

SECTION 04200

UNIT MASONRY - BRICK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Common Brick
- B. Face brick.
- C. Pavers

1.2 REFERENCES

- A. ASTM C 126 - Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.
- B. ASTM C 216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale).
- C. ASTM C 902 - Standard Specification for Pedestrian and Light Traffic Paving Brick.
- D. ASTM C 1088 - Standard Specification for Thin Veneer Brick Units Made From Clay or Shale.
- E. ASTM C 1272 - Standard Specification for Heavy Vehicular Paving Brick.
- F. OSHA 1926.450 – 1926.454, Subpart L – Scaffolds
- G. OSHA 1926.500 – 1926.503, Subpart M – Fall Protections
- H. Related Sections -
 - 1. Section 01400 – Quality Control
 - 2. Section 04065 - Mortar and Masonry Grout.
 - 3. Section 04080 - Masonry Reinforcement Systems.
 - 4. Section 04810 - Unit Masonry Assemblies

1.3 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Manufacturer's catalog data, detail sheets, and specifications.
- C. Selection Samples: For each product requiring color/texture selection, provide full size samples for final selection.
- D. Verification Samples: For each product, color and texture selected, provide two full-size units representing actual color and texture of products to be installed.
- E. Submit detailed shop drawings and installation details for sculptured brick murals.
- F. Certificates: Prior to delivery, submit to Architect/Engineer certificates for materials being used, attesting compliance with the applicable specifications for grades, type or classes included in these specifications.

1.4 QUALITY ASSURANCE

- A. Test in accordance with ASTM C67, with the following additional requirements:
- B. For engineered brick masonry, if the coefficient of variation of the compression samples tested exceeds 12%, obtain compressive strength by multiplying average compressive strength of specimens by: $1 - 1.5 (v/100 - .12)$ where v is the coefficient of variation of sample tested.
- C. In case of a dispute, cost of tests of units after delivery shall be borne by the purchaser, unless tests indicate that units do not conform to the requirements of the specifications, in which case cost shall be borne by the seller.
- D. For field construction, use materials and mix by proportions in accordance with BIA Technical Notes, measuring materials by volume.
- E. Laboratory mortar testing may be required to establish mortar properties before or during construction or to maintain a degree of quality control during mortar production in the field. This testing is to conform to ASTM C780.

1.5 SAMPLE PANELS

- A. Construct sample panel at location indicated or directed, and as follows:
 - 1. Size: 4 feet by 4 feet (1.2 m by 1.2 m).
 - 2. Include all unit types and sizes to be used, and mortar joint treatment showing the proposed color range, texture, bond, mortar, tooled joints, and workmanship. All brick shipped for the sample shall be included in the panel. Larger panels with more details such as flashing, ties, cavity and weepholes may be required.
- B. Obtain architect's acceptance of sample panel before beginning construction activities of this section.
- C. Do not remove sample panel until construction activities of this section have been accepted by architect.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products of this section on pallets, with individual faces protected; keep dry.
- B. Store glazed units in protected area or under cover on level ground; keep dry. Do not double-stack pallets.
- C. Store brick off ground and cover with plastic to prevent contamination by mud, dust or materials likely to cause staining or other defects.
- D. Store mortar bags off the ground and covered.
- E. Place sand on plastic and tarps, and cover with plastic at end of day.
- F. Protect reinforcement from elements.

1.7 PRECONSTRUCTION CONFERENCE

- A. A preconstruction conference, directed by the Architect/Engineer, will be held after the award of the General Contract, but prior to beginning of masonry work to discuss:
 - 1. Method and sequence of masonry construction
 - 2. Special masonry details
 - 3. Standard of workmanship
 - 4. Quality control requirements
 - 5. Job organization
- B. Attendance is mandatory for:
 - 1. General contractor job superintendent
 - 2. Masonry subcontractor job superintendent
 - 3. Masonry subcontractor foreman
 - 4. At least two masons
 - 5. Authorized representative of the brick supplier
 - 6. Mortar material suppliers

1.8 JOB CONDITIONS

- A. Protection of Work
 - 1. Wall covering to prevent mortar joint wash out and entry of water into the wall.
 - 2. During erection, cover top of wall with strong waterproof membrane at end of each day or shutdown.
 - 3. Cover partially completed walls when work is not in progress.
 - 4. Extend cover minimum of 24" down both sides.
 - 5. Hold cover securely in place.
- B. Load application.
 - 1. Do not apply uniform floor or roof loading for at least 12 hr. after building masonry columns or walls.
 - 2. Do not apply concentrated loads for at least 3 days after building masonry columns or walls.
- C. Provide temporary bracing during masonry erection, as required, and maintain in place until building structure provides permanent bracing.

1.9 STAINING

- A. Prevent grout or mortar from staining the face of masonry.
- B. Remove immediately grout or mortar in contact with face of masonry.
- C. Protect all sills, ledges and projections from droppings of mortar, protect door jambs and corners from damage during construction.
- D. Protect the base of the wall from rain splashed mud and mortar splatter by using straw, sawdust or plastic spread along the base.
- E. Scaffold boards near the wall should be turned on edge at the end of the day.

1.10 COLD WEATHER PROTECTION

- A. When ambient air temperature is below 40°degrees F, implement cold weather procedures, and comply with the following:
 1. Do not lay masonry units having either a temperature below 20° F or containing frozen moisture, ice or snow on the surface.
 2. Heat water and sand to produce mortar between 40° F and 120° F. Protect newly constructed masonry by covering with a weather-resistive membrane for 24 hours.
 3. When ambient air temperature is between 32° F and 25° F, maintain mortar temperature above freezing until used in masonry.
 4. When ambient air temperature is between 25° F and 20° F, heat masonry surfaces under construction to 40°F and use wind breaks when wind speeds exceed 15 mph.
 5. When ambient air temperature falls below 20° F, provide an enclosure and auxiliary heat to maintain air temperatures above 32° F for 24 hours.

1.11 HOT WEATHER

- A. When the ambient air temperature exceeds 100° F or 90° F with a wind velocity greater than 8 mph, mortar beds shall not be spread more than 4 ft. ahead of the masonry units. Units shall be laid within one minute of spreading mortar.

1.12 PREPARATION

- A. Establish lines, levels and coursing. Protect from disturbances.
- B. Wetting Brick.
 1. Wet brick with average absorption rates in excess of 30 g./min/30 sq. in. determined by ASTM C67, so that rate of absorption when laid does not exceed this amount. During cold weather construction, these brick may require sprinkling with warm or hot water just before laying. During cold weather construction, the absorption rate may reach 40g./min/30 sq. in. before wetting may be required. The masons discretion must be counted upon to determine optimum workability for brick and mortar.
 2. Recommended procedure to insure that brick are nearly saturated, surface dry when laid is to place a hose on the pile of brick until the water runs from the pile. This should be done one day before brick are to be used. In extremely warm weather, place hose on pile several hours before brick are to be used.

1.13 CLEANING REINFORCEMENT

- A. Before being placed, remove loose rust, ice and other coatings from reinforcement.

2.0 GENERAL ERECTION REQUIREMENTS

A. Construction Tolerances

1. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4" in 10' or 3/8" in a story height not to exceed 20', nor 1/2" in 40' or more. For external corners, expansion joints, control joints and other conspicuous lines, do not

exceed 1/4" in any story or 20' maximum, nor 1/2" in 40' or more. For vertical alignment of head joints do not exceed plus or minus 1/4" in 10', 1/2" maximum.

2. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, nor 1/2" in 40' or more. For top surface of bearing walls do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.
3. Variation in Cross-Section Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4" nor plus 1/2".
4. Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

2.01 BOND PATTERN

- A. Lay exposed masonry in running bond or as indicated by Architect.
- B. Bond unexposed masonry units in a wythe by lapping at least 2".

2.02 JOINING OF WORK

- A. Where fresh masonry joins partially set masonry:
 1. Remove loose brick and mortar.
 2. Clean and lightly wet exposed surface of set masonry.
 3. Stop off horizontal run of masonry by racking back 1/2 length of unit in each course.
 4. Tothing is not permitted except upon written acceptance of the Architect/Engineer.

2.03 TOOLING AND TUCK POINTING

- A. Tooling:
 1. Tool exposed joints slightly concave or "V" or grapevine when "thumbprint" hard with a nonrusting round jointer slightly larger than width of joint, compressing mortar tightly against both sides of the joint, head joints shall match bed joint profile.
 2. Trowel-point or concave tool exterior joints below grade.
 3. Flush cut all joints not tooled.
- B. Tuck Pointing:
 1. If required, rake mortar joints to a depth of not less than 1/2" nor more than 3/4".
 2. Saturate joints with clean water.
 3. Fill solidly with pointing mortar of the same proportions as mortar in main part of the wall, if known; if not, type N.
 4. Tool joints.

2.04 FLASHING

- A. Clean surface of steel or masonry smooth and free from projections which might puncture flashing material.
- B. When installing the flashing in a mortar joint without an angle, place the flashing on a bed of mortar and cover with mortar.
- C. When installing the flashing on an angle, no mortar below or above the flashing is required.
- D. Extend flashings back through brick facing, turn up minimum 8" and bed into mortar joint of concrete block back-up. If metal stud back up, flashing to be mechanically fastened to back up. Lap end joints minimum 6" and seal watertight. Use flashing manufacturer's recommended adhesive.

- E. When back-up changes from block to a concrete or steel column, the flashing is to be mechanically fastened to the different material.
- F. Flashing should extend to: 1/4" past the face of the brick or per manufacturer's recommendation.
- G. All changes of direction such as columns, interior or exterior corners, the flashing is to be continuous around the changes and permanently sealed.
- H. Discontinuous flashing used at sills should be dammed up into the head joint 4" to 8" past the end of the sill. Mortar is to be placed on each side of the flashing in the head joints.
- I. All splices should be sealed with the manufacturers recommended adhesive.
- J. Spaces or cavities below soft flashings at the base of the walls are to be filled with mortar or grout.
- K. Provide neoprene pad over shelf angle bolts to minimize tearing of the flashing.

2.05 WEEP HOLES

- A. Provide weep holes in head joints in first course immediately above all flashing by:
 - 1. Leaving head joint free and clean of mortar
or
 - 2. Plastic brick vent
or
 - 3. Rope Wick, 18" long.
- B. Maximum Spacing - 24" for open head or vent, 16" for rope wick. Keep weep holes and area above flashing free of mortar droppings.

2.06 MISCELLANEOUS

- A. Sealant Recesses - Leave joints around outside perimeters of exterior doors, window frames and other wall openings; a uniform depth of 3/4" and 1/4" to 3/8" wide.
- B. Movement Joints - Horizontal and Vertical
 - 1. Keep clean from all mortar and debris and reinforcement.
 - 2. Locate as shown on drawings, 3/8" to 1/2" wide unless otherwise noted.
 - 3. Install backer-rod and sealant according to manufacturers specifications.
- C. Cutting Brick - Cut exposed brick with motor-driven saw or by other methods which provide cuts that are straight and true.
- D. Mortar Joint Thickness - Lay all brick with 3/8" joint.
- E. Ties
 - 1. Ties placed in bed joints should be placed with one-half brick width embedment, approximately 2", but no less than 5/8" mortar cover.
 - 2. Adjustable wall ties; i.e., eye and pintel, should have a tight fit for both pushing and pulling, 1/16" play.
 - 3. Spacing
 - a. Flexible anchors to structural framework, 24" o.c.
 - b. Double pintel, flexible anchors, brick to block back-up, 1 tie per 2-2/3 sq. ft. with maximum vertical and horizontal spacing of 24".
 - c. Standard, one piece, joint reinforcement, brick to block back-up, maximum vertical spacing of 16" o.c.
 - d. Masonry veneer anchors to steel stud backup, single pintel, 1 tie per 2 sq. ft. with maximum vertical spacing of 24" and maximum horizontal spacing of 18".

- e. At openings provide additional ties, spaced not more than 3 ft. apart around the perimeter and within 12" of the opening.
 - f. Place ties 8" from the edge for tops of walls and for control joints.
- F. Cavity Width - During construction the width is to be approximately 2". If rigid insulation is placed in the cavity, there is to be a 1" clear cavity after wall construction.

3.01 WORKMANSHIP AND INSTALLATION

A. Mortar Handling

1. Mixing Procedures

- a. Thoroughly mix ingredients in clean mechanical batcher for 3 to 5 minutes.
- b. Mix mortar ONLY in quantities needed for immediate use.
- c. Measure materials by volume or equivalent weight, using the same measurement for each material and batch. Do not measure by shovel.
- d. If mortar color is to be used, add in accordance with manufacturers recommendations. Ensure uniformity of mix and coloration.
- e. DO NOT use anti-freeze compounds to lower the freezing point of mortar or accelerators.

2. Retempering

- a. If necessary, retemper mortar within two hours of mixing to replace water lost by evaporation.
- b. DO NOT retemper mortar after two (2) hours from time of mixing. Throw away after 2 hours.
- c. ONLY add a small amount of water within a basin formed in the mortar, than rework mortar.
- d. Dashing or pouring water over mortar WILL NOT be permitted.
- e. Discard all mortar that has stiffened because of chemical reaction (hydration), or which is harsh, nonplastic.

3.02 BRICK INSTALLATION

- A. DO NOT install cracked, broken, chipped, or otherwise damaged masonry units.
- B. Lay-out and adjust each coursing to each wall space so that no course shall finish at an external corner or at a jamb with a piece less than 1/2 size unit wherever possible. Bond of each course at jamb openings shall be symmetrical.
- C. Lay brick plumb and true to lines, head joints to line up and be plumb.
- D. Lay with completely filled mortar joints; bed joints should not be deeply furrowed and brick should be buttered with sufficient mortar to fill head joints.
- E. Rock closures into place with head joints thrown against two adjacent brick in place.
- F. Adjust units to line and level while mortar is soft and plastic. Do not disturb unit once in place except to completely remove and set in fresh bed of mortar. If head joints are opened during adjusting, refill head joints.
- G. Do not pound corners and jambs to fit stretcher units after they are set in position. Where an adjustment must be made after mortar has started to harden, remove mortar and replace with fresh mortar.
- H. Keep cavity in cavity walls clean by:
 - 1. Installing a type of subsurface drainage matting in the cavity to prevent mortar droppings from clogging the cavity
 - or
 - 2. Plastering excess mortar onto back of brick
 - or
 - 3. Placing wood strips with attached wire pulls on metal ties. Before placing next row of metal ties, remove and clean wood strips.

- I. Minimize brick cleaning by:
 1. Careful workmanship should be practiced to prevent excessive mortar droppings and if any mortar droppings do adhere to the brick, they should be immediately removed.
 2. After tooling, mortar tailings should be cut off with a trowel and excessive mortar and dust brushed from the surface.
 3. Avoid any motion that will result in rubbing or pressing mortar particles into the brick faces.

3.06 CLEANING

- A. Cut out any defective joints and holes in exposed masonry and repoint with mortar.
- B. Clean all exposed unglazed masonry:
 1. At least 21 days prior to regular cleaning apply cleaning agent to sample wall area of 20 sq. ft. in location acceptable to Architect/Engineer.
 2. Do Not proceed with cleaning until sample area is approved by Architect/Engineer.
 3. Dry clean the wall first, removing blobs of mortar with wooden paddles or tools.
 4. No wet cleaning shall take place within seven days of placing masonry.
 5. Do not use high pressure spray to apply cleaning solution or rinsing down the walls; unless approved in advance by Architect in writing.
- C. When cleaning agent is required:
 1. Follow brick manufacturer's recommendations.
 2. Thoroughly wet surface of masonry.
 3. Scrub with acceptable cleaning agent, avoiding mortar joints.
 4. Wait time as suggested by manufacturer before rinsing with clear water.
 5. Do small sections at a time.
 6. Work from top to bottom, insuring that lower portion of wall is thoroughly wetted when cleaning the upper portion.
 7. Protect all sash, metal lintels and other corrodible parts when masonry is cleaned with acid solution.

End of Section