. 2 (Unit Price #2) has been clarified to refer to trench rock. Allowance No. 14 (Unit Price #6) has been added to cover potential mass rock removal.
- B. Specification Section 015000, Part 1.3 B and C state water, sewer and electric power from Owner's existing systems are available for use without metering and without payment of use charges. Part 1.3 D states sewer, water and electric power use charges are specified in Section 011200 "Multiple Contract Summary." There is no Section 011200 included in the Bid Documents. Please confirm contractors will be able to use existing water, sewer, and electric power from existing services at no cost to contractor.
 - 1. Section 015000, 1.3 has been revised to clarify contractors are responsible for utility costs associated with the project construction. Reference to Section 011200 has been removed.
- C. We are requesting clarification regarding the downspout boots shown on the project drawings. Please provide the applicable specifications for the downspout boots, including the required manufacturer, product/type, material, size, finish, color and installation requirements. If the downspout boots are intended to be a specific proprietary or manufactured product, please provide the applicable product information or specification for bidding and procurement purposes. Please confirm the required boot specifications so that we can ensure the appropriate product is included in our proposal.
 - 1. Metal Downspout Boots are specified in Section 055000 – Metal Fabrications.
- D. The exterior elevations identify pre-manufactured column covers at the exterior columns; however, we were unable to locate a corresponding specification section or additional details defining the requirements for these column covers. Please provide the applicable specification section and/or additional details necessary to properly price and include the complete scope of the pre-manufactured column covers in our proposal.
 - 1. Section 064000 – Expanded Cellular PVC Columns has been added. Columns are to rest on manufacturer recommended cap and not bear directly on brick bases.
- E. Specification Section 064116, Part 1.5 C requires submittal of AWI Quality Certification Program certificates. However, Part 1.6 A does not require participation in the AWI Quality Certification Program. Please provide clarification. If participation in the AWI Quality Certification Program is required, we request this requirement be waived if the fabricator has the qualifications required for this project and has a record of successful in-service performance.
 - 1. Participation in the AWI Quality Certification Program is not required. However, the manufacturer must comply with AWI's Architectural Woodwork Standards
- F. On Sheet 1-A111 at Room 1113, are the two items shown a washer and dryer. The note #9 also states that these are stacked washer and dryer. Is this correct?
 - 1. These are a washer and dryer. They are not to be stacked.
- G. Please provide a specification on the refrigerator shown in rooms 1117 and 1102.
 - 1. Section 114000 – Food Service Equipment has been updated.
- H. Are the coiling doors electrically or mechanically operated?
 - 1. Mechanically.
- I. Are the coiling door finish to the standard baked enamel painted or the full range of powder coated. See specification 083323.
 - 1. Contractor is to provide the full range of manufacturer finish options for owner and architect consideration.

- J. In spec section 042000, 2.4, C states that brick much match Ider High School. Brick will be bid using the allowance per spec.
 - 1. This is an oversight. Please use the brick allowance to price the brick. Brick size is to be standard.
- K. Will any aid to construction fees be covered under Allowance 7? If not, provide additional allowance.
 - 1. An allowance for aid to construction costs has been added.
- L. The gymnasium plan for the competition gym shows portable goals for the main court units. Please provide a specification for the portable goals.
 - 1. Section 116623 – Gymnasium Equipment has been revised.
- M. The Storefront Schedule on A002 is not clear. SF-2 and SF-4 are both listed as HM frames. Please clarify your intent for these openings.
 - 1. The opening schedule has been corrected to call these out at Aluminum Storefront.

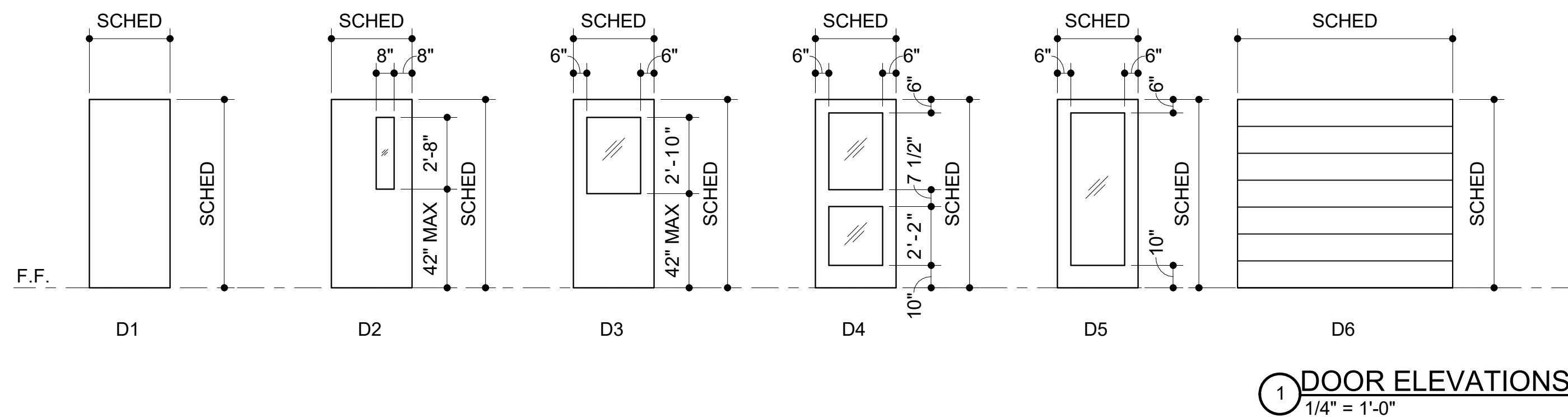
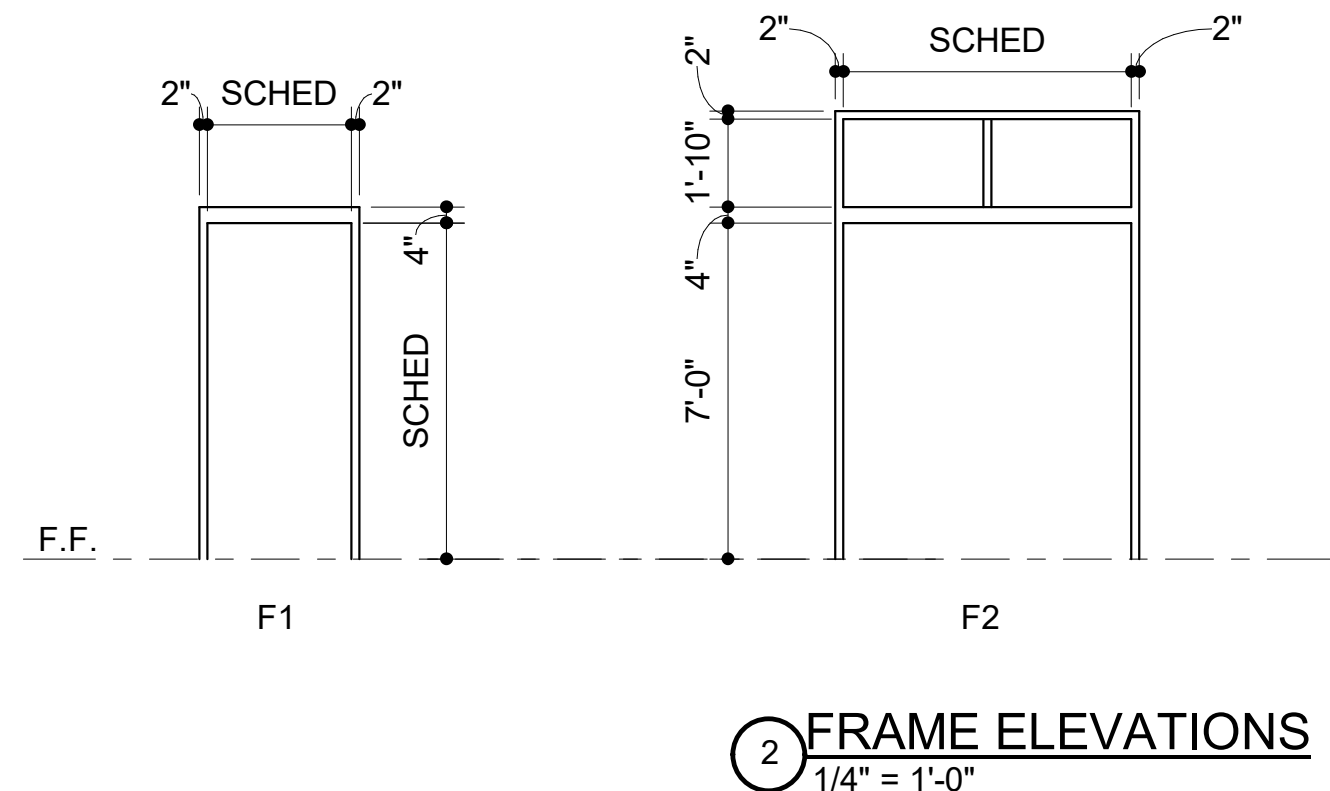


DOOR SCHEDULE												
DOOR NUMBER	FIRE RATING	DOOR WIDTH	DOOR HEIGHT	DOOR ELEV.	DOOR MATERIAL	DOOR GLAZING	FRAME ELEV.	FRAME MATERIAL	FRAME GLAZING	HARDWARE	SIGNAGE	COMMENTS
1101A	--	6'-0"	8'-0"	D4	ALUM	G1	SF1	ALUM	G1	SET: 1	--	1
1101B	--	6'-0"	8'-0"	D4	ALUM	G1	SF1	ALUM	G1	SET: 2	--	1
1101C	--	6'-0"	8'-0"	D4	ALUM	G1	SF1	ALUM	G1	SET: 2	--	1
1101D	--	6'-0"	8'-0"	D4	ALUM	G1	SF1	ALUM	G1	SET: 2	--	1
1102A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 15	--	--
1102B	--	7'-4"	4'-0"	D6	MFR	--	MFR	MFR	--	MFR	--	5
1102C	--	7'-4"	4'-0"	D6	MFR	--	MFR	MFR	--	MFR	--	5
1103A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 20	--	--
1104A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 19	--	--
1105A	--	7'-0"	8'-0"	D6	MFR	--	MFR	MFR	--	MFR	--	4
1106A	--	6'-0"	7'-0"	D2	HM	G1	F2	HM	--	SET: 11	--	1
1106B	--	6'-0"	7'-0"	D2	HM	G1	F2	HM	--	SET: 11	--	1
1106C	--	6'-0"	7'-0"	D4	HM	G1	SF2	HM	G1	SET: 3	--	1
1106D	--	6'-0"	7'-0"	D4	HM	G1	SF2	HM	G1	SET: 3	--	1
1106E	--	6'-0"	7'-0"	D4	HM	G1	SF2	HM	G1	SET: 3	--	1
1106F	--	6'-0"	7'-0"	D4	HM	G1	SF2	HM	G1	SET: 3	--	1
1107A	--	3'-0"	7'-0"	D1	HM	--	F1	HM	--	SET: 13	--	--
1108A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 16	A	--
1109A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 24	A	--
1110A	--	3'-0"	7'-0"	D1	HM	--	F1	HM	--	SET: 7	--	--
1111A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 16	A	--
1113A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 19	--	--
1114A	--	3'-0"	7'-0"	D3	WD	G1	F1	HM	--	SET: 22	B	--
1115A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 24	--	--
1116A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 19	--	--
1117A	--	3'-0"	7'-0"	D2	HM	G1	F1	HM	--	SET: 23	C	--
1118A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 19	--	--
1119A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 19	--	--
1120A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 19	--	--
1121A	--	3'-0"	7'-0"	D2	HM	G1	F1	HM	--	SET: 13	--	--
1121B	--	3'-0"	7'-0"	D1	HM	--	F1	HM	--	??18??	--	--
1122A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 19	--	--
1123A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 16	A	--
1124A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 24	A	--
1125A	--	3'-0"	7'-0"	D2	WD	G1	F1	HM	--	SET: 17	--	--
1125B	--	8'-0"	7'-0"	D2	HM	G1	F1	HM	--	SET: 5	--	--
1125C	--	8'-0"	7'-0"	D2	HM	G1	F1	HM	--	SET: 5	--	--
1126A	--	3'-0"	7'-0"	D2	WD	G1	F1	HM	--	SET: 17	--	--
1127A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 16	A	--
1128A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 16	--	--
1129A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 24	A	--
1130A	--	3'-0"	7'-0"	D3	WD	G1	F1	HM	--	SET: 22	--	--
1131A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 24	A	--
1132A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 19	--	--
1133A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 16	A	--
1135A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 19	--	--
1136A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 16	A	--
1137A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 24	A	--
1138A	--	3'-0"	7'-0"	D1	HM	--	F1	HM	--	SET: 8	--	--
1139A	--	6'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 12	--	1
1141A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 16	A	--
1142A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 21	--	--
1143A	--	3'-0"	7'-0"	D1	WD	--	F1	HM	--	SET: 16	A	--
1144A	--	3'-0"	7'-0"	D3	WD	G1	F1	HM	--	SET: 22	B	--
1145A	--	3'-0"	7'-0"	D1	HM	--	F1	HM	--	SET: 13	--	--
1146A	--	3'-0"	7'-0"	D1	HM	--	F1	HM	--	SET: 8	--	--

DOOR SCHEDULE LEGEND:
ALUM - ALUMINUM
HM - HOLLOW METAL
MFR - MANUFACTURER'S STANDARD
WD - WOOD

GLAZING LEGEND:
G1 - CLEAR TEMPERED GLASS

DOOR SCHEDULE COMMENTS:
1. PAIR OF DOORS
2. CASED OPENING
3. EXTERIOR OVERHEAD COILING DOOR
4. INTERIOR OVERHEAD COILING DOOR
5. COUNTER-TOP COILING DOOR



UNIT PRICES [ADD 4]

Attachment to DCM Form C-3: Unit Prices

1.1 SCHEDULE OF UNIT PRICES BASE BID

A. Unit Price No. 1: Unsuitable Soils

1. Undercutting unsuitable soils, disposing of material off site, and replacing with embankment fill or other material as approved by the Owner's geotechnical representative.

Unit Price per Cubic Yard in Place \$ _____

B. Unit Price No. 2 Excavation and Replacement of Trench Rock **[ADD 4]**

1. Undercutting unsuitable soils, disposing of material off site, and replacing with embankment fill or other material as approved by the Owner's geotechnical representative.

Unit Price per Cubic Yard in Place \$ _____

C. Unit Price No. 3: Concrete Foundations

1. Concrete foundation in place and installed as directed by the Owner, Architect, Engineer or the Construction Manager.

Unit Price per Ton in Place \$ _____

D. Unit Price No. 4: Reinforcing Steel

1. Reinforcing steel in place and installed as directed by the Owner, Architect, Engineer or the Construction Manager.

Unit Price per Ton in Place \$ _____

E. Unit Price No. 5: Structural Steel

1. Structural steel in place and installed as directed by the Owner, Architect, Engineer or the Construction Manager.

[ADD 2] Unit Price per Ton. in Place \$ _____

F. Unit Price No. 2 Excavation and Replacement of Mass Rock **[ADD 4]**

1. Undercutting unsuitable soils, disposing of material off site, and replacing with embankment fill or other material as approved by the Owner's geotechnical representative.

Unit Price per Cubic Yard in Place \$ _____

SECTION 012100 – ALLOWANCES [ADD 4]

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Unit-cost allowances.
 - 3. Quantity allowances.
 - 4. Contingency allowances.
 - 5. Testing and inspecting allowances.
- C. Related Requirements:
 - 1. Section 012200 "Unit Prices" for procedures for using unit prices, including adjustment of quantity allowances when applicable.
 - 2. Section 014000 "Quality Requirements" for procedures governing the use of allowances for field testing by an independent testing agency.

1.3 DEFINITIONS

- A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.5 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.6 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 UNIT-COST ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.9 QUANTITY ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.10 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.11 TESTING AND INSPECTING ALLOWANCES

- A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.
- B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.
- C. Costs of testing and inspection services not specifically required by the Contract Documents are Contractor responsibilities and are not included in the allowance.
- D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.12 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.
 - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
 - 3. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
 - 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs due to a change in the scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
 - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.

2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES, VOLUME 1 COMPETITION GYM

- A. Allowance No. 1: Removal and Replacement of Unsuitable/Unconsolidated Materials (Unit Price #1)
 1. Quantity Allowance: Include in base bid, 3,500 cu. Yd. of unsatisfactory soil excavation and disposal off-site and replacement with satisfactory soil material from off-site. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."
- B. Allowance No. 2 Excavation and Replacement of Rock (Unit Price #2)
 1. Quantity Allowance: Include in base bid, 2,750 cu. Yd. of rock excavation and disposal off-site and replacement with satisfactory soil material from off-site. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."
- C. Allowance No. 3: Concrete Foundations. (Unit Price #3)
 1. Quantity Allowance: Include in base bid, 70 cu. yd. of concrete for spread footings in place to support PEMB frames/bents foundations. Contractor to provide an in-place unit price for reinforcing steel and concrete spread footings based on these quantities. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."
- D. Allowance No. 4: Reinforcing Steel. (Unit Price #4)
 1. Quantity Allowance: Include in base bid, 2 tons of reinforcing steel in place in addition to the steel shown in structural drawings. This steel is to be placed in sizes and locations at the direction of the Architect or Engineer at no additional cost to the Owner. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."
- E. Unit Price Allowance No. 5: Structural Steel. (Unit Price #5)
 1. Include a unit price allowance of .5 tons structural steel in place in addition to the steel shown on the contract documents. This steel is to be placed in sizes and locations at the direction of the Owner, Architect, or Engineer.
- F. Allowance No. 6: Landscaping.
 1. Contingency Allowance: Include \$15,000 for use as instructed by the Owner and Architect for landscaping.
- G. Allowance No. 7: Permit & Utility Fees:
 1. Contingency Allowance: Include \$4,000 for use as instructed by the Owner and Architect for permit and utility fees.
- H. Allowance No. 8: Project Contingency.
 1. Contingency Allowance: Include \$300,000 for use as instructed by the Owner and Architect.
- I. Allowance No. 9: Fire Fighter Communication System.
 1. Contingency Allowance: Include \$75,000 for signal survey, procurement and installation of NFPA-compliant signal booster and bi-directional antenna system.
 - a. Scope to be verified by survey requirements and Section 284111.
- J. Allowance No. 10: AV Allowance
 1. Contingency Allowance: Include \$500,000 for the gym sound system (wireless mics and Bluetooth), play clocks, LED Digital Screen Scoreboards, LED digital scorer's table and all associated components and install.
- K. Allowance No. 11: – Exterior Building Signage
 1. Lump Sum Allowance: Include \$30,000 for use as instructed by the Owner and Architect, for procurement and installation of Exterior Architectural Signage as selected by the Owner.
- L. Unit Price Allowance No. 12: Brick Allowance:
 1. Include a unit price allowance of \$700 per thousand for all face brick indicated on drawings.

- M. Allowance No. 13: Interior Graphics
 - 1. Lump Sum Allowance: Include an allowance of \$50,000.00 for the purchase and installation of graphics as instructed by the Owner, Architect, or Construction Manager.
- N. Allowance No. 14: Excavation and Removal of Mass Rock (Unit Price #6) **[ADD 4]**
 - 1. Quantity Allowance: Include in base bid, 500 cu. Yd. of rock excavation and disposal off site and replacement with satisfactory soil material from off-site. Coordinate quantity allowance adjustment with unit-price requirement in Section 012200 Unit Prices.
- O. Allowance No. 15: Aid to Construction **[ADD 4]**
 - 1. Contingency Allowance: Include \$100,000 dollars for covering costs associated with aid to construction.

3.4 SCHEDULE OF ALLOWANCES, VOLUME 2 (ALTERNATE) MULTI-PURPOSE GYM

- A. Allowance No. A-1: Lump Sum Contingency
 - 1. Include a contingency allowance of \$250,000.00 for use as instructed by the Owner or Architect.
- B. Allowance No. A-2: Removal and Replacement of Unsuitable/Unconsolidated Materials (Unit Price #1)
 - 1. Quantity Allowance: Include in base bid, 3,000 cu. Yd. of unsatisfactory soil excavation and disposal off-site and replacement with satisfactory soil material from off-site. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."
- C. Allowance No. A-3: Excavation and Replacement of Rock (Unit Price #2)
 - 1. Quantity Allowance: Include in base bid, 1,750 cu. Yd. of rock excavation and disposal off-site and replacement with satisfactory soil material from off-site. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."
- D. Allowance No. A-4: Concrete Foundations (Unit Price #3) **[ADD 2]**
 - 1. Quantity Allowance: Include in base bid, 40 cu. yd. of concrete for spread footings in place to support PEMB frames/bents foundations. Contractor to provide an in place unit price for reinforcing steel and concrete spread footings based on these quantities. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."
- E. Allowance No. A-5: Reinforcing Steel (Unit Price #4) **[ADD 2]**
 - 1. Quantity Allowance: Include in base bid, 2.0 tons of reinforcing steel in place in addition to the steel shown in structural drawings. This steel is to be placed in sizes and locations at the direction of the Architect or Engineer at no additional cost to the Owner. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."
- F. Unit Price Allowance No. A-6: Structural Steel (Unit Price #5) **[ADD 2]**
 - 1. Include a unit price allowance of .5 tons structural steel in place in addition to the steel shown on the contract documents. This steel is to be placed in sizes and locations at the direction of the Owner, Architect, or Engineer.
- G. Allowance No. A-7: AV Allowance
 - 1. Contingency Allowance: Include \$250,000 for the gym sound system (wireless mics and Bluetooth), play clocks, LED Digital Numbers Scoreboards, LED digital scorer's table and all associated components and install.
- H. Allowance No. A-8: Fire Fighter Communication System.
 - 1. Contingency Allowance: Include \$50,000 for signal survey, procurement and installation of NFPA-compliant signal booster and bi-directional antenna system.
 - a. Scope to be verified by survey requirements and Section 284111.
- I. Unit Price Allowance No. A-9: Brick Allowance: **[ADD 2]**
 - 1. Include a unit price allowance of \$700 per thousand for all face brick indicated on drawings. **[ADD 3]**

END OF SECTION 012100

SECTION 012200 - UNIT PRICES [ADD 4]

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedures for using unit prices to adjust quantity allowances.
 - 2. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
 - 3. Section 014000 "Quality Requirements" for field testing by an independent testing agency.

1.3 DEFINITIONS

- A. Unit price is an amount incorporated into the Agreement, applicable during the duration of the Work, as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to, or deducted from, the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

- A. Unit Price No. 1: Removal and Replacement of Unsuitable/Unconsolidated Materials
 - 1. Description: Provide all materials, equipment, tools, labor and incidentals necessary to remove and dispose of off-site all unsuitable/unconsolidated materials underneath the building, pavement areas, sidewalks, curbs, and concrete areas as determined in the field during construction by the Owner's Geotechnical Representative and replace with material as specified as embankment fill in the technical specifications or other material(s) as approved by the Owner's Geotechnical Representative. All excavation, including unsuitable/unconsolidated materials, from existing ground elevation to the finished subgrade elevation in such areas, shall be included in the base bid and shall not be paid as Removal and Replacement of Unsuitable/Unconsolidated Materials. The stability of the subgrade shall be established as per the technical specifications (proof-rolling) and/or as required by the Owner's Geotechnical Representative. There shall be no additional payment for removal or remediation of spoil material, unsuitable, unconsolidated materials and/or subgrade stability required due to deterioration of such subgrade associated with contractor's negligence, including but not necessarily limited to, keeping the area dewatered, grading to provide positive drainage, erosion / siltation, sumps, etc. Following demolition, topsoil stripping in fill sections, base bid undercutting, and excavation operations to finished subgrade elevations in cut-sections; the Contractor shall notify the Owner's Geotechnical Representative before any questionable material is excavated so the area(s) of unsuitable/unconsolidated materials may be identified. Following the removal of such material, the Contractor shall once again notify the Owner's Geotechnical Representative before any embankment fill material is placed, so the area may be delineated and removal depths measured to derive the cubic yards of unsuitable/unconsolidated material removal and subsequent replacement. Failure to notify the Owner's Geotech-

nical Representative and performing unsuitable/unconsolidated excavation along with subsequent replacement material without his/her presence for measurement shall forfeit payment of that amount of unobserved work. The Owner's Representative measurement of the quantities shall be final. Haul tickets shall not be considered a valid determination of quantities. **The contractor shall anticipate and include the respective amounts listed in Section 012100 – Allowances for the Base Bid and Allowance in their respective bid amounts.** The unit price shall be used to adjust the base bid accordingly for either deductions or additions to the anticipated volume of excavation.

2. Unit of Measure: Cubic Yard in Place (CYIP)

B. Unit Price No. 2: Excavation and Replacement of Trench Rock **[ADD 4]**

1. Description: Provide all materials, equipment, tools, labor and incidentals necessary to remove and dispose of off-site all rock materials underneath the building, pavement areas, sidewalks, curbs, and concrete areas as determined in the field during construction by the Owner's Geotechnical Representative and replace with material as specified as embankment fill in the technical specifications or other material(s) as approved by the Owner's Geotechnical Representative. All excavation, including rock removal, from existing ground elevation to the finished subgrade elevation in such areas, shall be included in the base bid and shall not be paid as Excavation and Replacement of Rock. The stability of the subgrade shall be established as per the technical specifications (proof-rolling) and/or as required by the Owner's Geotechnical Representative. There shall be no additional payment for removal or remediation of spoil material, unsuitable, unconsolidated materials and/or subgrade stability required due to deterioration of such subgrade associated with contractor's negligence, including but not necessarily limited to, keeping the area dewatered, grading to provide positive drainage, erosion / siltation, sumps, etc. Following demolition, topsoil stripping in fill sections, base bid undercutting, and excavation operations to finished subgrade elevations in cut-sections; the Contractor shall notify the Owner's Geotechnical Representative before any questionable material is excavated so the area(s) of excavation and replacement of rock may be identified. Following the removal of such material, the Contractor shall once again notify the Owner's Geotechnical Representative before any embankment fill material is placed, so the area may be delineated and removal depths measured to derive the cubic yards of rock material removal and subsequent replacement. Failure to notify the Owner's Geotechnical Representative and performing rock excavation along with subsequent replacement material without his/her presence for measurement shall forfeit payment of that amount of unobserved work. The Owner's Representative measurement of the quantities shall be final. Haul tickets shall not be considered a valid determination of quantities. **The contractor shall anticipate and include the respective amounts listed in Section 012100 – Allowances for the Base Bid and Allowance in their respective bid amounts.** The unit price shall be used to adjust the base bid accordingly for either deductions or additions to the anticipated volume of excavation.
2. Unit of Measure: Cubic Yard in Place (CYIP)

C. Unit Price No. 3: Concrete Foundations

1. Description: Provide all materials, equipment, tools, labor and incidentals necessary to increase or decrease the quantity of concrete and reinforcing steel required for foundations supporting the PEMB frames/bents. **The contractor shall anticipate and include the respective amounts listed in Section 012100 – Allowances for the Base Bid and Allowance in their respective bid amounts.** The unit price shall be used to adjust the base bid accordingly for either deductions or additions to the anticipated volume of concrete.
2. Unit of Measure: Cubic Yard in Place (CYIP)

D. Unit Price No. 4: Reinforcing Steel

1. Reinforcing steel in place and installed as directed by the Owner, Architect, Engineer, or the Construction Manager. **The contractor shall anticipate and include the respective amounts listed in Section 012100 – Allowances for the Base Bid and Allowance in their bid price respective bid amounts.** The unit price shall be used to adjust the base bid accordingly for either deductions or additions to the anticipated volume of concrete.
2. Unit of Measure: Tons, in place

E. Unit Price No. 5: Structural Steel

1. Structural steel in place and installed as directed by the Owner, Architect, Engineer, or the Construction Manager. **The contractor shall anticipate and include the respective amounts listed in Section 012100 – Allowances for the Base Bid and Allowance in their respective bid amounts.** The unit price shall be used to adjust the base bid accordingly for either deductions or additions to the anticipated volume of concrete.
2. Unit of Measure: Tons, in place

F. Unit Price No. 6: Excavation and Replacement of Mass Rock [ADD 4]

1. Description: Provide all materials, equipment, tools, labor and incidentals necessary to remove and dispose of off-site all rock materials underneath the building, pavement areas, sidewalks, curbs, and concrete areas as determined in the field during construction by the Owner's Geotechnical Representative and replace with material as specified as embankment fill in the technical specifications or other material(s) as approved by the Owner's Geotechnical Representative. All excavation, including rock removal, from existing ground elevation to the finished subgrade elevation in such areas, shall be included in the base bid and shall not be paid as Excavation and Replacement of Rock. The stability of the subgrade shall be established as per the technical specifications (proof-rolling) and/or as required by the Owner's Geotechnical Representative. There shall be no additional payment for removal or remediation of spoil material, unsuitable, unconsolidated materials and/or subgrade stability required due to deterioration of such subgrade associated with contractor's negligence, including but not necessarily limited to, keeping the area dewatered, grading to provide positive drainage, erosion / siltation, sumps, etc. Following demolition, topsoil stripping in fill sections, base bid undercutting, and excavation operations to finished subgrade elevations in cut-sections; the Contractor shall notify the Owner's Geotechnical Representative before any questionable material is excavated so the area(s) of excavation and replacement of rock may be identified. Following the removal of such material, the Contractor shall once again notify the Owner's Geotechnical Representative before any embankment fill material is placed, so the area may be delineated and removal depths measured to derive the cubic yards of rock material removal and subsequent replacement. Failure to notify the Owner's Geotechnical Representative and performing rock excavation along with subsequent replacement material without his/her presence for measurement shall forfeit payment of that amount of unobserved work. The Owner's Representative measurement of the quantities shall be final. Haul tickets shall not be considered a valid determination of quantities. **The contractor shall anticipate and include the respective amounts listed in Section 012100 – Allowances for the Base Bid and Allowance in their respective bid amounts.** The unit price shall be used to adjust the base bid accordingly for either deductions or additions to the anticipated volume of excavation.
2. Unit of Measure: Cubic Yard in Place (CYIP)

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS [ADD 4]

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.
 - 2. Section 321313 "Concrete Paving" for construction and maintenance of cement concrete pavement for temporary roads and paved areas.

1.3 USE CHARGES [ADD 4]

- A. General: Cost or use changes for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Sewer connections will not be in place for most if not all of the duration of the project. When and if the off-site sewer is installed by others and sewer piping under this contract is installed, should the contractor decide to connect to the sewer he must pay all sewer use charges until the project is turned over to the Owner.
- C. Water Service: Pay water service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric power service use charges for electricity use by all entities for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 - 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch-(3.8-mm-)thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch-(60-mm-)OD line posts and 2-7/8-inch-(73-mm-)OD corner and pull posts, with 1-5/8-inch-(42-mm-)OD top and bottom rails. Provide galvanized-steel bases for supporting posts.
- B. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
 - 1. Store combustible materials apart from building.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

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

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- C. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
 - 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- D. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- E. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

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

- B. Temporary Erosion and Sedimentation Control: Comply with requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
- C. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- D. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
 - 1. Extent of Fence: As indicated on Drawings.
 - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- E. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking on site.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.4 MOISTURE AND MOLD CONTROL

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

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.

2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 064000 - EXPANDED CELLULAR PVC COLUMN SPECIFICATIONS

[ADD 4]

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Expanded cellular PVC Columns Covers.

1.2 RELATED SECTIONS

- A. Section 06200 - Finish Carpentry.
- B. Section 09900 - Painting.

1.3 REFERENCES

- A. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. [Product Data]: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Verification Samples: For each finish product specified, two samples, minimum size 4 inches square, representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

- A. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- B. Columns shall be stored in the manufacturer's packaging until ready for use. If necessary to remove from crates, store in crated position with duplicate supports as originally crated.
- C. Capitals and bases shall be stored in the manufacturer's packaging until ready for use.

1.7 PROJECT CONDITIONS

- 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 limits.

PART 2 - PRODUCTS

2.1 MANUFACTURER'S

- A. Basis of design: Endura-Craft Craftsman Series Flat Panel with Tuscan Base, Cap, and Neck Moulding.
 - 1. Available Products:
 - a. Endura-Craft, Craftsman Series
 - b. Melton Classics, Melton Craft
 - c. Royal Corinthian, Royal Wrap

2.2 COLUMNS

- A. Expanded Cellular PVC Columns:

1. Column Style: Flat, Square, Non-Tapered
1. Column Cap and Base Style: Square Tuscan non-tapered, with neck moulding
2. Column Shaft Width and Depth: Refer to Drawings.
3. Column Overall Height: Refer to Drawings

2.3 MATERIALS

- A. PVC: Expanded cellular PVC – 3/8" to 5/8" (Thickness varies depending on size and design.)

2.4 FABRICATION

- A. PVC Fabrications:
 1. Column panels expanded cellular PVC with mitered edges.
 2. Cap and base parts, expanded cellular PVC.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the 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.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. touch-up, repair or replace damaged products before Substantial Completion.

SECTION 074213 - FORMED METAL WALL PANELS [ADD 4]

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. Concealed-fastener, flush metal wall panels and soffit panels.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
 - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 - 5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
 - 6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
 - 7. Review temporary protection requirements for metal panel assembly during and after installation.
 - 8. Review of procedures for repair of metal panels damaged after installation.
 - 9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
- B. Shop Drawings:
 - 1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 - 2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches (1:10).
- C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.
 - 1. Include Samples of trim and accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish, prepared on Samples of size indicated below:
 - 1. Metal Panels: 12 inches (305 mm) long by actual panel width. Include fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Field quality-control reports.
- D. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of typical metal panel assembly as shown on Drawings, including supports, attachments, and accessories.
 - 2. Water-Spray Test: Conduct water-spray test of metal panel assembly mockup, testing for water penetration according to AAMA 501.2.
 - 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels during installation.
- E. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.9 FIELD CONDITIONS

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

1.10 COORDINATION

- A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems 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 and other materials beyond normal weathering.
 - 2. Warranty Period: Two 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 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.

PART 2 - PRODUCTS**2.1 PERFORMANCE REQUIREMENTS**

- A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
 - 1. Wind Loads: As indicated on Drawings.

2. Other Design Loads: As indicated on Drawings.
3. Deflection Limits: For wind loads, no greater than 1/180 of the span.
- B. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) when tested according to ASTM E 283 at the following test-pressure difference:
 1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa).
- C. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:
 1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa).
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- E. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 CONCEALED-FASTENER, FLUSH METAL WALL PANELS

- A. General: Provide factory-formed metal 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.
- B. Concealed-Fastener Metal Wall Panels:
 1. At locations indicated to receive standard flush metal wall panels, provide factory-formed metal 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.
 2. Basis of Design: Flush Wall Panels as manufactured by Pac-Clad Metal Roofing. Subject to the requirements of this specification other manufactures with equal products include:
 - a. Pac-Clad
 - b. Fabral
 - c. Alcoa Architectural Products (USA).
 - d. IMETCO, FW Series
 3. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Nominal Thickness: 22 gauge.
 - b. Exterior Finish: Two-coat fluoropolymer.
 - c. Color: As selected by Architect from manufacturer's full range of standard non-metallic, non-mica, non patterned colors.
 4. Panel Coverage: 12 inches (305 mm).
 - a. With two (2) formed ribs in each panel to prevent distortion and oil-canning.
 5. Panel Height: 1inch.

2.3 MISCELLANEOUS MATERIALS

- A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A 792/A 792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.
 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.

3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.
- E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.
 1. Sealant Tape: Pressure-sensitive, closed cell polyvinyl chloride foam sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 3/4 inch wide and 1/4 inch thick. Provide sealant tape equal to Norseal V748 as manufactured by Saint-Gobain.

2.4 FABRICATION

- A. General: Fabricate and finish metal panels and accessories at the factory, 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. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to 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 sealant and 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 in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. 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 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.
- C. Steel Panels and Accessories:
 1. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
 2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

- a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 METAL PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 1. Shim or otherwise plumb substrates receiving metal panels.
 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 3. Install screw fasteners in predrilled holes.
 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 5. Install flashing and trim as metal panel work proceeds.
 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
 8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Fasteners:
 1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
- C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.
 1. Apply panels and associated items true to line for neat and weathertight enclosure.
 2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
 3. Locate and space exposed fasteners in uniform vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of washer.
 4. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
 5. Flash and seal panels with weather closures at perimeter of all openings.
- E. Watertight Installation:
 1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels; and elsewhere as needed to make panels watertight.
 2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
 3. At panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with sealant and fastened together by interlocking clamping plates.
- F. Accessory Installation: 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 panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.
- G. 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 are permanently watertight.
 1. Install exposed flashing and trim that is without 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 achieve waterproof performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where

lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal wall panel installation, including accessories.
- C. Remove and replace metal wall panels where tests and inspections indicate that they do not comply with specified requirements.
- D. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- E. Prepare test and inspection reports.

3.5 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
- B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213.13

SECTION 114000 - FOOD SERVICE EQUIPMENT [ADD 4]

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes food service equipment indicated on drawings and schedules.
- B. Owner-Furnished Equipment: Where indicated, owner will furnish equipment items for Contractor installation

1.3 DEFINITIONS

- A. Terminology Standard: Refer to NSF 2, "Food Equipment" or other applicable NSF standards for definitions of food service equipment and installation terms not otherwise defined in this section or in other referenced standards.

1.4 SUBMITTALS

- A. Schedule: Provide initial submittals, as required below, within 30 days of notice of award.
- B. Product Data: For each type of food service equipment indicated. Include manufacturer's model number and accessories and requirements for access and maintenance clearances, water and drainage, power or fuel, and service-connections including roughing-in dimensions.
- C. Coordination Drawings: For locations of food service equipment and mechanical and electrical service utilities. Key equipment with item numbers and descriptions indicated in contract documents. Include plans and elevations of equipment, access and maintenance clearance requirements, details of concrete or masonry bases and floor depressions, and service-utility characteristics and dimensioned locations. Locate all floor drains, floor sinks, and floor troughs accurately with dimensions in relation to equipment. Locate ANSUL system control panel and exhaust fan switch.
- D. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for exposed products with color finishes.
- E. Product Certificates: Signed by manufacturers of refrigeration systems or their authorized agents certifying that systems furnished comply with requirements and will maintain operating temperatures indicated in the areas or equipment that they will serve.
- F. Maintenance Data: Operation, maintenance, and parts data for food service equipment to include in the maintenance manuals specified in Division 1. Include a product schedule as follows:
 - 1. Product Schedule: For each food service equipment item, include item number and description indicated in Contract Documents, manufacturer's name and model number, and authorized service agencies' addresses and telephone numbers.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer to perform work of this Section who has specialized in installing food service equipment, who has completed installations similar in design and extent to that indicated for this Project, and who has a record of successful in-service performance.
- B. Manufacturer Qualifications: Engage a firm experienced in manufacturing food service equipment similar to that indicated for this Project and with a record of successful in-service performance.
- C. Source Limitations: Obtain each type of food service equipment through one source from a single manufacturer.
- D. Product Options: Drawings and specifications indicate food service equipment based on the specific products indicated. Other manufacturers' equipment with equal size and performance characteristics may be considered. Refer to Division 1 Section "Substitutions."
- E. Regulatory Requirements: Comply with the following National Fire Protection Association (NFPA) codes:
 - 1. NFPA 17, "Dry Chemical Extinguishing Systems."
 - 2. NFPA 17A, "Wet Chemical Extinguishing Systems."
 - 3. NFPA 54, "National Fuel Gas Code."

4. NFPA 70, "National Electrical Code."
5. NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations."
- F. Listing and Labeling: Provide electrically operated equipment or components specified in this Section that are listed and labeled.
 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
- G. AGA Certification: Provide gas-burning appliances certified by the American Gas Association (AGA).
- H. ASME Compliance: Fabricate and label steam-generating and closed steam-heating equipment to comply with ASME Boiler and Pressure Vessel Code.
- I. ASHRAE Compliance: Provide mechanical refrigeration systems complying with the American Society of Heating, Refrigerating and Air-Conditioning Engineers' ASHRAE 15, "Safety Code for Mechanical Refrigeration."
- J. NSF Standards: Comply with applicable NSF International (NSF) standards and criteria and provide NSF Certification Mark on each equipment item, unless otherwise indicated.
- K. ANSI Standards: Comply with applicable ANSI standards for electric-powered and gas-burning appliances; for piping to compressed-gas cylinders; and for plumbing fittings, including vacuum breakers and air gaps, to prevent siphonage in water piping.
- L. SMACNA Standard: Where applicable, fabricate food service equipment to comply with the Sheet Metal and Air Conditioning Contractors National Association's (SMACNA) "Kitchen Equipment Fabrication Guidelines," unless otherwise indicated.
- M. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings." Review methods and procedures related to food service equipment including, but not limited to, the following:
 1. Review access requirements for equipment delivery.
 2. Review equipment storage and security requirements.
 3. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
 4. Review structural loading limitations.
 5. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver food service equipment as factory-assembled units with protective crating and covering.
- B. Store food service equipment in original protective crating and covering and in a dry location.
- C. Provide a bonded warehouse or sufficient on-site storage until building can receive equipment.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions of food service equipment installation areas by field measurements before equipment fabrication and indicate measurements on Shop Drawings and Coordination Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish required dimensions and proceed with fabricating equipment without field measurements. Coordinate construction to ensure actual dimensions correspond to established dimensions.

1.8 COORDINATION

- A. Coordinate equipment layout and installation with other work, including light fixtures, HVAC equipment, and fire-suppression system components.
- B. Coordinate location and requirements of service-utility connections.
- C. Coordinate size, location, and requirements of concrete bases, positive slopes to drains, floor depressions, and insulated floors.

1.9 WARRANTY

- A. General Warranty: The warranties specified in this section shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

- B. Refrigeration Compressor Warranty: Submit a written warranty signed by manufacturer agreeing to repair or replace compressors that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:
 - 1. Breakage.
 - 2. Faulty operation.
 - 3. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Provide per schedule, or
 - 1. Submit comparable manufacturer & product for prior approval per Section 016000.

2.2 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances, service-utility connections, and other conditions affecting installation and performance of food service equipment. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Examine roughing-in for piping, mechanical, and electrical systems to verify actual locations of connections before installation.

2.3 INSTALLATION, GENERAL

- A. Install food service equipment level and plumb, according to manufacturer's written instructions, original design, and referenced standards.
- B. Complete equipment field assembly, where required, using methods indicated.
 - 1. Provide closed butt and contact joints that do not require a filler.
 - 2. Grind field welds on stainless-steel equipment smooth, and polish to match adjacent finish. Comply with welding requirements in "Fabrication, General" Article.
- C. Install equipment with access and maintenance clearances according to manufacturer's written instructions and requirements of authorities having jurisdiction.
- D. Provide cutouts in equipment, neatly formed, where required to run service lines through equipment to make final connections.
- E. Except for mobile and adjustable-leg equipment, securely anchor and attach items and accessories to walls, floors, or bases with stainless-steel fasteners, unless otherwise indicated.

2.4 PROTECTING

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure food service equipment is without damage or deterioration at the time of Substantial Completion.

2.5 SCHEDULE OF FOOD SERVICE EQUIPMENT

- A. Contractor Furnished & Installed Equipment (CFCI)
 - 1. Ice Maker **[ADD#3]**
 - a. 1 Req'd in Concessions Rm 1102 and 1126 Training Rm
 - b. Manitowoc Indigo NXT Ice Machine – model IDT0300A
 - c. Coordinate power requirements with Electrical
 - d. Provide water filter system: Manitowac Arctic Pure System
 - 2. Ice Storage Bin **[ADD#3]**
 - a. 1 Req'd in Concessions Rm 1102 and 1126 Training Rm
 - b. Manitowoc Ice Storage Bin – model D570
 - 3. Stainless Steel Work Tables
 - a. 3 Req'd in Concessions Rm 1102
 - b. Advance Tabco KMS-303 Work table
 - 1) 36"W x 30"D, 16 gauge 304 stainless steel top with 5" H backplash, 18 Gauge stainless steel adjustable undershelf, stainless steel legs, & adjustable bullet feet, NSF
 - 4. Reach-In Refrigerator **[ADD 4]**
 - a. 2 Req'd in Concessions Rm 1102. 1 Req'd in Multipurpos Rm 1117

- b. Traulsen Model G20010
 - 1) Dimensions: 83.44(h) x 52.13(w) x 35(d)
 - 2) Capacity: 46.0 cu. Ft.
- c. Coordinate power requirements with Electrical
 - 1) 1/4 HP, 115v/60/1, 4.3 amps

END OF SECTION 114000

SECTION 116623 - GYMNASIUM EQUIPMENT [ADD 4]

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. Basketball equipment.
 - 2. Volleyball equipment.
 - 3. Safety pads.
- B. Related Requirements:
 - 1. Section 033000 "Cast-in-Place Concrete" for installation of floor insert sleeves to be cast in concrete slabs and footings.
 - 2. Section 096466 "Wood Athletic Flooring" for game lines and markers.
 - 3. Section 116653 "Gymnasium Dividers."

1.3 DEFINITIONS

- A. NCAA: The National Collegiate Athletic Association.
- B. NFHS: National Federation of State High School Associations.
- C. USAV: USA Volleyball.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. If applicable, include assembly, disassembly, and storage instructions for removable equipment.
 - 2. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements.
- B. Shop Drawings: For gymnasium equipment.
 - 1. Include plans, elevations, sections, details, and attachments to other work.
 - 2. Include details of field assembly for removable equipment, connections, installation, mountings, floor inserts, attachments to other work, and operational clearances.
 - 3. Include transport and storage accessories for removable equipment.
- C. Samples: For each exposed product and for each item and color specified.
- D. Samples for Initial Selection: For each type of gymnasium equipment.
- E. Samples for Verification: For the following products:
 - 1. Pad Fabric: Wall padding not less than 3 inches (76 mm) square, and corner and column Samples not less than 3 inches (76 mm) long, with specified treatments applied. Mark face of material.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Court layout plans, drawn to scale, and coordinated with floor inserts, game lines, and markers applied to finished flooring.
- B. Qualification Data: For Installer.
- C. Product Certificates: For each type of gymnasium equipment.
- D. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For gymnasium equipment to include in emergency, operation, and maintenance manuals.

1.7 QUALITY ASSURANCE

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

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not install gymnasium equipment until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Verify position and elevation of floor inserts and layout for gymnasium equipment.

1.9 COORDINATION

- A. Coordinate installation of floor inserts with structural floors and finish flooring installation and with court layout and game lines and markers on finish flooring.
- B. Coordinate layout and installation of overhead-supported gymnasium equipment and suspension-system components with other construction including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of gymnasium equipment that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Basketball backboard failures including glass breakage.
 - b. Faulty operation of basketball backstops.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS**2.1 MANUFACTURERS, GENERAL**

- A. Source Limitations: Obtain gymnasium equipment from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Basketball backstops and anchors shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.3 BASKETBALL EQUIPMENT

- A. General: Provide equipment complying with requirements in NFHS's "NFHS Basketball Rules Book."
- B. Protruding fasteners or exposed bolt heads on front face of backboards are not permitted.
- C. Provide manufacturer's recommended connections complying with Section 055000 "Metal Fabrications" of size and type required to transfer loads to building structure.
- D. Overhead-Supported Backstops:
 - 1. Folding Type: Provide manufacturer's standard assembly for forward-folding, front-braced backstop, with hardware and fittings to permit folding.
 - 2. Framing: Steel pipe, tubing, and shapes. Design framing to minimize vibration during play.
 - a. Center-Mast Frame: Welded with side sway bracing.
 - b. Finish: Manufacturer's standard polyester powder-coat finish.
 - 3. Folding Control System: Electric hoist that folds backstop with 115 volt actuator, integral limit switches that provide automatic shut-off in both positions, and safety catch with automatic reset.
- E. Main Court Basketball Backboards (2 each):
 - 1. Shape and Size:
 - a. Rectangular.
 - 2. Backboard Material: With predrilled holes or preset inserts for mounting goals, and as follows:
 - a. Glass: Not less than 1/2-inch- (13-mm-) thick, transparent tempered glass complying with ASTM C 1048 Kind FT (fully tempered) and with impact testing requirements in 16 CFR 1201 Category II or ANSI Z97.1 Class A for safety glazing. Provide glass with impact-absorbing resilient rubber or PVC gasket around perimeter in a fully welded, brushed-natural-finish, extruded-aluminum frame, with steel subframe, reinforcement, bracing, and mounting slots for mounting backboard frame to backboard support framing.
 - 1) Standard Mount: Provide steel corner reinforcement with mounting slots for mounting backboard frame to backstop at standard mounting centers. Provide center-strut frame reinforcement.
 - 2) Rim-Restraining Device: Complying with NCAA and NFHS rules and designed to ensure that basket remains attached if glass backboard breaks.
- F. Side Court Basketball Backboards (4 each):
 - 1. Shape and Size:

- a. Rectangular.
- b. Steel: Single-piece, steel face sheet, not less than 0.1046-inch (2.7-mm) nominal thickness, with 1-1/2-inch- (38-mm-) deep, roll-edged perimeter flange and with steel-reinforced, welded frame welded to back side of backboard; with mounting slots for mounting backboard frame to backboard support framing at standard mounting centers.
2. Target Area and Border Markings: Marked in pattern, stripe width, and color according to referenced rules.
3. Finish: Manufacturer's standard factory-applied, white background.
- G. Goal Mounting Assembly: Compatible with goal, backboard, and support framing; with hole pattern 5 inches (127 mm) o.c. horizontally and vertically that is manufacturer's standard for goal attachment.
 1. Glass Backboard Goal Mounting Assembly: Goal support framing and reinforcement designed to transmit load from goal to backboard frame and to minimize stresses on glass backboard.
 2. Direct Mount: Designed for mounting goal directly and independently to center mast of backboard support framing so no force, transmitted by ring, is directly applied to backboard, and rigidity and stability of goal are maximized.
- H. Basketball Goals: Complete with flanges, braces, attachment plate, and evenly spaced loops welded around underside of ring.
 1. Single-Rim Basket Ring Competition Goal: Materials, dimensions, and fabrication complying with referenced rules.
 2. Type: Movable, breakaway design with manufacturer's standard breakaway mechanism and rebound characteristics identical to those of fixed, nonmovable ring.
 3. Breakaway Characteristics: Positive-lock movable breakaway design, with manufacturer's standard breakaway mechanism including preset pressure release, set to release at 230-lb (105-kg) load, and automatic reset. Provide movable ring with rebound characteristics identical to those of fixed, nonmovable ring.
 4. Field Adjustment: Provide rim that is field-adjustable for rebound elasticity without being removed from the backboard.
 5. Net Attachment: No-tie loops for attaching net to rim without tying.
 6. Finish: Manufacturer's standard finish.
- I. Basketball Nets: 12-loop-mesh net, between 15 and 18 inches (380 to 460 mm) long, sized to fit rim diameter, and as follows:
 1. Competition Cord: Antiwhip, made from white nylon cord not less than 120-gm thread and not more than 144-gm thread.
- J. Backboard Safety Pads: Designed for backboard thickness indicated and extending continuously along bottom and up sides of backboard and over goal mounting and backboard supports as required by referenced rules.
 1. Attachment: Manufacturer's standard.
 2. Color: As selected by Architect from manufacturer's full range.
- K. Portable Basketball Goal **[ADD 4]**
 1. Basis of Design
 - a. 1610 Competition Gym: Gared 9408 Hoopmaster Portable Basketball Goal
 - b. Manufacturers
 - 1) Gared Performance Sport Systems
 - 2) Bison Inc.
 - 3) Gill Porter Athletic
 2. Frame: Steel tubing, pipe, and shapes
 - a. Welded with bracing
 - b. Finish: Manufacturer's standard
 3. Ballast
 - a. Minimum 900 lbs
 4. Padding
 - a. Main Vertical Mast and Front Face: 2" thick minimum heavy duty polyurethan foam with 14 oz tear and mildew resistant vinyl.
 - b. Other Portions: 2" thick foam with matching 14 oz vynil
 - c. No glue on padding
 5. Folding Cycle
 - a. 60 lb maximum effort to raise or lower unit
 6. Certifications
 - a. Compliance with following requirements

- 1) NCAA
- 2) NFHS

2.4 VOLLEYBALL EQUIPMENT

- A. General: Provide equipment complying with requirements in NFHS's "NFHS Volleyball Rules Book."
- B. Floor Insert: Solid-brass floor plate; and steel pipe sleeve, concealed by floor plate, with capped bottom end, sized with ID to fit post standards, not less than 9 inches (228 mm) long to securely anchor pipe sleeve in structural floor below finished floor in concrete footing as indicated; with anchors designed for securing floor insert to floor substrate indicated; one per post standard quantity as indicated.
 1. Floor Plate: Self-locking, hinged access cover, designed to be flush with adjacent flooring. Provide two tool(s) for unlocking access covers.
- C. Post Standards: Removable, paired volleyball post standards as indicated. Fixed height. Designed for easy removal from permanently placed floor insert supports. Fabricated from manufacturer's standard metal pipe or tubing, with nonmarking plastic or rubber end cap or floor bumper to protect permanent flooring. Finished with manufacturer's standard factory-applied, polyester powder-coat finish complying with finish manufacturer's written instructions for surface preparation, including pretreatment, application, baking, and minimum dry film thickness or plated metal finish.
 1. Nominal Pipe or Tubing Diameter: 3-inch (76-mm) OD at base.
 2. Net Height Adjuster: Manufacturer's standard mechanism for height adjustment, complete with fittings; designed for positioning net at heights indicated.
 - a. Net Heights: Between sitting volleyball net height and boys'/men's volleyball net height, 36 and 95-5/8 inches (910 and 2430 mm) or more.
- D. Net: 32 feet (9.75 m) long; one per pair of paired post standards; and as follows:
 1. Width and Mesh: Competition volleyball net, 36 inches (910 mm) with 4-inch- (102-mm-) square knotless mesh made of black nylon string.
 - a. Hem Band Edges: White, not less than 2-inch- (50-mm-) wide top, bottom, and side bindings; tie offs at top, bottom, and midpoint of each side end of net; end sleeves for dowels; and lines with linkage fittings threaded through top and bottom hems of binding. Provide lengths of lines and linkage fittings as required to properly connect to and set up net for post standard spacing indicated on Drawings.
 - 1) Top Line: Not less than 1/4-inch- (6-mm-) diameter rope.
 - 2) Bottom Line: Not less than 1/4-inch- (6-mm-) diameter rope.
 2. Dowels: Not less than 1/2-inch- (13-mm-) diameter fiberglass or 1-inch- (25-mm-) diameter wood. Provide two dowels per net threaded through each side hem sleeve for straightening net side edges.
 3. Boundary Tape Markers: 2-inch- (50-mm-) wide white strip, secured to net top and bottom with hook-and-loop attachment. Provide two tape markers per net for marking court boundaries.
- E. Net-Tensioning System: Designed to adjust and hold tension of net. Fully enclosed, nonslip worm-gear manufacturer's standard-type winch with cable length and fittings for connecting to net lines, positive-release mechanism, and manufacturer's standard handle. Mount net tensioner on post standard at side away from court. Provide end post with post top pulley. Provide opposing post with welded-steel loops, hooks, pins, or other devices for net attachment and post top grooved line guide.
- F. Bottom Net Lock Tightener: Provide manufacturer's standard quick-release-type tension strap; a spring-loaded, self-locking tensioner; a turnbuckle; a pulley; or other device and linkage fittings designed to quickly and easily tighten bottom line or net.
- G. Storage Cart: Manufacturer's standard wheeled unit designed for transporting and storing volleyball equipment and passing through 36-inch- (910-mm-) wide door openings. Fabricate welded-steel tubing units with heavy-duty casters, including no fewer than two swivel casters. Fabricate wheels from materials that do not damage or mark floors; number of units as required to provide transport and storage for specified equipment.

2.5 SAFETY PADS

- A. Safety Pad Surface-Burning Characteristics: ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 1. Flame-Spread Index: 25 or less.
 2. Smoke-Developed Index: 450 or less.
- B. Pad Coverings: Provide safety pad fabric covering that is fabricated from puncture- and tear-resistant, PVC-coated polyester or nylon-reinforced PVC fabric, not less than 14-oz./sq. yd (475-g/sq. m) and treated with fungicide for mildew resistance; with surface-burning characteristics indicated, and lined with fire-retardant liner.
- C. Wall and Column Safety Pads: Padded wall wainscot panels designed to be attached in a continuous row; each panel section consisting of fill laminated to backer board with visible surfaces fully covered by seamless fabric covering, free of sag and wrinkles and firmly attached to back of backer board.

1. Backer Board: Not less than 3/8-inch- (9.5-mm-) thick fire-retardant-treated plywood according to AWPA U1, UCFA Fire Retardant Interior.
2. Fill: Multiple-impact-resistant foam not less than 1-1/2-inch- (38-mm-) thick polyurethane, 3.5-lb/cu. ft. (56-kg/cu. m) density.
3. Size: Each panel section, as indicated.
4. Number of Modular Panel Sections: As indicated.
5. Installation Method: Concealed mounting Z-clips.
6. Fabric Covering Color(s): As selected by Architect from manufacturer's full range for one color(s).

2.6 MATERIALS

- A. Aluminum: Alloy and temper recommended by manufacturer for use and finish type indicated.
 1. Extruded Bars, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
 2. Cast Aluminum: ASTM B 179.
 3. Flat Sheet: ASTM B 209 (ASTM B 209M).
- B. Steel: Comply with the following:
 1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 2. Steel Tubing: ASTM A 500/A 500M or ASTM A 513, cold formed.
 3. Steel Sheet: ASTM A 1011/A 1011M.
- C. Support Cable: Manufacturer's standard galvanized-stranded-steel wire rope with a breaking strength of 7000 lb (3175 kg). Provide fittings complying with wire rope manufacturer's written instructions for size, number, and installation method.
- D. Support Chain and Fittings: For chains used for overhead lifting, provide Grade 80 heat-treated alloy steel chains, complying with ASTM A 391/A 391M, with commercial-quality, hot-dip galvanized or zinc-plated steel connectors and hangars.
- E. General-Purpose Chain: For chains not used for overhead lifting, provide carbon steel chain, complying with ASTM A 413/A 413M, Grade 30 proof coil chain or other grade recommended by gymnasium equipment manufacturer. Provide coating type, chain size, number, and installation method complying with manufacturer's written instructions.
- F. Castings and Hangers: Malleable iron, complying with ASTM A 47/A 47M; grade required for structural loading.
- G. Softwood Plywood: DOC PS 1, exterior.
- H. Particleboard: ANSI A208.1.
- I. Equipment Wall-Mounted Board: Wood, transparent finish, size, and quantity as required to mount gymnasium equipment according to manufacturer's written instructions.
- J. Anchors, Fasteners, Fittings, and Hardware: Manufacturer's standard corrosion-resistant or noncorrodible units; concealed; tamperproof, vandal- and theft-resistant design.
- K. Grout: Nonshrink, nonmetallic, premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout, complying with ASTM C 1107/C 1107 with minimum strength recommended in writing by gymnasium equipment manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for play court layout, alignment of mounting substrates, installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance of the Work.
 1. Verify critical dimensions.
 2. Examine supporting structure, subgrades, subfloors, and footings below finished floor.
 3. Examine wall assemblies, where reinforced to receive anchors and fasteners, to verify that locations of concealed reinforcements are clearly marked. Locate reinforcements and mark locations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's written installation instructions and competition rules indicated for each type of gymnasium equipment. Complete equipment field assembly where required.
- B. Unless otherwise indicated, install gymnasium equipment after other finishing operations, including painting, are completed.

- C. Permanently Placed Gymnasium Equipment and Components: Install rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated; in proper relation to adjacent construction; and aligned with court layout.
 - 1. Floor Insert Location: Coordinate location with application of game lines and markers, and core drill floor for inserts after game lines are applied.
 - 2. Floor Insert Elevation: Coordinate installed heights of floor insert with installation and field finishing of finish flooring and floor-plate type.
 - 3. Operating Gymnasium Equipment: Verify clearances for movable components of gymnasium equipment throughout entire range of operation and for access to operating components.
- D. Floor Insert Setting: Position sleeve in oversized, recessed voids in concrete slabs and footings. Clean voids of debris. Fill void around sleeves with grout, mixed and placed to comply with grout manufacturer's written instructions. Protect portion of sleeve above subfloor and footing from splatter. Verify that sleeves are set plumb, aligned, and at correct height and spacing; hold in position during placement and finishing operations until grout is sufficiently cured. Set insert so top surface of completed unit is flush with finished flooring surface.
- E. Wall Safety Pads: Mount with bottom edge at dimension indicated on Drawings above finished floor.
- F. Cut-out Trim: Limit cuts in face of padding from trim unit's corner-to-corner outside dimensions. Install with ends of cuts concealed behind trim flange.
- G. Anchoring to In-Place Construction: Use anchors and fasteners where necessary to secure built-in and permanently placed gymnasium equipment to structural support and to properly transfer load to in-place construction.
- H. Connections: Connect electric operators to building electrical system.
- I. Removable Gymnasium Equipment and Components: Assemble in place to verify that equipment and components are complete and in proper working order. Instruct Owner's designated personnel in properly handling, assembling, adjusting, disassembling, transporting, storing, and maintaining units. Disassemble removable gymnasium equipment after assembled configuration is approved by Architect, and store units in location indicated on Drawings.

3.3 ADJUSTING

- A. Adjust movable components of gymnasium equipment to operate safely, smoothly, easily, and quietly, free from binding, warp, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and moving parts.

3.4 CLEANING

- A. After completing gymnasium equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.
- B. Replace gymnasium equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

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

END OF SECTION 116623

SECTION 133419 - METAL BUILDING SYSTEMS [ADD 4]

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. Structural-steel framing.
 - 2. Metal roof panels.
 - 3. Metal soffit panels.
 - 4. Metal Liner Panels: interior, perforated
 - 5. Thermal insulation.
 - 6. Accessories.
 - a. Roof Drainage System
- B. Related Requirements:
 - 1. Division 3 Section "Cast-in-Place Concrete" for concrete foundations, slabs, and anchor-bolt installation.
 - 2. Division 4 Section "Unit Masonry Assemblies" for exterior and load-bearing walls fabricated from concrete masonry units.
 - 3. Division 5 Section "Cold-formed Metal Framing"
 - 4. Division 7 Section "Formed Metal Wall Panels"
 - 5. Division 7 Section "Joint Sealants"
 - 6. Division 8 Section "Hollow Metal Doors & Frames"

1.3 DEFINITIONS

- A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in standards referenced by this Section.

1.4 COORDINATION

- A. Coordinate sizes and locations of concrete foundations and casting of anchor-rod inserts into foundation walls and footings. Anchor rod installation, concrete, reinforcement, and formwork requirements are specified in Section 033000 "Cast-in-Place Concrete."
- B. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to metal building systems including, but not limited to, the following:
 - a. Condition of foundations and other preparatory work performed by other trades.
 - b. Structural load limitations.
 - c. Construction schedule. Verify availability of materials and erector's personnel, equipment, and facilities needed to make progress and avoid delays.
 - d. Required tests, inspections, and certifications.
 - e. Unfavorable weather and forecasted weather conditions and impact on construction schedule.
 - 2. Review methods and procedures related to metal roof panel assemblies including, but not limited to, the following:
 - a. Compliance with requirements for purlin and rafter conditions, including flatness and attachment to structural members.
 - b. Structural limitations of purlins and rafters during and after roofing.
 - c. Flashings, special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect metal roof panels.
 - d. Temporary protection requirements for metal roof panel assembly during and after installation.

- e. Roof observation and repair after metal roof panel installation.
- 3. Review methods and procedures related to metal wall panel assemblies including, but not limited to, the following:
 - a. Compliance with requirements for support conditions, including alignment between and attachment to structural members.
 - b. Structural limitations of girts and columns during and after wall panel installation.
 - c. Flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
 - d. Temporary protection requirements for metal wall panel assembly during and after installation.
 - e. Wall observation and repair after metal wall panel installation.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of metal building system component.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - a. Metal roof panels.
 - b. Thermal insulation and vapor-retarder facings.
- B. Shop Drawings: Indicate components by others. Include full building plan, elevations, sections, details and the following:
 - 1. Anchor-Rod Plans: Submit anchor-rod plans and templates before foundation work begins. Include location, diameter, and minimum required projection of anchor rods required to attach metal building to foundation. Indicate column reactions at each location.
 - 2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
 - 3. Metal Roof Panel Layout Drawings: Show layouts of panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, clip spacing, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners.
 - a. Show roof-mounted items including roof hatches, equipment supports, pipe supports and penetrations, lighting fixtures, and items mounted on roof curbs.
 - 4. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches (1:8):
 - a. Flashing and trim.
 - b. Gutters.
 - c. Downspouts.
- C. Samples for Initial Selection: For units with factory-applied finishes.
- D. Samples for Verification: For the following products:
 - 1. Panels: Nominal 12 inches (300 mm) long by actual panel width. Include fasteners, closures, and other exposed panel accessories.
 - 2. Flashing and Trim: Nominal 12 inches (300 mm) long. Include fasteners and other exposed accessories.
 - 3. Vapor-Retarder Facings: Nominal 6-inch- (150-mm-) square Samples.
 - 4. Accessories: Nominal 12-inch- (300-mm-) long Samples for each type of accessory.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For erector manufacturer.
- B. Welding certificates.
- C. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
 - 1. Name and location of Project.
 - 2. Order number.
 - 3. Name of manufacturer.
 - 4. Name of Contractor.
 - 5. Building dimensions including width, length, height, and roof slope.
 - 6. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
 - 7. Governing building code and year of edition.

8. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
9. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
10. Building-Use Category: Indicate category of building use and its effect on load importance factors.
- D. Erector Certificates: For qualified erector, from manufacturer.
- E. Material Test Reports: For each of the following products:
 1. Structural steel including chemical and physical properties.
 2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 3. Tension-control, high-strength, bolt-nut-washer assemblies.
 4. Shop primers.
 5. Nonshrink grout.
- F. Source quality-control reports.
- G. Field quality-control reports.
- H. Surveys: Show final elevations and locations of major members. Indicate discrepancies between actual installation and the Contract Documents. Have surveyor who performed surveys certify their accuracy.
- I. Sample Warranties: For special warranties.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panel finishes to include in maintenance manuals.

1.9 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer.
 1. Accreditation: Manufacturer's facility accredited according to the International Accreditation Service's AC472, "Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems."
 2. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in jurisdiction where Project is located.
- B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 2. AWS D1.3, "Structural Welding Code - Sheet Steel."
- D. Land Surveyor Qualifications: A professional land surveyor who practices in jurisdiction where Project is located and who is experienced in providing surveying services of the kind indicated.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. 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 foam-plastic materials as rapidly as possible in each area of construction.

1.11 FIELD CONDITIONS

- A. Weather Limitations: Proceed with panel installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.

1.12 WARRANTY

- A. Standard manufacturer's roofing guarantees which contain language regarding the governing of the guarantee by any state other than the State of Alabama, must be amended to exclude such language, and substituting the requirement that the Laws of the State of Alabama shall govern all such guarantees.

1. Special Warranty on Metal Panel Finishes: Manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - a. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - 1) Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - 2) Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - 3) Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - b. Finish Warranty Period: 25 years from date of Substantial Completion.
2. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.
 - a. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 1. American Buildings, a Nucor Company
 2. Butler Manufacturing Company; a division of BlueScope Buildings North America, Inc.
 3. Ceco Building Systems; an NCI company.
 4. Gulf States Manufacturers; Nucor Company.
 5. Varco-Pruden Buildings; a division of BlueScope Buildings North America, Inc.
- B. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

2.2 SYSTEM DESCRIPTION

- A. Provide a complete, integrated set of mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.
- B. Primary-Frame Type:
 1. Rigid Clear Span: Solid-member, structural-framing system without interior columns.
- C. End-Wall Framing: Manufacturer's standard, for buildings not required to be expandable, consisting of primary frame, capable of supporting one-half of a bay design load, and end-wall columns.
- D. Secondary-Frame Type: As indicated on drawings.
- E. Eave Height: As indicated on Drawings.
- F. Bay Spacing: As indicated on Drawings.
- G. Roof Slope: 1 inch per 12 inches (1:12).
- H. Roof System: Manufacturer's standard standing-seam, vertical-rib, metal roof panels.
- I. Exterior Wall System: as detailed on drawings.
- J. Interior Liner Panels: perforated.
- K. Prefabricated Metal Awning Support
 1. Provide gusset plates flush with exterior finish material (brick) for anchorage of prefabricated awning.
 2. Locations as indicated on drawings.

2.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design metal building system.
- B. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."
 1. Design Loads: As indicated on Drawings.
 2. Deflection and Drift Limits: Design metal building system assemblies to withstand serviceability design loads without exceeding deflections and drift limits recommended in AISC Steel Design Guide No. 3 "Serviceability Design Considerations for Steel Buildings."
 3. Deflection and Drift Limits: as indicated on drawings

- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- D. Structural Performance for Metal Roof Panels: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592 or FM 4474.
 - 1. Wind Loads: As indicated on Drawings.
- E. Air Infiltration for Metal Roof Panels: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) when tested according to ASTM E 1680 or ASTM E 283 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 1.57 lbf/sq. ft. (75 Pa).
- F. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E 1646 or ASTM E 331 at the following test-pressure difference:
 - 1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa).
- G. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with required wind-uplift-resistance.
 - 1. Uplift Rating: As indicated on drawings.
- H. FM Global Listing: Provide metal roof panels and component materials that comply with requirements in FM Global 4471 as part of a panel roofing system and that are listed in FM Global's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
 - 1. Hail Resistance: MH.
- I. Energy Performance: Provide roof panels according to the following when tested according to CRRC-1:
 - 1. Initial solar reflectance of 77 and emissivity of not less than 0.08.
 - 2. Solar Reflectance Index of 72 and emissivity of not less than 0.08.

2.4 STRUCTURAL-STEEL FRAMING

- A. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings."
- B. Bolted Connections: Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
- C. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.
- D. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafters, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.
 - 1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.
 - 2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
 - 3. Frame Configuration: as indicated on drawings.
 - 4. Exterior Column: as indicated on drawings.
 - 5. Rafter: as indicated on drawings.
- E. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly to comply with the following:
 - 1. End-Wall and Corner Columns: I-shaped sections fabricated from structural-steel shapes; shop-welded, built-up steel plates; or C-shaped, cold-formed, structural-steel sheet.
 - 2. End-Wall Rafters: C-shaped, cold-formed, structural-steel sheet; or I-shaped sections fabricated from shop-welded, built-up steel plates or structural-steel shapes.
- F. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating, to comply with the following:
 - 1. Purlins: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; minimum 2-1/2-inch- (64-mm-) wide flanges.
 - a. Depth: As indicated on Drawings.
 - 2. Purlins: Steel joists of depths indicated on Drawings.
 - 3. Girts: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees from flange, with minimum 2-1/2-inch- (64-mm-) wide flanges.
 - a. Depth: As indicated on Drawings.

4. Eave Struts: Unequal-flange, C-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; to provide adequate backup for metal panels.
 5. Flange Bracing: Minimum 2-by-2-by-1/8-inch (51-by-51-by-3-mm) structural-steel angles or 1-inch- (25-mm-) diameter, cold-formed structural tubing to stiffen primary-frame flanges.
 6. Sag Bracing: Minimum 1-by-1-by-1/8-inch (25-by-25-by-3-mm) structural-steel angles.
 7. Base or Sill Angles: Manufacturer's standard base angle, minimum 3-by-2-inch (76-by-51-mm), fabricated from zinc-coated (galvanized) steel sheet.
 8. Purlin and Girt Clips: Manufacturer's standard clips fabricated from steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
 9. Framing for Openings: Channel shapes; fabricated from cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings and head, jamb, and sill of other openings.
 10. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.
- G. Bracing: Provide adjustable wind bracing using any method as follows:
1. Rods: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 (345); or ASTM A 529/A 529M, Grade 50 (345); minimum 1/2-inch- (13-mm-) diameter steel; threaded full length or threaded a minimum of 6 inches (152 mm) at each end.
 2. Cable: ASTM A 475, minimum 1/4-inch- (6-mm-) diameter, extra-high-strength grade, Class B, zinc-coated, seven-strand steel; with threaded end anchors.
 3. Angles: Fabricated from structural-steel shapes to match primary framing, of size required to withstand design loads.
 4. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
 5. Fixed-Base Columns: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
 6. Diaphragm Action of Metal Panels: Design metal building to resist wind forces through diaphragm action of metal panels.
- H. Anchor Rods: Headed anchor rods as indicated in Anchor Rod Plan for attachment of metal building to foundation.
- I. Materials:
1. W-Shapes: ASTM A 992/A 992M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
 2. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
 3. Plate and Bar: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
 4. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
 5. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B or C, structural tubing.
 6. Structural-Steel Sheet: Hot-rolled, ASTM A 1011/A 1011M, Structural Steel (SS), Grades 30 through 55 (205 through 380), or High-Strength Low-Alloy Steel (HSLAS) or High-Strength Low-Alloy Steel with Improved Formability (HSLAS-F), Grades 45 through 70 (310 through 480); or cold-rolled, ASTM A 1008/A 1008M, Structural Steel (SS), Grades 25 through 80 (170 through 550), or HSLAS, Grades 45 through 70 (310 through 480).
 7. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, SS, Grades 33 through 80 (230 through 550), or HSLAS or HSLAS-F, Grades 50 through 80 (340 through 550); with G60 (Z180) coating designation; mill phosphatized.
 8. 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.
 - a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, SS, Grades 33 through 80 (230 through 550), or HSLAS or HSLAS-F, Grades 50 through 80 (340 through 550); with G90 (Z275) coating designation.
 - b. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, SS, Grade 50 or 80 (340 or 550); with Class AZ50 (AZM150) coating.
 9. Joist Girders: Manufactured according to "Standard Specifications for Joist Girders," in SJI's "Standard Specifications and Load Tables for Steel Joists and Joist Girders"; with steel-angle, top- and bottom-chord members, and end- and top-chord arrangements as indicated on Drawings and required for primary framing.
 10. Steel Joists: Manufactured according to "Standard Specifications for Open Web Steel Joists, K-Series," in SJI's "Standard Specifications and Load Tables for Steel Joists and Joist Girders"; with steel-angle, top- and

- bottom-chord members, and end- and top-chord arrangements as indicated on Drawings and required for secondary framing.
11. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A, carbon-steel, hex-head bolts; ASTM A 563 (ASTM A 563M) carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers.
 - a. Finish: Hot-dip zinc coating, ASTM F 2329, Class C.
 12. Structural Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.
 - a. Finish: Hot-dip zinc coating, ASTM F 2329, Class C.
 13. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy-hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers, plain.
 14. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex-head steel structural bolts with spline ends.
 - a. Finish: Mechanically deposited zinc coating, ASTM B 695, Class 50.
 15. Unheaded Anchor Rods: ASTM F 1554, Grade 36.
 - a. Configuration: Straight.
 - b. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
 - c. Plate Washers: ASTM A 36/A 36M carbon steel.
 - d. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
 - e. Finish: Hot-dip zinc coating, ASTM F 2329, Class C.
 16. Headed Anchor Rods: ASTM F 1554, Grade 36.
 - a. Configuration: Straight.
 - b. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
 - c. Plate Washers: ASTM A 36/A 36M carbon steel.
 - d. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
 - e. Finish: Hot-dip zinc coating, ASTM F 2329, Class C.
 17. Threaded Rods: ASTM A 193/A 193M.
 - a. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
 - b. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
 - c. Finish: Hot-dip zinc coating, ASTM F 2329, Class C.
- J. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.
1. Clean and prepare in accordance with SSPC-SP2.
 2. Coat with manufacturer's standard primer. Apply primer to primary and secondary framing to a minimum dry film thickness of 1 mil (0.025 mm).
 - a. Prime secondary framing formed from uncoated steel sheet to a minimum dry film thickness of 0.5 mil (0.013 mm) on each side.

2.5 METAL ROOF PANELS

- A. Standing-Seam, Double Lok, Metal Roof Panels: Formed with vertical ribs at panel edges and 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.
1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 24-gauge nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Exterior Finish: Galvalume.
 2. Clips: One-piece fixed to accommodate thermal movement.
 3. Joint Type: Mechanically seamed.
 4. Panel Coverage: 24 inches.
 5. Panel Height: 2 inches (51 mm).
 6. 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 (0.013 mm).

2.6 METAL WALL PANELS

- A. Refer to Section 074213 – Form Metal Wall Panels for exterior wall panels. **[ADD 4]**

- B. ~~Exposed Fastener, Tapered Rib, Metal Wall Panels: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced flat pan between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.~~
- ~~1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch (0.61 mm) nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A755/A755M.~~
 - ~~a. Exterior Finish: Siliconized polyester.~~
 - ~~b. Color: As selected by Architect from manufacturer's full range.~~
 - ~~2. Major Rib Spacing: 12 inches (305 mm) o.c.~~
 - ~~3. Panel Coverage: 36 inches (914 mm).~~
 - ~~4. Panel Height: 1.25 inches (32 mm). [ADD 4]~~
- C. Perforated Metal Liner Panels: Perforated panels formed with vertical panel edges and intermediate stiffening ribs symmetrically spaced between panel edges; with flush joint between panels; designed for interior side of metal wall panel assemblies and installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps.
1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch (0.61-mm) nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A755/A755M.
 - a. Interior Finish: Siliconized Polyester
 - b. Color: As selected by Architect from manufacturer's full range.
 - c. Perforated, acoustic design
 2. Sound Absorption: Provide SAB/Sound Attenuating Batts for NRC not less than 0.65 when tested according to ASTM C423.
 3. Panel Coverage: 12 inches (305 mm).
 4. Panel Height: 1.5 inches (38 mm).
- D. Finishes:
1. Exposed Coil-Coated Finish:
 - a. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a minimum dry film thickness of 0.2 mil (0.005 mm) for primer and 0.8 mil (0.02 mm) for topcoat.
 2. 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 (0.013 mm).

2.7 THERMAL INSULATION FOR FIELD-ASSEMBLED METAL PANELS

- A. Roof Liner Insulation System:
1. Basis-of-Design system: Simple Saver System – New Roof and Insulation System by Thermal Design, Inc., 800-255-0776, www.thermaldesign.com
 - a. Or Equal
 2. Provide system **R30+R11** with thermal blocks.
- B. Wall Liner Insulation System
1. Wall Liner Insulation System. Wall insulation to be as detailed w/ interior batt insulation min. **R-21** and continuous exterior insulation min. **R-7.5**. Note that interior perforated acoustic metal liner panels are insulated for NRC rating.

2.8 ACCESSORIES

- A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
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.
- B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, 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 material as metal roof panels.
 2. Clips: Manufacturer's standard, formed from steel sheet, designed to withstand negative-load requirements.
 3. Cleats: Manufacturer's standard, mechanically seamed cleats formed from steel 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, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
6. Thermal Spacer Blocks: Where metal panels attach directly to purlins, provide thermal spacer blocks of thickness required to provide 1-inch (25-mm) standoff; fabricated from extruded polystyrene.
- C. Flashing and Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch (0.46-mm) nominal uncoated steel thickness, prepainted with coil coating; finished to match adjacent metal panels.
 1. 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.
 2. Opening Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch (0.46-mm) nominal uncoated steel thickness, prepainted with coil coating. Trim head and jamb of door openings, and head, jamb, and sill of other openings.
- D. Gutters: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch (0.46-mm) nominal uncoated steel thickness, prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- (2438-mm-) long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."
 1. Gutter Supports: Fabricated from same material and finish as gutters.
 2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.
- E. Downspouts: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch (0.46-mm) nominal uncoated steel thickness, prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- (3-m-) long sections, complete with formed elbows and offsets.
 1. Mounting Straps: Fabricated from same material and finish as gutters.

2.9 FABRICATION

- A. General: Design components and field connections required for erection to permit easy assembly.
 1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
 2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.
- B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.
- C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
 1. Make shop connections by welding or by using high-strength bolts.
 2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.
 3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
 4. Weld clips to frames for attaching secondary framing if applicable, or punch for bolts.
 5. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.
- D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll forming or break forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
 1. Make shop connections by welding or by using non-high-strength bolts.
 2. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.
- E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
 1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

2.10 SOURCE QUALITY CONTROL

- A. Special Inspection: Owner will engage a qualified special inspector to perform source quality control inspections and to submit reports.
 1. Accredited Manufacturers: Special inspections will not be required if fabrication is performed by an IAS AC472-accredited manufacturer approved by authorities having jurisdiction to perform such Work without special inspection.

- a. After fabrication, submit copy of certificate of compliance to authorities having jurisdiction, certifying that Work was performed according to Contract requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.
 1. Engage land surveyor to perform surveying.
- C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.
- B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

- A. Erect metal building system according to manufacturer's written instructions and drawings.
- B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.
- C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.
- D. Base and Bearing 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. 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.
 3. 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.
- E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. 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 will be completed and in service.
- F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.
 1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt type and joint type specified.
 - a. Joint Type: Snug tightened or pretensioned as required by manufacturer.
- G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.
 1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
 2. Locate and space wall girts to suit openings such as doors and windows.
 3. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.
- H. Steel Joists and Joist Girders: Install joists, girders, and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Standard Specifications and Load Tables for Steel Joists and Joist Girders," joist manufacturer's written instructions, and requirements in this Section.
 1. Before installation, splice joists delivered to Project site in more than one piece.

2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
4. Joist Installation: Bolt joists to supporting steel framework using carbon-steel bolts unless otherwise indicated.
5. Joist Installation: Bolt joists to supporting steel framework using high-strength structural bolts unless otherwise indicated. Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for high-strength structural bolt installation and tightening requirements.
6. Joist Installation: Weld joist seats to supporting steel framework.
7. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.
- I. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
 1. Tighten rod and cable bracing to avoid sag.
 2. Locate interior end-bay bracing only where indicated.
- J. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.
- K. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 METAL PANEL INSTALLATION, GENERAL

- A. Fabricate and finish metal panels and accessories at the factory, 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. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.
 1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.
- D. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
 - a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.
 2. Install metal panels perpendicular to structural supports unless otherwise indicated.
 3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 5. Locate metal panel splices over structural supports with end laps in alignment.
 6. Lap metal flashing over metal panels to allow moisture to run over and off the material.
- E. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.
 1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
- F. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.
- G. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.
 1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.5 METAL ROOF PANEL INSTALLATION

- A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
 - 1. Install ridge and hip caps as metal roof panel work proceeds.
 - 2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.
- B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.
 - 1. Install clips to supports with self-drilling or self-tapping fasteners.
 - 2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
 - 3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
 - 4. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
 - 5. Rigidly fasten eave end of metal roof panels and allow ridge end free movement for thermal expansion and contraction. Pre-drill panels for fasteners.
 - 6. Provide metal closures at peaks rake edges rake walls and each side of ridge caps.
- C. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.
- D. Metal Roof Panel Installation Tolerances: Shim and align metal roof panels within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.6 THERMAL INSULATION INSTALLATION

- A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.
 - 1. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
 - 2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
 - 3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.
 - 4. Install blankets straight and true in one-piece lengths. Install vapor retarder over insulation, with both sets of facing tabs sealed, to provide a complete vapor retarder.
- B. Blanket Roof Insulation: Comply with the following installation method:
 - 1. Over-Framing Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal roof panels fastened to secondary framing.
 - 2. Over-Purlin-with-Spacer-Block Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Install layer of filler insulation over first layer to fill space formed by metal roof panel standoffs. Hold in place by panels fastened to standoffs.
 - a. Thermal Spacer Blocks: Where metal roof panels attach directly to purlins, install thermal spacer blocks.
 - 3. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.
- C. Roof Liner Insulation: Comply with manufacturer's installation instructions.

3.7 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.
 - 2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
 - 3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.
- 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. 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 (3 m) with no joints allowed within 24 inches (600 mm) 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 (25 mm) 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 as required for gutter size, but not more than 36 inches (914 mm) 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 (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1524 mm) o.c. in between.
 1. Provide elbows at base of downspouts to direct water away from building.
 2. Tie downspouts to underground drainage system indicated.
- E. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

3.8 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform field quality control special inspections and to submit reports.
- B. Product will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.9 CLEANING AND PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.
- B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- C. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.
 1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."
 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
- D. Touchup Painting: Cleaning and touchup painting are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
- E. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
 1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 133419

