



**SPECIAL PROVISIONS
FOR
INTEGRAL THIN VENEER BRICK FOR STRUCTURAL CONCRETE**

**Woodbury County
IM-NHS-029-6(200)147--03-97
IM-NHS-029-6(202)147--03-97
IM-NHS-029-6(204)147--03-97
IM-NHS-029-7(50)149--03-97**

**Effective Date
November 21, 2017**

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.

150311.01 DESCRIPTION.

This specification describes the requirements for using integral thin veneer brick and a compatible form liner gasket system for installation within forms for vertical cast-in-place structural concrete and for precast retaining wall panels.

150311.02 MATERIALS.

A. Manufacturers.

1. Thin Veneer Brick Form Liner Gasket System Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Scott System, Inc.
 - b. Architectural Polymers
 - c. United Wall Systems
 - d. Other manufacturers submitted to the Iowa DOT, Office of Bridges and Structures for review and approval.
2. Thin Veneer Brick Unit Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Metro Brick by Ironrock Capital
 - b. Summitville Tile Co.
 - c. Feldhaus Thin Brick
 - d. Endicott Clay Products Co.
 - e. Other manufacturers submitted to the Iowa DOT, Office of Bridges and Structures for review and approval.

B. Thin Veneer Brick Form Liner Gasket Materials.

1. Single or multi-use template system for vertical poured concrete walls and corners. Modular templates formed of styrene plastic or polyurethane to securely surround individual thin veneer brick units, having factory-applied face wax or other bond breaker.
2. Maximum variation from indicated nominal dimensions of brick cavities:
 - a. Length: $\pm 1/32$ inch.
 - b. Height: $\pm 1/32$ inch.
 - c. Depth: $\pm 1/32$ inch.
3. Maximum variation from square, measured diagonally across non-adjacent corners: $\pm 1/16$ inch.
4. Coursing: Running bond for the abutment towers and piers, and both running bond and stacked course for the 5 foot by 5 foot mechanically stabilized earth (MSE) retaining wall panels as indicated in the plans.

C. Thin Veneer Brick Units.

1. Exterior grade thin brick shall meet the requirements of ASTM C 1088, Type TBX (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 TBX, the more stringent of the two tolerance requirements shall apply.
2. Size: Normal (modular) 2 1/4 inches high by 7 5/8 inches wide by 9/16 to 3/4 inch thick. Corner bricks (modular) long side 2 1/4 inches high by 7 5/8 inches wide, short side 2 1/4 inches high by 3 5/8 inches wide. Both sides of corner bricks shall be 9/16 to 3/4 inch thick.
3. Color and Texture: As indicated in the plans, and subject to approval of submitted samples. Brick color and texture shall match brick in the adjacent stage constructed bridge as closely as possible. All thin veneer brick used in the Project shall be from a single production run to ensure color and texture uniformity. Corner bricks (if used) shall match normal bricks in both color and texture.
4. Bond Breaker: Thin veneer brick units shall have 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. Additional Furnish-Only Thin Bricks: Include 120 additional thin veneer brick units from the same production run as the furnished and installed units for future patching operations. Of the provided quantity, 100 units shall be normal modular bricks and 20 units shall be corner bricks. Deliver materials in manufacturer's unopened packaging to a site as directed by the Engineer.

D. Accessories.

1. 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.
2. Epoxy grout in accordance with manufacturer's recommendations for the setting of patch bricks into defects and tie hole voids. Epoxy grout shall be non-leaching.
3. Other accessories as recommended by the manufacturer.

E. Quality Assurance.

1. **Manufacturer Qualifications:** Firm(s) experienced in manufacturing thin veneer brick form liner gaskets and thin veneer brick units similar to those indicated for this project and with a record of successful in-service performance, as well as sufficient production capacity to manufacture required units.
2. **Source Limitations for Form Liner Gaskets:** Obtain form liner gaskets through one source from a single manufacturer.
3. **Source Limitations for Thin Veneer Brick Materials:** Obtain thin veneer brick units through one source from a single manufacturer, and from a single production run for the entire Project to ensure color and texture uniformity.

F. Product Delivery, Storage and Handling.

1. Do not use damaged products. Do not install products not bearing product trade name and manufacturer's name.
2. Store all installation materials in manufacturer's unopened packaging in a dry storage area, with ambient temperature between 30°F and 120°F until installation. Protect all materials from exposure to sun, rain, dirt and dust until installation.
3. Do not top load or otherwise crush form liners in their packages.

150311.02 CONSTRUCTION.

A. Submittals.

The following shall be submitted to the Engineer for approval.

1. **Product Data:** Manufacturer's data sheets on each product to be used including:
 - a. Preparation instructions and recommendations.
 - b. Storage and handling requirements and recommendations.
 - c. Installation methods.
 - d. Cleaning methods following form removal.
 - e. Patching methods.
2. **Shop Drawings:** Submit elevation drawings and details that indicate:
 - a. Horizontal and vertical brick coursing.
 - b. Alignment of brick coursing to adjacent construction.
 - c. Corner details.
 - d. Construction joints.
 - e. Brick color and texture.
 - f. Special conditions.
3. **Selection Samples:** For each finish product specified, two complete sets of samples, representative of full range of color and finish for each brick type.
4. **Verification Samples:** For each finish product specified, two samples, representative of selected range of color and finish for each brick type. Include form liner sample and bond breaker sample applied to full size thin veneer brick, representing bond breaker to be used.

B. Mock-ups.

Construct mock-ups meeting the following requirements.

1. **Abutment Tower Mock-Up** [for project no. IM-NHS-029-6(204)147--03-97] - Construct a mockup with the dimensions and features shown in the "Abutment Tower Mock-Up

- Details" in the plans. Abutment tower mock-up is to be located near the jobsite, but shall not become part of the final construction. Use construction methods identical to those intended for final production abutment towers. Demonstrate brick void epoxy grout patching method on the mock-up. No production abutment tower work shall proceed until approval of the mock-up by the Engineer. Rebuild mock-up as required to produce acceptable work.
2. Pier Column Mock-Up [for project nos. IM-NHS-029-6(200)147--03-97; IM-NHS-029-6(202)147--03-97; IM-NHS-029-6(204)147--03-97] - Construct a mockup with the dimensions and features shown in the "Pier Column Mock-Up Details" in the plans. Pier column mock-up is to be located near the jobsite, but shall not become part of the final construction. Use construction methods identical to those intended for final production piers. Demonstrate brick void epoxy grout patching method on the mock-up. No production pier column concrete work shall proceed until approval of the mock-up by the Engineer. Rebuild mock-up as required to produce acceptable work.
 3. Overhead Sign Foundation Stem Wall Mock-Up [for project no. IM-NHS-029-7(50)149--03-97] - Construct a mockup with the dimensions and features shown in the "Foundation Stem Wall Mock-Up Details" in the plans. Foundation stem wall mock-up is to be located near the jobsite, but shall not become part of the final construction. Use construction methods identical to those intended for final production foundation stem wall. Demonstrate brick void epoxy grout patching method on the mock-up. No production foundation stem wall concrete work shall proceed until approval of the mock-up by the Engineer. Rebuild mock-up as required to produce acceptable work. This mock-up shall also represent application of the Thin Veneer Brick on the Cantilever Sign Foundation Pedestal as noted in the plans, and a separate mock-up for the Cantilever Sign Foundation Pedestal is not required.
 4. 5 foot by 5 foot MSE Panel Mock-Up [for project no. IM-NHS-029-7(50)149--03-97] - Construct a 5 foot by 5 foot (nominal) precast MSE panel with the dimensions and features shown in the plans. Use construction methods identical to those intended for final production 5 foot by 5 foot MSE panels. No production 5 foot by 5 foot MSE panel work shall proceed until approval of the mock-up by the Engineer. Rebuild mock-up as required to produce acceptable work.
 5. Additional Requirements - A qualified technical representative of the thin veneer brick form liner gasket system manufacturer or a supplier with at least three years of system installation experience shall be on site during mock-up construction and review. Representative shall also be on site for at least one complete production work cycle of form setup, concrete pouring, stripping, cleaning, and finish patching operations associated with the integral thin veneer brick.
 6. Mock-Up Removal - Upon completion of the project, the abutment tower, pier column and foundation stem wall mock-ups shall become the property of the Contractor and shall be removed from the site. The MSE panel mock-up, if approved for use by the Engineer, may be incorporated into the project.

C. Forming.

1. Do not begin installation until concrete forms have been properly prepared.
2. Carefully align brick gasket pattern at both horizontal brick coursing and vertical brick joint locations with the brick pattern in the adjacent stage constructed bridge. Place plastic or foam bricks in brick gasket pockets that cross the stage construction joint for later installation of patch bricks.
3. 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.

4. Coordinate installation of form liner gasket system with installation of required form inserts, rustication strips, construction joints, etc. as shown in the plans.

D. Installation of Form Liner Gasket System.

1. Thoroughly clean form surfaces prior to installation.
2. Prepare, install, and finish form liner gasket system in accordance with manufacturer's recommendations, and with guidance from the manufacturer's on site representative.

E. Installation of Thin Veneer Brick Units.

1. 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.
2. Install thin brick units in accordance with form liner gasket system manufacturers written instructions and with guidance from manufacturers on site representative.
3. Ensure that all thin brick units are securely held in form liner gasket system.
4. 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.
5. 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, and only with guidance from the manufacturer's on site representative.

F. Installation Tolerances.

1. Maximum variation in alignment of horizontal or vertical mortar joints: 1/4 inch in 10 feet, non-cumulative.
2. Maximum offset in plane of adjacent form liner units: 1/16 inch.
3. Maximum misalignment between adjacent form liner units: 3/64 inch.

G. Loading of Forms.

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

1. Do not drop concrete directly upon thin veneer brick during loading of vertical concrete forms.
2. Do not touch thin veneer brick with internal vibrators (stingers).
3. Do not externally vibrate vertical concrete forms or strike the outside of vertical forms with heavy objects. Precast panel forms may be externally vibrated if panels are cast horizontally and provided that the thin veneer bricks will not be dislodged from the form liner gasket by the vibratory process used.

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

H. Stripping and Cleaning.

1. 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.
2. Immediately following form stripping and form liner removal, commence power washing of brick surfaces in accordance with the manufacturer's recommendations and with guidance from the manufacturer's on site representative. 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.

I. Patching.

1. Clean and prepare defects and form tie voids, if any, in accordance with manufacturer's recommendations, and with guidance from the manufacturer's on site representative.
2. Securely grout thin veneer bricks into voids using epoxy grout in accordance with manufacturer's recommendations, and with guidance from the manufacturer's on site representative. Tool and finish patched brick grout to blend with surrounding grout lines. Immediately clean any mortar from brick faces before staining can occur.
3. Patch brick installation tolerances:
 - a. Maximum offset of patch brick face to plane of adjacent brick faces: 1/16 inch.
 - b. Maximum misalignment of patch brick relative to adjacent bricks: 1/16 inch.
 - c. Maximum variation in mortar joints surrounding patch brick: 1/16 inch.

150311.04 METHOD OF MEASUREMENT.

Integral Thin Veneer Brick will be measured by the square foot of acceptable thin brick installed.

150311.05 BASIS OF PAYMENT.

The accepted quantity for Integral Thin Veneer Brick will be paid for at the contract unit price per square foot. Payment for Integral Thin Veneer Brick as measured shall be full compensation for all materials, labor, tools, equipment, testing, inspection, services, accessories, and incidentals necessary to perform the work of this section. Payment for Integral Thin Veneer Brick shall also include the furnishing of additional thin brick units for future patching operations.