

-ADDENDUM NUMBER 4

May 22, 2023

**PROJECT:
CITY OF MOBILE PARK IMPROVEMENTS**

GMC PROJECT NO. AMOB220095

AD4-1 CLARIFICATIONS / RFI RESPONSES / ADDITIONS / ETC.:

AZALEA

- A. Bidders shall acknowledge receipt of the Addendum in writing, as provided on the Acknowledgment Receipt.
- B. Scranton is approved as an equal. See attached substitution request.
- C. The Bid Opening for Azalea will now be on May 31st at 2:30.
- D. **Question:** Is there a brick spec or allowance?
Response: See B-1 Finish Schedule on A-A801 for brick type. See Unit Masonry spec attached.
- E. **Question:** The wall section on A5.02 shows air/water barrier on the outside of the rigid insulation. Is this correct? Is there an air/water barrier specification?
Response: The vapor barrier should be on the CMU block. See Cold Fluid-Applied Waterproofing spec attached.
- F. **Question:** Scope of work on the BCS page state that "New Mechanical System." Please provide more details about mechanical, equipment replacement? Ductwork replacement/relocation? Restroom exhaust equipment replacement/relocation?
Response: Not any New Mechanical Systems in this project.
- G. **Question:** What are the type of doors that are needed, because there is no door spec?
Response: The Range House doors will be FRP and the doors in the Club House will match existing doors. See FRP door spec attached.
- H. **Question:** There is no #A03 so what is the door schedule talking about for door 102L.
Response: I don't see it listed. A03 will need a lever set storeroom mortise lockset with deadbolt L9080HD SCH, 6 Butts 5BB1 4.5x4.5 IVE, uncombined SFIC interchangeable core 65-73-7P uncombined SAR, 2 wall stops WS406/407CCV IVE, 3 silencers SR64 IVE, and 2 surface closers 4040XP SCUSH TBSRT LCN.
- I. **Question:** Where are the floor plans with the door numbers on the doors at?
Response: See sheet A-A1.03 for the door numbers for the Range House. The only new doors in the Club House is 102L and it is shown on A-A1.02.

BAUMHAUER

- A. Bidders shall acknowledge receipt of the Addendum in writing, as provided on the

- Acknowledgement receipt.
- B. The Bid Opening for Baumhauer will now be on June 7th at 2:30.
 - C. Exterior wall paint finishes scheduled on B-A6.01 should be cancelled and changed to split-face CMU with the Sherwin Williams coating system shown on Revised Drawing B-A4.01 Rev 1
 - D. Alternate #1, including the restroom/ concession building for Baumhauer is no longer in the project.

TAYLOR

- A. There will be no work for Taylor Park bidding at this time.

AD4-2 ISSUED SPECIFICATIONS:

AZALEA

- A. Substitution Request for lockers at Azalea
- B. 042000- Unit Masonry
- C. 042200 – Concrete Unit Masonry
- D. 054000 – Cold-Formed Metal Framing
- E. 072200 – Vented Nail Base Insulation
- F. 071416 – Cold Fluid-Applied Waterproofing
- G. 082250 – Fiberglass Doors and Frames
- H. 092423 – Cement Stucco

BAUMHAUER

- A. Exhibit E- Splashpad Drawing Set
- B. 51-116850 – Aquatic Playground

AD4-3 ISSUED DRAWINGS:

AZALEA

- A. Replace sheet A-A3.01 Roof Plan – Alternate 1
- B. Replace sheet A-S0.01 Range House General Notes
- C. Replace sheet A-S0.03 Range House Typical Details
- D. Replace sheet A-S1.01 Range House Foundation & Floor, & Roof Framing Plans & Sections

END OF ADDENDUM

PREPARED BY

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SUBSTITUTION REQUEST
(During the Bidding/Negotiating Stage)

Project: <u>Azalea City Golf Course Range Building Clubhouse Restroom (23-139373)</u>	Substitution Request Number: <u>SubReq-27093</u>	
<u>MOBILE, AL</u>	From: <u>Courtney Smith, Scranton Products</u>	
To: <u>Jim Walker, GMC / Goodwyn Mills and Cawood Inc. (Mobile)</u>	Date: <u>05/17/2023</u>	
<u>jim.walker@gmcnetwork.com, (251) 460-4006</u>	A/E Project Number: _____	
Re: <u>Metal Lockers</u>	Contract For: <u>City of Mobile</u>	

Specification Title: <u>Metal Lockers</u>	Description: <u>Knocked Down Corridor Lockers</u>
Section: <u>10 5113</u> Page: <u>3</u>	Article/Paragraph: <u>2.3</u>

Proposed Substitution: <u>Tufftec Lockers</u>			
Manufacturer: <u>Scranton Products</u>	Address: <u>scrantonproducts.com</u>	Phone: <u>570-348-0997</u>	
Trade Name: <u>Scranton Tufftec Lockers</u>		Model No.: <u>N/A</u>	

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.

Submitted by: Courtney Smith

Signed by: Courtney Smith

Firm: Scranton Products

Address: 801 E. Corey Street
Scranton, Pennsylvania 18504

Telephone: (570) 348-0997 ext. 8032, courtney.smith@azekco.com

A/E' s REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Substitution Procedures.
- Substitution approved as noted - Make submittals in accordance with Specification Substitution Procedures.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: _____ **Date:** _____

Supporting Data
Attached: Drawings Product Data Samples Tests Reports _____

SUBSTITUTION REQUEST
(During the Bidding/Negotiating Stage)

Project: <u>Azalea City Golf Course Range Building Clubhouse Restroom (23-139373)</u>	Substitution Request Number: <u>SubReq-27094</u>	
<u>MOBILE, AL</u>	From: <u>Courtney Smith, Scranton Products</u>	
To: <u>Jim Walker, GMC / Goodwyn Mills and Cawood Inc. (Mobile)</u>	Date: <u>05/17/2023</u>	
<u>jim.walker@gmcnetwork.com, (251) 460-4006</u>	A/E Project Number: _____	
Re: <u>Metal Lockers</u>	Contract For: <u>City of Mobile</u>	

Specification Title: <u>Metal Lockers</u>	Description: <u>E. Fixed Benches</u>	
Section: <u>10 5113</u> Page: <u>8</u>	Article/Paragraph: <u>3.2</u>	

Proposed Substitution: <u>Tufftec Bench</u>			
Manufacturer: <u>Scranton Products</u>	Address: <u>scrantonproducts.com</u>	Phone: <u>570-348-0997</u>	
Trade Name: <u>Scranton Tufftec Bench</u>		Model No.: <u>N/A</u>	

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.

Submitted by: <u>Courtney Smith</u>
Signed by: <u>Courtney Smith</u>
Firm: <u>Scranton Products</u>
Address: <u>801 E. Corey Street</u>
<u>Scranton, Pennsylvania 18504</u>
Telephone: <u>(570) 348-0997 ext. 8032, courtney.smith@azekco.com</u>

A/E' s REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Substitution Procedures.
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- Substitution rejected - Use specified materials.
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Signed by: _____	Date: _____
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Supporting Data
Attached: Drawings Product Data Samples Tests Reports _____

SECTION 042000

UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General Conditions, GMC Special Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related work specified elsewhere includes:
 - 1. Section 05500 - "Metal Fabrications"
 - 2. Section 06100 - "Rough Carpentry"
 - 3. Section 07160 - "Bituminous Dampproofing"
 - 4. Section 07600 - "Flashing and Sheet Metal"
 - 5. Section 07900 - "Joint Sealers"
 - 6. Section 09900 - "Painting"

1.2 SUMMARY:

- A. The extent of each type of masonry work is indicated on the Drawings and Schedules.
 - 1. All CMU shall extend up to bottom of structure, unless specifically indicated otherwise.
 - 2. A continuous reinforced and concrete filled CMU bond beam shall occur at top of all CMU walls, unless specifically indicated otherwise.
- B. This Section includes the following:
 - 1. Face Brick (fields and accents), in standard size units, and custom shapes, or custom units as indicated, where any new brickwork is indicated, to include joint tooling.
 - 2. Concrete masonry units (CMU), as indicated on the Drawings.
 - 3. Architectural Concrete Masonry Units (ACMU, brick shapes, etc.), and Cast Stone/Precast Concrete Units, at locations indicated on the Drawings.
 - a. Exterior: Integrally colored, with integral water repellent and matching color mortar with raked joints.
 - b. Interior: Natural color, with integral water repellent, natural color mortar and raked joint tooling; to be painted under the work of Division 9 Section "Painting".
 - c. Other types and face finishes, as indicated on the Drawings, or equivalent priced units selected by the Architect after bidding.

- d. Where smooth face is indicated within or adjacent to ACMU, it is intended to be standard CMU, unless ACMU is specifically indicated and noted.
- 4. Standard gray colored mortar at exposed interior and concealed exterior locations.
- 5. Mortar color and tooling at exposed exterior locations to be as specified – Argus “porcelain”.
- 6. Anchors, ties, reinforcing, masonry accessories, and concealed flashings, and galvanized steel lintels.
 - a. Special interlocking flashings below any parapet caps and all other tops of walls exposed at the exterior of buildings, and other locations where occurs on site.
 - b. Elastic through-wall flashing at all wall base flashing, at heads and sills of exterior wall openings, at flashing at perimeters of all exterior wall openings, and as otherwise indicated.
- 7. Masonry Insulation, at locations specified:
 - a. Rigid board insulation (exterior walls’ air space).
 - b. Foamed-in-place-insulation, at all full-height interior and exterior hollow CMU and ACMU which is not indicated to be filled with grout or concrete; as specified and as otherwise indicated.
- 8. Water Repellents:
 - a. Integral water repellent added to all exterior mortar mix at single-wythe wall construction only (i.e.: ACMU and CMU single-wythe walls only, if any).
 - b. Field applied to all completed exterior masonry work.

1.3 SYSTEM PERFORMANCE REQUIREMENTS:

- A. Provide concrete unit masonry that develops at least the following installed compressive strengths (f'm): f'm = 1,500 psi.
- B. Precast Concrete Masonry Units: ASTM C1364.
 - 1. Standard of materials, quality and workmanship shall be pre-approved equivalent to standard products of “Rock Cast”, as manufactured by Reading Rock; Cincinnati, Ohio; with finishes, reinforcing and ties, integral water repellent, grouted joints, field-applied water-repellent, etc., as specified.

1.4 SUBMITTALS:

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
1. Manufacturer's product data for each different masonry unit, accessory, water repellent (integral and surface-applied types), and other manufactured product indicated, including certifications that each item and type complies with specified requirements.
 - a. Include instructions for handling, storage, installation, and protection.
 2. Shop drawings for reinforcing detailing fabrication, bending, and placement of unit masonry reinforcing bars. Comply with ACI 315 "Details and Detailing of Concrete Reinforcing" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of masonry reinforcement.
 3. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with the specified requirements:
 - a. Concrete Masonry Unit Test: For each type of unit required, according to ASTM C 140 for compressive strength.
 4. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 5. Samples for initial selection and/or verification purposes of the following (4 sets minimum):
 - a. Exposed Masonry, showing full extent of colors and variations anticipated, for each standard and special shape unit selected, and as indicated on the Drawings, and as further indicated below.
 - b. Field brick or blend, as indicated.
 - c. ACMU and Precast Concrete, for each type, as indicated.
 - d. Full sample set for ACMU and Precast Concrete for initial color selection where not preselected, and four (4) full size units for verification following initial color selection.
 - e. Colored masonry mortar samples showing colors available, in price range of preselected mortar colors.
 - f. Exposed Masonry, showing full extent of colors and variations anticipated, for each standard and special shape unit selected, and as indicated on the Drawings.

1.5 QUALITY ASSURANCE:

- A. Fire Performance Characteristics: Where indicated, provide materials and construction identical to those of assemblies whose fire resistance has been determined per ASTM E 119 by a testing and inspecting organization, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.
- B. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
- C. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.
- D. Single-Source Responsibility for Water Repellents: Obtain each type of integral and applied water repellents from a single manufacturer for the entire project.
 - 1. Verify full compatibility with any other coatings, fluid applied waterproofing, etc., prior to application of this and other products. Notify Architect in writing and in detail, of any incompatible products, prior to any application, and await Architect's written direction on how to proceed.
- E. Subcontractors: Subcontractors shall have been established in their own firms for at least 5 verifiable years and shall have successfully completed at least 10 verifiable projects of this size, scope, and complexity. Furnish names and telephone numbers of General Contractors for each project submitted for consideration of experience requirements.
 - 1. Refer to Section 01015 - "Special Conditions" for additional information and minimum experience requirements.
- F. Field-Constructed Mock-Ups: Prior to installation of unit masonry, erect sample wall panels to further verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mock-ups to comply with the following requirements, using materials indicated for final unit of Work:
 - 1. Locate mock-ups on site in locations indicated or, if not indicated, as directed by Architect.
 - 2. Build mock-ups for the following types of masonry in sizes of approximately 4 feet long by 4 feet high by full thickness, including face and backup wythes as well as accessories.

- a. Each type of exposed unit masonry construction, utilizing mortar color and joint detail selected and/or specified, insulation, flashing, and weeps.
 - b. Incorporate Precast Concrete and integral and applied water repellents, the same as required for the completed work.
3. Notify Architect one week in advance of the dates and times when mock-ups will be erected.
 4. Protect mock-ups from the elements with weather-resistant membrane.
 5. Retain and maintain mock-ups during construction in undisturbed condition as standard for judging completed unit masonry construction.
 - a. When directed, demolish and remove mock-ups from Project site.

1.6 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.
- C. Store cementitious materials and insulation off the ground, under cover, and in dry location.
- D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.
- F. Store water repellents in strict accordance with manufacturer's written recommendations, off of ground, under cover, and otherwise as required to protect from damage, contamination, etc.
- G. Refer to Section 01010 - "Summary of Work" and Section 01015 - "Special Conditions", for additional information and requirements regarding stored materials.

1.7 PROJECT CONDITIONS:

A. Protection of Masonry:

1. During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
2. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
3. Where one wythe of multi-wythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

C. Stain Prevention:

1. Prevent grout, mortar, and soil from staining the face of masonry to be left exposed, painted, and/or to receive any other coatings. Remove immediately any grout, mortar, and soil that come in contact with such masonry.
2. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface, until landscaping or other improvements indicated adjacent to completed masonry work are in place.
3. Protect sills, ledges, and projections from mortar droppings.
4. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings, coatings, water repellents, and/or any other damage.

D. Clean Air Space:

1. Prevent grout and mortar from occurring in, bridging, forming ledges, and/or filling air space between masonry and back-up walls.
2. Remove excess grout and mortar flush with back side of masonry as work progresses, using trowel, board pulled up through air space, or other effective and acceptable method(s), pre-approved by Architect.
3. Provide cavity drainage material specified just above ALL through-wall flashings and weeps.

E. Cold-Weather Construction: Comply with referenced unit masonry standard and applicable Building Code requirements for cold-weather construction, and the following:

1. Do not lay masonry units that are wet or frozen.

2. Remove masonry damaged by freezing conditions.
- F. Hot-Weather Construction: Comply with referenced unit masonry standard and applicable Building Code requirements for hot-weather construction.
- G. Thoroughly clean and rinse all masonry prior to application of water repellents, waterproofing, coatings, paint, etc. Comply with current written recommendations of each manufacturer of products to be applied to masonry work.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL:

- A. Comply with referenced unit masonry standard and other requirements specified in this Section applicable to each material indicated.

2.2 BRICK:

- A. Size: Unless otherwise indicated, provide brick manufactured to the following actual dimensions:
 1. Standard Modular: 2-1/4 inches high x 3-5/8 inches wide x 7-5/8 inches long; Provide special molded shapes where indicated, and for applications requiring brick of form, size and finish on exposed surfaces which cannot be produced from standard brick sizes by sawing (all saw cuts must be concealed in the finished masonry work); or
 2. Or, equivalent priced brick units selected by Architect after bidding.
- B. For sills, caps and similar applications resulting in exposure to brick surfaces which otherwise would be concealed from view, provide uncored or unfrogged units with all exposed surfaces by sawing.
- C. Facing Brick: ASTM C 216, Type FBS, SW: Brick texture and colors shall be as follows:
 1. Match Existing Clubhouse Brick
Close to Glen Gery M/S Marion Blend
Riley-Stuart- Contact: Bo Colclough
Mobile, AL
- D. Application: Use above at all locations where brick is indicated on the Drawings.

2.3 CONCRETE MASONRY UNITS:

- A. General:

1. Comply with requirements indicated below applicable to each form of concrete masonry unit required.
 2. Provide special shapes where indicated and as follows:
 - a. For lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
 - b. Square-edged units for outside corners, except where indicated otherwise.
 3. Size: Provide concrete masonry units complying with requirements indicated below for size that are manufactured to specified face dimensions within tolerances specified in the applicable referenced ASTM specification for concrete masonry units.
 4. Concrete Masonry Units:
 - a. Manufacturer's standard sixteen (16) inches long x eight (8) inches x eight (8) inches nominal dimension, unless indicated otherwise on Drawings.
 - b. Provide 1/4 notched foundation block and other preformed shapes, if any, as indicated on the Drawings.
 5. Concrete Building Brick: Standard Modular, 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.
 6. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.
- B. Hollow Load-Bearing Concrete Masonry Units - (CMU):
1. ASTM C 90, Grade N, Type II.
 2. Unit Compressive Strength: Provide units with minimum average net area compressive strength of 1,900 psi.
 3. Weight Classification: Lightweight, unless indicated otherwise.
 4. Weight Classification: Normal weight where necessary to achieve required fire-ratings according to manufacturer's testing and/or by "calculated fire resistance" as may be allowed by applicable building code.
- C. Concrete Building Brick:
1. ASTM C 55, Grade N.
 2. Unit Compressive Strength: Provide units with minimum average net area compressive strength of 3,500 psi.
 3. Weight Classification: Lightweight.

2.4 ARCHITECTURAL CAST STONE/PRECAST MASONRY UNITS: **NOT USED**

- A. Provide pre-approved equivalent to standard or custom units shall be equivalent to standard precast concrete products of "RockCast", as manufactured by Reading Rock; Cincinnati, Ohio; at locations and in sizes, shapes and configurations indicated and shown on the Drawings, complete with finishes, reinforcing and ties, integral water repellent, grouted joints, field-applied water-repellent, etc., as specified.
1. Style: Architectural Series, with custom wall caps and miscellaneous units as indicated on the Drawings.
 2. Sizes: Varies; at locations indicated on the Drawings, to include the following.
 - a. Custom size units, unless specifically indicated otherwise by sizes indicated on the Drawings.
 3. Finish: Manufacturer's standard smooth face finish.
 4. Color(s): As indicated, or if not indicated, at least three (3) colors, as selected by the Architect from manufacturer's full line of standard colors, after bidding.
 5. Grout Color(s): To match cast stone masonry units, where occurs, unless specifically indicated otherwise; To Be Included in Base Bid.

2.5 MORTAR AND GROUT MATERIALS:

- A. Portland Cement for Grout: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce required mortar color.
- B. Masonry Cement:
1. ASTM C 91.
 2. For colored pigmented mortars use premixed colored masonry cements of formulation required to produce color indicated, or if not indicated, as selected by Architect after bidding from manufacturer's full line of standard colors.
 - a. Bases of Design Color Selection: Argus "Porcelain".
- C. Sand: ASTM C 144.
- D. Hydrated Lime: ASTM C 207, Type S.
- E. Aggregate for Mortar:

1. ASTM C 144, except for joints less than 1/4 inch use aggregate graded with 100 percent passing the No. 16 sieve.
 2. White Mortar Aggregates: Natural white sand or ground white stone, only where necessary to achieve selected colors.
- F. Aggregate for Grout: ASTM C 404.
- G. Colored Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in masonry mortars.
- H. Water: Clean and potable.

2.6 REINFORCING STEEL:

- A. General: Provide reinforcing steel complying with requirements of referenced unit masonry standard and this article.
- B. Steel Reinforcing Bars: Billet steel complying with ASTM A 615, and Section 03310 - "Concrete".

2.7 JOINT REINFORCEMENT:

- A. General: Provide joint reinforcement complying with requirements of referenced unit masonry standards and this article, formed from the following:
1. Galvanized carbon steel wire complying with ASTM A 82, hot-dipped galvanized after fabrication to comply with ASTM A 153, class B-2 coating (1.5 ounces per square foot).
- B. Description: For single wythe masonry: Ladder type with single pair of side rods.
- C. Description: For multi-wythe masonry, provide welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet in widths approximately 2 inches less than nominal width of walls and partitions, as required for full mortar embedment and mortar coverage of not less than 5/8 inch at exterior sides and not less than 1/2-inch elsewhere; with prefabricated corner and tee units, and complying with requirements indicated below, unless otherwise indicated:
1. Wire Diameter for Side Rods: 0.1483 inch (9 gauge).
 2. Wire Diameter for Cross Rods: 0.1483 inch (9 gauge).
 3. Type as follows:
 - a. Ladder design with cross rods spaced not more than 16 inches o.c. and number of side rods as follows:

- b. Number of Side Rods for Multi-wythe Masonry: One side rod for each face of masonry units more than 4 inches in nominal width plus one side rod for each wythe of masonry 4 inches or less in nominal width.
 - c. Tab type, ladder design, with 1 side rod at each face shell of backing wythe and with rectangular tabs sized to extend at least halfway through facing wythe but with at least 5/8-inch cover on outside face.
 - d. Adjustable (two-piece) type, ladder design, with one side rod at each face shell of backing wythe and with separate adjustable ties with pintle-and-eye connections having a maximum adjustment of 1-1/4 inches. Size ties to extend at least halfway through facing wythe but with at least 5/8-inch cover on outside face.
- D. Manufacturers: Subject to compliance with requirements, provide joint reinforcement by one of the following:
- 1. Dur-O-Wal, Inc.
 - 2. Heckman Building Products, Inc.
 - 3. Hohmann & Barnard, Inc.
 - 4. Masonry Reinforcing Corp. of America.
 - 5. Southern Construction Products, Inc.

2.8 TIES AND ANCHORS, GENERAL:

- A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of referenced unit masonry standards and of this article.
- B. Galvanized Carbon Steel Wire:
 - 1. ASTM A 82, coating class as required by the International Building Code and referenced unit masonry standard for application indicated.
 - 2. Wire Diameter: 0.1875 inch.
- C. Galvanized Steel Sheet as follows: ASTM A 366 (commercial quality) cold-rolled carbon steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153, Class B2 (for unit lengths over 15 inches) and Class B3 (for unit lengths under 15 inches), for sheet metal ties and anchors exposed to the weather and not completely embedded in mortar and grout.
- D. Thickness of Steel Sheet Galvanized after Fabrication: Uncoated thickness of steel sheet hot-dip galvanized after fabrication:
 - 1. 0.0598 inch (16 gage).

- E. Steel Plates and Bars: ASTM A 36, hot-dip galvanized to comply with ASTM A 123 or ASTM A 153, Class B3, as applicable to size and form indicated.
- F. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AA Wire Products Co.
 - 2. Dur-O-Wal, Inc.
 - 3. Heckman Building Products, Inc.
 - 4. Hohmann & Barnard, Inc.
 - 5. Masonry Reinforcing Corp. of America.
 - 6. National Wire Products Industries.
 - 7. Southern Construction Products, Inc.

2.9 ADJUSTABLE ANCHORS, FOR CONNECTING MASONRY TO STRUCTURAL FRAMEWORK:

- A. General: Two-piece assemblies as described below allowing vertical or horizontal differential movement between wall and framework parallel to plane of wall, but resisting tension and compression forces perpendicular to it.
- B. For anchorage to new concrete, provide manufacturer's standard with dovetail anchor section formed from sheet metal and triangular-shaped wire tie section sized to extend within 1-inch of masonry face and 16-inches o.c. vertically and 16-inches o.c. horizontally (minimum).
- C. For anchorage to steel framework provide manufacturer's standard anchors with crimped 1/4-inch-diameter wire anchor section for welding to steel and triangular-shaped wire tie section sized to extend within 1-inch of masonry face and 16-inches o.c. vertical (minimum):
 - 1. Wire Diameter: 0.1875 inch.

2.10 RIGID ANCHORS AT LOCATIONS INDICATED OR REQUIRED:

- A. Provide straps of form and length indicated, or required (if any), fabricated from metal strips 1-1/2-inches wide by 1/4-inch thick, hot-dipped galvanized after fabrication.

2.11 ADJUSTABLE MASONRY VENEER ANCHORS FOR CONNECTING MASONRY TO WOOD OR METAL STUDS AT SINGLE-WYTHE WALLS, AND WHERE THRU-WALL JOINT REINFORCING CANNOT BE USED:

- A. General: Provide 2-piece galvanized assemblies where required (if any), allowing vertical or horizontal differential movement between wall and framework parallel to plane of wall, but resisting tension and compression forces perpendicular to it;

for attachment over sheathing to metal studs or masonry back-up and with the following structural performance characteristics:

1. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in either tension or compression without deforming over, or developing play in excess of, 0.05-inch.
- B. Screw-Attached (to studs) and Expansion Anchor Attached (to masonry back-up) Masonry Veneer Anchors:
1. Units consisting of wire tie section and metal anchor section complying with the following requirements:
 - a. Wire Tie Shape: Z-shaped pintle (single or double).
 - b. Wire Tie Length: As required to extend 2-1/2-inches into masonry wythe of veneer face.
 2. Anchor Section: 16-gauge sheet metal plate (at single-leg or double-leg pintle), or similar wire eye-configuration (at double-leg pintle), with plate type pre-punched for screw hole(s) at top and outward legs bent to form leg to bridge insulation and abut studs, or masonry; of overall size as required for intended application.
- C. Steel Drill Screws for Steel Studs or Masonry: ASTM C 954 except manufactured with hex washer head and neoprene washer, #10 diameter by length required to penetrate steel stud flange by not less than 3-exposed threads, and masonry but not less than 1-inch, and with corrosion protective coating; as recommended by manufacturer for the intended use.
- D. Galvanize all components.
- 2.12 MISCELLANEOUS ANCHORS AT LOCATIONS INDICATED OR AS REQUIRED BY PROJECT CONDITIONS:
- A. Unit Type Masonry Inserts in New Concrete: Cast iron or malleable iron inserts of type and size indicated.
 - B. Dovetail Slots for New Concrete: Furnish dovetail slots, with filler strips, of slot size indicated, or if not indicated, as required by project conditions, fabricated from 0.0336-inch (22-gage) galvanized sheet metal.
 - C. Anchor Bolts: Steel bolts complying with A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations, as indicated on the Drawings, or if not indicated, as required for the intended use:

1. Headed bolts.
2. Nonheaded bolts, straight.
3. Nonheaded bolts, bent in manner indicated.

2.13 POST-INSTALLED ANCHORS, WHERE INDICATED OR AS REQUIRED:

- A. Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing laboratory.
1. Type: Expansion anchors.
 2. Material: Zinc-plated carbon steel, hot-dipped galvanized after fabrication, or Zamac, or other non-corrosive or coated material in compliance with requirements and submitted for prior approval.
 3. For post-installed anchors in grouted concrete masonry units: Capability to sustain, without failure, a load equal to 6-times loads imposed by masonry.

2.14 EMBEDDED FLASHING MATERIALS:

- A. Vinyl Sheet Flashing (typical except below parapet caps and all other tops of walls exposed at the exterior of buildings and other locations on site):
1. Smooth surfaced flexible sheet flashings especially formulated from virgin polyvinyl chloride with plasticizers and other modifiers, to remain flexible and waterproof in concealed masonry applications, black in color and of thickness indicated below:
 - a. Thickness: 30-mils.
 2. Product/Manufacturer: "Nervastral 300" (smooth surface both sides, not textured, grained, etc.), or pre-approved equivalent submitted at least 10-days prior to original Bid Date and subsequently approved, including mastic, and where required companion surface conditioner product, and all other materials and components required.
 3. Application: Use where flashing is fully concealed in masonry, including in part, wall flashing, below sills, at lintels, above grade weeps at base of exterior walls, etc.
 4. Adhesive for Flashings: Type recommended by manufacturer of flashing material, for each use indicated.
- B. Interlocking Metal Flashing (typical below parapet caps and all other tops of walls exposed at the exterior of buildings and other locations on site):
1. Low-profile concealed through-wall sheet metal flashing, fabricated with ribs at 3-inch intervals along length of material, to provide an integral bond with solid mortar bedding at each side.

2. Height: 3/8-inch.
3. Width: 1-inch less than wall thickness (set in-place 1/2-inch back from each exterior wall face).
4. Material: ASTM A 167, Type 302/304, 2d finish, fully annealed or dead soft temper stainless steel, 0.018-inch thickness.
5. Product/Manufacturer: Provide one of the following, or pre-approved equivalent product, properly submitted (refer to section 01015 - "Special Conditions") at least 10-days prior to original bid dated and subsequently accepted by addendum or letter by Architect.
 - a. "Dovetail Design Flashing"; Cheney Flashing Co.; 1-800-322-2873.
 - b. "Three-Way Interlocking Flashing"; Keystone Flashing Co.; 1-800-526-8348.
 - c. "Interlocking Mechanically-Keyed Flashing"; Mastercraft Metals, Inc.; 1-888-593-3572.

2.15 MISCELLANEOUS MASONRY ACCESSORIES:

- A. Nonmetallic Expansion Joint Strips: Premolded filler strips complying with ASTM D 1056, Type 2 (closed cell), Class A (cellular rubber and rubber-like materials with specific resistance to petroleum base oils), Grade 1 (compression-deflection range of 2-5 psi), compressible up to 35 percent, of width and thickness indicated, formulated from the following material:
 1. Flexible Cellular Neoprene.
- B. Preformed Control Joint Gaskets:
 1. Material as indicated below, designed to fit project conditions, and to maintain lateral stability in masonry wall; size and configuration as indicated, or if not indicated, T-shape (or other special shapes required by project conditions to fit inside masonry, and of depth through joint to allow proper sealant application with only one backer rod.
 2. Styrene-Butadiene Rubber Compound: ASTM D 2000, Designation 2AA-805.
- C. Bond Breaker Strips: Asphalt-saturated organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- D. Weep Holes, Provide the Following: Cotton sash cord; 3/8-inch outside diameter by length(s) as required to overlap cord 2-inches past adjacent weep hole at bottom of air space at interior wall cavity, extend through exterior wythe(s), and 4-inches on exterior side - until water repellent is applied and excess is trimmed flush with raked mortar joint at flashing.
 1. Wet cord prior to embedding in mortar.

- E. Cavity Drainage Material: 1-inch- (25-mm-) thick (or other thickness as required by open joints and/or by clear wall cavities indicated on the Drawings or as otherwise required by project conditions), free-draining mesh; made from polyethylene strands and shaped to avoid being clogged by mortar droppings. Configuration shall be such that product cannot be dislodged after placement of masonry, and with either random or patterned protrusions or keystone shaped cut-outs so as to allow moisture evacuation to below any accumulated mortar droppings into cavities. Provide in rolls or sheets approximately 11-inches wide.
1. Product/Manufacturer: Provide one of the following, or pre-approved equivalent product, properly submitted (refer to section 01015 - "Special Conditions") at least 10-days prior to original bid dated and subsequently accepted by addendum or letter by Architect.
- a. Mortar Maze; Advanced Building Products, Inc.
 - b. CavClear Masonry Mat; CavClear.
 - c. Mortar Net; Mortar Net USA, Ltd.
 - d. Mortar Stop; Polytite Manufacturing Corp.
- F. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

2.16 MASONRY CLEANERS:

- A. Job-Mixed Detergent Solution: Solution of trisodium phosphate (1/2-cup dry measure) and laundry detergent (1/2-cup dry measure) dissolved in one gallon of water.

2.17 MORTAR AND GROUT MIXES:

- A. General:
- 1. Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
 - 2. Do not use calcium chloride in mortar or grout.
- B. Mixing: Combine and thoroughly mix cementitious, water and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.
- C. Mortar for Unit Masonry:
- 1. Comply with ASTM C 270, Proportion Specification, for types of mortar required, unless indicated otherwise.

2. Use Type M or S mortar for masonry below grade and in contact with earth, and where indicated.
3. Use Type S mortar for reinforced masonry and where indicated.
4. Use Type S mortar for exterior, above-grade load-bearing and non-loadbearing walls and parapet walls; for interior load-bearing walls; for interior non-loadbearing partitions, and for other applications where another type is not indicated.
5. Use Type "N" for veneer.

D. Mortar Colors:

1. Standard gray colored mortar at exposed interior and concealed locations.
2. Colored mortar at exposed exterior locations, as indicated, or as selected by Architect in same price range after bidding.
 - a. Up to two (2) colors may be selected for each type and color of unit masonry.

E. Grout for Unit Masonry:

1. Comply with ASTM C 476 for grout for use in construction of reinforced and nonreinforced unit masonry. Use grout of consistency indicated or if not otherwise indicated, of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout.
2. Use fine grout in grout spaces less than two inches (2") in horizontal direction, unless otherwise indicated.
3. Use coarse grout in grout spaces two inches (2") or more in least horizontal dimension, unless otherwise indicated.
4. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143.

- F. Water Repellent Additive AT ANY EXPOSED SINGLE-WYTHE EXTERIOR CONCRETE MASONRY: "Dry-Block" Integral Water Repellent, as manufactured by Grace Construction Products, Div. of W.R. Grace & Co.-Conn.; Cambridge, MA, other products listed in Paragraph 2.4 above, or pre-approved equivalent submitted at least 10-days prior to original Bid Date and subsequently accepted by Architect in writing or by Addendum.

2.18 WATER REPELLENT:

- A. Exterior Water Repellent and Sealer: Subject to compliance with requirements, provide penetrating water repellent from a manufacturer and by an applicator complying with experience requirements herein and in "Special Conditions," and as follows. Clean and lightly pressure wash building exterior, and apply water repellent to all exposed exterior masonry.

1. Field applied to all completed exterior masonry work.

- B. Provide from a manufacturer and by an applicator complying with experience requirements in “Special Conditions,” as follows: Equivalent to “BSM-40 VOC” as manufactured by Chemtrete Division of Evonik Industries; Mobile, Alabama, with UV sensitive/fugitive dye, in water carrier; Two Coats, unless otherwise required to obtain complete coverage.
 - 1. Product Description: 40% minimum and up to 50% Silane solution.
- C. Submit for approval prior to application.
- D. Application rate shall not be less than product manufacturer’s current written instructions and recommendations, but 100% coverage is required.
- E. Special Notes: Omit fugitive dye at surfaces concealed from or not exposed to sunlight, after prior approval of a particular area by the Architect, on site.

2.19 INSULATION FOR SINGLE WYTHE AND COMPOSITE MASONRY WALLS:

- A. Provide the insulation products below at all interior and exterior CMU masonry walls, except where cells are required to be filled with grout or concrete.
 - 1. Foamed-in-place Foam Insulation System - Pre-approved Equivalent To:
 - a. “Core Foam Masonry Foam Insulation”, as manufactured by **cfiFOAM, Inc.**; Knoxville, TN; Phone: 1-800-656-3626; or
 - b. “Core-Fill 500”, as manufactured by Tailored Chemical Products, Inc.; Hickory, N.C.; Phone: 1-800-627-1687; or
 - c. “R501”, as manufactured by PolyMaster, Inc.; Knoxville, TN.; Phone: 1-800-580-3626 (Representative: Southeast Construction Services, LLC; Dothan, AL.; Phone: (334) 673-0622).
 - 2. Where foam insulation may occur at exterior and other double-wythe walls, install from cavity side, and conceal drilled holes at all locations where possible.
 - 3. Holes for installation of foam insulation shall occur in and be no larger than typical 3/8-inch mortar joints. Patches for holes shall be for the full depth of mortar removed by drilling, and shall match adjacent mortar joint tooling and texture.
- B. Rigid Insulation Board: Provide one of the following:
 - 1. Extruded Polystyrene Board Insulation: Rigid, cellular polystyrene thermal insulation with closed cells and integral high density skin, formed by the expansion of polystyrene base resin in an extrusion process to comply with

ASTM C 578 for type indicated; with 5-year aged r-values of 5.4 and 5 at 40 and 75 deg F (4.4 and 23.9 deg C), respectively; and as follows:

- a. Type IV, 1.6 pcf min. density, unless otherwise indicated.
 - b. Product/Manufacturer: Styrofoam “Square Edge” or “Score Board”, as manufactured by Dow Chemical Co., or acceptable equivalent, with joint closure/sealer accessories.
 - c. Provide 3/4-inch thickness at any air space of exterior composite masonry walls and in air spaces of other exterior building walls, unless other thickness is indicated on the Drawings.
2. Polyisocyanurate Board Insulation: Aluminum-foil-faced, glass-fiber-reinforced, rigid, cellular, polyisocyanurate thermal insulation complying with ASTM C 1289, Type I, Class 2.
- a. Product/Manufacturer: “Thermax”, as manufactured by Dow Chemical Co., or acceptable equivalent, with joint closure/sealer accessories.
 - b. Provide 3/4-inch thickness at any air space of exterior composite masonry walls and in air spaces of other exterior building walls, unless other thickness is indicated on the Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION:

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit masonry.
 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of unit masonry, if any.
- B. Examine rough-in and built-in construction to verify actual locations of other or related work, prior to installation.
- C. Do not proceed until any unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL:

- A. Comply with referenced unit masonry standards and other requirements indicated, applicable to each type of installation included in Project.
 1. Install bought-out manufactured items (i.e.: flashing, special flashing, insulation, etc.), in accordance with manufacturer’s current written

directions and recommendations, related fire tests/certifications, and reviewed submittal data and shop drawings.

- B. Thickness: Build cavity and composite walls and other masonry construction to the full thickness indicated. Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.
- C. Height: Build walls and other masonry construction to full height indicated, or if not indicated, at least up to bottom of structure or structure bearing height where occurs. Extend fire-rated walls, and all perimeter/surrounding walls at the following rooms up to bottom of structure or roof deck, as required to seal-off top of walls:
 - 1. Toilet and Janitor's Rooms (including chase walls).
 - 2. Storage Rooms.
 - 3. Mechanical, Electrical and Utility Rooms.
 - 4. Laundry Rooms.
 - 5. Kitchens, and rooms where food is stored, prepared, cooked and/or served.
- D. Build chases and recesses as shown or required to accommodate items specified in this and other Sections of the Specifications. Provide not less than 8 inches of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.
- E. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.
- F. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting where possible.
 - 1. Use dry cutting saws to cut concrete masonry units.
- G. Wetting Clay Brick: Wet brick made from clay or shale which have ASTM C 67 initial rates of absorption (suction) of much than 30 grams per 30 sq. in. per minute. Use wetting methods which ensure each clay masonry unit being nearly saturated but surface dry when laid.
- H. Do not wet concrete masonry units.
- I. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.
- J. Fill all hollow masonry and air spaces below grade with concrete.

- K. Provide solid and smooth substrate for all wall flashing.
- L. Wet sash cord weeps prior to embedding in mortar, so it will not draw water out of mortar.

3.3 CONSTRUCTION TOLERANCES - REQUIRED FOR ACCEPTANCE:

- A. Comply with construction tolerances of referenced unit masonry standards.
- B. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4-inches in 10-feet, or 3/8-inches in a story height not to exceed 20-feet, nor 1/2-inches in 40-feet or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4-inches in any story or 20-feet maximum, nor 1/2-inch in 40-feet or more. For vertical alignment of head joints do not exceed plus or minus 1/4-inches in 10-feet, 1/2-inch maximum.
- C. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4-inches in any bay or 20-feet maximum, nor 1/2-inches in 40' or more. For top surface of bearing walls do not exceed 1/8-inches between adjacent floor elements in 10' or 1/16" within width of a single unit.
- D. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2-inch in any bay or 20' maximum, nor 3/4" in 40' or more.
- E. Variation in Cross Sectional Dimensions: Do not exceed bed joint thickness indicated by more than plus or minus 1/8". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

3.4 LAYING MASONRY WALLS:

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.
- B. Lay up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.
- C. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

1. Exterior Brick and Concrete Masonry Units: Stack bond, unless otherwise indicated on Drawings.

- D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

- E. Stopping and Resuming Work: In each course, rack back 1/2-unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet masonry units lightly (if required), and remove loose masonry units and mortar prior to laying fresh masonry.

- F. Built-In Work:
 1. As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
 2. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
 3. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
 4. Fill cores in hollow concrete masonry units with grout 3 courses (24 inches) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING:

- A. Lay hollow concrete masonry units as follows:
 1. With full mortar coverage on horizontal and vertical face shells and cross webs.
 2. Bed webs in mortar in starting course on footings and in all courses of walls, piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
 3. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.

- B. Cut joints flush for masonry walls to be concealed or to be covered by base, crown moulding, and/or other materials, unless otherwise indicated.

- C. Tool all joints in exposed work as follows:

1. Interior: Slightly concave, with a tool of at least 50% but no more than 100% larger than joint width.
 2. Exterior: Slightly concave, with a tool of at least 50% but no more than 100% larger than joint width.
 - a. At Exterior ACMU: Rake back same depth as mortar joint width and tool recessed joint, unless otherwise required at specific locations indicated.
 3. Where specifically indicated in this Section to cut flush with face of exposed masonry, take care not to spread mortar over onto face of masonry units.
- D. Maintain joint widths of 3/8 inch, except for minor variations required to maintain bond alignment, or as otherwise required to align with or match immediately adjacent work.
- E. Collar Joints: After each course is laid, fill vertical longitudinal joint between wythes solidly with mortar, for the following work:
1. Exterior walls, except where clear air space above flashing is indicated.
 2. Interior bearing walls.

3.6 STRUCTURAL BONDING OF MULTI-WYTHE MASONRY:

- A. Use continuous horizontal joint reinforcement installed in horizontal mortar joints for bond tie between wythes, at 16 inches o.c. vertically (maximum) at running bond and 8 inches o.c. (maximum) at stacked bond.
- B. Corners:
1. Provide interlocking masonry unit bond in each course at corners, unless otherwise shown.
 2. Provide continuity with horizontal joint reinforcement at corners using prefabricated "L" units, in addition to masonry bonding.
- C. Intersecting and Abutting Walls:
1. Unless vertical expansion or control joints are shown or necessary at juncture, provide same type of bonding specified for structural bonding between wythes and space as follows:
 2. Provide individual metal ties to columns and stud walls, at 16 inches o.c. vertically (maximum).
 - a. Provide additional anchors within 1'-0" of openings and at intervals around perimeter not exceeding 3'-0" o.c.

3. Provide continuity with horizontal joint reinforcement using prefabricated "T" units.
4. Provide continuous dovetail slots, with anchors at 16 inches o.c. maximum vertically and 16 inches o.c., at new concrete back-up walls, columns, etc.

3.7 MASONRY WALL CELL INSULATION:

- A. Fill foamed-in-place insulation in cavities as indicated, to completely fill void spaces. Maintain inspection ports to show presence of insulation at extremities of each area. Close ports after complete coverage has been confirmed. Limit fall of insulation to one story in height, but not to exceed 8'-0".
 1. Provide foamed-in-place insulation at the following locations:
 - a. In cells of all hollow CMU and ACMU indicated in Paragraphs 2.3 and 2.4 above, except cells which are required to be filled with concrete or grout, and except at partition walls which are not full height.

3.8 CAVITIES/AIR SPACES:

- A. Keep cavities/air spaces clean of mortar droppings and other materials during construction. Strike joints facing cavities/air spaces flush.
 1. Where not possible and at wood and metal studs, tie exterior wythe to backup with individual metal ties spaced not more than 16 inches o.c. vertically and 16" o.c. horizontally. Stagger alternate courses.
- B. Provide weepholes in exterior wythe of new cavity walls, located immediately above ledges and flashing, and as follows, unless otherwise indicated on Structural Drawings:
 1. 16-inches o.c. at single-wythe exterior walls (ACMU or CMU).
 2. 32-inches o.c. at double-wythe exterior walls (Brick with CMU back-up).
- C. Tie exterior wythe to backup and multi-wythe walls with continuous horizontal joint reinforcing at 16 inches o.c. vertically.
- D. Install continuous rigid insulation as the work progresses, in compliance with manufacturer's current written recommendations, including in part, adhesives for securing to substrate, and joint fillers, sealers, or other treatments
 1. Place small dabs of adhesive, spaced approximately 12 inches (300 mm) o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall

ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.

2. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.9 HORIZONTAL JOINT REINFORCEMENT (FOR MULTI-WYTHER WALLS):

- A. General: Provide continuous horizontal joint reinforcement as indicated and as required by Code, but not more than 16 inches o.c. vertically at running bond and 8 inches o.c. vertically at stacked bond. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcing a minimum of 6 inches.
- B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.
- D. Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" beyond jambs of the opening except at control joints.

3.10 ANCHORING MASONRY WORK:

- A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
 1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
 2. Anchor masonry to structural members with flexible anchors which allow 4-way movement embedded in masonry joints and attached to structure.
 3. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally.
- B. Anchor single-wythe masonry veneer to studs with masonry veneer anchors to comply with the following requirements:
 1. Fasten each anchor section through sheathing to studs with 2 metal fasteners of type indicated.

2. Embed tie section in masonry joints. Provide not less than 1-inch air space between back of masonry veneer wythe and face of sheathing.
3. Locate anchor section relative to course in which tie section is embedded to allow maximum vertical differential movement of tie up and down.
4. Space anchors as indicated but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally with not less than one anchor for each 2 sq. ft. of wall area. Install additional anchors within 1'-0" of openings and at intervals around perimeter not exceeding 3'-0" o.c.

3.11 CONTROL AND EXPANSION JOINTS:

- A. General: Install control and expansion joints in unit masonry where existing in floor slabs, walls, and roof, and as otherwise indicated. Build in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.
- B. Form control joints in masonry as follows: Install preformed control joint gaskets designed to fit wall construction, at approximate center of CMU and ACMU. Fill recesses with backer rod and flexible sealant, as specified in Section 07900 - "Joint Sealers." Use firestop materials at fire-rated walls, as specified in Section 07270 - "Firestopping."
- C. Provide control joints at locations indicated or as approved by Architect, and not to exceed the following at continuous straight runs:
 1. Exterior walls: 30'-0" o.c. maximum.
 2. Interior walls: 40'-0" o.c. maximum.

3.12 LINTELS:

- A. Install hot-dipped galvanized, factory prime coated, steel lintels where exterior steel lintels are indicated. Painting of exposed steel lintels is specified in Division 9 Section "Painting."
- B. Provide masonry or precast lintels where shown and wherever openings of more than 1'-0" for brick size units are shown without structural steel or other supporting lintels. Temporarily support formed-in-place lintels, including steel lintels, for at least 7-days after masonry above has been completed; Supports shall be from cured concrete or masonry construction (at least 8-days old) or other surface accepted in writing by Architect, prior to installing supports.
 1. For hollow concrete masonry unit walls (CMU and ACMU), use specially formed bond beam units with reinforcement bars placed as indicated and filled with course grout.

- C. Provide minimum bearing of 16 inches at each jamb, unless otherwise indicated.
 - 1. Unless indicated otherwise, fill all jamb cells with concrete, from supporting structure below, up to bottom of lintel bearing, 8-inches wide by CMU wall thickness - minimum.

3.13 FLASHING/WEEP HOLES:

- A. General: Install embedded concealed flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to the downward flow of water in exterior walls, and where indicated.
- B. Prepare masonry surfaces so that they are smooth and free from projections that could puncture flashing. Place flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with adhesive/sealant/tape, as recommended by flashing manufacturer before covering with mortar.
 - 1. Where indicated or required by manufacturer, provide continuous seal at top edge, using their recommended materials.
- C. Install flashings as follows:
 - 1. At lintels and shelf angles, extend flashing a minimum of 4 inches into masonry at exterior end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4 inches on back-up wall (at stud walls), and seal top edge with product specified; except turned up a minimum of 8 inches at back-up masonry walls and extended through back-up wall to within 1/2-inch of its interior face.
 - 2. At heads and sills, extend flashing as specified above unless otherwise indicated but turn up ends not less than 2 inches to form a pan.
 - 3. Cut off flashing 1/2-inch from exterior face of wall and tool joint in accordance with flashing manufacturer's requirements.
 - 4. Comply with manufacturer's current written instructions and recommendations.
- D. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches (38 mm) or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Division 7 Section "Joint Sealants" for application indicated.
- E. Install weep holes, in the head joints in exterior wythes of the first course of masonry immediately above embedded flashings and as follows:
 - 1. Form weep holes with product specified in Part 2 of this Section.
 - 2. Wet cotton sash cord prior to embedding in mortar.
 - 3. Unless specifically indicated otherwise on Structural Drawings:

- a. 16-inches o.c. at single-wythe exterior walls (ACMU or CMU).
 - b. 32-inches o.c. at double-wythe exterior walls (Brick with CMU back-up).
- F. Place cavity drainage material immediately above ALL flashing in cavities.

3.14 INSTALLATION OF REINFORCED UNIT MASONRY:

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height. Grout shall be consolidated into cells using mechanical vibration as specified in referenced standards.
 - 2. Limit height of vertical grout pours to not more than 60 inches for low-lift grouting methods.

3.15 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Level B special inspections according to the "International Building Code" and the referenced Masonry Standard, unless otherwise noted.
 - 1. Begin masonry construction only after inspectors have verified proportions of site-prepared mortar.
 - 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.
 - 3. Place grout only after inspectors have verified proportions of site-prepared grout.
- C. Testing Frequency: One set of tests for each 2500 sq. ft. of wall area or portion thereof.

- D. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C 67 for compressive strength.
- E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- F. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.16 REPAIRING, POINTING, AND CLEANING:

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.
- C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave 1/2- panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 - 4. Saturate wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
 - 5. Clean brick by means of bucket and brush hand-cleaning method described in BIA "Technical Note No. 20 Revised", to clean brick masonry made of clay or shale, except use detergent as the masonry cleaner.
 - 6. Clean concrete masonry by means of cleaning method indicated in NCMA TEK 45 applicable to type of stain present on exposed surfaces.
 - a. Comply with masonry manufacturer's instructions.

3.17 WATER REPELLENTS:

- A. Apply water repellents to all exterior masonry and architectural precast concrete after thorough cleaning and rinsing, prior to any backfill or any other concealment.

- B. Install in strict accordance with manufacturer's current written instructions and recommendations.

3.18 PROTECTIONS:

- A. Trim excess sash cord flush with cured mortar joint at exterior side of walls.
- B. Protection: Contractor shall provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

END OF UNIT MASONRY

SECTION 04 2200

CONCRETE UNIT MASONRY

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. Concrete masonry units.
2. Concrete building brick.
3. Mortar and grout.
4. Steel reinforcing bars.
5. Masonry joint reinforcement.
6. Miscellaneous masonry accessories.

B. Related Sections:

1. Section "Structural Tests and Special Inspections" for specific masonry quality Control and special inspections of post-installed anchors.
2. Section 071900 "Water Repellents" for water repellents applied to unit masonry assemblies.
3. Section 076200 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PERFORMANCE REQUIREMENTS

- A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.

1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.
2. Net Area Compressive Strength for Concrete Masonry: f'_m – 1,900 psi (10.3Mpa).

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product Specified.
- B. Shop Drawings: For the following:
 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 2. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, “Details and Detailing of Concrete Reinforcement.” Reproduction and re-use of contract drawings for the purpose of preparing shop drawings is strictly prohibited. As a minimum, masonry reinforcement shop drawings shall contain the following:
 - a. Key Plan with rebar size and spacing for each wall condition
 - b. Rebar diagrams depicting splice locations and grout pour heights for each different wall height
 - c. Bending diagrams and dimensions for each type of bent bar and footing dowel
 - d. Wall Elevations showing placement of reinforcement at South gymnasium wall
 - e. Details of the following:
 - 1) Typical Wall Opening
 - 2) Typical Masonry Control Joint
 - f. Rebar Lap Splice Schedule

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with the specified requirements:
 1. Concrete Masonry Unit Test: For each type of unit required, according to ASTM C 140 for compressive strength.
 2. Grout Test (Compressive Strength): For each mix required, according to ASTM C 1019.
- C. Material Certificates: For each type and size of the following:
 1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements.
 - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
 - c. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.

2. Cementitious materials. Include brand, type, and name of manufacturer.
3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
4. Grout mixes. Include description of type and proportions of ingredients.
5. Reinforcing bars.
6. Joint reinforcement.
7. Anchors, ties, and metal accessories.

- D. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
1. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- E. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.
- F. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
- B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.
- D. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches (600 mm) down both sides of walls and hold cover securely in place.
- B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
- C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

- B. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
 - 1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
 - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 - 2. Provide square edge units for outside corners unless otherwise indicated.
- B. CMUs: ASTM C 90.
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi (13.1 MPa).
 - 2. Density Classification: Lightweight or Medium weight
 - 3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
- C. Face shells and web option requirements:
 - 1. 4-inch nominal width face shell with 3/4-inch face shell thickness; 3/4-inch web thickness with a web area of 6.5 in²/ ft².
 - 2. 6-inch nominal width face shell with 1-inch face shell thickness; 3/4-inch web thickness with a web area of 6.5 in²/ ft².
 - 3. 8-inch and greater nominal width face shell with 1 1/4-inch face shell thickness; 3/4-inch web thickness with a web area of 6.5 in²/ ft².
- D. Exposed Faces: Provide split texture on all exposed ends of block where split-face is called for on drawings.

General: Provide one of the following:

- 1. Masonry Lintels: Built-in-place masonry lintels made from bond beam CMUs with reinforcing bars placed as indicated and filled with coarse grout. Temporarily support built-in-place lintels until cured.

2.3 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C 91.
- E. Aggregate for Mortar: ASTM C 144.
 - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
 - 2. For joints less than 1/4 inch (6 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.
- F. Aggregate for Grout: ASTM C 404.
- G. Cold-Weather Admixture: Non-chloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
- H. Water: Potable.

2.4 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60 (Grade 420).
- B. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.
 - 1. Exterior Walls: Hot-dip galvanized, carbon or Stainless steel.
 - 2. Wire Size for Side Rods: 0.148-inch (3.77-mm) diameter.
 - 3. Wire Size for Cross Rods: 0.148-inch (3.77-mm) diameter.
 - 4. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches (407 mm) o.c.
 - 5. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.
- C. Masonry Joint Reinforcement for Single-Wythe Masonry: Ladder type with single pair of side rods.
 - 1. Tab type, ladder design, with 1 side rod at each face shell of backing wythe and with rectangular tabs sized to extend at least halfway through facing wythe but with at least 5/8-inch (16-mm) cover on outside face.
- D. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch (16-mm) cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches (50 mm) parallel to face of veneer.

2.5 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene, urethane or PVC.
- B. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- C. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and hold reinforcing bars in center of cells. Units are formed from 0.148-inch (3.77mm) steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

2.6 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Use masonry cement mortar unless otherwise indicated.
 - 3. For exterior masonry, use masonry cement mortar.
 - 4. For reinforced masonry, use masonry cement mortar.
 - 5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion] Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
 - 1. For masonry below grade or in contact with earth, use Type M or Type S.
 - 2. For reinforced masonry, use Type S
- D. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Use grout of type indicated or, if not otherwise indicated, of type coarse that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.

2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi (14 MPa).
3. Provide grout with a slump of 8 to 11 inches (203 to 279 mm) as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 1. Verify that foundations are within tolerances specified.
 2. Verify that reinforcing dowels are properly placed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.3 TOLERANCES

- A. Dimensions and Locations of Elements:
 1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
 2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
 3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.
- B. Lines and Levels:
 1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
 3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.
 4. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2 inch (12 mm) maximum.

5. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2 inch (12 mm) maximum.
 6. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.
- C. Joints:
1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
 2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
 3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
 4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).
 5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.5 mm) from one masonry unit to the next.

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay CMUs as follows:
 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
 2. With webs fully bedded in mortar in grouted masonry, including starting course on footings.

3.6 MASONRY JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).
 - 1. Space reinforcement not more than 16 inches (406 mm) o.c.
 - 2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.
 - 3. Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings
- B. Provide continuity at wall intersections by using prefabricated T-shaped units, unless noted otherwise.
- C. Provide continuity at corners by using prefabricated L-shaped units.
- D. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.7 REINFORCED UNIT MASONRY INSTALLATION

- A. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- B. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height. Grout shall be consolidated into cells using mechanical vibration as specified in referenced standards.

3.8 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner may engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to work areas, as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections: Level C special inspections according to TMS 402/ACI 530/ ASCE5.
 - 1. Begin masonry construction only after inspectors have verified proportions of site prepared mortar.
 - 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.

3. Place grout only after inspectors have verified proportions of site-prepared grout. C.

Testing Prior to Construction: One set of tests.

- D. Testing Frequency: One set of tests for each 1000 sq. ft. of wall area or portion thereof.
- E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- F. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

3.9 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.

3.10 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

END OF SECTION 04 2200

SECTION 05 4000

COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Exterior non-load-bearing wall framing.
 - 2. Soffit framing.
- B. Related Requirements:
 - 1. Section 01 4100 "Special Inspections" for special inspections.
 - 2. Section 05 5000 "Metal Fabrications" for miscellaneous steel shapes, masonry shelf angles, and connections used with cold-formed metal framing.
 - 3. Section 09 2216 "Non-Structural Metal Framing" for standard, interior non-load-bearing, metal-stud framing, with height limitations and ceiling-suspension assemblies.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
- B. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their structural consultants; Contractor and its superintendent; cold-formed framing subcontractors; cold-formed framing suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Cold-formed steel framing materials.
 - 2. Vertical deflection clips.
 - 3. Single deflection track.

4. Double deflection track.
 5. Drift clips.
 6. Ceiling joist framing.
 7. Soffit framing.
 8. Post-installed anchors and screws.
 9. Power-actuated anchors.
 10. Sill sealer gasket.
 11. Sill sealer gasket/termite barrier.
- B. Shop Drawings:
1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
- C. Delegated-Design Submittal: For cold-formed steel framing.

1.5 INFORMATIONAL SUBMITTALS

- A. Contractor's Statement of Responsibility - refer to Specification Section 01 41 00. Submit three originals, signed by the Contractor.
- B. Welding certificates.
- C. Product Test Reports: For each listed product, for tests performed by a qualified testing agency.
1. Expansion anchors & concrete screws.
 2. Power-actuated anchors.
 3. Mechanical fasteners.
 4. Vertical deflection clips.
 5. Horizontal drift deflection clips
 6. Miscellaneous structural clips and accessories
- D. Research Reports: For non-standard cold-formed steel framing, from ICC-ES.
1. For nonstandard cold-formed steel framing post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
 2. For sill sealer gasket/termite barrier, showing compliance with ICC-ES AC380.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

- B. Testing Agency Qualifications: Qualified according to ASTM E329 for testing indicated.
- C. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- D. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Steel Stud Manufacturers Association.
- E. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, to design cold-formed steel framing.
 - 1. The Contract Documents contain selections for cold formed metal framing members, materials, accessories and detailing. The selections indicated in the Contract documents shall be minimum requirements for the design of the Cold Formed Metal Framing and in addition to indicated Structural Performance requirements.
- B. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: As indicated.
 - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Exterior Non-Load-Bearing Framing: Horizontal deflection of 1/360 of the wall height.
 - b. Ceiling Joist Framing: Vertical deflection of 1/240 of the span for total loads of the span.
 - 3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure,

connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.

4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward movement of 1/2 inch.
 5. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
- C. Cold-Formed Steel Framing Design Standards:
1. Wall Studs: AISI S211.
 2. Headers: AISI S212.
 3. Lateral Design: AISI S213.
- D. AISI Specifications and Standards: Unless more stringent requirements are indicated, comply with AISI S100 and AISI S200.
- 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 COLD-FORMED STEEL FRAMING, GENERAL

- A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
1. Grade: As required by structural performance.
 - a. When specific grade is indicated provide grade indicated.
 2. Coating: G60 (Z180) minimum.
- B. Steel Sheet for Vertical Deflection Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
1. Grade: As required by structural performance.
 2. Coating: G90 (Z275) minimum.

2.3 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0566 inch.
 2. Minimum Flange Width: 1-5/8 inches.
 3. Minimum Return: 0.43 inches.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: Matching steel studs.
 2. Minimum Flange Width: 1-1/4 inches.
- C. Vertical Deflection Clips: Manufacturer's standard bypass and head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
1. Minimum Base-Metal Thickness: 0.0538 inch.
 2. Flange Width: 1 inch plus the design gap.
- E. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.
- F. Steel Box or Back-to-Back Headers: Manufacturer's standard C-shapes used to form header beams, of web depths indicated, unpunched, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: Matching steel studs.
 2. Flange Width: 1-5/8 inches for studs; 1-1/4 inches for tracks.

2.4 CEILING JOIST AND SOFFIT FRAMING

- A. Exterior Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm).
 2. Flange Width: 1-5/8 inches (41 mm), minimum.

2.5 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
1. Supplementary framing.
 2. Bracing, bridging, and solid blocking.
 3. Web stiffeners.
 4. Anchor clips.
 5. End clips.
 6. Foundation clips.
 7. Gusset plates.
 8. Stud kickers and knee braces.
 9. Hole reinforcing plates.
 10. Backer plates.

2.6 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- B. Anchor Bolts: ASTM F 1554, Grade 36 threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.
- C. Post-Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 as appropriate for the substrate.
1. Uses: Securing cold-formed steel framing to structure.
 2. Type: Torque-controlled expansion anchor or adhesive anchor.
 3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F194, Class Fe/Zn 5, unless otherwise indicated.
 4. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F593, and nuts, ASTM F594.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.
1. Corrosion Resistance: Tested in accordance with ASTM B 117 for 0% red rust after 500 hour exposure.
- E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.

1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
 2. Length: For self-drilling and self-threading screws thread bearing length, as defined by the manufacturer, shall be not less than as required to extend a minimum of three full threads through the material(s) being anchored.
 3. Corrosion Resistance: Tested in accordance with ASTM B 117 for 0% red rust after 500 hour exposure.
- F. Welding Electrodes: Comply with AWS standards.

2.7 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20 or ASTM A 780.
- B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107/C 1107M, with fluid consistency and 30-minute working time.
- D. Shims: Load bearing, high-density multimonomer plastic, and nonleaching; or of cold-formed steel of same grade and coating as framing members supported by shims.
- E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.8 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
1. Fabricate framing assemblies using jigs or templates.
 2. Cut framing members by sawing or shearing; do not torch cut.
 3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by no fewer than three exposed screw threads.

4. Fasten other materials to cold-formed steel framing and cold-formed steel framing to other materials by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
 2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Install load bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch (6 mm) to ensure a uniform bearing surface on supporting concrete or masonry construction.
- B. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

- A. Cold-formed steel framing shall be field assembled.
- B. Install cold-formed steel framing according to AISI S200 and to manufacturer's written instructions unless more stringent requirements are indicated.

- C. Install field-fabricated, cold-formed framing and securely anchor to supporting structure.
- D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - 1. Cut framing members by sawing or shearing; do not torch cut.
 - 2. Fasten cold-formed steel framing members together by screw fastening. Wire tying of framing members is not permitted.
 - a. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by no fewer than three exposed screw threads. Complying with requirements for spacing and edge distances.
 - 3. Fasten other materials to cold-formed steel framing and cold-formed steel framing to other materials by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- H. Install insulation, specified in Section 07 21 00 "Building Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.
- J. Coordinate layout and spacing of cold-formed metal framing to comply with fastening requirements of metal composite material wall panels.

3.4 EXTERIOR NON-LOAD-BEARING WALL AND CEILING/SOFFIT INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
1. Stud Spacing: 16 inches maximum unless indicated otherwise.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
1. Connect vertical deflection clips to bypassing and infill studs and anchor to building structure.
 2. Connect drift clips to cold-formed metal framing and anchor to building structure.
- E. Install horizontal bridging in stud system, spaced vertically as indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.
1. Channel Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs with a minimum of two screws into each flange of the clip angle for framing members up to 6 inches deep.
 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges, and secure solid blocking to stud webs or flanges.
 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.
- G. Install headers over wall openings wider than stud spacing. Locate headers above openings. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners, or gusset plates.
1. Frame wall openings with not less than a double stud at each jamb of frame. Fasten jamb members together to uniformly distribute loads.
 2. Install tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height wall studs.
- H. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring attachment to framing.
1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.

3.5 INSTALLATION TOLERANCES

- A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
 - 1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.6 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace work where test results indicate that it does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.7 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, which ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF COLD FORMED METAL FRAMING

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SECTION 07 2200

VENTED NAILBASE INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related work specified elsewhere includes:
 - .. Section 05310 - "Steel Deck"
 - .. Section 07311 - "Asphalt Shingles"

1.2 SUMMARY:

- A. This section includes ventilated nailbase insulation panel system.

1.3 REFERENCES:

- A. ASTM C 209 – Methods of Testing Insulating Board, Structural and Decorative.
- B. ASTM C 1289 – 02 – Specifications for Faced Rigid Cellular Polyisocyanurate Thermal Insulating Board.
- C. ASTM C 1303-00 – Standard Test Method for Estimating the Long Term Change in the Thermal Resistance of Unfaced Closed Cell Plastic Foams by Slicing and Scaling Under Controlled Laboratory Conditions.
- D. ASTM D 1621 – Test Methods for Compressive Properties of Rigid Cellular Plastics.
- E. ASTM D 2126 – Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
- F. ASTM E 84 – Surface Burning Characteristics of Building Materials.
- G. ASTM E 96 – Test Method for Water Vapor Transmission of Materials.
- H. CAN/ULC S77 – Standard Test Method for Determination of Long Term Thermal Resistance of Closed Cell Plastic Thermal Insulating.
- I. UL 1256 – Fire Test of Roof Deck Constructions.
- J. PS2-92 – Performance Standard for Wood-based Structural-use Panels.

1.4 SYSTEM DESCRIPTION:

- A. Physical properties (Foam Core):

- a. Compressive Strength: ASTM D 1621 and ASTM C 1289, Type II, 20 psi (138 kPa) minimum for Grade 2 and 25 psi (172 kPa) for Grade 3.
 - b. Dimensional Stability: ASTM D 2126, 2 percent linear change (7 days).
 - c. Moisture Vapor Transmission: ASTM E 96, <1 perm
 - d. Water Absorption: ASTM C 209, 1 percent by volume
 - e. Flame Spread (foam core): ASTM E 84, 0-25.
 - f. Service Temperature: -100 degrees to 250 degrees F (-73 degrees C to 122 degrees C).
- B. Foam Core R Values: Based on Long Term Thermal Resistance in accordance with ASTM C 1289, using techniques from CAN/ULC S770 based on ASTM C 1303.

1.5 **SUBMITTALS:**

- A. Submit under provisions of Division I.
- B. Product Data: Manufacturer's data sheets on roof panels and fasteners to be used, including:
 - a. Preparation instructions and recommendations.
 - b. Storage and handling requirements and recommendations.
 - c. Installation methods.
- C. Manufacturer's Certificate: Certify panels will conform to specified performance requirements.

1.6 **DELIVERY, STORAGE, AND HANDLING:**

- A. Store products off the ground, in dry conditions, under cover and in manufacturer's unopened packaging until ready for installation.
- B. The manufacturer's plastic wrapping is provided for protection during shipment only. Replace any panels that become wet before installation.

PART 2 - PRODUCTS

2.1 **MANUFACTURERS:**

- A. Manufacturers: Subject to compliance with requirements, provide vented nail base insulation products of one of the following:
 1. Manufacturers of Vented nail Base Insulation:
 - a. Cornell Corporation
 - b. Atlas Roofing Corporation

- c. Hunter Panels
- d. R-Max, Inc.

B. Requests for substitutions will be considered in accordance with provisions of Division 1.

2.2 PANEL CONSTRUCTION:

- A. Panels shall consist of a top layer of APA rated Plywood, a middle layer of vented air space consisting of 1.5 inch thick wood spacers and a bottom layer of fiber reinforced faced polyisocyanurate foam insulation.
 - a. Polyisocyanurate foam insulation shall conform to ASTM C1289, Type II with a compressive strength of:
 - i. Grade 3 (25 psi (172 kPa) minimum).
 - b. Multiple top layer substrate shall be as follows:
 - i. Plywood with a thickness of:
 - 1. 5/8 inch.
 - c. Wood spacers shall be solid wood. Other materials such as woodfiber, EPS, or strips of foam will not be acceptable. Spacers shall be not more than 12 inches (304.8 mm) apart in both the horizontal and vertical direction.
- B. Vented airspace shall be a minimum of 1.5 inches in depth and provide not less than 92 percent overall free air movement through the panel. It shall have 55 percent or greater lateral free air movement. Panels shall be manufactured to provide cross directional ventilation without additional material being incorporated into the construction. Provide an airspace of:
 - a. 1.5 inch air space.
- C. Panel with wood substrate as specified shall be factory rabbetted 1/8 inch (3.2 mm) on all sides to provide for expansion of substrate.

2.3 PANEL TYPES:

- A. Nail Base Insulation panels shall be 4 feet by 8 feet with an overall thickness, R-value, and flute spanability as follows:
 - a. Thickness as required for minimum R Value of 20.

2.4 PANEL FASTENERS:

- A. Fasteners shall be square drive (SIP/NB), 3/16 inch shank, corrosion resistant type with oversized heads. Length of fasteners shall be as recommended by the panel manufacturer. Fasteners shall be equal to the panel depth plus a minimum of 1 inch penetration into the steel deck substrate.

PART 3 - EXECUTION

3.1 EXAMINATION:

- A. Do not begin installation until structural deck has been properly prepared.

- B. Verify deck, adjacent materials, and structural backing is dry and ready to receive insulation.
- C. Verify deck surface is flat, free of fins or protrusions and irregularities.

3.2 PREPARATION:

- A. Apply proper ridge and soffit vents to create an effective eave to ridge venting systems in conjunction with vented nail base insulation.

3.3 INSTALLATION:

- A. Install panels with the wood (OSB/Plywood) side face up. Place panels in the manufacturers recommended pattern. Fasten the panels through the panel spacers using manufacturer's approved threaded fasteners, spaced as directed by manufacturer. Only factory assembled panels will be accepted.

3.4 PROTECTION:

- A. Protect installed products until completion of project.
- B. Cover the top and edges of unfinished roof panel work to protect it from the weather and to prevent accumulation of water in the cores of the panels. Only install as many vented nail base panels as can be covered by roofing felt and approved shingles on the same day.
- C. Do not leave panels exposed to moisture. Wet panels shall be removed and replaced.

END OF VENTED NAILBASE INSULATION

SECTION 071416

COLD FLUID-APPLIED WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

1. Polyurethane waterproofing.

- B. Related Requirements:

1. Section 072726 "Fluid-Applied Membrane Air Barriers" for vapor-retarding and vapor-permeable air barrier coatings that interface with waterproofing.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1. Review waterproofing requirements including, but not limited to, the following:
- a. Surface preparation specified in other Sections.
 - b. Minimum curing period.
 - c. Forecasted weather conditions.
 - d. Special details and sheet flashings.
 - e. Repairs.
 - f. <Insert agenda items>.

1.4 ACTION SUBMITTALS

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

1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.

- B. Shop Drawings:
 - 1. Show locations and extent of waterproofing.
 - 2. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.
 - 3. Include setting drawings showing layout, sizes, sections, profiles, and joint details of pedestal-supported concrete pavers.

- C. Samples: For each exposed product and for each color and texture specified, including the following products:
 - 1. Flashing sheet, 8 by 8 inches.
 - 2. Membrane-reinforcing fabric, 8 by 8 inches.
 - 3. Insulation, 8 by 8 inches.
 - 4. Drainage panel, 4 by 4 inches.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field quality-control reports.
- C. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.
- B. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for installation.
 - 1. Build mockup for each typical waterproofing installation including accessories to demonstrate surface preparation, crack and joint treatments, inside and outside corner treatments, and protection.
 - a. Size: 100 sq. ft. in area.
 - b. Description: Each type of wall installation.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer.
 - 1. Do not apply waterproofing to a damp or wet substrate, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F above dew point.
 - 2. Do not apply waterproofing in snow, rain, fog or mist, or when such weather conditions are imminent during application and curing period.
- B. Maintain adequate ventilation during application and curing of waterproofing materials.

1.8 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace waterproofing that fails in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- B. Installer's Special Warranty: Specified form, signed by Installer, covering Work of this Section, for warranty period of five years.
 - 1. Warranty includes removing and reinstalling protection board, drainage panels, insulation and any other component of the original system installation.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

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

2.2 SINGLE-COMPONENT POLYURETHANE WATERPROOFING

- A. Single-Component, Modified Polyurethane Waterproofing: ASTM C 836/C 836M and coal-tar free.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Polyguard Products, Inc.; Polyguard Commercial Stretch or comparable product by one of the following:
 - a. Anti-Hydro International, Inc.; A-H Seamless Membrane PF.
 - b. Neogard; a division of Jones-Blair, Inc.; Neogard 7401.
 - c. Polyguard Products, Inc.; Polyguard Commercial Stretch.

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials recommended in writing by waterproofing manufacturer for intended use and compatible with one another and with waterproofing.
 - 1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
- B. Primer: Manufacturer's standard primer, sealer, or surface conditioner; factory-formulated acrylic latex, polyurethane, or epoxy.
- C. Sheet Flashing: 50-mil-minimum, nonstaining, uncured sheet neoprene.
 - 1. Adhesive: Manufacturer's recommended contact adhesive.
- D. Membrane-Reinforcing Fabric: Manufacturer's recommended fiberglass mesh or polyester fabric, manufacturer's standard weight.
- E. Joint Reinforcing Strip: Manufacturer's recommended fiberglass mesh or polyester fabric.
- F. Joint Sealant: Multicomponent polyurethane sealant, compatible with waterproofing; ASTM C 920, Type M, Class 25 or greater; Grade NS for sloping and vertical applications and Grade P for deck applications; Use NT exposure; and as recommended by manufacturer for substrate and joint conditions.
 - 1. Backer Rod: Closed-cell polyethylene foam.

2.4 PROTECTION COURSE

- A. Protection Course: ASTM D 6506, semi rigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:
 - 1. Thickness: 1/4 inch, nominal.
 - 2. Adhesive: Rubber-based solvent type recommended in writing by waterproofing manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

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

1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.

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

3.2 PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Close off deck drains and other deck penetrations to prevent spillage and migration of waterproofing fluids.
- D. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, acid residues, and other penetrating contaminants or film-forming coatings from concrete.
 1. Abrasive blast clean concrete surfaces uniformly to expose top surface of fine aggregate according to ASTM D 4259 with a self-contained, recirculating, blast-cleaning apparatus. Remove material to provide a sound surface free of laitance, glaze, efflorescence, curing compounds, concrete hardeners, or form-release agents. Remove remaining loose material and clean surfaces according to ASTM D 4258.
- E. Remove fins, ridges, and other projections, and fill honeycomb, aggregate pockets, holes, and other voids.

3.3 PREPARATION AT TERMINATIONS, PENETRATIONS, AND CORNERS

- A. Prepare surfaces at terminations and penetrations through waterproofing and at expansion joints, drains, sleeves, and corners according to waterproofing manufacturer's written instructions and to recommendations in ASTM C 898/C 898M.
- B. Apply waterproofing in two separate applications, and embed a joint reinforcing strip in the first preparation coat when recommended by waterproofing manufacturer.

3.4 JOINT AND CRACK TREATMENT

- A. Prepare, treat, rout, and fill joints and cracks in substrate according to waterproofing manufacturer's written instructions and to recommendations in ASTM C 898/C 898M.

Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.

1. Comply with ASTM C 1193 for joint-sealant installation.
2. Apply bond breaker on sealant surface, beneath preparation strip.
3. Prime substrate along each side of joint and apply a single thickness of preparation strip at least 6 inches wide along each side of joint. Apply waterproofing in two separate applications and embed a joint reinforcing strip in the first preparation coat.

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

1. Extend sheet flashings for 4 inches onto perpendicular surfaces and items penetrating substrate.

3.5 WATERPROOFING APPLICATION

A. Apply waterproofing according to manufacturer's written instructions and to recommendations in ASTM C 898/C 898M.

B. Start installing waterproofing in presence of manufacturer's technical representative.

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

D. Unreinforced Waterproofing Applications: Mix materials and apply waterproofing by spray, roller, notched squeegee, trowel, or other application method suitable to slope of substrate.

1. Apply one or more coats of waterproofing to obtain a seamless membrane free of entrapped gases and pinholes, with a dry film thickness of 90 mils.
2. Apply waterproofing to prepared wall terminations and vertical surfaces.
3. Verify manufacturer's recommended wet film thickness of waterproofing every 100 sq. ft.

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

F. Install protection course with butted joints over waterproofing before starting subsequent construction operations.

1. For horizontal applications, install protection course loose laid over fully cured membrane.
2. For vertical applications, set protection course in nominally cured membrane, which will act as an adhesive. If membrane cures before application of protection course, use adhesive.

3. Molded-sheet drainage panels, Insulation drainage panels, or Board insulation may be used in place of a separate protection course for vertical applications when approved in writing by waterproofing manufacturer.

3.6 MOLDED-SHEET DRAINAGE PANEL INSTALLATION

- A. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate, according to manufacturer's written instructions. Use adhesive or another method that does not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.
 1. For vertical applications, install board insulation and protection course before installing drainage panels.
- B. Molded-Sheet Collector-Panel System: Install according to manufacturer's written instructions. Connect to piped subdrainage system specified in Section 334600 "Subdrainage."

3.7 INSULATION INSTALLATION

- A. Install one or more layers of board insulation to achieve required thickness over waterproofed surfaces. Cut and fit to within 3/4 inch of projections and penetrations.
- B. On vertical surfaces, set insulation units in adhesive applied according to manufacturer's written instructions.
- C. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

3.8 INSULATION DRAINAGE PANEL INSTALLATION

- A. Install drainage panels over waterproofed surfaces. Cut and fit to within 3/4 inch of projections and penetrations.
- B. Ensure that drainage channels are aligned and free of obstructions.
- C. On vertical surfaces, set insulation drainage panels in adhesive or tape applied according to manufacturer's written instructions.
- D. On horizontal surfaces, loosely lay insulation drainage panels according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

3.9 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components and to furnish daily reports to Architect.
- B. If test results or inspections show waterproofing does not comply with requirements, remove and replace or repair the waterproofing as recommended in writing by manufacturer, and make further repairs after retesting and inspecting until waterproofing installation passes.
- C. Prepare test and inspection reports.

3.10 PROTECTION

- A. Do not permit foot or vehicular traffic on unprotected membrane.
- B. Protect waterproofing from damage and wear during remainder of construction period.
- C. Protect installed board insulation and insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- D. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- E. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION 071416

SECTION 08 2250

FIBERGLASS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Fiberglass reinforced polyester (FRP) doors; Large Missile Impact Resistant.
- B. Frames for fiberglass reinforced polyester doors; Large Missile Impact Resistant.
- C. Hinges and other door hardware and some hardware; Large Missile Impact Resistant.
- D. Glazing; Large Missile Impact Resistant.

1.2 RELATED REQUIREMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 08 71 00 - "Finish Hardware": Other door hardware.
- C. Section 08 80 00 - "Glass and Glazing": For additional information regarding glass and glazing provided and installed in this Section.

1.3 REFERENCE STANDARDS

- A. ANSI A250.4 - American National Standard Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings; 2001.
- B. ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2006.
- C. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2008.
- D. ASTM F 476 - Security of Swinging Door Assemblies.
- E. SFBC 3603.2 - (b)(5) - Forced Entry Resistance Test
- F. ASTM B 221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- G. ASTM D 1667 - Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers (Closed-Cell Form).

- H. ASTM D 2000 - Classification System for Rubber Products in Automotive Applications.
- I. ASTM D 6670-01 - Standard Practice for Full-Scale Chamber Determination of Volatile Organic Emissions from Indoor Materials/Products.
- J. TAS 201-94 - Large Missile Impact Resistant.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Obtain hardware templates from hardware manufacturer prior to starting fabrication.
 - 2. Coordinate color of doors to be same as color of windows, unless indicated otherwise.

1.5 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. See Section 01 70 00 - "Project Closeout", for additional information and requirements for submittals.
- C. Product Data: Provide manufacturer's standard details, installation instructions, and hardware and anchor recommendations.
- D. Shop Drawings: Show layout and profiles; include assembly methods.
 - 1. Indicate product components, including hardware reinforcement locations and preparations, accessories, finish colors, patterns, and textures.
 - 2. Indicate wall conditions, door and frame elevations, sections, materials, gages, finishes, location of door hardware by dimension, and details of openings; use same reference numbers indicated on Drawings to identify details and openings.
- E. Samples for Initial Selection and for Verification: Submit two complete sets of color chips, illustrating manufacturer's available finishes, colors, and textures.
- F. Door Corner Sample: Submit corner cross sections, 10 inch by 10 inch in size, illustrating construction (core, framing, and face sheets), finish, color, and texture.
- G. Maintenance Data:
 - 1. Include instructions for repair of minor scratches and damage.
 - 2. Submit manufacturer's maintenance and cleaning instructions for doors, including maintenance and operating instructions for hardware.

- H. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer; include detailed terms of warranty.
- I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 70 00 - "Project Closeout", for additional requirements.
 - 2. Package products with protective covering and identify with descriptive labels.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than five years of documented experience.
 - 1. Door and Frame components shall be from same manufacturer.
- B. Installer Qualifications: Company specializing in installing products of the type specified in this section with not less than three years of documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Store materials in original packaging, under cover, protected from exposure to harmful weather conditions and from direct contact with water.
 - 1. Store at temperature and humidity conditions recommended by manufacturer.
 - 2. Do not use non-vented plastic or canvas shelters.
 - 3. Immediately remove wet wrappers.
- C. Store in position recommended by manufacturer, elevated minimum 4 inches above grade, with minimum 1/4 inches space between doors.
- D. Refer to Division 1 Sections "Summary of Work" for additional information and requirements regarding stored materials.

1.8 FIELD CONDITIONS

- A. Do not install doors until structure is enclosed.
- B. Maintain temperature and humidity at manufacturer's recommended levels during and after installation of doors.

1.9 WARRANTY

- A. General: Warranties shall run concurrently with, be in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents or otherwise.
- B. Manufacturer's Warranty:
1. Provide manufacturer's warranty that doors, frames, panels and hardware are to be free of defective materials and faulty workmanship.
 2. Submit written agreement on door manufacturer's standard form signed by Manufacturer, Installer and Contractor, agreeing to repair or replace defective doors that do not conform to tolerance limitations herein and of referenced quality standards.
 3. Warranty shall also include refinishing and reinstallation which may be required due to repair or replacement of defective doors where defect was not apparent prior to hanging.
 4. Warranty shall be in effect from the date of "Substantial Completion":
 5. Provide Limited Lifetime Warranty for door covering:
 - a. Failure of corner joinery.
 - b. Core deterioration.
 - c. Delamination or bubbling of door skin.
 6. Provide 10 year manufacturer's warranty that Factory Installed Hardware is securely mounted, and, in normal usage, will not separate from the door.
 7. Provide 10 year manufacturer's warranty for the finish of door, and finish of frame.
- C. Contractor's Responsibilities: Replace or refinish doors where Contractor's work contributed to rejection or to voiding of manufacturer's warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS/ PRODUCTS

- A. Molded Fiberglass Doors and Aluminum Frame: Provide one of the following, or pre-approved equivalent properly submitted at least 10 days prior to Bid date, and subsequently accepted for bidding by Architect in writing or by Addendum.
1. Special-Lite, Inc.: www.special-lite.com. Product: SL-17 Door; SL 260 Frame (*Basis of Design*).
 2. Tubelite, Inc.: www.tubeliteinc.com.
 3. U.S. Aluminum: www.usalum.com.
 4. Vistawall: www.vistawall.com.
 5. Commercial Door Systems: www.commercialdoorsystems.com.

2.2 DOOR AND FRAME ASSEMBLIES

- A. Door Assemblies: Factory-fabricated, prepared and machined for hardware.
1. Door and frame pre-assembled, complete with hinges; shipped with braces, spreaders, and packaging as required to prevent damage.
 2. Mechanical Durability: Tested to ANSI A250.4 Level A (1,000,000 cycles), minimum; tested with hardware and fasteners intended for use on project.
 3. Screw-Holding Capacity: Tested to 900 psi, minimum.
 4. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less; when tested in accordance with ASTM E 84.
 5. Flammability: Self-extinguishing when tested in accordance with ASTM D 635.
 6. Clearance Between Door and Frame: 1/8 inch, maximum.
 7. Clearance Between Bottom of Door and Finished Floor: 3/4 inch, maximum; not less than 1/4 inch clearance to threshold.

2.3 COMPONENTS

- A. Doors: Flush Doors with Fiberglass reinforced polyester (FRP) face sheets.
1. Construction:
 - a. Thickness: 1-3/4 inches, overall.
 - b. Stiles and Rails: Aluminum Alloy 6063-T5, minimum of 2-5/16-inch depth.
 - c. Corners: Mitered.
 - d. Provide joinery of 3/8-inch diameter full-width tie rods through extruded splines top and bottom integral to standard tubular shaped stiles and rails reinforced to accept hardware as specified.
 - e. Securing Internal Door Extrusions: 3/16-inch angle blocks and locking hex nuts for joinery.
 - f. Furnish extruded stiles and rails with integral reglets to accept face sheets. Lock face sheets into place to permit flush appearance.
 - g. Rail caps or other face sheet capture methods are not acceptable.
 - h. Extrude top and bottom rail legs for interlocking continuous weather bar.
 - i. Meeting Stiles: Pile brush weatherseals. Extrude meeting stile to include integral pocket to accept pile brush weatherseals.
 - j. Bottom of Door: Install bottom weather bar with nylon brush weatherstripping into extruded interlocking edge of bottom rail.
 - k. Glue: Use of glue to bond sheet to core or extrusions is not acceptable.
 - l. Edges: All exposed aluminum edges shall be finished as described for Face Sheet.
 - m. Must have integral recessed pulls on exterior.
 2. Face Sheet:
 - a. Material: Fiberglass Reinforced Polyester (FRP), 0.120-inch thickness (minimum), finish color throughout.

- b. Protective Coating: Abuse-resistant engineered surface. Provide FRP with "SpecLite3" protective coating, or equal.
 - c. Texture: Sandstone-textured.
 - d. Finish and Color: Kynar 3-coat finish in color as selected by Architect from manufacturer's full range of colors.
 - e. Adhesion: The use of glue to bond face sheet to foam core is not allowed.
3. Core:
- a. Material: Poured-in-place polyurethane foam.
 - b. Density: Minimum of 5 pounds per cubic foot.
 - c. R-Value: Minimum of 9.
4. Cutouts:
- a. Manufacture doors with cutouts for required vision lites, louvers, and panels.
 - b. Factory install vision lites, louvers, and panels.
5. Hardware:
- a. Premachine doors in accordance with templates from specified hardware manufacturers and hardware schedule.
 - b. Factory install hardware.
6. Materials:
- a. Aluminum Members:
 - 1) Extrusions: ASTM B 221.
 - 2) Sheet and Plate: ASTM B 209.
 - 3) Alloy and Temper: As required by manufacturer for strength, corrosion resistance, application of required finish, and control of color.
 - b. Fasteners:
 - 1) Material: Aluminum, 18-8 stainless steel, or other non-corrosive metal.
 - 2) Compatibility: Compatible with items to be fastened.
 - 3) Exposed Fasteners: Screws with finish matching items to be fastened.

- B. Frames: Profiles and dimensions as indicated on drawings; same type and construction used in mechanical durability test for doors.
1. Tubular Framing:
 - a. Size and Type: As indicated on Drawings. (2-inches by 6-inches, unless indicated otherwise.)
 - b. Material: Aluminum Alloy 6063-T5, 0.125-inch minimum wall thickness tube.
 - c. Perimeter Frame Members:
 - 1) Box type with 4 enclosed sides.
 - 2) Factory fabricated.
 - 3) Open-back framing is not acceptable.
 - d. Applied Door Stops:
 - 1) 0.625-inch high, with screws and weatherstripping.
 - 2) Incorporate pressure gasketing for weathering seal.
 - 3) Counterpunch fastener holes in door stop to preserve full-metal thickness under fastener head.
 - e. Caulking: Caulk joints before assembling frame members.
 - f. Joints:
 - 1) Secure joints with fasteners.
 - 2) Provide hairline butt joint appearance.
 - g. Hardware:
 - 1) Premachine and reinforce frame members for hardware in accordance with manufacturer's standards and door hardware schedule.
 - 2) Factory install door hardware.
 - h. Anchors:
 - 1) Anchors appropriate for wall conditions to anchor framing to wall materials.
 - 2) Door Jamb and Header Mounting Holes: Maximum or 24-inch centers.
 - 3) Secure head and sill members of transom, side lites, and similar conditions.

i. Applied Stops:

- 1) For side, transom and borrowed lites and panels.
- 2) Incorporate pressure gasketing for weathering seal.
- 3) Reinforce with solid bar stock fill for frame hardware attachments.
- 4) Corner joints of miter design, secure with furnished aluminum clips, and screw into place.

j. Fasteners:

- 1) Material: Aluminum, 18-8 stainless steel, or other noncorrosive metal.
- 2) Compatibility: Compatible with items to be fastened.
- 3) Exposed Fasteners: Screws with finish matching items to be fastened.

C. Hinge and Hardware Fasteners: Stainless steel, Type 304; wood screws, or as recommended by manufacturer.

D. Finishes:

1. Aluminum Finish: Kynar 500, 3-Coat Finish, in color as selected by Architect from manufacturer's full range of colors.

2.4 ACCESSORIES

A. Vision Lites:

1. Factory Glazing:

- a. Exterior: 5/16" Old Castle Storm Glass
- b. Interior (if any): 1/4-inch tempered safety glass.

2. Lites in Exterior Doors: Allow for thermal expansion.

3. Rectangular Lites:

- a. Size: As indicated on the Drawings.
- b. Factory glazed with screw-applied aluminum stops finished to match door.
- c. Surface Applied Muntin System: Provide manufacturer's 1/2" surface muntin system.

C. Glazing Gaskets: Gaskets installed in captive assembly of glazing stops.

1. EPDM: ASTM D 2000.
2. Closed-Cell Foam: ASTM D 1667.

- D. Hardware: Provide the following, and as otherwise required for Large Missile Impact Resistant rating.
 - 1. Hinges: Geared continuous hinge, by Select Hinge.
 - a. Color: to match door, unless otherwise indicated.
 - 2. Weatherstripping: Integral with frame.
 - 3. Pulls: Recessed vandal-resistant, fabricated into door at same time door is manufactured.
 - 4. Balance of Hardware: As specified in Section 08 71 00.

2.5 FABRICATION

- A. Sizes and Profiles: Required sizes for door and frame units, and profile requirements shall be as indicated on the drawings.
- B. Coordination of Fabrication: Field measure before fabrication and show recorded measurements on shop drawings.
- C. Assembly:
 - 1. Complete cutting, fitting, forming, drilling, and grinding of metal before assembly.
 - 2. Remove burrs from cut edges.
- D. Welding: Welding of doors or frames is not acceptable.
- E. Fit:
 - 1. Maintain continuity of line and accurate relation of planes and angles.
 - 2. Secure attachments and support at mechanical joints with hairline fit at contacting members.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.

3.2 PREPARATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- B. Clean and prepare substrate in accordance with manufacturer's directions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's current written instructions; Do not penetrate frames with anchors.
- B. Set units plumb, level, and true-to-line, without warping or racking doors, and with specified clearances; anchor securely in place.
- C. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by the Architect.
- D. Set thresholds in bed of mastic and backseal.
- E. Install exterior doors to be weathertight in closed position.
- F. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- G. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.4 ADJUSTING

- A. Lubricate, test, and adjust doors to operate easily, free from warp, twist or distortion, and to fit watertight for entire perimeter.
- B. Adjust hardware for smooth and quiet operation.
- C. Adjust doors to fit snugly and close without sticking or binding.

3.5 CLEANING

- A. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance.
- B. Do not use harsh cleaning materials or methods that would damage finish.

3.6 PROTECTION

- A. Protect installed products from damage during subsequent work.

END OF FIBERGLASS DOORS AND FRAMES

SECTION 09 2423

CEMENT STUCCO

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 materials and installation of trowel applied air barrier and stucco brown coat over vertical above grade concrete and concrete masonry walls.
- B. Related Requirements (add/delete, depending on specific project requirements):
 - 1. Section 033000: Cast-In-Place Concrete
 - 2. Section 042200: Concrete Unit Masonry
 - 3. Section 061000: Rough Carpentry
 - 4. Section 072720: Fluid Applied Air Barrier
 - 5. Section 075213: APP Modified Bituminous Membrane Roofing
 - 6. Section 07600: Flashing and Sheet Metal
 - 7. Section 084113: Aluminum Entrances and Storefronts
 - 8. Section 08920: Glazed Aluminum Curtain Walls

1.3 DEFINITIONS

- A. Air Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air Barrier Auxiliary Material: A transitional component that provides air barrier continuity furnished by a source other than the primary air barrier manufacturer.
- D. Air Barrier Assembly: The collection of air barrier materials, accessory and auxiliary materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 PRE-INSTALLATION MEETINGS

A. Pre-installation Conference

1. Review air barrier and stucco installation requirements and installation details, mock-ups, testing requirements, protection, and sequencing of work.

1.5 REFERENCES

A. Building Codes and Standards

- | | |
|-----------------|---|
| 2012, 2015 IBC | International Building Code |
| 2012, 2015 IRC | International Residential Code |
| 2012, 2015 IECC | International Energy Conservation Code |
| ICC ES AC 11 | Acceptance Criteria for Cementitious Exterior Wall Coatings |

B. ASTM Standards

- | | |
|------------------|---|
| C 926 | Standard Specification for Application of Portland Cement-Based Plaster |
| D 4541-09 | Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers |
| E 96-00 | Test Method for Water Vapor Transmission of Materials |
| E 283-04 (2012) | Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen |
| E 330-14 | Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference |
| E 331-00 (2009) | Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference |
| E 514 | Standard Test Method for Water Penetration and Leakage Through Masonry |
| E 779-10 | Standard Test Method for Determining Air Leakage Rate by Fan Pressurization |
| E 783-02 | Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors |
| E 1186-03 (2009) | Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems |
| E 1827-96 (2007) | Standard Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door |
| E 2178-03 | Test Method for Air Permeance of Building Materials |

C. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE)

2013 ASHRAE Handbook – Fundamentals

ASHRAE 90.1 2016, Energy Standard for Buildings Except Low-Rise Residential Buildings

- D. South Coast Air Quality Management District (SCAQMD)
Rule 1113 (2007) Architectural Coatings

1.6 COORDINATION/SCHEDULING

- A. Provide minimum 28 day cure of concrete and concrete masonry units before the installation of air barrier and stucco components.
- B. Sequence work such that placement of stucco, stucco primers and finish coats closely follow air barrier installation (90 days maximum between coats) to prevent surfaces from being contaminated by atmospheric conditions, dust, dirt, salts, trades, or other sources of surface contamination.
- C. Commence the stucco installation after completion of all floor, roof construction and other construction that imposes dead loads on the wall to prevent excessive deflection (and potential cracking) of the stucco.
- D. Provide site grading such that stucco terminates above earth grade minimum 4 inches (100 mm) and above finished grade (pavers/sidewalk) minimum 2 inches (51 mm). Provide increased clearance in freeze/thaw climate zones.
- E. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors and other wall penetrations to provide a continuous air barrier.
- F. Install primary air barrier before installing stucco accessories.
- G. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall.
- H. Provide sill flashing before windows and doors are installed to direct water beyond the finished exterior wall surface.
- I. Install window and door head flashing immediately after windows and doors are installed.
- J. Install diverter flashings wherever water can enter the assembly to direct water beyond the finished exterior wall surface.
- K. Install sealants, parapet cap flashing and similar flashing at copings and sills to prevent water entry into the wall assembly immediately after installation of stucco and after finish coatings are dry. Do not install sealant against stucco finish coat in dynamic joint conditions.

- L. Attach penetrations through stucco into structural support and provide water tight seal at penetrations.

1.7 SUBMITTALS

- A. Manufacturer's specifications, details and product data.
- B. Manufacturer's standard warranty.
- C. Samples for approval as directed by architect or owner.
- D. Shop drawings: substrate joints, cracks, flashing transitions, penetrations, corners, terminations, and tie-ins with adjoining construction, interfaces with separate materials that form part of the air barrier and stucco wall assembly.

1.8 QUALITY ASSURANCE

- A. Manufacturer requirements
 - 1. Manufacturer of exterior wall air barrier materials for a minimum of 30 years in North America.
 - 2. ISO 9001:2008 Certified Quality System and ISO 14001:2004 Certified Environmental Management System
- B. Contractor requirements
 - 1. Knowledgeable in the proper use and handling of Sto materials.
 - 2. Employ skilled mechanics who are experienced and knowledgeable in waterproofing, air barrier, and stucco application, and familiar with the requirements of the specified work.
 - 3. Provide the proper equipment, manpower and supervision on the job-site to install the air barrier, and stucco assembly in compliance with the project plans & specifications, shop drawings, and Sto's published specifications and details.
- C. Regulatory Compliance
 - 1. Primary air barrier material:
 - a. Comply with VOC requirements of SCAQMD Rule 1113.
 - b. Comply with allowable air leakage requirements of ASHRAE 90.1 – 2016
 - c. Comply with IRC, IBC, and IECC – 2012 or 2015
 - 2. Stucco brown coat
 - a. Comply with ASTM C 926
- D. Mock-ups

1. Build stand-alone site mock up or sample wall area on as-built construction to incorporate back-up wall construction, typical details covering substrate joints, cracks, flashing transitions, penetrations, corners, terminations, tie-ins with adjoining construction, and interfaces with separate materials that form part of the air barrier and stucco wall assembly. Apply air barrier and scratch coat, stucco brown coat, and stucco primer and finish coat consistent with specified materials and methods of construction. For stucco wall assemblies applied directly to concrete build full assembly for field adhesion tests as determined by design professional.

1.9 TESTING

- A. Conduct site testing by qualified test agency or building envelope consultant as directed by design professional
 1. Construct full-scale mock-up of typical stucco/window wall assembly with specified tools and materials and test air and water infiltration and structural performance in accordance with ASTM E 283, ASTM E 331 and ASTM E 330, respectively, through independent laboratory. Mock-up shall comply with requirements of project specifications. Where mock-up is tested at job site maintain approved mock-up at site as reference standard. If tested off-site accurately record construction detailing and sequencing of approved mock-up for replication during construction.
 2. Conduct assembly air leakage testing in accordance with ASTM E 783.
 3. Conduct adhesion testing to substrates in accordance with ASTM D 4541.
 4. Conduct wet sealant adhesion testing in accordance with sealant manufacturer's field quality control test procedure.
 5. Conduct pH testing to check stucco surface alkalinity before application of primer or finish materials. Where alkaline resistant primer is used pH testing may be waived.
 6. Notify design professional minimum 7 days prior to testing.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.
- B. Protect coatings (pail products) from freezing temperatures and temperatures in excess of 90 degrees F (32 degrees C). Store away from direct sunlight.
- C. Protect portland cement-based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.

- D. Protect and store accessory and auxiliary products in accordance with manufacturer's written instructions.

1.11 PROJECT/SITE CONDITIONS

- A. Maintain ambient and surface temperatures above 40 degrees F (4 degrees C) and below 100 degrees F (38 degrees C), during application and drying period, minimum 24 hours after application of materials.
- B. Provide supplementary heat for installation in temperatures less than 40 degrees F (4 degrees C) or if surface temperature is likely to fall below 40 degrees F (4 degrees C).
- C. Provide protection of surrounding areas and adjacent surfaces from application of materials.

1.12 WARRANTY

- A. Provide manufacturer's standard warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design: Sto Corp. or equal
- B. Obtain primary air barrier, accessory air barrier materials, stucco, stucco primer and finish coat from single source, except stucco brown coat may be any ASTM C 926 compliant material.

2.2 MATERIALS

- A. Primary Air Barrier Material: Sto ExtraSeal or equal - single component polymer modified portland cement-based air barrier material.
- B. Accessory Materials
 - 1. Rough Opening Protection
 - a. Sto RapidGuard™ or equal - one component STPE rapid drying gun-applied treatment for sheathing joints, rough openings, seams, cracks, penetrations and other static transitions in above grade wall construction such as: wall to floor slab or ceiling, and through wall penetrations – pipes, electrical boxes, and scupper penetrations
 - b. StoGuard RapidSeal or equal: one component rapid drying gun-applied rough opening protection for concrete and CMU walls.
 - 2. Transition Detail Component

- a. StoGuard Transition Membrane or equal: flexible air barrier membrane for continuity at transitions – sheathing to foundation, dissimilar materials (CMU to frame wall), wall to floor slab or ceiling, floor line deflection joints, masonry control joints, and through wall joints in masonry or frame construction.
 - b. Sto RapidGuard or equal: one component STPE rapid drying gun-applied treatment for sheathing joints, rough openings, seams, cracks, penetrations and other static transitions in above grade wall construction such as: shingle laps over flashing, wall to floor slab or ceiling, and through wall penetrations – pipes, electrical boxes, and scupper penetrations
 - c. StoGuard RapidFill or equal: one component gun-applied air and moisture barrier membrane material for continuity at static transitions such as: wall to floor slab or ceiling, and through wall penetrations such as pipes, electrical boxes, and scupper penetrations
- C. Auxiliary Materials
1. Wet sealant: Dow Corning 790, 791, and 795 sealants or equal
 2. Pre-cured sealant tape: Dow 123 or equal
 3. Spray foam:
 - a. Sto TurboStick Adhesive or equal
 - b. Dow Great Stuff or equal for Gaps and Cracks
- D. Patching and Leveling Material for Prepared Concrete and Masonry
1. Sto ExtraSeal or equal: polymer modified cement-based patch and leveling material for applications up to 3/8 inch in (10 mm) in depth.
- E. Stucco Brown Coat
1. 102 StoPowerwall Stucco Pre-Blended or equal: fiber reinforced one coat portland cement stucco pre-blended with graded sand, and in compliance with ICC AC 11. See ICC ESR 2323.
 2. 103 StoPowerwall Stucco or equal: fiber reinforced one coat portland cement stucco concentrate in compliance with ICC AC 11. See ICC ESR 2323 (as recommended in writing by stucco manufacturer.
 3. ASTM C 926 compliant stucco brown coats (as recommended in writing by cement stucco manufacturer.
- F. Stucco Crack Defense
1. Sto Mesh or equal with any Base Coat Product: nominal 4.5 oz/yd² glass fiber reinforcing mesh with alkaline resistant coating for compatibility with Sto

materials for embedment in Sto base coats (refer to base coat product bulletins)

G. Stucco Primer

1. StoPrime Hot or equal - acrylic based primer/sealer for freshly placed (minimum 4 day old) and high pH stucco surfaces.
 - a. As recommended in writing by cement stucco manufacturer.
2. StoPrime Sand or equal - acrylic based tinted, sanded primer for fully cured (minimum 28 day old or pH less than 10) stucco surfaces.
3. StoPrime or equal - acrylic based tinted primer for fully cured (minimum 28 day old or pH less than 10) stucco surfaces.
 - a. Where recommended in writing by cement stucco manufacturer.

H. Stucco Finish

1. As approved by Owner on basis of job site installed mock-ups.

2.3 PERFORMANCE REQUIREMENTS (AIR BARRIER)

- A. Water Penetration: ASTM E 514, no water penetration through concrete masonry after 4-hour spray period
- B. Adhesion: ASTM D 4541, ≥ 50 psi on prepared CMU substrates
- C. Shear bond strength: Lab Method, ≥ 50 psi on prepared CMU substrates
- D. Water vapor permeance: ASTM E 96 Method B, minimum 5 perms
- E. Air permeance: ASTM E 2178, ≤ 0.004 cfm/ft² air leakage at 1.57 psf
- F. Field adhesion testing: ASTM D 4541, strength requirements as dictated by design professional based on exposure conditions such as building height, orientation, climate, and building design
- G. Surface burning: ASTM E 84, ≤ 25 flame spread and ≤ 450 smoke developed
- H. Building envelope air leakage: ASTM E 779 or 1827, ≤ 0.4 cfm/ft²
- I. Volatile Organic Compounds: SCAQMD Rule 1113, primary air barrier material, < 50 g/L

2.4 DESIGN CRITERIA

A. Structural (Axial Loads)

1. Design for maximum allowable deflection normal to the plane of the wall: L/360

- B. Moisture Control
1. Prevent the accumulation of water in the wall assembly and behind the exterior wall cladding:
 - a. Minimize condensation within the assembly.
 - b. Drain water directly to the exterior where it is likely to penetrate components in the wall assembly (windows and doors, for example).
 - c. Provide corrosion resistant flashing to direct water to the exterior in accordance with code requirements, including: above window and door heads, beneath window and door sills, at roof/wall intersections, floor lines, decks, intersections of lower walls with higher walls, and at the base of the wall.
 - d. Air Leakage Prevention – prevent excess air leakage in the design and detailing of the wall assembly. Provide continuity between air barrier components in the wall assembly.
 - e. Vapor Diffusion and Condensation – perform a dew point analysis of the wall assembly to determine the potential for accumulation of moisture in the wall assembly as a result of water vapor diffusion and condensation. Adjust wall assembly components accordingly to minimize the risk of condensation. Avoid the use of vapor retarders on the interior side of the wall in warm, humid climates.
 - f. Protect rough openings with StoGuard rough opening treatment extended no further than the stucco termination accessory expanded flange (as Sto ExtraSeal will not adhere to some StoGuard rough opening treatments). Refer to Sto Guide Details.
 - g. Where casing bead is used back-to-back at expansion joints, back joints with appropriate StoGuard Transition Membrane. Refer to Sto Guide Details.
 - h. Seal accessory butt joints with sealant.
- C. Air Barrier Continuity: provide continuous air barrier assembly of compatible air barrier components.
- D. Substrates
1. Provide surface plane tolerance not to exceed ¼ inch in 10 feet (6 mm in 3.0 m).
 2. Remove form ties, trim projecting concrete and fill honeycombs or other surface defects with appropriate patch or levelling material.
 3. Concrete – provide for removal of form oil, curing compounds, efflorescence, coatings, salts, or other surface contamination, laitance or other surface conditions that could interfere with adhesion. Provide an absorbent surface, slightly scarified or with surface roughness, or both (refer to Section 3.2A1).

4. Concrete Masonry – provide open texture concrete masonry units with flush joints, free of efflorescence, coatings, salts, or other surface contamination, weak surfaces or other surface conditions that could interfere with adhesion (refer to Section 3.2B1).
 5. Do not install air barrier, stucco, primers or finishes over efflorescence, laitance or weak surface conditions, painted, coated, salt-contaminated, non-absorbent, smooth, or any concrete or CMU substrate where adhesion is in question, or when total stucco thickness (including finish coat) will exceed 5/8 inch (16 mm). Use appropriate metal plaster base in these cases.
- E. Mechanical Ventilation: maintain pressurization and indoor humidity levels in accordance with recommendations of ASHRAE (see 2013 ASHRAE Handbook – Fundamentals).

PART 3 EXECUTION

3.1 EXAMINATION

- A. Inspect concrete and concrete masonry surfaces for:
1. Contamination – algae, dirt, dust, efflorescence, form oil, fungus, grease, mildew or other foreign substances.
 2. Surface deficiencies – weak, friable, chalkiness, laitance, bugholes, honeycombs, and spalls.
 3. Cracks – measure crack width and record location of cracks.
 4. Damage or deterioration.
 5. Moisture damage – record any areas of moisture damage or excess moisture.
- B. Report deviations from the requirements of project specifications or other conditions that might adversely affect the air barrier installation. Do not start work until deviations are corrected.

3.2 SURFACE PREPARATION

- A. Concrete
1. Remove form ties and trim projecting concrete so it is even with the plane of the wall. Fill honeycombs or other surface defects with patch or leveling material. Remove form release agents or other surface contamination by chemical or mechanical means. Provide a surface that is structurally sound, free of laitance and other surface defects, absorbent, and slightly scarified or with surface roughness, or both. Ensure that the surface is structurally sound and free of all dust, dirt, grease, efflorescence, coatings, salts or other surface contamination before proceeding with work. Ensure that the surface is

sufficiently absorbent and roughened for adequate adhesion. Pre-moisten highly absorbent surfaces with water just prior to placement of air barrier, especially during hot, dry conditions. Verify adhesion with load tests after air barrier/stucco assembly has fully cured (28 days) on mock-up wall, and throughout the project as directed in 1.9, Testing.

B. Concrete Masonry Units

1. Remove projecting joint mortar so it is even with the plane of the wall. Remove surface contaminants such as efflorescence, existing paint or coatings, or any other surface contamination by chemical or mechanical means. Pre-moisten the surface with water just prior to placement of air barrier. Verify adhesion with load tests after stucco/air barrier assembly has fully cured (28 days) on mock-up wall, and throughout the project as directed in 1.9, Testing.

- C. For A and B above, where bond inhibiting material cannot be removed, where concrete or masonry surface irregularities are such that more than 5/8 inch (16 mm) of stucco (including Sto ExtraSeal skim coat and scratch coat, stucco brown coat, and stucco finish) must be applied, or where the surface is too smooth, dense, or non-absorbent to receive the air barrier or stucco components, install furred or self-furred lath as specified by the design professional. Verify adequacy of lath attachment with respect to design wind pressures. Do not install stucco over unprepared substrates or any substrate where adhesion is in question. (Note: where metal lath is used Sto Flexyl or Sto Watertight Coat may be installed over the stucco brown coat as an air/moisture barrier with proper integration of other air barrier materials).

3.3 INSTALLATION

- A. Coordinate work with other trades to ensure air barrier continuity with connections at foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line.
- B. Install materials only when surface and ambient temperature are minimum 40 degrees F (4 degrees C) and rising during application and drying period and below 100 degrees F (38 degrees C). Install air barrier material to dry or damp surfaces (no standing or glistening water).
- C. Rough Opening Protection:
1. Install Sto RapidGuard or StoGuard RapidSeal or equal over wood buck and lap onto Sto ExtraSeal or equal minimum 2 inches (51 mm). Do not install Sto ExtraSeal over Sto RapidGuard or StoGuard RapidSeal. Limit extension of Sto RapidGuard and StoGuard RapidSeal to limit of expanded flange accessories. Refer to Sto Guide Detail 65c.25.

D. Skim Coat

1. Concrete – install one coat of Sto ExtraSeal or equal by spray or trowel in a uniform, continuous application at 1/8 inch thick. “Knock down” spray applications with a trowel. Do not install over working or moving joints or joint sealants.
2. Concrete Masonry – install one liberal coat of Sto ExtraSeal or equal in a uniform, continuous application by spray or trowel at 1/8 inch thick. “Knock down” spray applications with a trowel. Surface must be free of voids and pinholes when dry. Final application must not show CMU surface texture or joints. Do not install over working or moving joints or joint sealants.

E. Transitions

1. Install air barrier accessory material or auxiliary material at transition areas: foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line. Refer to Sto Guide Details 65c.xx. Limit extension of transition materials to limit of expanded flange accessories at stucco terminations.

F. Stucco Accessories

1. Install stucco accessories – casing beads, expansion and control joints – over air barrier with appropriate fasteners into supporting construction as required by ASTM C 926.

G. Scratch Coat

1. Scratch coat: apply an approximate 3/8 inch (9 mm) scratch coat of Sto ExtraSeal by spray or trowel any time after the skim coat application is dry. Scratch the surface horizontally with a stucco rake tool. Moist cure the scratch coat during hot or extremely dry weather conditions.

H. Brown Coat

1. Brown coat: allow scratch coat to dry minimum 24 hours and install stucco brown coat in accordance with applicable codes and manufacturer’s requirements. Limit total thickness, including Sto ExtraSeal skim coat and scratch coat, stucco brown coat, and allowance for finish coat, to 5/8 inches (16 mm) maximum.

I. Crack Defense

1. Apply base coat over the moist cured stucco brown coat with appropriate spray equipment or a stainless steel trowel to a uniform thickness of approximately 1/8 inch (3 mm). Work horizontally or vertically in strips of 40 inches (1016mm), and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh. Overlap mesh not less than

2-½ inches at mesh seams and at overlaps of detail mesh. Feather seams and edges. Avoid wrinkles in the mesh. The mesh must be fully embedded so that no mesh color shows through the base coat when it is dry. Re-skim with additional base coat if mesh color is visible. Do not install base coat or mesh over joints or accessories in the stucco wall assembly.

J. Primer Installation

1. StoPrime Hot or equal - Moist cure stucco brown coat for a minimum of 48 hours. Allow stucco to dry an additional 48 hours, then apply primer evenly with brush, roller or proper spray equipment over the clean, dry stucco, and allow to dry. Age of stucco must be minimum 7 days before application of finish.
2. StoPrime Sand or equal - Moist cure stucco brown coat for a minimum of 48 hours. Wait until stucco is 28 days old or the pH level of the surface is below 10 before applying primer. Age of stucco must be minimum 28 days before application of finish or pH must be below 10.
3. StoPrime or equal - Moist cure stucco brown coat for a minimum of 48 hours. Wait until stucco is 28 days old or the pH level of the surface is below 10 before applying primer. Age of stucco must be minimum 28 days before application of finish or pH must be below 10.

K. Finish Installation

1. Apply finish to primed stucco and foam build-outs when dry. Apply finish by spraying or troweling with a stainless steel trowel, depending on the finish specified. Follow these general rules for application of finish:
 - a. Allow 28 day stucco age or check for pH < 10 before applying finish. If StoPrime Hot is used, allow minimum 7 day age of stucco.
 - b. Avoid application in direct sunlight.
 - c. Apply finish in a continuous application, and work a wet edge towards the unfinished wall area. Work to an architectural break in the wall before stopping to avoid cold joints.
 - d. Weather conditions affect application and drying time. Hot or dry conditions limit working time and accelerate drying. Adjustments in the scheduling of work may be required to achieve desired results; cool or damp conditions extend working time and retard drying and may require added measures of protection against wind, dust, dirt, rain and freezing. Adjust work schedule and provide protection.
 - e. Float "R" (rilled or swirl texture) finishes with a plastic float to achieve their rilled texture
 - f. Do not install separate batches of finish side-by-side.

- g. Do not apply finish into or over sealant joints or joint accessories. Apply finish to outside face of wall only.
- h. Do not apply finish over irregular, high pH, or unprepared surfaces, or surfaces not in compliance with the requirements of the project specifications.

3.4 FIELD QUALITY CONTROL

- A. Owner's qualified testing agency or building envelope consultant shall perform inspections and tests.
- B. Inspections: air barrier materials are subject to inspection to verify compliance with requirements.
 - 1. Condition of substrates and substrate preparation.
 - 2. Installation of primary air barrier material, accessory materials, and compatible auxiliary materials over structurally sound substrates and in conformance with architectural design details, contractor's shop drawings, project mock-up, and manufacturer's written installation instructions.
 - 3. Air barrier continuity and connections without gaps and holes at foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line.
- C. Tests: air barrier materials and assembly are subject to tests to verify compliance with performance requirements:
 - 1. Qualitative air leakage test: ASTM E 1186
 - 2. Quantitative air leakage test: ASTM E 779, ASTM E 783, and ASTM E 1827
 - 3. Adhesion test: ASTM D 4541
 - 4. Qualitative adhesion and compatibility testing: wet sealant manufacturer's field quality control adhesion test
- D. Repair non-conforming substrates and air barrier material installation to conform with project requirements.
- E. Take corrective action to repair and replace, or reinstall materials, seal openings, gaps, or other sources of air leakage to conform with project performance requirements.

3.5 PROTECTION

- A. Provide protection of installed materials from water infiltration into or behind them.

- B. Provide protection of installed materials from dust, dirt, salts, or other surface contamination, precipitation, and freezing.
- C. Provide protection of installed primer and finish from dust, dirt, salts, precipitation, freezing and continuous high humidity until fully dry.

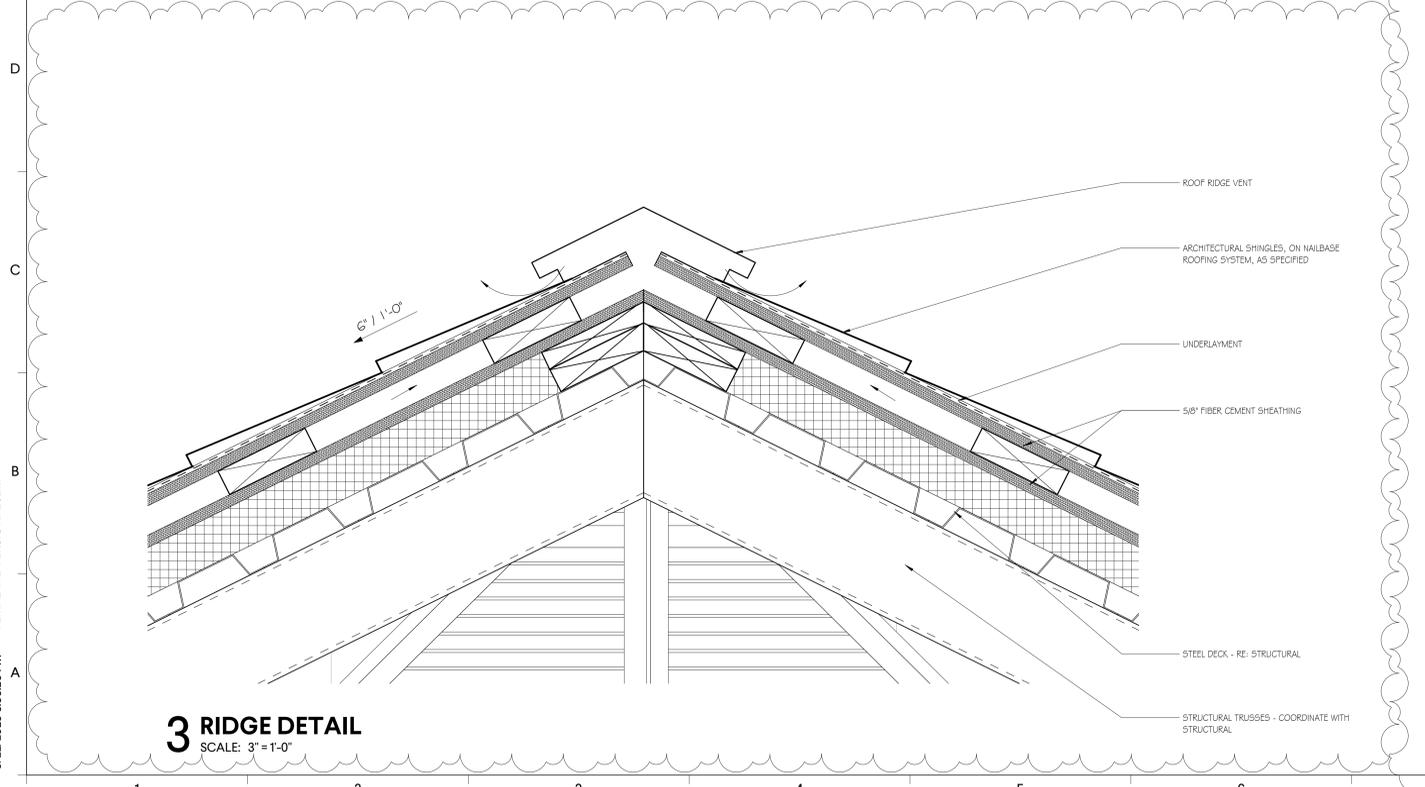
3.6 CLEANING, REPAIR AND MAINTENANCE

- A. Clean and maintain the stucco finish for a fresh appearance and to prevent water entry into and behind the stucco. Repair cracks, impact damage, spalls or delamination promptly.
- B. Maintain adjacent components of construction such as sealants, joints in construction, windows, doors, and flashing, to prevent water entry into the wall assembly.
- C. Refer to Sto reStore or equal Repair and Maintenance Guide ([reStore Program](#)) for detailed information on stucco restoration – cleaning, repairs, recoating, resurfacing and refinishing, or re-cladding.

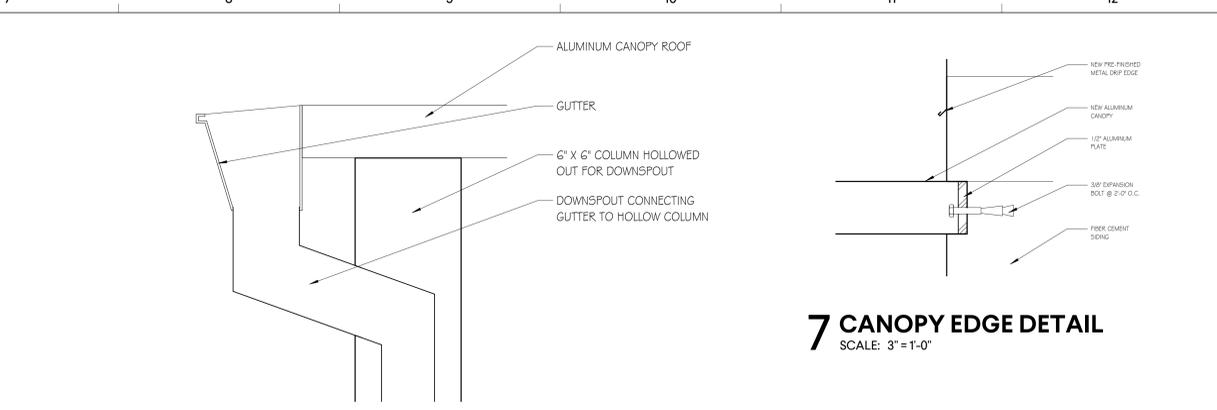
END OF CEMENT STUCCO



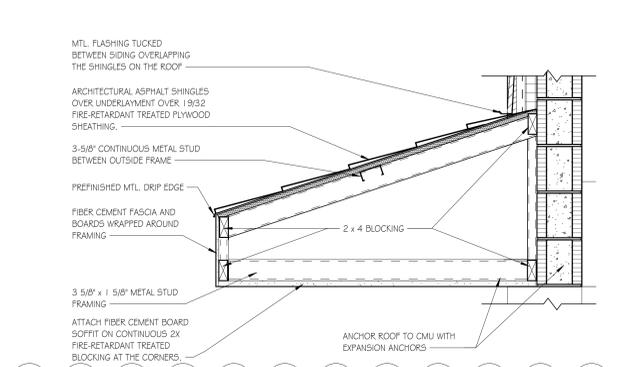
1 RANGE HOUSE ROOF PLAN
SCALE: 1/4" = 1'-0"
PLAN NORTH



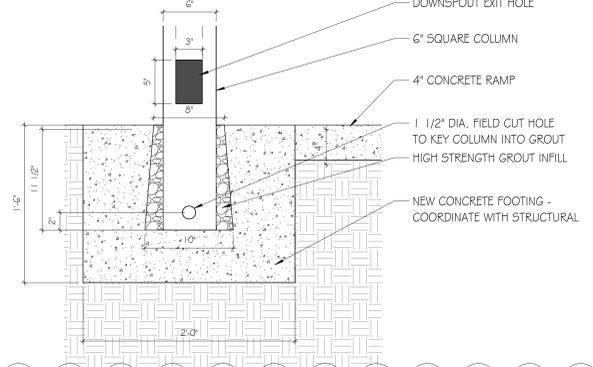
3 RIDGE DETAIL
SCALE: 3" = 1'-0"



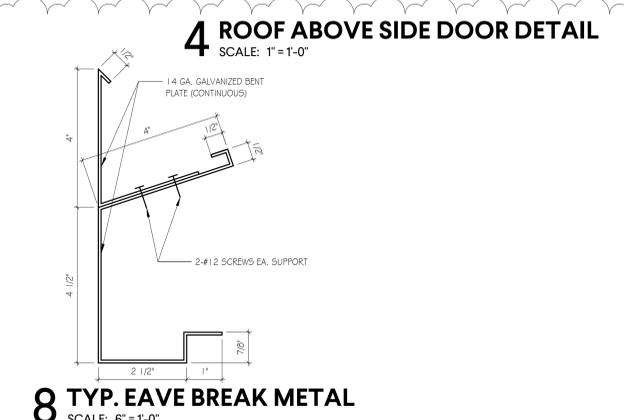
6 GUTTER AND COLUMN CONNECTION
SCALE: 3" = 1'-0"



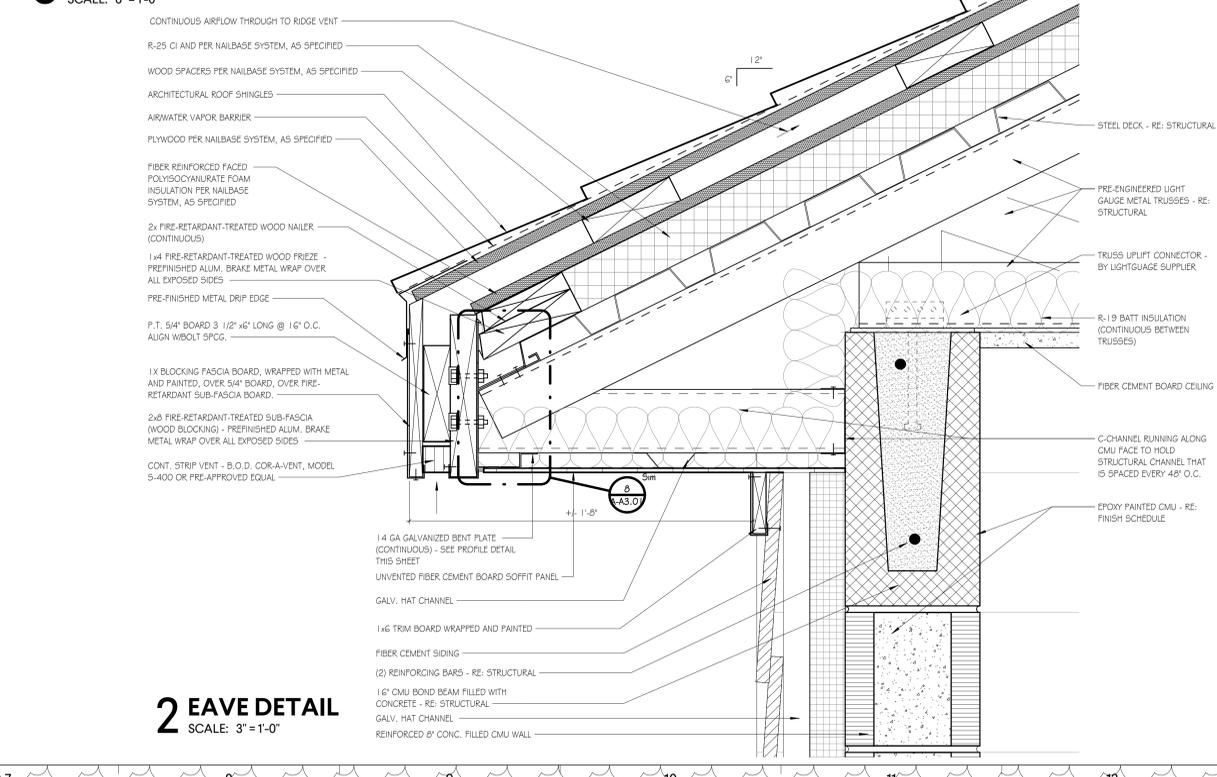
4 ROOF ABOVE SIDE DOOR DETAIL
SCALE: 1" = 1'-0"



5 CANOPY FOOTING DETAIL
SCALE: 1 1/2" = 1'-0"



8 TYP. EAVE BREAK METAL
SCALE: 6" = 1'-0"



2 EAVE DETAIL
SCALE: 3" = 1'-0"



11 North Water Street, Suite 15250
Mobile, AL 36602
T 251.460.4006
GMCNETWORK.COM

ISSUE DATE	DATE
ISSUE FOR BID SET	04/12/2023
ADDENDUM #4	05/22/2023

AZALEA CITY GOLF COURSE
1000 GAILLARD DRIVE
MOBILE, ALABAMA 36608
GMC # AMOB220095
COM # PR-029-21

DRAWN BY: Author
CHECKED BY: Checker



ROOF PLAN - ALTERNATE 1

A-A3.01
sheet of

GENERAL NOTES:

- 1. CONTRACTOR SHALL COORDINATE BETWEEN ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND OTHER DRAWINGS.
A. ANY DISCREPANCIES OR CONFLICTS BETWEEN DRAWINGS OF DIFFERENT DISCIPLINES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT.
CONTRACTOR SHALL NOT PROCEED WITH SHOP DRAWING PREPARATION OR ANY CONSTRUCTION UNTIL THE ARCHITECT HAS GIVEN DIRECTION OF RESOLUTION FOR THE DISCREPANCY OR CONFLICT.
B. NOT ALL OPENINGS AND OTHER COMPONENTS THAT ARE REQUIRED HAVE BEEN SHOWN ON THE STRUCTURAL DRAWINGS, COORDINATE AND VERIFY THE LOCATIONS AND SIZES OF CHASES, INSERTS, OPENINGS, SLEEVES, FINISHES, DEPRESSIONS AND OTHER PROJECT REQUIREMENTS AT FLOORS, WALLS, AND ROOFS BETWEEN DRAWINGS OF DIFFERENT DISCIPLINES.
2. IN THE CASE OF INCONSISTENCIES BETWEEN DRAWINGS AND SPECIFICATIONS OR WITHIN EITHER DOCUMENT, A BIDDER WILL BE DEEMED TO HAVE INCLUDED IN ITS BID THE BETTER QUALITY OR GREATER QUANTITY OF THE WORK INVOLVED UNLESS THE BIDDER ASKED FOR AND OBTAINED THE ARCHITECT'S WRITTEN CLARIFICATION OF THE REQUIREMENTS BEFORE SUBMISSION OF BID.
3. ALL DIMENSIONS SHOWN TAKE PRECEDENCE OVER SCALE SHOWN ON PLANS, SECTIONS, AND DETAILS. DO NOT SCALE THE DRAWINGS.
4. THE DETAILS PROVIDED ON SHEETS LABELED AS 'TYPICAL DETAILS' APPLY GENERALLY TO THE DRAWINGS IN AREAS WHERE CONDITIONS ARE SIMILAR TO THOSE DESCRIBED IN THE DETAILS, UNLESS NOTED OTHERWISE.
5. ALL OF THE CONTRACTOR'S PROPOSED SUBSTITUTIONS ARE CONSIDERED CHANGE ORDERS AND SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER FOR REVIEW AND/OR APPROVAL PRIOR TO ANY PERTINENT WORK OR FABRICATION.
6. CONSTRUCTION METHODS, PROCEDURES AND SEQUENCES ARE THE CONTRACTOR'S RESPONSIBILITY. THE CONTRACTOR SHALL TAKE ALL THE NECESSARY MEASURES TO MAINTAIN AND PROTECT THE STRUCTURAL INTEGRITY OF ALL CONSTRUCTION, NEW AND EXISTING, AT ALL STAGES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:
A. BRACE ALL BASEMENT-TYPE WALLS RETAINING EARTH UNTIL RESTRAINING SLABS/FLOORS HAVE BEEN INSTALLED AND REACHED REQUIRED DESIGN STRENGTH.
B. BRACE/SHORE ALL WALLS AS REQUIRED TO MAINTAIN STABILITY DURING CONSTRUCTION.
C. SHORE EXISTING FLOORS, WALLS, AND/OR ROOFS AS REQUIRED DURING DEMOLITION OF ANY PORTION OF EXISTING STRUCTURE UNTIL NEW SUPPORT FRAMING HAS BEEN INSTALLED.
7. ALL STRUCTURAL MEMBERS, AS SHOWN, HAVE BEEN DESIGNED TO CARRY IN PLACE DESIGN LOADS ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUPPORT OF ANY LOADS AND FORCES IMPOSED DURING CONSTRUCTION, TRANSPORTATION, ERECTION, AND HANDLING. THE CONTRACTOR SHALL INSURE THAT CONSTRUCTION LOADS DO NOT EXCEED THE DESIGN LIVE LOADS INDICATED ON THE STRUCTURAL DRAWINGS AND THAT THESE LOADS ARE NOT IMPOSED ON THE STRUCTURAL MEMBERS PRIOR TO THE TIME THAT CONCRETE REACHES THE FULL SPECIFIED DESIGN STRENGTH. STEEL MEMBERS AND THEIR CONNECTIONS ARE FULLY BOLTED AND /OR WELDED AND ALL OTHER FRAMING MEMBERS AND THEIR CONNECTIONS ARE IN PLACE.
8. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO ANY PERTINENT WORK OR FABRICATION. ALL EXISTING CONDITIONS AND DIMENSIONS SHALL BE NOTED ON THE SHOP DRAWINGS.
9. ALL CONSTRUCTION JOINTS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE INCORPORATED INTO THE STRUCTURE. ADDITIONAL CONSTRUCTION JOINTS TO FACILITATE CONSTRUCTION SHALL BE LOCATED AND DETAILED ON THE SHOP DRAWINGS FOR REVIEW.
10. ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED.

SHOP DRAWINGS/SUBMITTALS:

- 1. SHOP DRAWING SUBMITTAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE PROJECT CONTRACT DOCUMENTS (DRAWINGS AND SPECIFICATIONS) AND SHALL FOLLOW INDUSTRY GUIDELINES AND STANDARDS.
2. ALL QUESTIONS, CLARIFICATIONS, OR MODIFICATIONS OF THE CONTRACT DOCUMENTS SHALL BE CLEARLY LISTED AND INDICATED ON THE SHOP DRAWING TRANSMITTAL OR COVER SHEET. ITEMS SHALL NOT BE CONSIDERED APPROVED UNLESS SPECIFICALLY ADDRESSED BY MBA IN THE REVIEW COMMENTS.
3. ALL SHOP DRAWINGS ARE TO BE NEWLY PREPARED. REPRODUCTIONS OF CONTRACT STRUCTURAL DRAWINGS FOR USE AS ERECTION DRAWINGS WILL NOT BE PERMITTED. SHOULD SHOP DRAWINGS SUBMITTALS CONTAIN ANY REPRODUCTIONS OF CONTRACT STRUCTURAL DRAWINGS, THEY WILL BE REJECTED AND RETURNED WITHOUT ENGINEER REVIEW.
A. MBA MAY CONSIDER TRANSFERRING COMPUTER FILES, IN THE FORMAT CREATED, OF THE PLAN SHEETS TO PROJECT SUBCONTRACTORS TO ASSIST IN DEVELOPING SHOP DRAWINGS ON A CASE BY CASE BASIS. A SIGNED FILE TRANSFER AGREEMENT WILL BE REQUIRED PRIOR TO RELEASE OF MBA FILES.
4. CONTRACTOR TO REVIEW ALL SHOP DRAWING SUBMITTALS AND STAMP WITH APPROVAL PRIOR TO SUBMISSION TO ARCHITECT/ENGINEER. SHOP DRAWINGS RECEIVED BY ARCHITECT/ENGINEER THAT HAVE NOT BEEN REVIEWED AND COORDINATED BY THE CONTRACTOR WILL BE RETURNED WITHOUT ARCHITECT/ENGINEER REVIEW. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRECTING DIMENSIONS WHICH PERTAIN TO FABRICATION PROCESSES OR CONSTRUCTION TECHNIQUES PRIOR TO SUBMITTAL AND FOR COORDINATION OF WORK OF ALL TRADES.
5. CONTRACTOR MAY PROVIDE REVIEWED AND APPROVED SUBMITTALS IN AN ELECTRONIC PDF FORMAT FOR ENGINEER REVIEW AND APPROVAL, IN LIEU OF ELECTRONIC SUBMITTALS. CONTRACTOR MAY PROVIDE NO MORE THAN FOUR PAPER COPIES OF EACH STRUCTURAL SHOP DRAWING SUBMITTAL TO THE ENGINEER. THE STRUCTURAL ENGINEER WILL REVIEW AND RETURN TWO OF THE COPIES TO THE ARCHITECT. ADDITIONAL COPIES BY THE CONTRACTOR SHALL BE MADE BY THE CONTRACTOR AFTER THE REVIEW PROCESS.
6. MBA REVIEW OF SHOP DRAWING SUBMITTALS IS FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND FOR GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS. REVIEW AND/OR APPROVAL OF SHOP DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR DEVIATIONS FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS OR FOR ERRORS/ OMISSIONS IN THE SHOP DRAWINGS.
7. RESUBMITTED SHOP DRAWINGS SHALL HAVE CHANGES AND/OR ADDITIONS CLEARLY INDICATED. REVIEW OF RESUBMITTED SHOP DRAWINGS IS LIMITED TO THE ITEMS REQUIRING CORRECTION ON THE PREVIOUS SUBMITTAL.

SITE AND FOUNDATION:

- 1. THE DESIGN OF FOUNDATIONS AND RELATED COMPONENTS IS BASED ON THE GEOTECHNICAL ENGINEERING REPORT PREPARED BY GEOTECHNICAL ENGINEERING TESTING, INC., PROJECT NO. 22-225, DATED 12/15/22. THE GENERAL CONTRACTOR SHALL ADHERE TO ALL REQUIREMENTS AND RECOMMENDATIONS IN THE REPORT.
2. ALLOWABLE SOIL BEARING PRESSURES (PSF):
ISOLATED FOOTINGS 2050
CONTINUOUS FOOTINGS 1950
3. EXCAVATE, WHERE REQUIRED, TO BUILDING AND STRUCTURE SUBGRADE.
4. PROOF-ROLL THE AREA UNDER THE BUILDING, PLUS 5'-0" ON ALL SIDES, WITH A LOADED DUMP TRUCK TO LOCATE ANY SOFT AREAS. A GEOTECHNICAL ENGINEER IS TO BE PRESENT DURING THIS OPERATION. ANY SOFT AREAS DETECTED ARE TO BE UNDERCUT AND REPLACED WITH ENGINEERED FILL.
5. ACCEPTABLE FILL MATERIAL SHALL BE FREE OF ORGANICS, AND HAVE A P.I. OF LESS THAN 6. CRUSHED STONE BACKFILL TO MEET REQUIREMENTS OF A.H.D. NO. 57 STONE. DRAINAGE FILL SUPPORTING SLABS SHALL MEET THE REQUIREMENTS OF THE GEOTECHNICAL ENGINEER.
6. FILL, WHERE REQUIRED, IS TO BE PLACED IN 8" LOOSE LIFTS AND COMPACTED TO 95% STANDARD PROCTOR (ASTM D-698), WITHIN ±2% OF OPTIMUM MOISTURE CONTENT.
7. THE GEOTECHNICAL ENGINEER SHALL REVIEW THE FINAL FOUNDATION DESIGN TO VERIFY THAT ALL FOUNDATION SYSTEMS, INCLUDING SLAB ON GRADE DESIGN AND DETAILING, COMPLIES WITH THE GEOTECHNICAL PARAMETERS INCLUDED IN THE GEOTECHNICAL REPORT. WRITTEN VERIFICATION OF THIS REVIEW SHALL BE SUBMITTED TO THE ARCHITECT TWO WEEKS BEFORE FINAL PRICING/BID DATE.

CONCRETE:

- 1. CONCRETE CONSTRUCTION AND QUALITY ASSURANCE SHALL BE IN ACCORDANCE WITH CURRENT ACI STANDARDS.
2. CONCRETE SCHEDULES
A. CONCRETE COLUMNS 28 DAY COMPRESSIVE STRENGTH 4000 PSI NORMAL WEIGHT
B. CONCRETE IN CMU CELLS 3000 PSI GROUT
C. ALL OTHER CONCRETE 3000 PSI NORMAL WEIGHT
3. CONCRETE COVER OVER REINFORCING (UNO)
A. UNFORMED SURFACE IN CONTACT WITH EARTH: 3 IN.
B. UNFORMED SURFACE OVER VAPOR BARRIER: 2 IN.
C. FORMED SURFACES EXPOSED TO EARTH OR WEATHER #6 AND LARGER 2 IN.
#5 AND SMALLER 1 1/2 IN.
D. FORMED SURFACES NOT EXPOSED TO EARTH OR WEATHER: WALLS, SLABS: 3/4 IN.
COLUMNS, BEAMS: 1 1/2 IN. TO TIES
4. CONCRETE AT SLABS ON GRADE SHALL HAVE A NOMINAL MAXIMUM COARSE AGGREGATE SIZE OF 3/4 INCH. ADJUST PORTIONS OF COMBINED COARSE, INTERMEDIATE AND FINE AGGREGATES TO PROVIDE A COARSENESS FACTOR OF 60 TO 75%.
5. ALL REINFORCING SHALL CONFORM TO THE LATEST REVISION OF ASTM SPECIFICATION A615, GRADE 60 AND BE DETAILED IN ACCORDANCE WITH THE LATEST REVISION OF ACI STANDARD 315.
6. NO REINFORCING BAR SHALL BE WELDED IN ANY MANNER, UNLESS SPECIFICALLY SHOWN OR NOTED ON THE DRAWINGS.
7. CONTINUOUS FOOTING REINFORCING BARS SHALL BE LAPPED 30 BAR DIAMETERS, BUT NOT LESS THAN 4'-0".
8. GRADE BEAM, ELEVATED BEAM, AND ELEVATED SLAB REINFORCING BARS SHALL BE SPLICED ONLY AS SHOWN ON THE DRAWINGS, EXCEPT THE REINFORCING DESIGNATED AS "CONTINUOUS" SHALL HAVE A CLASS "B" LAP SPLICE (PER ACI 318). LAP SPLICES OF CONTINUOUS REINFORCING SHALL BE MADE OVER SUPPORTS FOR BOTTOM BARS AND AT INTERMEDIATE BARS AND AT MID-SPAN FOR TOP BARS. AT EXTERIOR SUPPORTS, TOP AND BOTTOM BARS SHALL BE HOOKED AND INTERMEDIATE BARS SHALL EXTEND TO WITHIN 2" OF EXTERIOR FACE.
9. COLUMN AND WALL VERTICAL REINFORCING BARS SHALL BE LAPPED WITH A CLASS "B" SPLICE. WALL HORIZONTAL REINFORCING BARS SHALL BE LAPPED 30 DIAMETERS AT SPLICE POINTS. PROVIDE CORNER BARS FOR WALLS.
10. PROVIDE FULL EMBEDMENT FOR ALL DOWELS. IF NOT OTHERWISE SPECIFIED, DOWEL SIZE AND SPACING SHALL BE THE SAME AS MAIN REINFORCING.
11. CONSTRUCTION JOINTS IN CONCRETE BEAMS AND SLABS SHALL BE AT OR NEAR MIDSPAN. ALL CONSTRUCTION JOINTS TO BE KEPT.
12. HORIZONTAL CONSTRUCTION JOINTS SHALL NOT BE PERMITTED IN WALLS AND BEAMS, UNLESS SHOWN ON THE STRUCTURAL DRAWINGS.
13. CONDUIT, PIPES, AND SLEEVES SHALL NOT BE SPACED CLOSER THAN 3 DIAMETERS ON CENTER. NOT HAVE AN OUTSIDE DIAMETER GREATER THAN 1/3 THE OVERALL THICKNESS OF THE SLAB, WALL OR BEAM IN WHICH THEY ARE EMBEDDED, AND SHALL HAVE A MINIMUM COVER OF 1 1/2 INCH FOR CONCRETE EXPOSED TO EARTH OR WEATHER AND 3/4 INCH FOR CONCRETE NOT EXPOSED TO EARTH OR WEATHER.
14. PIPING AND CONDUIT SHALL BE SO FABRICATED AND INSTALLED THAT CUTTING, BENDING, OR DISPLACEMENT OF REINFORCEMENT FROM ITS PROPER LOCATION WILL NOT BE REQUIRED.
15. THE CONTRACTOR SHALL SUBMIT, FOR REVIEW, SHOP DRAWINGS FOR ALL REINFORCING BARS INCLUDING DETAILS AT ALL OPENINGS AND ASSOCIATED ADDED REINFORCEMENT AS SHOWN ON TYPICAL DETAILS.

TENSION LAP SPLICE LENGTH table with columns for BAR SIZE, TOP BARS, OTHER BARS, and sub-columns for fc = 3000 PSI and fc = 4000 PSI.

CONCRETE MASONRY:

- 1. MASONRY CONSTRUCTION SHALL CONFORM TO ACI 530.1, SPECIFICATION OR TMS 402/602.
2. MASONRY COMPRESSIVE STRENGTH (fm) SHALL BE 1900 PSI BASED ON THE UNIT STRENGTH METHOD OR VERIFIED BY PRISM TESTS IN ACCORDANCE WITH ASTM C 1314.
3. MORTAR SHALL BE TYPE S OR M.
4. ALL REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60.
5. NO REINFORCING BAR SHALL BE WELDED IN ANY MANNER, UNLESS SPECIFICALLY SHOWN OR NOTED ON THE DRAWINGS.
6. BLOCK FILL SHALL BE GROUT WITH AN 8" TO 11" SLUMP, PROPORTIONED PER ASTM C 476 OR ATTAINING 3000 PSI AT 28 DAYS PER ASTM C 1019. DO NOT USE MORTAR AS BLOCK FILL.
7. ALL GROUT SHALL BE CONSOLIDATED AT TIME OF PLACEMENT USING A LOW-VELOCITY MECHANICAL VIBRATOR WITH A 3/4-INCH HEAD. RE-CONSOLIDATE GROUT AFTER INITIAL WATER LOSS AND SETTLEMENT HAS OCCURRED. DO NOT PLACE NEXT LIFT OF GROUT UNTIL LOWER LIFT HAS BEEN RE-CONSOLIDATED.
8. ALL BLOCK CELLS AND CAVITIES BELOW GRADE SHALL BE GROUTED SOLID. ALL LINTELS & BOND BEAMS SHALL BE GROUTED SOLID.
9. ALL BLOCK CELLS WHICH HAVE VERTICAL REINFORCING SHALL BE GROUTED FULL-HEIGHT IN 5'-0" LIFTS (MAXIMUM HEIGHT). PROVIDE 1 1/2" (MINIMUM) GROUT KEY BELOW MORTAR JOINT AT TOP OF EACH LIFT.
10. VERTICAL REINFORCING SHALL BE DOWELED TO FOOTING WITH HOOKED BARS AT THE BASE AND EXTEND FULL-HEIGHT INTO BOND BEAM AT THE TOP, WHERE SPLICES ARE NECESSARY. PROVIDE LAP LENGTH = 48 BAR DIAMETERS.
11. VERTICAL REINFORCING SHALL BE LOCATED IN THE CENTER OF THE BLOCK CELLS, UNLESS NOTED, AND SHALL BE HELD IN PLACE WITH BAR POSITIONERS (HECKMANN #376 OR HOHMANN & BARNARD #R8) PRIOR TO GROUTING. "WET-STICKING" OF REINFORCING SHALL NOT BE ALLOWED.
12. MINIMUM VERTICAL WALL REINFORCING IN ALL WALLS SHALL CONSIST OF ONE VERTICAL (MATCHING WALL REINF. BUT NOT LESS THAN #5) IN EACH CORNER, AT EACH DOOR & WINDOW JAMB & AT EACH SIDE OF CONTROL AND/OR EXPANSION JOINTS. PROVIDE ADDITIONAL VERTICAL REINFORCING AS SHOWN IN SECTIONS AND AS NOTED ON PLANS.
13. AT CORNERS AND INTERSECTIONS OF BOND BEAMS IN WALLS, PROVIDE CORNER BARS (48 DIAMETERS LONG EA. LEG) TO THE WALLS TOGETHER. BAR DIAMETER SHALL MATCH BOND BEAM REINFORCING.
14. AT TOP OF ALL MASONRY WALLS (BEARING OR NON-BEARING), PROVIDE 8" DEEP CONTINUOUS BOND BEAM REINFORCED WITH #6 CONTINUOUS, UNLESS NOTED OTHERWISE.
15. WHERE CMU IS PLACED IN A STACK BOND PATTERN, HORIZONTAL WALL REINFORCING SHALL CONSIST OF A MINIMUM STANDARD (8 GAGE) LADDER-TYPE JOINT REINFORCING AT EVERY COURSE (8" O.C.) FOR 12" CMU OR AT EVERY OTHER COURSE (16" O.C.) FOR 8" CMU. COORDINATE W/ ARCHITECTURAL DRAWINGS. WHERE CMU IS PLACED IN A RUNNING BOND PATTERN, HORIZONTAL WALL REINFORCING SHALL CONSIST OF A MINIMUM STANDARD (8 GAGE) LADDER-TYPE REINFORCING AT EVERY OTHER COURSE (16" O.C.).
16. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR DETAILS AND LOCATIONS OF MASONRY CONTROL JOINTS. IF NOT OTHERWISE SHOWN, DO NOT EXCEED 30'-0" BETWEEN BLOCK WALL CONTROL JOINTS AND 20'-0" BETWEEN BRICK VENEER CONTROL JOINTS.
17. ANCHOR WALLS TO SUPPORTING STRUCTURES AS SHOWN ON THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY BRACING OF ALL MASONRY WALLS DURING CONSTRUCTION.
18. THE CONTRACTOR SHALL SUBMIT, FOR REVIEW, SHOP DRAWINGS FOR ALL REINFORCING BARS INCLUDING DETAILS AT ALL OPENINGS AND ASSOCIATED ADDED REINFORCEMENT AS SHOWN ON TYPICAL DETAILS.

STRUCTURAL STEEL:

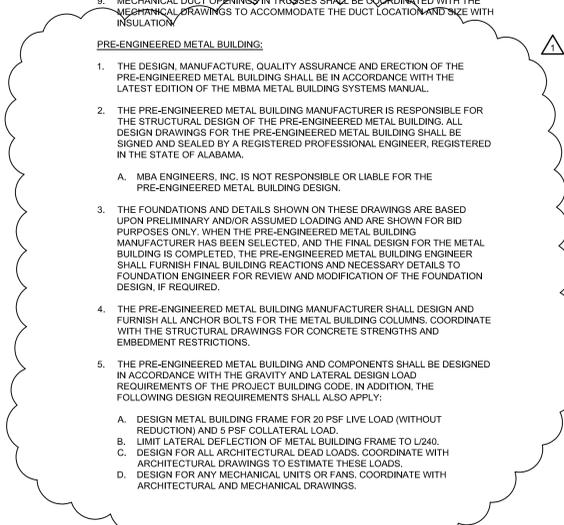
- 1. DESIGN, CONSTRUCTION, QUALITY ASSURANCE, AND ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH CURRENT AISC STANDARDS.
2. ALL STRUCTURAL STEEL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992 ITEM
3. ALL STRUCTURAL STEEL PLATES, ANGLES AND CHANNELS SHALL CONFORM TO ASTM A36.
4. ALL STRUCTURAL STEEL SQUARE, RECTANGULAR AND ROUND HSS SECTIONS SHALL CONFORM TO ASTM A500, GRADE B.
5. ALL STRUCTURAL STEEL PIPE SHALL CONFORM TO ASTM A53, TYPE E OR S, GRADE B
6. FABRICATION AND ERECTION SHALL CONFORM TO AISC CODE OF STANDARD PRACTICE.
7. ALL WELDING SHALL CONFORM TO AWS STANDARDS. THICKNESS OF WELDS ARE AS SHOWN, SPECIFIED OR REQUIRED.
8. ALL BOLTED CONNECTIONS SHALL BE MINIMUM 3/4" DIAMETER, A325 HIGH STRENGTH BOLTS, UNLESS NOTED OTHERWISE.
9. THE STRUCTURAL STEEL FABRICATOR SHALL PROVIDE CERTIFICATIONS BY A PROFESSIONAL STRUCTURAL ENGINEER (P.E.) REGISTERED IN THE STATE OF ALABAMA THAT THE CONNECTION DESIGN IS IN ACCORDANCE WITH ALL APPLICABLE CODES AND SPECIFICATIONS. CONNECTION DESIGN CALCULATIONS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER OF RECORD FOR REVIEW.
10. ALL BEAM CONNECTIONS SHALL BE "SIMPLE SHEAR CONNECTIONS" UNLESS NOTED OTHERWISE. WHERE BEAM REACTIONS AND/OR DESIGN FORCES ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS, THE CONNECTIONS SHALL BE DESIGNED TO SUPPORT A REACTION EQUAL TO ONE-HALF THE TOTAL UNIFORM LOAD CAPACITY FROM THE MAXIMUM UNIFORM LOAD TABLE (LATEST AISC MANUAL OF STEEL PRACTICE) MULTIPLIED BY A FACTOR OF 1.2 (NON-COMPOSITE BEAMS) OR 1.45 (COMPOSITE BEAMS) FOR GIVEN SHAPE, SPAN, AND GRADE OF STEEL.
STEEL DECK:
1. STEEL DECK CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF SDI STANDARDS.
2. ATTACH ROOF DECK TO SUPPORTS AT 12" OC. 1/8" S18 PUDDLE WELDS (#12 TEK SCREWS - ENGINEER'S OPTION), ATTACH TO PERIMETER SUPPORTS AT 6" OC. PROVIDE #10 TEK SCREW SIDELAP FASTENERS AT 12" OC. (MIN. 4 PER SPAN).
3. DECK SHALL BE ATTACHED TO STEEL BEAMS AT 12" OC. EITHER BY STUDS OR 3/4" PUDDLE WELDS. SIDE LAP WELDS SHALL BE PROVIDED PER MANUFACTURER'S RECOMMENDATIONS.
4. DECK SHALL BE CONTINUOUS OVER THREE OR MORE SPANS.
PRE-FABRICATED COLD-FORMED STEEL TRUSSES:
1. THE DESIGN, MANUFACTURE, QUALITY ASSURANCE AND ERECTION OF COLD-FORMED STEEL TRUSSES SHALL BE IN ACCORDANCE WITH THE CURRENT AISI NORTH AMERICAN STANDARDS FOR COLD-FORMED STEEL FRAMING.
2. A TRUSS DESIGN PACKAGE SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER OF RECORD FOR REVIEW PRIOR TO FABRICATION AND ERECTION. THIS PACKAGE SHALL INCLUDE, AT A MINIMUM, EACH INDIVIDUAL TRUSS DESIGN DRAWING AND CALCULATION, THE TRUSS PLACEMENT DIAGRAM, THE PERMANENT INDIVIDUAL TRUSS MEMBER RESTRAINT BRACING METHOD AND DETAILS, AND ANY OTHER STRUCTURAL DETAILS GERMANE TO THE TRUSSES. THE TRUSS DESIGN DRAWINGS SHALL BEAR THE SEAL AND SIGNATURE OF THE TRUSS DESIGNER WHO SHALL BE REGISTERED IN THE STATE OF ALABAMA.
3. TRUSS TO TRUSS CONNECTIONS SHALL BE DESIGNED AND SPECIFIED BY THE TRUSS MANUFACTURER FOR THE DESIGN LOADS.
4. TRUSS MANUFACTURER SHALL DESIGN AND PROVIDE COLD-FORMED STEEL FRAMING FOR ALL RIDGE, HIP RIDGE AND VALLEY MEMBERS.
5. ALL TEMPORARY AND PERMANENT BRACING MEMBERS AND CONNECTIONS REQUIRED FOR TRUSSES SHALL BE DESIGNED AND DETAILED BY THE TRUSS DESIGNER. AT A MINIMUM, TRUSS INSTALLER SHALL COMPLY WITH THE "GUIDE TO GOOD PRACTICE FOR HANDLING, INSTALLING, RESTRAINING, AND BRACING OF COLD-FORMED STEEL TRUSSES" BY THE COLD-FORMED STEEL COUNCIL.
6. TRUSSES SHALL BE DESIGNED FOR THE FOLLOWING SUPERIMPOSED LOADS:
ROOF TOP CHORD DEAD LOAD = 20 PSF
ROOF BOTTOM CHORD DEAD LOAD = 10 PSF
ROOF TOP CHORD LIVE LOAD = 20 PSF
7. TRUSSES SHALL BE DESIGNED FOR COMPONENT AND CLADDING WIND LOADS BASED ON THE PROVIDED DESIGN CRITERIA AND COMPONENT AND CLADDING WIND LOAD TABLES.
8. TRUSS DESIGNER SHALL VERIFY THAT ALL EQUIPMENT WEIGHTS, CONCENTRATED LOADS, AND LOCATIONS ARE PROVIDED BY THE GENERAL CONTRACTOR. GENERAL CONTRACTOR SHALL PROVIDE THIS INFORMATION TO THE TRUSS DESIGNER. THE LOADS AND CORRESPONDING LOCATIONS SHALL BE IDENTIFIED ON THE TRUSS PLACEMENT DIAGRAM.
9. MECHANICAL DUCT OPENINGS IN TRUSSES SHALL BE COORDINATED WITH THE MECHANICAL DRAWINGS TO ACCOMMODATE THE DUCT LOCATION AND SIZE WITH INSULATION.

PRE-ENGINEERED METAL BUILDING:

- 1. THE DESIGN, MANUFACTURE, QUALITY ASSURANCE AND ERECTION OF THE PRE-ENGINEERED METAL BUILDING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MBMA METAL BUILDING SYSTEMS MANUAL.
2. THE PRE-ENGINEERED METAL BUILDING MANUFACTURER IS RESPONSIBLE FOR THE STRUCTURAL DESIGN OF THE PRE-ENGINEERED METAL BUILDING. ALL DESIGN DRAWINGS FOR THE PRE-ENGINEERED METAL BUILDING SHALL BE SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF ALABAMA.
A. MBA ENGINEERS, INC. IS NOT RESPONSIBLE OR LIABLE FOR THE PRE-ENGINEERED METAL BUILDING DESIGN.
3. THE FOUNDATIONS AND DETAILS SHOWN ON THESE DRAWINGS ARE BASED UPON PRELIMINARY AND/OR ASSUMED LOADING AND ARE SHOWN FOR BID PURPOSES ONLY. WHEN THE PRE-ENGINEERED METAL BUILDING MANUFACTURER HAS BEEN SELECTED, AND THE FINAL DESIGN FOR THE METAL BUILDING IS COMPLETED, THE PRE-ENGINEERED METAL BUILDING ENGINEER SHALL FURNISH FINAL BUILDING REACTIONS AND NECESSARY DETAILS TO FOUNDATION ENGINEER FOR REVIEW AND MODIFICATION OF THE FOUNDATION DESIGN, IF REQUIRED.
4. THE PRE-ENGINEERED METAL BUILDING MANUFACTURER SHALL DESIGN AND FURNISH ALL ANCHOR BOLTS FOR THE METAL BUILDING COLUMNS. COORDINATE WITH THE STRUCTURAL DRAWINGS FOR CONCRETE STRENGTHS AND EMBEDMENT RESTRICTIONS.
5. THE PRE-ENGINEERED METAL BUILDING AND COMPONENTS SHALL BE DESIGNED IN ACCORDANCE WITH THE GRAVITY AND LATERAL DESIGN LOAD REQUIREMENTS OF THE PROJECT BUILDING CODE. IN ADDITION, THE FOLLOWING DESIGN REQUIREMENTS SHALL ALSO APPLY:
A. DESIGN METAL BUILDING FRAME FOR 20 PSF LIVE LOAD (WITHOUT REDUCTION) AND 5 PSF COLLATERAL LOAD.
B. LIMIT LATERAL DEFLECTION OF METAL BUILDING FRAME TO L/240.
C. DESIGN FOR ALL ARCHITECTURAL LOADS. COORDINATE WITH ARCHITECTURAL DRAWINGS TO ESTIMATE THESE LOADS.
D. DESIGN FOR ANY MECHANICAL UNITS OR FANS, COORDINATE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS.

DESIGN CRITERIA:

- 1. GOVERNING CODE:
A. INTERNATIONAL BUILDING CODE, I.B.C. 2018
2. GRAVITY DESIGN LOADS:
A. DEAD
1. DESIGN DEAD LOADS ARE BASED ON THE SELF-WEIGHT OF CONSTRUCTION MATERIALS SHOWN IN THE ARCHITECTURAL AND STRUCTURAL DRAWINGS. ANY ALTERNATE MATERIALS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER TO REVIEW.
B. LIVE:
1. ROOF 20 PSF
C. SNOW
1. GROUND SNOW LOAD (Pg) = 0 PSF
2. FLAT ROOF SNOW LOAD (P) = 5 PSF
3. SNOW EXPOSURE FACTOR (Ce) = 1.0
4. SNOW LOAD IMPORTANCE FACTOR (Is) = 1.0
5. THERMAL FACTOR (Ct) = 1.0
3. LATERAL DESIGN LOADS:
A. WIND
1. DESIGNED PER ASCE 7-16
2. ULTIMATE WIND SPEED = 154 MPH
3. RISK CATEGORY = II
4. BUILDING CATEGORY = ENCLOSED
5. EXPOSURE CATEGORY = C
6. INTERNAL PRESSURE COEFFICIENT (Cp) = +0.18
7. COMPONENT & CLADDING WIND PRESSURES SEE CHART
B. EARTHQUAKE
1. SEISMIC RISK CATEGORY = II
2. SEISMIC IMPORTANCE FACTOR (Ie) = 1.0
3. MAPPED SPECTRAL RESPONSE ACCELERATIONS
A. Ss = 0.094
B. S1 = 0.090
4. SOIL SITE CLASS = D
5. DESIGN SPECTRAL RESPONSE ACCELERATIONS
A. Sds = 0.100
B. Sd1 = 0.096
6. SEISMIC DESIGN CATEGORY = B
7. BASIC SEISMIC-FORCE-RESISTING SYSTEM
ORDINARY REINFORCED MASONRY SHEARWALLS
8. DESIGN BASE SHEAR = 20 KIPS
9. SEISMIC RESPONSE COEFFICIENT (Cs) = 0.05
10. RESPONSE MODIFICATION FACTOR (R) = 2
11. ANALYSIS PROCEDURE:
EQUIVALENT LATERAL FORCE
SPECIAL INSPECTIONS:
1. THE OWNER SHALL EMPLOY A QUALIFIED TESTING AGENT/ENGINEER TO PROVIDE SPECIAL INSPECTIONS. SPECIAL INSPECTORS SHALL SUBMIT RESUME OF EXPERIENCE AND QUALIFICATIONS OF ALL INDIVIDUALS PERFORMING WORK TO THE ARCHITECT/STRUCTURAL ENGINEER OF RECORD FOR APPROVAL PRIOR TO ANY WORK BEING PERFORMED. SPECIAL INSPECTIONS SHOULD BE IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, 2018 ED. AND AS INDICATED IN THE SPECIFICATIONS.



Vertical information strip on the right side of the page. Includes the GMC logo at the top, contact information for 11 North Water Street, Suite 15250, Mobile, AL 36602, and phone number 251-460-4006. Below this is a table with columns for ISSUE, DATE, and a grid for tracking revisions. At the bottom, there is a circular professional seal for MBA ENGINEERS, INC. and project information for AZALEA CITY GOLF COURSE, 1000 GAILLARD DRIVE, MOBILE, ALABAMA 36608, with drawing number GMC # AMOB220095 and sheet number A-SO.01.

