*NOTE TO SPECIFIER: PLEASE ENABLE VIEWING OF HIDDEN TEXT! Notes are interspersed throughout to offer explanations or guidance, and indications on when or if to keep certain items.*

Replace the term "Design Professional" with the identity of the design professional as defined in the General and Supplementary Conditions.

References to "DSA" indicate portions of the California Building Code (CBC) modified and adopted by DSA-SS and OSHPD 1 and 4.

# SECTION 042200.13 – CONCRETE UNIT VENEER MASONRY

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Division 01 Specification Sections, Drawings, General Conditions, Supplementary General Conditions, and Special Conditions apply to this section.

### 1.2 REFERENCES

A. TMS 602/ACI 530.1/ASCE 6 2008 Specification for Masonry Structures

B. ASTM International (latest versions)
1. ASTM A82/A85M Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
2. ASTM A153/A153M Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
3. ASTM A951 Standard Specification for Masonry Joint Reinforcement
4. ASTM A1008/A1008M Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Baked Hardenable
5. ASTM C90 Standard Specification for Loadbearing Concrete Masonry Units
6. ASTM C150 Standard Specification for Portland Cement
7. ASTM C270 Standard Specification for Mortar for Unit Masonry
8. ASTM C920 Standard Specification for Elastomeric Joint Sealants
9. ASTM D226 Standard Specification for Asphalt-saturated Organic Felt Used in Roofing and Waterproofing

### 1.3 SUMMARY

A. Section Includes:
1. Concrete masonry units (CMUs).
2. Mortar and grout.
3. Control joint materials.
4. Masonry joint reinforcement.
5. Ties and anchors.
6. Embedded flashing.

7. Miscellaneous masonry accessories.

B. Products installed, but not furnished, under this Section:

Edit the following list as needed.

1. Section 055000 Metal Fabrication for steel lintels and shelf angles for unit masonry.
2. Section 076200 Sheet Metal Flashing and Trim.

C. Related Sections:

Edit the following list as needed.

1. Section 042200 Concrete Unit Masonry
2. Section 042223.23 Prefaced Concrete Unit Masonry for Astra-Glaze-SW glazed masonry units
3. Section 042300 Glass Unit Masonry
4. Section 047200 Cast Stone Masonry
5. Section 055000 Metal Fabrications for steel shelf angles
6. Section 071900 Water Repellents
7. Section 076200 Sheet Metal Flashing and Trim.
8. Section 078413 Penetration Firestopping
9. Section 078443 Fire-Resistive Joint Sealants
10. Section 079200 Joint Sealants
11. Section 321413 Precast Unit Paving
12. Section 323223 Segmental Retaining Walls

## 1.4 SUBMITTALS

A. Obtain written acceptance of submittals prior to use of the following:
   1. Submit mix designs
      a. Preblended mortar: mix design indicating types and proportions of materials according to proportion specification of ASTM C270.
   2. Submit material certificates for each of the following certifying compliance.
      a. Concrete masonry units.
      b. Anchors, ties, fasteners, and metal accessories.
      c. Elastomeric Joint Sealants

For samples required below, state quantity of each.

B. Samples for Verification: For each type and color of the following:
   1. Exposed concrete masonry units.

Include subparagraph below if colored mortar is specified.

   2. Mortar, for color selection or confirmation.

## 1.5 QUALITY ASSURANCE

A. Sample Panels: Construct an approximate [Width:] long by [Height:] panel for representation of completed masonry, joint tooling, design details, and workmanship. Comply with requirements in Division 01 Section "Quality Requirements" for mockups.

If it is desirable to demonstrate particular units or areas of critical detailing, specify them in the following subparagraph, otherwise delete it.

1. The following shall be installed in the sample panel:
   a. [Specify units]
   b. [Specify details or conditions]

It is typically good practice to conduct preinstallation meetings to provide opportunity to clarify critical details, schedules, specification intent, inspections, etc. If the work under this section is of a minor nature, delete the following subparagraph.

B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

## 1.6 DELIVERY, STORAGE, AND HANDLING

A. All materials of this section shall be protected to maintain quality and physical requirements.

B. All masonry units shall be stored on the jobsite so that they are protected from rain, stored off-ground and kept clean from contamination. Prevent units from being otherwise wetted.

C. Store Spec Mix preblended mortar mix in manufacturer's original, unopened, undamaged containers with identification labels intact, covered and protected from weather, or in a Spec Mix dispensing silo.

## 1.7 FIELD CONDITIONS

A. Securely cover tops of all unsheltered walls and partially completed walls when work is not in progress.

Cold-weather and hot-weather masonry construction is addressed in CBC Sections 2104.3 and 2104.4 (2104A.3 and 2104A.4 for DSA), referring to TMS 602/ACI 530.1/ASCE 6 Article 1.8 C and 1.8 D respectively. Include and modify below as necessary.

B. Cold-weather procedures when ambient temperature falls below 40°F (4°C) or the temperature of masonry units is below 40°F (4°C):
   1. Wet or frozen units shall not be laid.
   2. Implement cold weather construction procedures in accordance with TMS 602/ACI 530.1/ASCE 6 Article 1.8 C.

C. Hot-weather procedures when ambient temperature exceeds 100°F (38°C), or exceeds 90°F(32°C) with a wind velocity greater than 8 mph:
   1. Implement hot weather construction procedures in accordance with TMS 602/ACI 530.1/ASCE 6 Article 1.8 D.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Concrete masonry units.
   1. Angelus Block Co., Inc.
      a. Sun Valley, CA (818) 767-8576
      b. Orange, CA (714) 637-8594
      c. Fontana, CA (909) 350-0244
      d. Gardena, CA (310) 323-8841
      e. Oxnard, CA (805) 485-1137
      f. Indio, CA (760) 347-3245
   2. Desert Block Co., Inc.
      a. Mojave, CA (661) 824-2624
      b. Bakersfield (661) 858-2848

B. Preblended mortar.
   1. Spec Mix Preblended Mortar Mix, by E-Z Mix, Inc.
      a. Sun Valley, CA (818) 768-0568
      b. Rialto, CA (909) 874-7686

2.2 CONCRETE MASONRY UNITS

A. Concrete Masonry Units: ASTM C90.

The majority of structural design is based on the mediumweight classification; therefore, the greatest availability in Southern California of architectural cmu is in mediumweight. Edit below if design considers a different weight classification, or the specified product is only available in a given weight classification.

   1. Weight Classification: Mediumweight unless otherwise indicated.

Although it is common to call out colors and textures on elevation drawings or legend tables within the drawings set, it is helpful to also coordinate and list them here. Examples of Color: Sandstone, Warm Gray. Examples of Texture: Precision, Split Face, Burnished. If compatible mortar color other than natural gray is intended, specify in Article 2.3.

   2. Color(s) and texture(s):
      a. [Color] [Texture]

2.3 MORTAR MATERIALS

Preblended mortar below provides greater control and consistency than field-mixed. Spec Mix meets both proportion and properties requirements of ASTM C 270.

A. Spec Mix Masonry Mortar preblended factory mix: ASTM C270 (or, if a separate Section is included for mortar, append the foregoing with ", in accordance with Section 040513 Masonry Mortaring", and delete the following subparagraph).

Natural gray is often used, including use with colored cmu. If compatible mortar colors are desired, specify here. Where used with Angelus CMU fields, simply specify the Angelus CMU color. For example, for "Shoreline" cmu color fields, specify "Shoreline" Spec Mix mortar. For stock colors (Sandstone, Spice, and Harvest), specify the stock mortar color, "Medium Tan".

1. Natural gray color.

B. Water: Potable.

C. Admixtures:
   1. The use of admixtures shall not be permitted except as specified herein, or as approved by the Architect or Engineer of Record and the Building Official.

## 2.4 REINFORCEMENT AND METAL ACCESSORIES

The following paragraphs may instead be included in their respective specification Sections: 040519 Masonry Anchorage, 040523 Masonry Accessories. If so, replace details below with a reference to the appropriate Section.

Items below are typically used. Revise as required by design.

A. Metal reinforcement and accessories shall conform to TMS 602/ACI 530.1/ASCE 6 Article 2.4 (if separate sections are included for these items, append the foregoing with ", in accordance with Section 040519 Masonry Anchorage and Reinforcing and Section 040523 Masonry Accessories", and delete the remainder of this article).

B. Masonry Joint Reinforcement: ASTM A951.
   1. Masonry joint reinforcement used in exterior walls shall be hot-dipped galvanized, conforming to ASTM A153, Class B, minimum coating of 1.5 oz/ft$^2$.

For Seismic Design Categories E or F, include the following subparagraph:

   2. Provide continuous single wire joint reinforcement of wire size W1.7 (MW11).

C. Sheet Metal Anchors and Ties: ASTM A1008/A1008M.
   1. Sheet metal anchors and ties used in exterior walls shall be hot-dipped galvanized, conforming to ASTM A153, Class B.

D. Wire Ties and Anchors: ASTM A82.
   1. Wire ties and anchors used in exterior walls shall be hot-dipped galvanized, conforming to ASTM A153, Class B, minimum coating of 1.5 oz/ft$^2$.

For Seismic Design Categories E or F, include the following subparagraph:

   2. Anchor shall provide a hook, clip, notch, or other means to mechanically engage the joint reinforcement.

A continuous water-resistive barrier is required where the backing is constructed of studs.

2.5 WATER-RESISTIVE BARRIER

2.6 Provide No. 15 asphalt felt, complying with ASTM D226 for Type 1.

2.7 FLASHING MATERIALS

A. Provide metal flashing in accordance with Section 076200 Sheet Metal Flashing and Trim.

2.8 MISCELLANEOUS MASONRY ACCESSORIES

A. Control joint materials:
   1. Elastomeric joint sealer per ASTM C920.
   2. Use size and shape of joint filler per joint sealer manufacturer recommendations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to the start of masonry installation, verify all conditions pertinent to the performance of work in this Section are acceptable.

B. Masonry work shall not proceed until unsatisfactory conditions have been corrected or cleared by the governing authority.

3.2 INSTALLATION

A. Construct masonry veneer in compliance with TMS 402/ACI 530/ASCE 5 and TMS 602/ACI 530.1/ASCE 6.

B. Cut units as required to fit; use motor-driven masonry saw. Install cut units with cut surfaces edges concealed as much as possible.

C. Lay dry units only, unless otherwise approved.

D. Select and arrange units for exposed masonry to produce a uniform blend of colors and textures.
   1. Mix units from several pallets or cubes as they are placed.

E. All masonry shall be laid true, level, plumb, and in accordance with the drawings.

Running bond is the typical pattern. If stack bond or another pattern is to be used, edit paragraph below, or refer to drawings.

F. Masonry shall be laid in running bond unless otherwise indicated.

## 3.3 MORTAR BEDDING AND JOINTING

A. Place mortar in accordance with TMS 602/ACI 530.1/ASCE 6 Article 3.3 B (or, if a separate Section is included for mortar, append the foregoing with ", and with Section 040513 Masonry Mortaring", and delete the following subparagraphs).

B. Initial bed joint shall not be less than 1/4 inch nor more than 3/4 inch.

C. All head and bed joints, except as in paragraph 3.3 B. above, shall be a nominal 3/8 in. thick, unless otherwise required.

D. Lay solid units with full head and bed joints. Do not fill head joints by slushing with mortar. Bed joints shall not be furrowed deep enough to produce voids.

If another joint profile is used, revise paragraph below or refer to Drawings. Note that some decorative joint profiles are not recommended for weather exposure; consult your Angelus Block representative.

A. All mortar joints on exposed walls shall be concave, unless otherwise indicated, and struck to produce a dense, slightly concave surface well bonded to the surface of the masonry unit.

B. Remove and re-lay in fresh mortar any unit that has been disturbed to the extent the initial bond is broken.

## 3.4 MASONRY JOINT REINFORCEMENT, TIES, AND ANCHORS

A. Embed joint reinforcement, ties, and anchors with minimum 5/8 inch cover to outside face.

For Seismic Design Categories E or F, include the following subparagraph:

B. Place single wire joint reinforcement at maximum spacing of 18 inches on center vertically. Mechanically attach anchors to the joint reinforcement with clips or hooks.

## 3.5 WATER-RESISTIVE BARRIER

A. Attach No. 15 asphalt felt to the studs or sheathing, incorporating flashing as shown on the drawings.

## 3.6 CONTROL AND EXPANSION JOINTS

A. Construct control joints as detailed in the drawings as masonry progresses.

If the Seismic Design Category is D, E, or F, include the following article if the structure is classified as Occupancy Category IV under CBC and the structure is over 30 ft. above grade or walking surface, or if Occupancy Category II, III, or IV under DSA. (Both cases require periodic special inspection during the erection and fastening of exterior cladding.)

## 3.7 FIELD QUALITY CONTROL

Statement of Special Inspections per CBC Sections 1704.1.1 and 1705 (1704A.1.1 and 1705A for DSA).

A. Inspection tasks and frequency shall be performed in accordance with the Statement of Special Inspections.

## 3.8 POINTING, AND CLEANING

A. Point and tool holes in mortar joints to produce a uniform, tight joint.

B. During construction, minimize any mortar or grout stains on the wall. Immediately remove any staining or soiling that occurs.
   1. For precision or textured units, except as noted below, clean masonry by dry brushing before tooling joints.
   2. For burnished, glazed, or pre-finished concrete masonry units, immediately remove any green mortar smears or soiling with a damp sponge

C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

Light sandblasting is a common, non-chemical means of final cleaning of stains and efflorescence prior to the application of water repellents. Other non-silica media blasting utilizing soda, walnut shells, plastic, etc., are becoming more available as alternatives to sandblasting. Water blasting is sometimes used, but saturating the unprotected masonry can often lead to further development of efflorescence, especially if weather is cool or damp for extended periods.

If other chemical means are desired, edit this subparagraph according to manufacturer's recommendations, and specify the product in Part 2.

   1. Clean exposed cmu walls with a light sandblast. All nonmasonry work near the area to be sandblasted shall be covered or protected before the sandblasting starts. Care shall be taken to avoid contamination to areas that are not to be sandblasted.
      a. Burnished, glazed, or pre-finished masonry units, shall be protected from sandblast operations.

D. At completion of masonry work, remove all scaffolding and equipment used during construction, and remove all debris, refuse, and surplus masonry material from the site.

Include the following article for jobsite sandblasting when a sandblasted texture is specified for design purposes. This is different than light sandblasting for cleanup; sandblasting for textural effects is incorporated with the cleanup sandblasting. Specify "light", "medium", or "heavy" texture, or other defined reference for the desired effect.

## 3.9 JOBSITE SANDBLASTING

A. Sandblast for textural effects as indicated on the drawings.

B. Apply ["medium" or other definition] sandblasting to precision masonry walls at indicated areas, as demonstrated on approved samples, in uniform and consistent texture.

An application of water repellent is a critical component of the masonry wall and may be included here for emphasis, coordinated with Section 071900 Water Repellents.

## 3.10 WATER REPELLENT APPLICATION

A. Cleaning shall be complete and accepted by the Architect, and wall surfaces shall be thoroughly dry.

B. Apply water repellent in strict accordance with Section 071900 and the water repellent manufacturer's instructions.

END OF SECTION 042200.13