

SECTION 04 2223

ARCHITECTURAL CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Split-face concrete unit masonry, burnished concrete unit masonry, and polished concrete unit masonry. **** OR ****
 2. Split-face concrete unit masonry. **** OR ****
 3. Burnished concrete unit masonry. **** OR ****
 4. Polished concrete unit masonry.

1.2 REFERENCES

- A. ASTM International (ASTM) (www.astm.org):
1. A 153/ A153M - Standard Specification for Zinc-Coating (Hot Dip) on Iron and Steel Hardware.
 2. A 615/ A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 3. A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
 4. A 951 - Standard Specification for Masonry Joint Reinforcement.
 5. C 90 - Standard Specification for Hollow Loadbearing Concrete Masonry Units.
 6. C 129 - Standard Specification for Hollow Nonloadbearing Concrete Masonry Units.
 7. C 144 - Standard Specification for Aggregate for Masonry Mortar.
 8. C 150 - Standard Specification for Portland Cement.
 9. C 207 - Standard Specification for Hydrated Lime for Masonry Purposes.
 10. C 404 - Standard Specification for Aggregates for Masonry Grout.
 11. C 476 - Standard Specification for Mortar and Grout for Reinforced Masonry.
- B. The Masonry Society (TMS):
1. 402 - Building Code for Masonry Structures.
 2. 602 - Specification for Masonry Structures.

1.3 SUBMITTALS

- A. Product Data: Provide information on reinforcing and anchors including sizes, profiles, materials, and finishes.
- B. Sustainable Design Submittals:
1. Materials Reuse.
 2. Recycled Content.
 3. Regional Materials.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 5 years documented experience in work of this section.
- B. Mockup:
1. Size: 4 feet high x 8 feet wide.
 2. Show:
 - a. Masonry color and texture range.
 - b. Mortar joint size, color, and profile.
 - c. Each bond pattern.



- d. Anchors.
- e. Flashings and weeps.
- 3. Locate where directed facing south.

C. Perform Work in accordance with TMS 402 and 602.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store masonry off ground; prevent contact with materials that could cause staining or damage.
- B. Protect reinforcement and anchors from corrosion.

1.6 PROJECT CONDITIONS

- A. Wall Protection:
 - 1. During erection, cover tops of partially completed walls with strong waterproof membrane at end of each day or work stoppage.
 - 2. Extend cover minimum of 24 inches down both sides; hold securely in place.
- B. Load Application:
 - 1. Do not apply uniform loads for at least 12 hours after building masonry columns or walls.
 - 2. Do not apply concentrated loads for at least 3 days after building masonry columns or walls.
- C. Environmental Requirements:
 - 1. Hot weather requirements: If ambient temperature is over 95 degrees F or relative humidity is less than 50 percent, protect from direct sun and wind exposure for minimum 48 hours after installation.
 - 2. Cold weather requirements: Do not use frozen materials or build on frozen work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer - Concrete Masonry Units: Texas Building Products, Inc. (phone 800.368.1024 web site: www.texasbuildingproducts.com).
- B. Acceptable Manufacturers - Masonry Accessories:
 - Hohmann and Barnard, Inc. (www.h-b.com)
 - Wirebond (wirebond.com)
 - Blok-Lok Ltd. (www.blok-lok.com)

Acceptable Manufacturers - Colorants:
Arizona Oxides LLC. (www.arizonaoxides.com)
Davis Colors. (www.daviscolors.com)
Lambert Southwest (www.lambertsw.com)
Solomon Colors. (www.solomoncolors.com)

2.2 MATERIALS

[Note to specifier:
Use paragraph A for split-face, burnished, and polished CMU
or use paragraph B for split-face CMU only
or use paragraph C for burnished CMU only
or use paragraph D for polished CMU only]

- A. Split-face Concrete Unit Masonry, Burnished Concrete Unit Masonry, and Polished Concrete Unit Masonry:
 - 1. ASTM C 90, hollow load bearing type, [normal weight] [medium weight] [lightweight].
**** OR ****
 - 2. ASTM C 129, hollow non-load bearing type, [normal weight] [medium weight] [lightweight].
 - 3. Size: Nominally 8 inches high x 16 inches long x thickness(es) indicated.
 - 4. Provide manufacturer's standard split-face concrete unit masonry, burnished concrete unit masonry, and polished concrete unit masonry; color(s) as selected from manufacturer's complete color line.
 - 5. Special shapes: [Lintels] [Bond beams] [Solid units] [_____].

- B. Split-face Concrete Unit Masonry:
1. ASTM C 90, hollow load bearing type, [normal weight] [medium weight] [lightweight].
**** OR ****
 2. ASTM C 129, hollow non-load bearing type, [normal weight] [medium weight] [lightweight].
 3. Size: Nominally 8 inches high x 16 inches long x thickness(es) indicated.
 4. Provide manufacturer's standard split-face concrete unit masonry; color(s) as selected from manufacturer's complete color line.
 5. Special shapes: [Lintels] [Bond beams] [Solid units] [____].
- C. Burnished Concrete Unit Masonry:
1. ASTM C 90, hollow load bearing type, [normal weight] [medium weight] [lightweight].
**** OR ****
 2. ASTM C 129, hollow non-load bearing type, [normal weight] [medium weight] [lightweight].
 3. Size: Nominally 8 inches high x 16 inches long x thickness(es) indicated.
 4. Provide manufacturer's standard burnished concrete unit masonry; color(s) as selected from manufacturer's complete color line.
 5. Special shapes: [Lintels] [Bond beams] [Solid units] [____].
- D. Polished Concrete Unit Masonry:
1. ASTM C 90, hollow load bearing type, [normal weight] [medium weight] [lightweight].
**** OR ****
 2. ASTM C 129, hollow non-load bearing type, [normal weight] [medium weight] [lightweight].
 3. Size: Nominally 8 inches high x 16 inches long x thickness(es) indicated.
 4. Provide manufacturer's standard polished concrete unit masonry; color(s) as selected from manufacturer's complete color line.
 5. Special shapes: [Lintels] [Bond beams] [Solid units] [____].

2.3 ACCESSORIES

- A. Mortar:
1. Portland Cement: ASTM C 150, Type I. For exposed surfaces, provide cement from one source throughout project.
 - a. Provide white Portland cement for colored mortar used in laying split-face concrete unit masonry, burnished concrete masonry units, and polished concrete masonry units.
**** OR ****
 - b. Provide white Portland cement for colored mortar used in laying split-face concrete unit masonry.
**** OR ****
 - c. Provide white Portland cement for colored mortar used in laying burnished concrete unit masonry.
**** OR ****
 - d. Provide white Portland cement for colored mortar used in laying polished concrete unit masonry.
 2. Aggregate: ASTM C 144, standard masonry type. For exposed surfaces, provide aggregate from one source throughout project.
 3. Lime: ASTM C 207, Type S.
 4. Colorant: Pure mineral oxide type manufactured by one of the listed manufacturers; color to be selected from manufacturer's full color range.
 5. Water: Clean and free from oils, acids, alkalies, organic matter, and other substances in amounts deleterious to mortar or metals in masonry.
- B. Mortar Mixes: ASTM C 270 using the [Property] [Proportion] Method. Type [O.] [N.] [S.] [M.] [white] [gray] color.
1. Mixing: Mix mortar in accordance with ASTM C 270.
 - a. Thoroughly mix ingredients in quantities needed for immediate use.
 - b. Discard lumpy, caked, frozen, and hardened mixes.
 2. Colorant may not exceed 9 pounds per 94 pound bag of cement for mineral oxides.
 3. Do not add accelerators, retarders, water repellents, antifreeze compounds, or other additives without Architect's approval.
- C. Grout:
1. Portland Cement: ASTM C150, Type I.



2. Aggregate: ASTM C 404.
 3. Lime: ASTM C 207, Type S.
 4. Water: Clean and free from oils, acids, alkalies, organic matter, and other substances in amounts deleterious to mortar or metals in masonry.
- D. Grout Mix:
1. ASTM C 476, [fine] [and] [coarse] grout.
 2. Compressive strength: Minimum 2500 psi at 28 days.
 3. Slump: 7 to 8 inches.
 4. Mixing: Mix grout in accordance with ASTM C 476.
 - a. Thoroughly mix ingredients in quantities needed for immediate use.
 - b. Mix dry ingredients mechanically until uniformly distributed; add water to achieve workable consistency.
 - c. Discard lumpy, caked, frozen, and hardened mixes.
 - d. Use grout within 2-1/2 hours after initial mixing at ambient temperatures below 80 degrees F. and within 1-1/2 hours after initial mixing at ambient temperatures over 80 degrees F.
- E. Single Wythe Joint Reinforcement:
1. Truss type; ASTM A 951, hot-dip galvanized steel wire, 9 gage side rods with 9 gage cross ties.
 2. Width: Nominal wall thickness less 1-1/2 inches.
 3. Corner and tee fittings: Type to match reinforcement.
 4. Recycled content: Minimum [] percent recycled steel, with minimum [] percent classified as post-consumer.
- F. Double Wythe Joint Reinforcement:
1. Truss type; ASTM A 951, hot-dip galvanized steel wire, 9 gage side rods with 9 gage cross ties.
 2. Width: Nominal wall thickness less 1-1/2 inches.
 3. Corner and tee fittings: Type to match reinforcement.
 4. Recycled content: Minimum [] percent recycled steel, with minimum [] percent classified as post-consumer.
- G. Strap Anchors: Bent steel shape, [] x [] inches, hot dip galvanized, ASTM A 153/A 153M, Grade B2 finish.
- H. Veneer Ties: Formed steel wire, 9 gage thickness, two piece adjustable type with backing plate, hot dip galvanized, ASTM A 153/A 153M, B2 finish.
- I. Fasteners: Stainless or Fluoropolymer coated steel [nails,] [screws,] minimum 3/4 inch penetration into [framing.] [substrate.]
- J. Reinforcing Bars:
1. ASTM A 615/A 615M, deformed billet steel, Grade 60.
 2. Recycled content: Minimum [] percent recycled steel, with minimum [] percent classified as post-consumer.
- K. Cleaner:
1. Split-face Concrete Unit Masonry: SureKlean® Custom Masonry Cleaner by Prosoco, Inc. (phone 800.255.4255 web site: www.prosoco.com).
 2. Burnished Concrete Unit Masonry: SureKlean® Burnished Custom Masonry Cleaner by Prosoco, Inc. (phone 800.255.4255 web site: www.prosoco.com).
 3. Polished Concrete Unit Masonry: None
- L. Enhancer: Ground face block Enhancer as recommended by Texas Building Products, Inc. (800.368.1024 web site: www.texasbuildingproducts.com).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Establish lines, levels and courses indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimensions. Form horizontal and vertical joints of uniform thickness.

- C. Lay concrete masonry in [running] [stack] [] bond. Course one masonry unit and one mortar joint to equal 8 inches.
- D. Lay masonry plumb and level. Do not adjust masonry units after mortar has set.
- E. Lay solid masonry units in full mortar bed, with full head joints. Lay hollow masonry units with face shell bedding on head and bed joints.
- F. Do not butter corners or excessively furrow joints.
- G. Machine cut masonry with straight cuts and clean edges; prevent oversized or undersized joints. Discard damaged units. Do not expose cut cells.
- H. Isolate masonry from structural members with compressible filler.
- I. When joining fresh masonry to partially set masonry, remove loose masonry and mortar; clean and lightly wet exposed surface of set masonry.
- J. Stop horizontal runs by racking back normal bond unit in each course. Tothing not permitted.
- K. Horizontal Reinforcement:
 - 1. Place reinforcement at maximum 16 inches on center vertically, at topmost course, and at first two courses above and below openings.
 - 2. Extend minimum 24 inches each side of openings.
 - 3. Center reinforcing in wall.
 - 4. Lap ends 6 inches minimum; use fabricated tee and corner fittings at corners and intersections.
- L. Secure masonry to structural members with [strap anchors] [wall ties] spaced maximum 16 inches on center.
- M. Veneer Ties:
 - 1. Space ties to provide one tie per 2 square feet at maximum spacing of 16 inches on center horizontally.
 - 2. Locate ties within 3 inches of ends of masonry walls and openings.
- N. Control [and Expansion] Joints:
 - 1. Do not continue horizontal joint reinforcement through joints.
 - 2. Keep joints free from mortar and grout.
 - 3. Install joint backing and joint sealer at control joints in accordance with Section 07 9200.
 - 4. Form expansion joint as indicated on drawings.
- O. Finishing Mortar Joints:
 - 1. Exposed locations: Tool joints to concave profile.
 - 2. Concealed locations: Cut joints flush.
- P. Reinforcing Bars:
 - 1. Position reinforcing accurately and hold securely in place to prevent displacement. Maintain minimum 1 inch space between masonry and reinforcing.
 - 2. Grout at intervals of not more than 60 inches in 6 to 8 inch lifts.
 - 3. Vibrate grout during and after placement to ensure complete filling.
 - 4. Stop grout 1-1/2 inch below top of masonry if grouting is stopped for 1 hour or more, except where completing grouting of finished wall.
- Q. Installation Tolerances; Maximum variation from:
 - 1. Alignment of columns and pilasters: Plus or minus 1/4 inch.
 - 2. Alignment face to face of adjacent units: Plus or minus 1/8 inch.
 - 3. Vertical alignment of head joints: Plus or minus 1/2 inch in 10 feet.
 - 4. True plane of wall: Plus or minus 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.
 - 5. Plumb: Plus or minus 1/4 inch in 10 feet non-cumulative; 1/2 inch in 20 feet or more.
 - 6. Level coursing: Plus or minus 1/8 inch in 3 feet; 1/4 inch in 10 feet; 1/2 inch in 30 feet.



7. Joint thickness: Plus or minus 1/8 inch.
8. Cross sectional thickness of walls: Plus or minus 1/4 inch.

3.2 CLEANING

[Note to specifier:

Caution: Polished block requires care in cleaning to prevent damage to the polished surface. Do not use acidic cleaners as they may damage the polished surface. Do not use high pressure water blasting to clean the polished surface. Clean as you go using moist burlap rags or similar.]

- A. Protect adjacent and underlying surfaces.
- B. Apply masonry cleaner in accordance with manufacturer's instructions.
- C. Thoroughly rinse surfaces with clean water after completion of cleaning; remove all traces of cleaning solution.
- D. Do NOT use water-blast cleaning of architectural concrete unit masonry.
- E. Do not use muriatic acid for cleaning.
- F. Clean polished concrete unit masonry as you go using moist burlap rags or similar.
- G. For burnished block, upon completion of cleaning process, apply burnished block enhancer as recommended by Texas Building Products if needed.

END OF SECTION