SECTION 04812
THIN BRICK VENEER SYSTEM

PART 1 - GENERAL

1.01 PROVISIONS INCLUDED

A. The general provisions of the Contract, including General and Supplementary General Conditions, and Division 1 General Requirements, apply to work specified in this Section.

1.02 SUMMARY

A. This Section specifies a field erected thin brick veneer wall system.

B. Related Work Specified in Other Sections:
1. Conventional brick veneer: Section 04810.
2. Air- and water-barrier under thin brick system: Section 07270.
3. Joint sealants: Section 07920.

C. Alternates: Work of this Section is an Alternate. Refer to Section 01230 for a description of Alternates and procedural requirements related to Alternates.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's illustrated product literature, detailed specifications, installation and maintenance instructions for each of the products furnished under this section.

B. Shop Drawings: Dimensioned elevations showing layout of panels, brick coursing, control joints; indicate penetrations. Large scale details showing installation method, connections, joint conditions, terminations and penetrations, and other details requested by the architect.

C. Samples:

1. Brick and Mortar: Since brick and mortar should both match materials used in Section 04810, no additional submittal is required for the thin-brick system.

2. Steel support panel.

3. Panel fasteners.

4. Sample assembly, consisting of brick on steel support panels, with 50% of joints mortared; for verification of masonry and mortar.

D. Quality Control Submittals:

1. Test reports documenting compliance with specified system performance requirements.

2. Material certificates for adhesives and mortar materials, signed by manufacturer and Contractor certifying that each material complies with requirements.

3. Material certificates for support plate fasteners, signed by manufacturer and Contractor certifying that each material complies with requirements.

4. Material test reports from a qualified independent testing laboratory employed and paid by Contractor for masonry units. Include test results and interpretation test results relative to compliance with the specifications.

5. Qualification data for installers, as specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, telephone numbers, names of Architects and Owners, and other information specified.

E. Contract Closeout Submittals:
1. Maintenance instructions.
2. Warranty.

1.04 QUALITY ASSURANCE

A. Performance Requirements: Assembled wall shall meet or exceed the following performance standards when tested in accordance with the methods specified.

1. Surface Burning: ASTM E-84; flame spread 0, smoke developed 0.

2. Impact Resistance: ASTM E-695; wall system shall withstand impact of 27 kg (60 lbs) with no visible cracking of thin brick or mortar.

3. Wind-Driven Rain and Water Penetration: Water-resistant when tested in accordance with ICBO criteria, June 1, 1990; no moisture behind steel panels.

4. Freeze-Thaw Stability: System shall meet acceptance criteria recommended in ICBO "Freeze/Thaw Stability of System; Acceptance Criteria for Exterior Finish," June 1990. System shall withstand thermal cycling with no surface changes, deleterious surface effects, delamination of thin veneer, nor mortar shrinkage when viewed under 5X magnification.

5. Bond Strength of Mastic: ASTM C-297; bond of brick to steel backer panel shall withstand 10.5 kg/cm2 (150 psi) shear. After 7 day immersion in water, tensile strength shall meet or exceed 47 kg/m2 (70 psi).

6. Fastener Pull-Out Resistance: ASTM D-1037; Force needed to pull steel panel over the head of a #6 screw fastener shall be at least 160 kg (350 lbs) per fastener.

7. Salt Spray Resistance: ASTM B 117; support panel shall show no visible red rust after 3000 hours of continuous exposure.

B. Qualifications of Installer: Employees of the system manufacturer, or other installer trained, certified or approved by the manufacturer of the thin-brick system, and experienced in the installation of the system, who has at least three years of experience in the type of work required for this installation and who has successfully completed at least five similar installations in the past three years.

C. Mock-Ups: Before installing thin-brick system, build a mockup to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with Section 01400 requirements for mockups, and with the following requirements, using materials indicated for the completed Work:

1. Erect mock-up on the building wall at location directed by the Architect.

2. Size: The size of two of the support panels (two 2 x 4 panels minimum) so that the mock-up will show juxtaposition of two panels and will incorporate a sealant joint.

3. Approved mock-up may remain in place as part of the finished work.

D. Pre-Installation Conference: Conduct conference at Project site to discuss layout and installation of thin-brick system, protection of the work during installation, and coordination with surface preparation and abutting and penetrating work. Comply with requirements for Project Meetings in Section 01310, "Project Management and Coordination."

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in their original factory wrappings and containers, clearly labeled with identification of manufacturer, brand name, fire hazard classification, and lot number.

B. Store materials in original undamaged packages and containers, inside a well-ventilated area protected from weather, moisture, soiling, extreme temperatures and humidity, laid flat and blocked off-ground to prevent sagging and warping.

1.07 PROJECT/SITE CONDTIONS

A. Environmental Requirements:

1. Cold Weather Application: Do not use frozen materials in mortar mix. Do not apply mortar to frozen surfaces containing frost. Do not apply mortar when ambient temperature is less than 2°C (35°F) without providing sufficient protection and supplemental heat, as specified in Section 04810.

2. Hot Weather Application: Protect mortar from uneven and excessive evaporation. In warm weather (temperature above 70°F), or when conditions are dry or windy and evaporation is great, fog veneer with water daily for several days following grouting in order to prevent grout from drying out too quickly. Do not moist cure latex modified mortar.

B. Field Measurements: Take field measurements prior to preparing Shop Drawings and fabricating panels, to insure proper fitting of system. Note actual field measurements on Shop Drawings.

1.08 WARRANTY

A. Manufacturers warranty on materials and workmanship, covering labor and materials to repair or replace defective materials or installation. Defects shall be deemed to include, but not be limited to, fastener pullout, loss of bond between brick and support panel, loss of mortar beyond that due to normal weathering.

1. Duration of Warranty: 20 years from Date of Substantial Completion.

B. This warranty shall be in addition to and not in lieu of other warranties in these Contract Documents and other rights and remedies available to the Owner under these Contract Documents or under law.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Support System: American Brick Company (AMBRICO), Inc., 27303 West 8 Mile Road, Detroit, MI 48240.

B. Brick: Lachance Brick Co. in Gorham, Maine, a Division of Morin Brick.

2.02 VENEER SYSTEM MATERIALS

A. Steel Support Panel: 18 gauge architectural grade steel, hot-dipped galvanized, ASTM A525 G-90 coating, with stucco-embossed finish to promote adhesion of mortar, and with tabs punched into and protruding outwards from the face of the steel to support the brick.

1. Panel Size: Manufacturer's standard panel size or sizes, as recommended by manufacture to suit project conditions.

B. Brick: Same brick and same face size as specified in Section 04810 for the conventional veneer; 1/2 inch thick.

1. Special Shapes: Outside corner units consisting of one full length leg and one half length leg, to maintain running bond with 1/2 brick offset between courses.

C. Adhesive: Manufacturer's standard brick-to-steel adhesive; formulated to meet or exceed performance properties specified in ASTM C-557, with a shear value between the brick and steel panel of 10.5 kg/cm2 (150 psi) or greater when tested in accordance with ASTM E-297.

D. Mortar: Manufacturer's standard mortar mix, Type S, containing Portland cement, lime, aggregates, latex, pigments (if required), and other additives, designed to be mixed with water at

the project site, producing a mortar which has the properties of ASTM C270 Type S mortar and shear properties of at least 18 kg/cm2 (250 psi).

1. Mortar shall not efflorescence after installation.

2 Mortar Color: Match color of the mortar used for conventional brick veneer under Section 04810, which is specified to match mortar used on the lower floors of the Science Building Addition.

E Water: Clean and potable.

F Fasteners: For anchoring the steel support panels to concrete, furnish corrosion-resistant, large-diameter tapcon type concrete screws as manufactured by ITW Ramset/Red Head, U.S. Anchor Corp., or equal.

1. Size: 3/8" diameter x 1-1/2" length, unless larger size is recommended by fastener manufacturer to suite project conditions with respect to weather exposure, substrate, shear, fatigue, installation methods, and safety.

2.03 MASONRY CLEANERS

A. Job-Mixed Detergent Solution: Solution of trisodium phosphate (1/2-cup dry measure) and laundry detergent (1/2-cup dry measure) dissolved in one gallon of water.

B. Proprietary Chemical Cleaners: Conforming to specifications in Section 04810.

PART 3 - EXECUTION

3.01 EXAMINATION

A. In the company of the installer, examine substrate conditions and other conditions which will affect the installation of the thin brick system, including flatness and soundness of substrate. Confirm that the water barrier has been applied and sealed at perimeter and penetrations. Confirm that flashing is in place.

B. Do not proceed with installation of thin-brick until unsatisfactory conditions have been corrected.

3.02 PROTECTION

A. Protect adjacent materials from staining by adhesive and mortar used to installed thin brick. Protect sills, ledges, and projections from mortar droppings. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.

3.03 INSTALLATION, GENERAL

A. Install proprietary thin brick system in accordance with manufacturer's printed instructions.

B. Cover the entire surface of the existing precast concrete panels, as shown on the Drawings.

C. Control Joints: Locate support panels so that control joints in the wall system coincide with existing concrete control joints (sealant filled joints) and additionally are provided at the following locations:

1. 16'-0" on center, maximum spacing;

2. within 2 to 4 feet from corners;

3. at change in substrates and other locations where significant structural, substrate or frame movement will occur.

4. Where thin brick system abuts doors, windows, and similar construction, leave a gap of 1/4" to 3/8" to allow for movement.

D. Control Joint Width: 3/8-inch, unless otherwise shown.

E. Lay out support panels so that a full course of brick fits under or over openings; cut brick as little as possible at these locations. If a full course is not possible, use row locks, soldier coursing or trim.

3.04 STEEL SUPPORT PANEL INSTALLATION/APPLICATION

A. Install panels in correct orientation, in accordance with manufacturer's printed instructions.

B. Stagger panel joints between courses. Butt panels loosely at edges; leave 1/8" gap.

C. Align tabs at corners and joints.

D. Use tin snips or power shears to cut panels.

E. Fasten steel support panels to concrete substrate using the specified large-diameter tapcon anchors. Use at least one fastener per 900 cm^2 (1 square foot). Predrill holes for fasteners in accordance with fastener manufacturer's printed recommendations. Drive fasteners so that they penetrate the concrete at least 1-inch.

1. Keep panel as flat as possible and avoid buckling by fastening down center and then working out to edges. Install sufficient fasteners to pull panel flat to wall.

F. After installation clean panels to remove dirt, oil and other surface contaminants that may interfere with adhesion of mastic or mortar.

3.05 VENEER INSTALLATION

A. Bond Pattern: Running bond. Lay out brick so that pieces smaller than 1/2 brick will not be at corners and jambs and will be avoided where possible at other locations. Lay out brick so that grout joints are not placed directly over panel seams or joints.

B. Starting/Master Row: Comply with manufacturer's printed instructions, which are summarized below:

1. Start at an outside corner. Apply corner bricks, alternating long and short legs for running bond pattern. If corner bricks are not use, start wall with a full brick for the master row, and start the next course with a half brick.

2. Run one row of veneer the length of the wall to the next outside or inside corner, under or over window or door line. Then proceed with subsequent rows. Adjust tabs if necessary to keep courses level.

3. To install brick vertically (soldier course), flatten two rows of tabs into openings and rest bricks vertically on taps.

C. Cut brick by scoring face of brick to 1/4" depth with masonry blade of circular or cut-off saw, then breaking scored pieces with offset tile nippers. Install factory edge toward window and door moldings; or if that edge will be concealed by trim, place factory edge at exposed edge of the brick.

D. Adhere veneer to panel using specified adhesive in accordance with manufacturer's instructions for mixing, application method, and open time. Apply adhesive to the back of the bricks in dabs approximately 1-inch diameter or in vertical stripes 3/8-inch (1 cm) wide, two dabs or stripes per brick. Apply mastic to corner bricks with two daps or strips on the long leg and one dab or strip on the short leg. Apply the masonry within 5 to 10 minutes after adhesive has been applied.

1. Do not run a continuous horizontal bead of mastic on the steel panel; continuous mastic will hinder water drainage behind the brick.

2. Avoid using too much mastic, as this can push bricks away from the wall. Vent mastic by pulling brick away from supporting panel for a few seconds and then pushing the brick back into place; this will allow solvent to flash off and the mastic to become tacky.

3. In hot weather, mastic can form a film which hinders the bond. Slide brick on supporting panel to break the surface film.

E. After adhesive has set, fill joints with latex-modified mortar. Mix and apply mortar in accordance with manufacturer's printed instruction; follow manufacturer's recommended sequence of application. Mortar both horizontal and vertical joints as the work progresses; do not apply mortar over an area larger than that which can be tooled before the mortar becomes too stiff.

1. Mortar Mix: Screen dry mortar through 1/4" screen cloth before and after mixing to remove stones and lumps. Gauge dry mortar mix with water in proportions recommended by manufacturer of the thin-brick system. Take care not to add too much water, as this can result in formation of hairline cracks as mortar dries.

2. Overfill joints as the mortar will shrink as it dries.

3. When mortar is thumbprint dry, tool to pack mortar into the joint. Avoid striking too early, as this can cause hairline cracks to form.

4. Minimize formation of hairline cracks by following good joint grouting procedures, including using the correct proportion of water in the mix, allowing mortar to set properly before tooling, and preventing too rapid curing in hot, dry weather.

F. Corners: Where veneer turns a 90° outside corner, use prefabricated corner units or, if acceptable to the Architect, miter the thin brick at 45° with a nominal 8-inch leg and a nominal 4-inch leg. If field fabrication of corner unit is permitted, select the two brick carefully for color match and bond legs together with approved epoxy adhesive before installing, so that the unit will have the appearance of a single, full-size veneer brick.

G. Cure mortar in accordance with system manufacturer's recommendations. Take cold- and hot-weather precautions specified in Part 1 of this section to protect mortar against freezing and against too rapid drying.

H. Water Drainage: Provide weep holes, to allow water to drain through the brick. Locate weep holes at the base of the wall and above all openings, space 16" on center. Make weep holes at least 1/4" diameter. Leave the lowest joint, where the panel meets the starter angle, open.

3.06 FIELD QUALITY CONTROL

A. The Owner's testing and inspection agency will test brick and evaluate mortar mixes as specified in Section 04812. Prism testing will not be required.

3.07 CLEANING

A. Let mortar cure for at least 24 hours before cleaning. Clean brick to remove excess mortar from face within 48 to 72 hours after installation. Clean brick in accordance with Section 04810 specifications and also comply with thin brick system manufacturer's instructions to avoid damaging or displacing brick during cleaning.

END OF SECTION 04812