

**SECTION 04 20 00
UNIT MASONRY**

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies requirements for construction of masonry unit walls.

1.2 RELATED WORK

- A. Mortars: Section 04 05 13, MASONRY MORTARING.
- B. Cavity insulation: Section 07 21 13, THERMAL INSULATION.
- C. Flashing: Section 07 60 00, FLASHING AND SHEET METAL.
- D. Sealants and sealant installation: Section 07 92 00, JOINT SEALANTS.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- B. Samples:
 - 1. Face brick, sample panel, 200 mm by 400 mm (8 inches by 16 inches,) showing full color range and texture of bricks, bond, and proposed mortar joints.
 - 2. Anchors, and ties, one each and joint reinforcing 1200 mm (48 inches) long.
- C. Certificates:
 - 1. Certificates signed by manufacturer, including name and address of contractor, project location, and the quantity, and date or dates of shipment of delivery to which certificate applies.
 - 2. Indicating that the following items meet specification requirements:
 - a. Face brick.
- D. Manufacturer's Literature and Data:
 - 1. Anchors and ties.

1.4 WARRANTY

Warrant exterior masonry walls against moisture leaks and subject to terms of "Warranty of Construction", FAR clause 52.246-21, except that warranty period shall be five years.

1.5 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.
- B. American Society for Testing and Materials (ASTM):
 - A951-06.....Steel Wire for Masonry Joint Reinforcement.

- A615/A615M-09.....Deformed and Plain Billet-Steel Bars for
Concrete Reinforcement.
- A675/A675M-03(R2009)....Standard Specification for Steel Bars, Carbon,
Hot-Wrought, Special Quality, Mechanical
PropertiesC34-03 Structural Clay Load-Bearing
Wall Tile
- C55-09.....Concrete Building Brick
- C56-10.....Structural Clay Non-Load-Bearing Tile
- C62-10.....Building Brick (Solid Masonry Units Made From
Clay or Shale)
- C67-09.....Sampling and Testing Brick and Structural Clay
Tile
- C90-11.....Load-Bearing Concrete Masonry Units
- C126-10.....Ceramic Glazed Structural Clay Facing Tile,
Facing Brick, and Solid Masonry Units
- C216-10.....Facing Brick (Solid Masonry Units Made From Clay
or Shale)
- C476-10.....Standard Specification for Grout for Masonry
- C612-10.....Mineral Fiber Block and Board Thermal Insulation
- C744-11.....Prefaced Concrete and Calcium Silicate Masonry
Units.
- D1056-07.....Flexible Cellular Materials - Sponge or Expanded
Rubber
- D2000-08.....Rubber Products in Automotive Applications
- D2240-05(R2010).....Rubber Property - Durometer Hardness
- D3574-08.....Flexible Cellular Materials-Slab, Bonded, and
Molded Urethane Foams
- F1667-11.....Fasteners: Nails, Spikes and Staples
- C. Masonry Industry Council:
Hot and Cold Weather Masonry Construction Manual-98 (R2000).
- D. American Welding Society (AWS):
D1.4-11 Structural Welding Code - Reinforcing Steel.
- E. Federal Specifications (FS):
FF-S-107C-00.....Screws, Tapping and Drive
- F. Brick Industry Association - Technical Notes on Brick Construction
(BIA):
11-2001.....Guide Specifications for Brick Masonry, Part I
11A-1988.....Guide Specifications for Brick Masonry, Part II
11B-1988.....Guide Specifications for Brick Masonry, Part III
Execution

11C-1998.....Guide Specification for Brick Masonry Engineered
Brick Masonry, Part IV

11D-1988.....Guide Specifications for Brick Masonry
Engineered Brick Masonry, Part IV continued

G. Masonry Standards Joint Committee; Specifications for Masonry Structures
TMS 602-08/ACI 530.1-08/ASCE 6-08 (2008 MSJC Book Version TMS-0402-08).

PART 2 - PRODUCTS

2.1 BRICK

A. Face Brick:

1. ASTM C216, Grade SW, Type FBS.
2. Brick when tested in accordance with ASTM C67: Classified slightly efflorescent or better.
3. Size:
 - a. Standard

2.2 ANCHORS, TIES, AND REINFORCEMENT

A. Corrugated Wall Tie:

1. Form from 16-gauge, corrugated, galvanized steel 1-1/4 inches wide by lengths so as to extend at least 4 inches into joints of new masonry plus 1-1/2 inch turn-up.
2. Provide 3/16 inch hole in turn-up for fastener attachment.

2.3 ACCESSORIES

A. Weep Hole Wicks: MTI Cavity Weep™ CV5010 or approved equal.

B. Gypsum Board Sheathing:

1. Georgia-Pacific DensGlass® Sheathing.
2. 1/2 inch thickness.
3. Other sheathing material having similar characteristics may be used subject to the COR's approval.

C. Water-Resistive Barrier:

1. Vapor permeable flexible sheet water-resistive barrier intended for mechanical attachment.
2. Manufactured from flash spunbonded high density polyethylene fibers bonded by heat and pressure without binders or fillers.
3. Install according to the manufacturer's written instructions.

D. Masonry Cleaner:

1. Detergent type cleaner selected for each type masonry used.
2. Acid cleaners are not acceptable.
3. Use soapless type specially prepared for cleaning brick or concrete masonry as appropriate.

E. Fasteners:

1. Concrete Nails: ASTM F1667, Type I, Style 11, 3/4 inch minimum length.
2. Masonry Nails: ASTM F1667, Type I, Style 17, 3/4 inch minimum length.
3. Screws: FS-FF-S-107, Type A, AB, SF thread forming or cutting.

PART 3 - EXECUTION

3.1 JOB CONDITIONS

A. Protection:

1. Cover tops of walls with nonstaining waterproof covering, when work is not in progress. Secure to prevent wind blow off.
2. On new work protect base of wall from mud, dirt, mortar droppings, and other materials that will stain face, until final landscaping or other site work is completed.

B. Cold Weather Protection:

1. Masonry may be laid in freezing weather when methods of protection are utilized.
2. Comply with MSJC and "Hot and Cold Weather Masonry Construction Manual".

3.2 CONSTRUCTION TOLERANCES

- A. Lay masonry units plumb, level and true to line within the tolerances as per MSJC requirements and as follows:
- B. Maximum variation from plumb:
 1. In 10 feet - 1/4 inch.
 2. In 20 feet - 3/8 inch.
 3. In 40 feet or more - 1/2 inch.
- C. Maximum variation from level:
 1. In any bay or up to 20 feet - 1/4 inch.
 2. In 40 feet or more - 1/2 inch.
- D. Maximum variation from linear building lines:
 1. In any bay or up to 20 feet - 1/2 inch.
 2. In 40 feet or more - 3/4 inch.
- E. Maximum variation in cross-sectional dimensions of columns and thickness of walls from dimensions shown:
 1. Minus 1/4 inch.
 2. Plus 1/2 inch.
- F. Maximum variation in prepared opening dimensions:
 1. Accurate to minus 0 inch.
 2. Plus 1/4 inch.

3.3 INSTALLATION GENERAL

- A. Keep finish work free from mortar smears or spatters, and leave neat and clean.

- B. Anchor masonry as specified in Paragraph, ANCHORAGE.
- C. Apply water-resistive barrier over sheathing of wood framed backer walls.
- D. Wall Openings:
 - 1. Fill hollow metal frames built into masonry walls and partitions solid with mortar as laying of masonry progresses.
 - 2. If items are not available when walls are built, prepare openings for subsequent installation.
- E. Tooling Joints:
 - 1. Do not tool until mortar has stiffened enough to retain thumb print when thumb is pressed against mortar.
 - 2. Tool while mortar is soft enough to be compressed into joints and not raked out.
 - 3. Finish joints in exterior face masonry work with a jointing tool, and provide smooth, water-tight concave joint unless specified otherwise.
 - 4. Tool Exposed interior joints in finish work concave unless specified otherwise.
- F. Wall, Furring, and Partition Units:
 - 1. Lay out field units to provide for running bond of walls and partitions, with vertical joints in second course centering on first course units unless specified otherwise.
 - 2. Align head joints of alternate vertical courses.
 - 3. At sides of openings, balance head joints in each course on vertical center lines of openings.
 - 4. Use no piece shorter than 4 inches long.
 - 5. Use not less than 4 inches nominal thick masonry for free standing furring unless shown otherwise.
 - 6. Do not abut existing plastered surfaces except suspended ceilings with new masonry partitions.
- G. Before connecting new masonry with previously laid, remove loosened masonry or mortar, and clean and wet work in place as specified under wetting.
- H. Wetting and Wetting Test:
 - 1. Test and wet brick or clay tile in accordance with BIA 11B.

3.4 ANCHORAGE

- A. Veneer to Frame Walls:
 - 1. Use corrugated veneer anchors.
 - 2. Fasten anchor to stud through sheathing with self drilling and tapping screw.

3. Space anchors not more than 18 inches on center vertically at each stud.

B. Veneer to Concrete Walls:

1. Anchor new masonry facing to existing concrete with corrugated wall ties spaced at 18 inch maximum vertical and horizontal intervals. Fasten ties to concrete with power actuated fasteners or concrete nails.

3.5 REINFORCEMENT

A. Joint Reinforcement:

1. Brick veneer over frame backing walls does not require joint reinforcement.

3.6 BRICK EXPANSION AND CMU CONTROL JOINTS.

- A. Provide brick expansion (BEJ) joints where shown on drawings.
- B. Keep joint free of mortar and other debris.

3.7 BRICKWORK

A. Lay clay brick in accordance with BIA Technical Note 11 series.

B. Laying:

1. Lay brick in running bond with course of masonry bonded at corners unless shown otherwise. Match bond of existing building on alterations and additions.
2. Maintain bond pattern throughout.
3. Do not use brick smaller than half-brick at any angle, corner, break or jamb.
4. Where length of cut brick is greater than one half but less than a whole brick, maintain the vertical joint location of such units.
5. Lay exposed brickwork joints symmetrical about center lines of openings.
6. Do not structural bond multi wythe brick walls unless shown.
7. Before starting work, lay facing brick on foundation wall and adjust bond to openings, angles, and corners.
8. Lay brick for sills with wash and drip.
9. Build solid brickwork as required for anchorage of items.

C. Joints:

1. Exterior and interior joint widths: Lay for three equal joints in eight inches vertically, unless shown otherwise.
2. Rake joints for pointing with colored mortar when colored mortar is not full depth.
3. Arches:

- a. Flat arches (jack arches) lay with camber of 1 in 200 (1/16 inch per foot) of span.
 - b. Face radial arches with radial brick with center line of joints on radial lines.
 - c. Form Radial joints of equal width.
 - d. Bond arches into backing with metal ties in every other joint.
- D. Weep Holes:
- 1. Install continuous cavity weeps in exterior masonry veneer as shown on the drawings.
 - 2. Form weep holes using MTI Cavity Weep™ CV5010 or approved equal.

3.8 POINTING

- A. Fill joints with pointing mortar using rubber float trowel to rub mortar solidly into raked joints.
- B. Wipe off excess mortar from joints of glazed masonry units with dry cloth.
- C. Finish exposed joints in finish work with a jointing tool to provide a smooth concave joint unless specified otherwise.
- D. At joints with existing work match existing joint.

3.9 CLEANING AND REPAIR

- A. General:
 - 1. Clean exposed masonry surfaces on completion.
 - 2. Protect adjoining construction materials and landscaping during cleaning operations.
 - 3. Cut out defective exposed new joints to depth of approximately 3/4 inch and repoint.
 - 4. Remove mortar droppings and other foreign substances from wall surfaces.
- B. Brickwork:
 - 1. First wet surfaces with clean water, then wash down with a solution of soapless detergent. Do not use muriatic acid.
 - 2. Brush with stiff fiber brushes while washing, and immediately thereafter hose down with clean water.
 - 3. Free clean surfaces of traces of detergent, foreign streaks, or stains of any nature.

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