SECTION 04 2000

UNIT MASONRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Concrete unit masonry.
2. Brick unit masonry.
3. Integral flashings.

B. Related Sections:
1. Division 01: Administrative, procedural, and temporary work requirements.
2. Section 04 0513 - Masonry Mortaring.
3. Section 04 0516 - Masonry Grouting.
4. Section 07 9200 - Joint Sealers.

1.2 REFERENCES

A. ASTM International (ASTM)
1. A153/A153M - Standard Specification for Zinc-Coating (Hot Dip) on Iron and Steel Hardware.
2. A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
3. A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
4. A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
5. A951 - Standard Specification for Masonry Joint Reinforcement.
6. B370 - Standard Specification for Copper Sheet and Strip for Building Construction.
7. C27 - Standard Classification of Fireclay and High-Alumina Refractory Brick.
8. C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
9. C90 - Standard Specification for Hollow Loadbearing Concrete Masonry Units.
10. C129 - Standard Specification for Hollow Nonloadbearing Concrete Masonry Units.
11. C216 - Standard Specification for Facing Brick (Solid Units Made from Clay or Shale).
12. C315 - Standard Specification for Clay Flue Linings.
13. C652 - Standard Specification for Hollow Brick (Hollow Masonry Units Made From Clay or Shale).
14. C744 - Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units.
15. C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Concrete.
16. C1019 - Standard Test Method for Sampling and Testing Grout.
17. C1261 - Standard Specification for Firebox Brick for Residential Fireplaces.
18. C1283 - Standard Practice for Installing Clay Flue Linings.
19. C1314 - Standard Test Method for Compressive Strength of Masonry Prisms.
20. C1386 - Standard Specification for Precast Autoclaved Aerated Concrete (PAAC) Wall Construction Units.

B. The Masonry Society (TMS):
1. 402 - Building Code for Masonry Structures.
2. 602 - Specification for Masonry Structures.

1.3 SUBMITTALS

A. Submittals for Review:
1. Product Data: Provide information on reinforcing and anchors including sizes, profiles, materials, and finishes.
2. Samples: Brick samples in quantities showing full color and texture range.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Minimum 5 years experience in work of this Section.

B. Mockup:
1. Size: 4 feet high x 4 feet wide x 4 feet long in L shape, “corner”, configuration for brick and cast stone.
2. Show:
a. Brick color and texture range.
b. Cast stone color and texture range
c. Mortar joint size, color, and profile.
d. Each bond pattern.
e. Anchors.
f. Flashings and weeps.
3. Locate where directed.
4. Approved mockup may not remain as part of the Work, but it shall be used as mockup for water repellant.

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 Manufacturers – Standard Concrete Masonry Units:
1. Featherlite Building Products.
2. Or equal

B. Acceptable Manufacturers – Custom Concrete Masonry Units:
1. Spectra Development Corp. (www.spectraglaze.com)
2. Trenwyth Industries. (www.trenwyth.com)
3. Or equal.

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C. Acceptable Manufacturers - Brick Masonry Units:
   1. Acme Brick Co. (www.brick.com)
   2. Belden Brick Co. (www.beldenbrick.com)
   3. Endicott Clay Products. (www.endicott.com)
   4. Glen-Gery Corporation. (www.glengerybrick.com)
   5. Or equal

D. Acceptable Manufacturers - Masonry Accessories:
   1. Blok-Lok Ltd. (www.blok-lok.com)
   2. Dur-O-Wal. (www.dur-o-wal.com)
   3. Heckmann Building Products. (www.heckmannbuildingprods.com)
   4. Hohmann and Barnard, Inc. (www.h-b.com)
   5. Or equal

2.2 MATERIALS

A. Standard Concrete Masonry Units:
   1. ASTM C90, hollow load bearing type, Light weight, Grade N, Type I - Moisture Controlled.
   2. Size: Nominally 8 inches high x 16 inches long x thickness indicated.
   3. Special shapes: Lintels, Bond beams, Solid units.
   4. UL fire rated for rating indicated on drawings.

B. Brick:
   1. ASTM C216, Grade SW, Type FBS.

2.3 ACCESSORIES

A. Mortar: Specified in Section 04 0513.

B. Grout: Specified in Section 04 0516.

C. Single Wythe Joint Reinforcement:
   1. Truss type; ASTM A951, 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.

D. Double Wythe Joint Reinforcement:
   1. Ladder type; ASTM A951, 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.

E. Strap Anchors: Bent steel shape, hot dip galvanized, ASTM A153/A153M, Grade B2 finish.]

F. Veneer Ties: Corrugated formed sheet metal, hot dip galvanized, ASTM A153/A153M, B2 finish.

G. Fasteners: Hot-dip galvanized steel nails or screws, minimum 3/4 inch penetration into substrate.

H. Reinforcing Bars:
   1. ASTM A615/A615M, deformed billet steel, Grade 60.

I. Flashings: Galvanized steel, ASTM A653/A653M, G90 coating class, 24 gage core steel, natural finish.

J. Weeps: Preformed plastic tubes filled with cotton wicks.

K. Mortar Dropping Control: Preformed plastic mesh.

L. Joint Sealer: Specified in Section 07 9200.

M. Cleaner: Type recommended by masonry manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

A. Wet brick having an absorption rate in excess of 20 g per 30 square inches per minute as determined by ASTM C67 so that absorption rate when laid does not exceed this amount.

B. Remove dirt, loose rust, and other foreign matter from reinforcement and anchors.

3.2 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 bond. Course one masonry unit and one mortar joint to equal 8 inches.

D. Lay brick running common bond. Course three brick units and three mortar joints to equal 8 inches.

E. Lay masonry plumb and level. Do not adjust masonry units after mortar has set.

F. 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.

G. Do not butter corners or excessively furrow joints.

H. Machine cut masonry with straight cuts and clean edges; prevent oversized or undersized joints. Discard damaged units. Do not expose cut cells.

I. Isolate masonry from structural members with compressible filler.

J. When joining fresh masonry to partially set masonry, remove loose masonry and mortar; clean and lightly wet exposed surface of set masonry.

K. Stop horizontal runs by racking back normal bond unit in each course. Toothing not permitted.

L. Horizontal Reinforcement:
   1. Place reinforcement at maximum 16 inches on center vertically (unless noted differently), at topmost course, and at first two courses above and below openings except at 8” ands 12” thick masonry walls around bathrooms where joint reinforcing shall be installed each block course as noted. Storm shelter walls shall have joint reinforcing each block course.
   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.

M. Secure masonry to structural members with strap anchors spaced maximum 16 inches on center.

N. Veneer Ties:
   1. Space ties to provide one tie per 2 square feet at maximum spacing of 16 inches on center horizontally.

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2. Locate ties within 3 inches of ends of masonry walls and openings.

O. 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.

P. Finishing Mortar Joints:
1. Exposed locations: Tool joints to concave profile.
2. Concealed locations: Cut joints flush.

Q. 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 cells with bars solid. Walls filled solid with concrete shall be filled in 4'-0" maximum vertical 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.

R. Flashings:
1. Install flashing with outer edge flush with outside face of masonry; extend up backup 8 inches minimum and build into masonry and seal
2. Lap end joints 4 inches minimum and seal.
3. Form end dams where flashing is stopped or interrupted.
4. Apply trowel coat of mastic along flashing at top edge, seams, cuts, and penetrations.

S. Weeps:
1. Locate in head joints in first course above flashings at maximum 32 inches on center.
2. Set weeps flush with exterior face of masonry.

T. Install mortar dropping control continuously in cavities above flashings.

U. 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 noncumulative; 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.

3.3 FIELD QUALITY CONTROL

A. Testing and Inspection Services:
1. Masonry units: Inspect masonry units prior to and during installation for compliance with specified requirements.
2. Masonry assemblies:
   a. Determine compressive strength of masonry by the prism method, ASTM C1314.
   b. Verify dimensions and condition of grout spaces and type, quantity, and placement of reinforcement during installation and just prior to closing of cleanouts.
   c. Verify type, quantity, and installation of reinforcement, anchors, and ties.
   d. Inspect placement of grout.
3. Grout: Mold and test one set of compressive strength cubes in accordance with ASTM C1019 for each 100 square feet of masonry wall area or fraction thereof.

3.4 CLEANING

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.

END OF SECTION

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