

**SECTION 04211
MASONRY**

1.00 GENERAL

1.01 DESCRIPTION

- A. Brick unit masonry.
- B. Installation of reinforcing steel for brick unit masonry and dowels projecting into subsequently placed concrete.
- C. Setting of anchors, bearing plates and other work to be embedded into masonry.
- D. Drypack under bearing plates.
- E. **Related Work specified elsewhere:**
 - 1. Testing laboratory services: Section 01410.
 - 2. Furnishing of reinforcing steel for masonry: Section 03200.
 - 3. Concrete, including dowels, installed in concrete placed prior to installation of masonry work for anchorage of masonry: Section 04510.
 - 4. Furnishing items to be embedded in masonry: Pertinent Sections.
 - 5. Masonry cleaning: Section 04510.
 - 6. Structural steel: Section 05120.
 - 7. Open web steel joist: Section 05210.
 - 8. Metal Decking: Section 05300.
 - 9. Metal pan Stairs: Section 05512.
 - 6. Water repellant weatherproofing: Section 07177.
 - 7. Sealants: Section 07920

1.02 QUALITY ASSURANCE

- A. **Reference specifications and standards:**
 - 1. ASTM C144, Aggregate for Masonry Mortar.
 - 2. ASTM C404, Aggregates for Masonry Grout.
 - 3. ASTM C150, Portland Cement.
 - 4. ASTM C207, Hydrated Lime for Masonry Purposes.
 - 5. ASTM C270, Mortar for Unit Masonry.
 - 6. ASTM C652, Hollow Brick (Hollow Masonry Units Made From Clay or Shade).
- B. **Testing:**
 - 1. Test all grout and mortar for conformance by a Testing Agency paid for by Owner.
 - 2. Testing and coring:
 - a. If the 28-day mortar and grout tests fail to meet minimum ultimate compressive design strength, brick unit masonry shall be considered defective and cores from selected area may be taken as directed by Architect.



- b. If compressive tests of core specimens fail to meet desired strength, brick unit masonry shall be assumed to be defective and shall be further tested and, if required, adequately strengthened or removed and replaced in a manner acceptable to Architect.
- c. Repair brick unit masonry to match existing when coring or other testing is done.
- d. Pay for coring, testing of Work-in-place cores and all necessary repairs pertaining thereto.

1.03 SUBMITTALS

- A. **Procedures:** In accord with Section 01340.
- B. **Samples:** Submit duplicate samples of each type and color of brick units required for the Work, including mortar colors.
- C. **Certificates:** Prior to delivery, submit certificates attesting compliance with applicable specifications for grades, types or classes.

1.04 SAMPLE WALL MOCK-UP

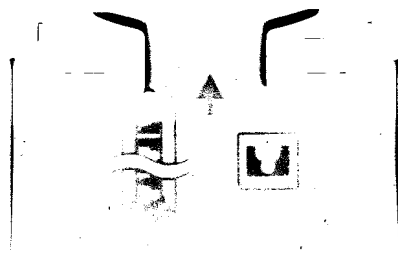
- A. Construct a full size wall mock-up as the standard of quality at location selected by Architect, illustrating bonding pattern, jointing, color and finish.
- B. Obtain Architect's review and acceptance prior to performing brick masonry Work.

1.05 PRODUCT HANDLING

- A. Procedures: In accord with Section 01625.

1.06 PROJECT CONDITIONS

- A. Conform to requirements of Section 01041.
- B. **Scaffold and protection:** Provide and maintain scaffolding, staging and forms of protection necessary for execution of Work of this Section.
- C. **Shores and centering:** Provide for the Work, constructed to required shape, size and form, well-braced and made rigid and capable of supporting and sustaining the loads imposed.
 - 1. Leave shores and centering in place until the masonry is sufficiently set to safely carry



its own weight and added loads of construction or retained earth.

2.00 PRODUCTS

2.01 MANUFACTURES

- A. Interstate Brick
- B. Other manufacturer meeting product design criteria, and acceptable to Architect.

2.02 MATERIALS

- A. **Brick unit:** ASTM C652, Unit Strength: (ICBO RR #2730, Class H 12000, UBC Table 24-C), F'm =4700 p.s.i. (min.), Grade SW, hollow load-bearing.
 - 1. Basic shapes and sizes: 6 in. W x 4 in. H x 12 in. L and 8 in. W x 4 in. H x 12 in. L Atlas units.
 - 2. Special shapes: Head, sill, bullnose units and accent band.
 - 3. Field colors (medley pattern) and texture: Mountain Red and Baja Brown (% of each to be determined by manufacturer and Architect).
 - 4. Accent band, headers and sills: Ironstone.
- B. **Cement:** ASTM C150, Type I or II, Low Alkali.
- C. **Additive:** GIBCO MRF liquid additive, as manufactured by GIBCO Industries, Inc., Tulsa, Oklahoma (1-800-822-0802) in lieu of lime.
- D. **Mortar Color:** Tamms or Custom standard commercial brand of chemically inert coloring material as selected by Architect.
- E. **Aggregates:** ASTM C144 and ASTM C404.
 - 1. **Sand:** Fine granular material, composed of hard, strong, durable mineral particles, free from injurious amounts of saline, alkaline, organic or other deleterious substances.
 - 2. **Pea gravel:** ASTM C404, Worked and graded with no more than 5% passing No. 8 sieve and with 100% passing 3/8 in. sieve.
- F. **Water:** Clean, potable, from domestic supply.
- G. **Cleaning material:** See Section 04510, Masonry Cleaning.
- H. **Miscellaneous items:** Additional materials required to complete the Work.

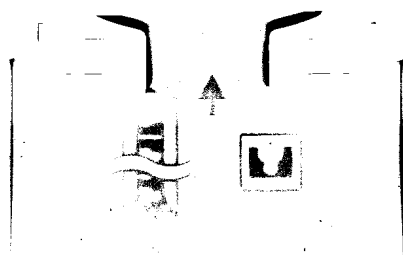


2.03 MORTAR AND GROUT

- A. **Mortar for joints:** Type M, complying with ASTM C270 and UBC 2402, composed of 1 sack Portland cement, 3 ounces of GIBCO's MRF and 2-1/2 cubic feet of clean masonry sand. Admixture proportions to be verified with manufacturer and accepted by Architect.
1. **Additive:** GIBCO MRF, as distributed by GIBCO Industries, Inc., in lieu of lime.
 2. **Mixing:** Mix 3-1/2 to 4 gals. of water, GIBCO's MRF, 1/3 amount of sand required and 1 sack (94 lb.) of Portland cement. Then add remaining 2/3 of sand in a mechanically operated batch mixer for 3 to 5 minutes.; a continuous mortar mixer will not be permitted.
 3. **Slump:** Add water to desired consistency to do Work.
- B. **Grout for cells:** Pump mix composed of 1 sack Portland cement, 1 ounce of GIBCO's MRF, 1/3 cubic feet of pea gravel and 2/3 cubic feet of clean masonry sand. Admixture proportions to be verified with manufacturer and accepted by Architect.
1. **Additive:** GIBCO's MRF, as distributed by GIBCO Industries, Inc., in lieu of lime.
 2. **Mixing:** Mix as required for mortar, except adjust amount of water to make a creamy flow that will not allow gravel for grout spaces less than 2 in. clear in horizontal dimension.
 3. **Slump:** 7 inch max. (12" cone). **Add no water at jobsite.**
- C. Mortar and grout not used within 30 minutes after leaving mixer shall not be permitted on the Work. **Retempering of mixture is not permitted.**
- D. **Grout:** Minimum 5,000 p.s.i. at 28 days – compressive strength.

2.04 DRYPACK FOR BEARING PLATES

- A. **Drypack:** Mix 1 part Portland cement, 2 parts fine aggregate, and enough water to hydrate cement and provide a mixture that can be molded with the hands into a stable ball (a stiff mix). Do not mix more than can be used in 30 minutes. Use for drypacking under bearing plates and structural members.



3.00 EXECUTION

3.01 INSPECTION

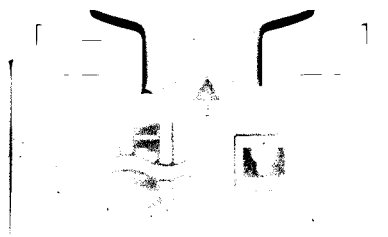
- A. Inspect related Work and adjacent surfaces for completeness and report to Architect conditions detrimental to a proper and timely completion of the Work.

3.02 PLACING REINFORCEMENT

- A. Accurately set and place reinforcing steel, except dowels in other material. In spaces containing reinforcement except small rods or mesh 1/4 in. less in diameter, space at least 1/4 in. clear distances between masonry and reinforcement.
 - 1. **Vertical bars:** Continuous from bottom cell to top of wall, centered in cells, except where otherwise indicated. Where necessary, hold vertical steel firmly in place by frames or other suitable devices acceptable to Architect.
 - 2. **Horizontal bars:** Wire Temporarily above exact position and tag to indicate correct locations. Use calibrated vertical bars where indicated, wired to vertical bars or dowels.

3.03 PREPARATION

- A. **Previously placed concrete or masonry:** Clean of encrustations, laitance, oil and coatings which would reduce bond. Wash Work thoroughly with water under pressure; leave surfaces damp where masonry units connect with earlier placed Work.
- B. **Brick units:** Thoroughly clean of dust, grease, oil or other matter which would reduce bond.
- C. **Wetting of brick:** Wet brick having ASTM C67 absorption rates greater than 0.025 oz. per sq. in. per minute.
 - 1. Determine absorption by placing 20 drops of water inside a circle the size of a quarter on typical units. If water is absorbed within 1 1/2 minutes, wet brick before laying.
 - 2. Use wetting methods which ensures that each masonry unit is nearly saturated but surface dry when laid.
- D. **Reinforcement:** Clean of mill scale, loose rust, oil and coatings which would reduce bond. Securely anchor in place.
- E. Obtain acceptance of methods of placement and fastenings of reinforcement prior to start of Work from Architect.



3.04 WORKMANSHIP

- A. Preserve unobstructed vertical continuity of cells to be filled. Fully bed webs and crosswalls forming such cells in mortar to prevent leakage of grout. Strike joints around cells smooth.
- B. Fractional parts of masonry units are prohibited where whole units can be used. Chinking of interstices with fragments will not be allowed. Provide special units as necessary to form openings and lintels.
- C. Fill all cells of masonry solid with grout in lifts not exceeding 4 feet in height. Except at finished course, stop grout one-half course height below top of last grouted. Grout fill all cells unless otherwise noted.
- D. No part of any masonry wall may be carried more than 6 feet higher than adjoining portions.
- E. Where absolutely necessary, for construction purposes to stop off longitudinal runs of masonry, stop off only by racking back one-half unit length in each course. Tothing will not be permitted.
- F. At openings for ducts, pipes and conduit built into masonry walls, cut to form fractional units with abrasive saw.

3.05 COLD WEATHER MASONRY CONSTRUCTION

- A. Cold weather masonry construction shall be held to a minimum, but if deemed necessary and accepted by Architect, conform to Specifications entitled, Recommended Practices for Cold Weather Masonry Construction, as issued by International Masonry Industry and Weather Council.

3.06 JOINTS AND COURSING

- A. Where masonry is exposed on interior or exterior, tool all joints concave, dense and smooth.
- B. **Bond:** Common running bond unless otherwise indicated.
- C. **Joints:** 1/2 in. wide.

3.07 BOLTS, ANCHORS AND FRAMES

- A. Set bolts, frames and inserts necessary for attachment of subsequent Work and items furnished under other Sections.



1. Truss contractor to verify accuracy, securing and placement of hold down bolts, with written acceptance given to masonry subcontractor, with copy to Architect.
- B. Hold down anchor bolts for trusses shall be set in accord with truss manufacturer's shop drawings and layout templates.

3.08 POINTING AND CLEANING

- A. Leave exposed surfaces clean and free of surplus mortar, mortar stains, or foreign material. Immediately remove grout and mortar droppings from finished surfaces.
- B. **Defective joints:** Point holes or defective mortar joints in exposed masonry and cut out and repoint defective joints. Replace chipped or broken masonry units.
- C. **Staining and excess mortar:** Protect exposed masonry against grout staining. Where grout or mortar does contact the faces of masonry, remove it immediately. Should accidental spillage occur, wash and clean surfaces immediately. Remove stains where they occur. Clean efflorescence with specified masonry cleaner.

3.09 DRYPACK UNDER BEARING PLATES

- A. Drypack under bearing plates, anchoring devices, and leveling shims with specified drypack.

END OF SECTION 04211

