SP- 153015
(New)

# SPECIAL PROVISIONS
# FOR
# ORNAMENTAL BRICK COLUMNS

**Ida County**
**BRM-SWAP-3650(606)--SD-47**

**Effective Date**
**June 15, 2021**

**THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.**

## 153010.01 DESCRIPTION.

**A. General**
These Special Provisions specify requirements for ornamental brick columns to be constructed on the bridge abutments at each of four locations on the project, including but not limited to, the following:

1. Full Size Brick masonry work for column construction.
2. Integral Thin Veneer Brick for Structural Concrete.
3. Ornamental Cut Stone Sections
4. Masonry reinforcing, accessories and similar items as may pertain to masonry work.

## 153010.02 MATERIALS.

**A. Modular Brick**
Provide face brick conforming to ASTM C 216, Grade SW, Type FBS. Brick of one color shall be from the same production run. Provide brick masonry as follows:

1. Compressive strength, individual: Not less than 2500 psi.
2. Compressive strength, average of five: Not less than 3000 psi.
3. Water absorption, individual: Not more than 10%; ASTM C 67.
4. Water absorption, average of five: Not more than 8%.

5. Initial rate of absorption (suction), as defined in Section 9 of ASTM C67 shall not be greater than 10 gallons per minute per 30 square inches.

6. Size: Modular, 2 1/4 inch by 3 5/8 inch by 7 5/8 inch.

7. Color and Texture: Color shall be a grey color like Dunes Gray Tuscan produced by Glen-Gery. Texture shall be velour. See the sample submittal requirements for details.

8. Acceptable brick manufacturers include the following:

   **a.** Glen-Gery

   **b.** Endicott Clay Products Company

   **c.** Belden Brick Company

   **d.** Other suppliers submitted to and approved by the Engineer.

9. Joint Size: 3/8 inch typical uniform width.

10. Additional Furnish-Only Bricks: Include 20 additional modular brick units from the same production run as the furnished and installed units for future patching operations. Deliver materials to a site as directed by the Engineer.

**B. Integral Thin Veneer Brick**

1. Exterior grade thin brick shall meet the requirements of ASTM C 1088, Type TBS (Select). When the allowable thin brick unit tolerance values indicated by the thin veneer brick form liner gasket system manufacturer's recommendations are different than those specified for Type TBS, the more stringent of the two tolerance requirements shall apply.

2. Size: Normal (Modular), 2 1/4 inch by 7 5/8 inch by 9/16 to 3/4 inch thick.

3. Color and Texture: Color and texture shall match that used for the full-size modular bricks.

4. Bond Breaker: Thin veneer brick units shall have a factory-applied face wax or other bond breaker to prevent grout staining of the brick faces. Bond breaker shall be approved for use with the form liner gasket system by the form liner manufacturer.

5. Acceptable thin brick manufacturers include the following:

   **a.** Metro Brick by Ironrock Capital

   **b.** Summitville Tile Co.

   **c.** Feldhaus Thin Brick

   **d.** Endicott Clay Products

   **e.** Other suppliers submitted to and approved by the Engineer.

6. Additional Furnish-Only Thin Bricks: Include 20 additional thin veneer brick units from the same production run as the furnished and installed units for future patching operations. Deliver materials in manufacturer's unopened packaging to a site as directed by the Engineer.

**C. Thin Veneer Brick Form Liner Gasket Materials**

1. Acceptable Thin Veneer Brick Form Liner Gasket System Manufacturers

   **a.** Scott Systems, Inc.

   **b.** Architectural Polymers

   **c.** United Wall Systems

   **d.** Other manufacturers submitted to and approved by the Engineer.

2. Single or multi-use template system for vertical poured concrete walls. Modular templates formed of styrene plastic or polyurethane to securely surround individual thin veneer brick units, having factory-applied face wax or another bond breaker.

3. Maximum variation from indicated nominal dimensions of brick cavities:

   **a.** Length: +/- 1/32 inch.

   **b.** Height: +/- 1/32 inch.

   **c.** Depth: +/- 1/32 inch.

4. Coursing: soldier course as indicated in the plans.

**D. Mortar Materials**

1. Portland cement: ASTM C 150, Type I, except Type III may be used for cold weather construction. Provide natural color or white cement as required to produce required mortar color.

2. Lime: ASTM C 207, hydrated, Type S.

3. Mortar Aggregate: Complying with ASTM C 144, well graded and free of gypsum. Except for joints less than 1/4 inch use aggregate graded with 100% passing the No. 16 sieve.

4. Water: Clean and potable.

**E. Mortar Mix**

1. Provide mortar complying with ASTM C 270. Mix using known volume measures. Do not batch by shovel.

2. Provide Type S mortar for all masonry.

3. Limit cementitious materials in mortar to Portland cement-lime.

**F. Reinforcing, Welded Steel Wire Fabric**

1. In accordance with ASTM A 185.

2. Minimum gauge: 20.

3. Mesh: 1/2 inch.

4. Hot-dipped galvanized wire in accordance with ASTM A 82, with ASTM A 153, Class B-2 coating.

5. Width: 1 inch less than width of masonry.

**G. Masonry Cleaners**

Keep stonework as clean as possible as work progresses. Upon completion clean stone thoroughly with water or detergent and water and fiber brushes. Thoroughly rinse when complete with clean water. Do not use acids or wire brushes.

**H. Accessories**

Plastic or foam bricks for tie hole locations (if needed), sized to securely fit form liner gasket and to create voids of appropriate dimensions for installation of grouted patch brick units following stripping of forms.

**153010.03 CONSTRUCTION.**

**A. Submittals**

1. Product Data: Provide manufacturer's product date for each type of masonry unit, integral think veneer brick, ornamental cut stone, and manufactured product, including certifications that each type complied with specified requirements.

2. Shop Drawings: Submit shop drawings detailing the Ornamental Brick Column construction for approval by the Engineer.

3. Samples for Initial Selection Process:

   a. Modular Brick - Submit unit masonry samples showing color and texture.

   b. Integral Think Veneer Brick - Submit samples showing color and texture.

   c. Ornamental Cut Stone - Submit samples showing color and texture.

   d. Mortar - Submit color samples.

**B. Mock-Up**

1. Prior to installation of masonry work, erect sample brick column to further verify selections made for color and textural characteristics, under sample submittals of masonry unity and mortar, and to represent completed masonry work for qualities of appearance, materials, and construction.

2. Build mock-up for the brick column including mortar, accessories, and structural elements.

3. Retain mock-up during construction as standard for judging completed masonry work. Mock-up may be incorporated into project if property located and if it is acceptable.

**C. Product Delivery, Storage, and Handling**

1. Materials shall be delivered, stored, and handled fully protected from wetting, staining, chipping, and other damage. Store masonry materials on raised timber or platforms, above ground, under weathertight covers or indoors, and kept clean and dry.

2. Deliver and store cement, lime, and other perishable materials in their original containers, plainly marked with brand name and manufacturer's name, indoors or in weathertight sheds.

3. Protect masonry accessories from elements. Immediately before placing, remove loose rust, dirt, and other foreign materials.

**D. Standards**

For each type of material required by these Special Provisions, provide primary materials which are products of a single manufacturer. Provide secondary materials which are acceptable to manufacturers of primary materials

**E. Tests**

Contractor is responsible for testing and quality control implementation of mortar, grout, and other masonry materials as specified herein.

**F. Quality Assurance**

1. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface of visually related surfaces.

2. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

**G. Integral Thin Veneer Brick Construction**

1. Forming

   a. Do not begin installation until concrete forms have been properly prepared.

   b. If form ties are necessary within the brick zones indicated in the plans, coordinate location of ties with the form liner gasket system. Ties shall be located only within brick cavities of liner. Adjust position of ties, not form liner, as necessary to avoid conflicts with liner.

2. Installation of Form Liner Gasket System

   a. Thoroughly clean form surfaces prior to installation.

   b. Prepare, install, and finish form liner gasket system in accordance with manufacturer's recommendations.

3. Installation of Thin Veneer Brick Units

   a. Clean brick pockets free of all foreign material prior to setting thin bricks. Take special care not to damage the form liner gasket system during cleaning.

   b. Install thin brick units in accordance with form liner gasket system manufacturers written instructions.

**c.** When more than one color or texture brick is used to create a single-color brick field with variations, mix the different thin brick units prior to installing into gaskets so that color or texture differences are randomly patterned in the finished surface.

**d.** Ensure that all thin brick units are securely held in form liner gasket system.

**e.** Remove and replace any individual form liner gasket module that does not securely hold the thin veneer brick. Remove and replace any individual form liner gasket module if the thin brick unit falls out of it for any reason. Remove and replace any individual form liner gasket module if the thin brick is purposely removed from it for any reason.

**f.** If allowed by the manufacturer, glue may be used to aid in securing thin veneer bricks in place within the form liner gasket system. Use only approved glue as recommended by the manufacturer.

**4.** Installation Tolerances

**a.** Maximum variation in alignment of horizontal or vertical mortar joints: 1/4 inch in 10 feet, non-cumulative.

**b.** Maximum offset in plane of adjacent form liner units: 1/16 inch.

**c.** Maximum misalignment between adjacent form liner units: 3/64 inch.

**5.** Loading of Forms

**a.** Load forms with concrete according to the Standard Specifications and the following:

**i.** Do not drop concrete directly upon thin veneer brick during loading of vertical concrete forms.

**ii.** Do not touch thin veneer brick with internal vibrators (stingers).

**iii.** Do not externally vibrate forms or strike the outside of forms with heavy objects.

**iv.** Take particular care to ensure consolidation of concrete into all joint spaces between thin bricks.

**6.** Stripping and Cleaning

**a.** Remove the form liner gaskets immediately following stripping of the concrete forms. If approved by the form liner gasket system manufacturer, power washing may be used to aid removal of the gaskets from the brick surfaces.

**b.** Immediately following form stripping and form liner removal, commence power washing of brick surfaces in accordance with the manufacturer's recommendations. Use water pressure and temperature recommended by the manufacturer. Washing operations shall remove all concrete mortar leakage, thin veneer brick face wax or bond breaker, and any remaining form liner gasket components.

**c.** Do not re-use single-use brick gaskets on the project. Do not re-use any multi-use brick gaskets that are warped, cracked, torn, folded, crushed, or show other signs of damage. Replace any gaskets as directed by the Engineer.

**7.** Patching

**a.** Clean and prepare defects, including form tie voids and lost brick zones, if any, in accordance with manufacturer's recommendations. Concrete in any areas from which brick dropped out of form liner gasket prior to or during concrete pour must be carefully chipped out to create a pocket like an intentional block-out and prepared for patch brick installation. Do not damage surrounding brick or concrete during preparation of brick pocket.

**b.** Securely grout thin veneer bricks into voids using epoxy grout in accordance with manufacturer's recommendations and finish patched brick grout to blend with surrounding grout lines. Immediately clean any mortar from brick faces before staining can occur.

**c.** Patch brick installation tolerances:

**i.** Maximum offset of patch brick face to plane of adjacent brick faces: 1/16 inch.

**ii.** Maximum misalignment of patch brick relative to adjacent bricks: 1/16 inch.

**iii.** Maximum variation in mortar joints surrounding patch brick: 1/16 inch.

## H. Full Size Modular Brick Construction

**1.** Project Conditions

**a.** Hot Weather Protection: Hot weather construction is defined as occurring when ambient temperatures exceed 100F or 90F when wind velocity is greater than 8 mph. Use mortar within 1 1/2 hours after mixing. Discard mortar over 1 1/2 hours old and mortar stiffened due to hydration (setting).

**b.** Cold Weather Protection: Cold weather construction is defined as occurring when ambient temperatures fall below 40F or when the temperature of masonry units is below 40F. Strictly comply with Brick Institute of America (BIA) Technical Note 1, Hot and Cold Weather Construction, and Recommended Practices & Guide Specifications for Cold Weather Masonry Construction, Portland Cement Association.

**c.** Protection: As the work progresses, continuously protect brick and all surrounding surfaces which could be stained by mortar. Cover columns at end of each day’s work. Extend cover down sides of columns and hold securely in place. Turn scaffold boards on edge at end of day and protect base of columns to prevent rain splashed mud or mortar from contacting masonry.

**d.** Loading: Do not apply loads until work has set and cured and is ready to accept loading.

**2.** Masonry Construction, General

**a.** Masonry work shall be done by skilled masons, fully instructed as to the requirements of these Special Provisions, and adequately supervised during the

work. Masonry work quality shall comply with applicable recommendations of the Brick Institute of America (BIA), except as modified below.

**b.** Cold weather masonry shall conform to BIA Technical Note 1, Hot and Cold Weather Construction, and International Masonry Institute (IMI) Recommended Practices & Guide Specifications for Cold Weather Masonry Construction and the following:

**i.** Do no masonry work when outdoor temperature is less than 40°F unless provisions are made to adequately protect materials and finished work from frost by heating materials, enclosing work, and heating enclosed spaces.

**ii.** If masonry work must be done when ambient temperature is freezing or below, all masonry material must be at temperature between 50°F and 90°F, and mortar, when used, shall have a temperature between 60°F and 80°F. In addition, all masonry shall be protected from temperatures below 40°F for at least 48 hours after being laid.

**c.** Lay masonry plumb, true to line, and with level courses, with straight, clean, uniform joints, and true surfaces, and plumb corners. Maintain vertical alignment of joints as required by bond patterns indicated. Lay units in solid partitions to provide same evenness of surface on each side. Head and bed joints shall be approximately 3/8 inches wide. Use brick from at least two different pallets concurrently to prevent striping or patching or noticeable color variation.

**d.** If cutting of bricks is required, cut bricks with a motor driven saw to obtain true, even and undamaged edges. Do not use over-burned or oil- or grease-marked bricks. Do not use bricks with cracks or splits in any face, or with chips extending more than 1/8 inch from edges or 1/4 inch from corners. Do not break bricks with mason's hammer. Do not lay bricks until they are at least 60 days old.

**e.** Mix mortar using quantity of water to ensure good workability. For each batch, measure cement and lime in full bags; sand by weight or measure in suitable calibrated containers, with allowance made for moisture content, bulking, and consolidation. Do not use split sacks. Do not use shovel measurements of sand. Discard hardening mortar. Mix by machine only, for at least 3 minutes, but not more than 5 minutes. Use mortar within 2 hours of mixing at temperatures over 74°F, and 2 1/2 hours at temperatures between 50°F and 74°F.

**f.** Adjust each brick in final position while mortar is still soft and plastic. Remove bricks disturbed after mortar has stiffened and re-lay with fresh mortar.

**g.** Do not use installed masonry work to support or in any way receive scaffolding or other temporary supports.

**h.** Maintain masonry clean as work progresses. Exercise extreme care at exposed work to prevent smearing or staining with mortar.

**i.** At completion of work cut out and rejoint holes and defective joints, leaving entire work free of blemishes.

**j.** Contractor is responsible for adequately bracing all masonry work during construction.

**3.** Tolerances

**a.** Maximum variation from plumb for vertical lines and surfaces of columns: 1/4 inch in 10 feet.

**b.** Maximum variation in cross section dimensions and thicknesses of brick columns from plan dimensions shown: -1/4 inch; +1/2 inch.

**4.** Brick Masonry Installation

**a.** Lay all masonry without wetting, unless given written permission by the Engineer to wet the brick. At connections to masonry previously laid, wet the existing masonry surfaces with clean water before laying new masonry. Avoid standing water on masonry surfaces. At closure bricks, butter all sides of all surfaces of the brick to be placed, and butter the abutting surfaces of the in-place bricks.

**b.** Lay face brick in "Running Bond" pattern unless otherwise indicated. Construct brickwork to conform to approved mock-up. Lay bed mortar only a few bricks ahead of the work to prevent drying out. Use only soft and plastic mortar. Butter all four edges on ends of bricks to be laid with enough mortar so that some mortar will ooze out on top when the brick is laid. After spreading the mortar, bevel the cavity edge of the bed with flat of trowel to slope mortar away from the cavity. Roll brick into place to reduce the amount of mortar oozing from bed joint into cavity. Strike bed and head joints on inner face of wythe flush with brick surface and scoop up excess mortar with trowel or parge across inner face to prevent mortar from falling into cavity.

**c.** Shove bricks into place (do not lay) in full mortar beds, with vertical and horizontal joints filled. Do not slush. Strike exposed joints flush with face of brick, then finish as specified below.

**d.** When mortar at exposed joints has become partially set, but still sufficiently plastic to flow under pressure (i.e., is "thumb-print" hard), tool joints to a glassy hard, smooth, concave finish using 1 inch sled-type stainless steel jointer. During tooling of joints, enlarge any voids or holes and completely fill with mortar. Point up all joints including corners to provide a neat, uniform appearance.

**e.** Rake joints between brickwork and concrete base approximately 3/8 inch deep, ready to receive joint backing and sealant, if required.

**5.** Repair, Pointing, and Cleaning

**a.** Remove and replace masonry units which are loose, chipped, broken, stained, or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.

**b.** Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.

**c.** Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:

**i.** Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.

**ii.** Test cleaning methods on sample column; leave half column unclean for comparison purposes. Obtain approval of sample cleaning by Owner's Representative prior to proceeding with cleaning of masonry.

**iii.** Saturate wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clean water.

**iv.** Use bucket and brush hand cleaning method described in BIA "Technical note No. 20" to clean brick masonry made from clay or shale using job mixed detergent solution.

**v.** Clean concrete unit masonry to comply with masonry manufacturer's directions and applicable NCMA "Tek" bulletins.

**6.** Protection

**a.** Provide final protection and maintain conditions in a manner acceptable to installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

**153010.04 METHOD OF MEASUREMENT.**

The quantity of Ornamental Brick Columns will be measured by each column that is satisfactorily completed.

**153010.05 BASIS OF PAYMENT.**

Ornamental Brick Columns satisfactorily completed and in place will be paid for at the contract unit price. This payment shall be full compensation for all labor, materials, equipment, services, and incidentals necessary to perform the work of this section.