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DIVISION: 04—MASONRY
Section: 04810—Unit Masonry Assemblies

REPORT HOLDER:

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EVALUATION SUBJECT:

NOVABRIK—MORTARLESS CONCRETE BRICK VENEER

1.0 EVALUATION SCOPE

Compliance with the following codes:

2003 *International Building Code*® (IBC)

2003 *International Residential Code*® (IRC)

Properties evaluated:

- Weather resistance
- Transverse wind load resistance
- Structural

2.0 USES

NovaBrik is a mortarless, nonstructural, concrete brick veneer mechanically fastened to the structural framing of buildings.

3.0 DESCRIPTION

3.1 General:

The NovaBrik siding system is a nonstructural, nonload-bearing, concrete brick veneer that is mechanically attached to the structural framing of buildings and is installed without mortar at the joints. NovaBrik may be installed on various types of structural supporting material: concrete, masonry, steel framing or wood framing. When installed, the units interlock with the units below and are fastened to wood furring strips every third or fourth course with corrosion-resistant screws. The units are approximately 8 inches (203 mm) long, 3 inches (76 mm) high and 2⁹/₁₆ inches (65 mm) thick. See Figure 1.

Use of the veneer is limited to Type V, nonfire-resistance-rated, building construction.

3.2 Materials:

3.2.1 NovaBrik: NovaBrik units are concrete masonry units conforming to ASTM C 55 and C 140 as Grade N, Type II, concrete masonry units, except:

- a. The net minimum compressive strength is 3,500 psi (24 MPa).
- b. The maximum allowable absorption is 5 percent for normal-weight units and 7.5 percent for medium-weight units.
- c. The minimum face shell and web thicknesses are not applicable, since the NovaBrik units are solid units having a proprietary shape.

NovaBrik units have the dimensions shown in Figure 1. Each unit weighs 4.3 pounds (2 kg). Installed units have a dry weight of 27 psf (132 kg/m²).

3.2.2 NovaBrik PVC Starter Strip: The NovaBrik PVC Starter Strip is formed with polyvinyl chloride plastic and has a unique triangular cross section designed to accommodate the NovaBrik proprietary profile. The starter strip has 1/4-inch-diameter (6.3 mm) weep holes spaced 6 inches (150 mm) on center. See Figure 2.

3.2.3 Fasteners: Fasteners used to attach the veneer's wood furring strips to wood framing members shall be No. 10, corrosion-resistant wood screws long enough to penetrate at least 1 1/4 inches (31.7 mm) into the framing members. When the veneer's wood furring strips are attached to preservative-treated wood, fasteners shall be of hot-dipped zinc-coated galvanized steel or stainless steel. When used to attach the wood furring strips to cold-formed steel framing members, the fasteners shall comply with IBC Section 2209.1 [North American Specification for Design of Cold-formed Steel Structural Members (2001 edition)] or IRC Section R603.2.4. Fasteners used to attach the wood furring strips to concrete or masonry construction shall comply with the IBC, the IRC or a current evaluation report. The approved plans shall show connection details and specify the size and locations of fasteners.

In addition to the requirements specified above, fasteners shall comply with the requirements outlined in the detailed installation guidelines provided by NovaBrik International, Inc. These guidelines include fastener specifications as to material, heat treatment, finish, and pullout.

3.2.4 Water-resistive Barrier: The NovaBrik system shall be installed with a water-resistive barrier complying with IBC Section 1404.2 or IRC Section R703.2.

4.0 INSTALLATION AND DESIGN

4.1 Installation:

NovaBrik veneer shall be installed in accordance with IBC Section 1405.5 or IRC Section R703.7, as applicable. Additionally, installation shall comply with Sections 6.1 and 6.2 of Building Code Requirements for Masonry Structures, ACI 530-02/ASCE 5-02/TMS 402-02; this evaluation report; and the manufacturer's published installation instructions. See Figures 3 and 4. A water-resistive barrier complying with IBC Section 1404.2 or IRC Section R703.2 shall be installed

over the wall or, where applicable, the extruded polystyrene board. The NovaBrik PVC Starter Strip is applied over the water-resistive barrier and attached to the base of the wall with fasteners described in Section 3.2.2 of this report, spaced at every furring strip [maximum 16 inches (400 mm) on center]. The PVC starter strip is located immediately above the flashing.

Expansion or control joints shall be provided to limit the effect of differential movement of supports, and shall be specified on the approved plans by a registered design professional or the veneer manufacturer, in that order. Consideration shall be given to movement caused by temperature changes, creep, and deflection.

4.1.1 Installation in Accordance with the IBC: The NovaBrik veneer shall be installed on 1-inch-by-3-inch (25.4 mm by 76 mm) furring strips having a minimum specific gravity equal to 0.55, No. 2 grade or better, with the fastener size and spacing designed in accordance with Section 4.2.1 of this report.

4.1.2 Installation in Accordance with the IRC:

4.1.2.1 Installation on Wood Studs: A NovaBrik PVC Starter Strip shall be attached to the furring strips and leveled. Nominally 1-inch-by-3-inch or 1-inch-by-4-inch vertical furring strips having a minimum specific gravity equal to 0.55, No. 2 grade or better, shall be attached to wood studs as noted in Table 1, with fasteners as described in Section 3.2.2 spaced 10 inches (255 mm) on center. The base course of NovaBrik shall be placed on the starter strip, leveled, and attached to the starter strip with one No. 10 by 2¹/₂-inch-long (63.5 mm), corrosion-resistant wood screw at every furring strip [maximum 16 inches (406 mm) on center]. After the base course is installed, three to four courses (depending on stud spacing) are stacked and leveled, with each course staggered from the course below. Each NovaBrik in contact with a vertical furring strip, the third course [studs spaced 24 inches (609 mm) on center] or fourth course [studs spaced 16 inches (406 mm) on center], shall be drilled and attached to furring strips with one No. 10 by 2¹/₂-inch-long (63.5 mm), corrosion-resistant wood screw. Holes through the individual NovaBrik units shall be drilled on-site, and shall comply with the recommendations of NovaBrik International. The installation shall continue in a similar manner to the top of the wall, with attachment of the NovaBrik units to furring strips on every third or fourth course. The minimum edge distance from the center of the attachment hole to the edge of the NovaBrik units shall be ³/₄ inch (19 mm).

4.2 Design:

4.2.1 Design in Accordance with the IBC: Calculations and plans shall be submitted to the code official for approval. The calculations shall verify that the structural framing or wall substrate, lintels, connectors, and fasteners supporting the NovaBrik veneer are adequate to resist the additional vertical and lateral loads imposed by the veneer. Horizontal wood members supporting the NovaBrik shall be designed to limit deflection to ¹/₆₀₀ of the span of the supporting members.

In areas designated as Seismic Design Category C, D, E or F, fastener design and installation requirements shall comply with Sections 1405.5 and 1621 of the IBC and Section 6.2.2.10 of ACI 530/ASCE 5/TMS 402.

Installation of the NovaBrik veneer shall be limited to areas where the design wind pressure, as calculated in accordance with Section 1609.6.2.2 of the IBC for components and cladding, does not exceed 90 lbf/ft² (4.3 kPa).

4.2.2 Design in Accordance with the IRC: Plans shall be submitted to the code official for approval. In lieu of structural calculations, the design of the supporting structural wood framing shall be in accordance with this section, subject to the

wind speeds and snow loads for stud size and spacing noted in Table 1. Where wall openings occur, the wood header and trimmer and king studs shall be sized in accordance with IRC Section R502.5. The wood header at the opening shall be reinforced with an APA-rated plywood sheathing lintel having a minimum thickness of ²³/₃₂ or ³/₄ inch and a height determined in accordance with Table 2. The plywood sheathing face grain shall be oriented horizontally. Buildings constructed with the NovaBrik system and designed in accordance with this section are subject to the wall bracing and height limitations noted in IRC Sections R301.2.2.3, R301.2.2.4 and R703.7.

5.0 CONDITIONS OF USE

The NovaBrik Mortarless Concrete Brick Veneer described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** The materials, fabrication and installation comply with this report and the manufacturer's instructions.
- 5.2** For design in accordance with the IBC, wall framing, veneer installation and fasteners supporting the veneer shall be analyzed and designed in accordance with Section 4.2.1 of this report. The calculations shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.3** For design in accordance with the IRC, wall framing and header size and reinforcement shall be in accordance with Section 4.2.2 of this report.
- 5.4** Installation of the NovaBrik veneer shall be limited to areas where the design wind pressure, as calculated in accordance with Section 1609 of the IBC or Section R301.2.1 of the IRC, for components and cladding, does not exceed 90 lbf/ft² (4.3 kPa).
- 5.5** The veneer shall not be assumed to add fire resistance to the wall construction.
- 5.6** Use of the veneer is limited to Type V-B, nonfire-resistance-rated, building construction.
- 5.7** Substrates over which the veneer is installed shall be flat and solid and comply with the applicable provisions of the IBC or IRC and shall be capable of supporting the loads imposed by the veneer.
- 5.8** Use of NovaBrik veneer as a floor protector or wall shield for factory-built, solid-fuel-burning, heating appliances is outside the scope of this report.

6.0 EVIDENCE SUBMITTED

- 6.1** Manufacturer's descriptive literature, specifications and installation instructions.
- 6.2** Data and reports of tests in accordance with the ICC-ES Acceptance Criteria for Precast Stone Veneer (AC 51), dated January 2001.
- 6.3** Test reports on structural load fastening of NovaBrik to studs, lintels, gables; on uniform transverse wind load under ASTM 330; and on compressive strength, water absorption and dimensional characteristics under ASTM C 55.
- 6.4** Structural calculations for exterior wall stud size and spacing.

7.0 IDENTIFICATION

The veneer bricks shall be identified by their unique shape (see Figure 1 for details). Additionally, pallets of the bricks shall be labeled with the evaluation report number (ESR-1235), the name of the manufacturer (NovaBrik International, Inc.), and the product name (NovaBrik).

TABLE 1—BACKUP WALL SUPPORT REQUIREMENTS^{1,2,3,4,5}

| MAXIMUM BASIC WIND SPEED—3-SECOND GUST (mph) | WIND EXPOSURE CATEGORY | MAXIMUM GROUND SNOW LOAD (psf) | NUMBER OF STORIES | EXTERIOR WALL STUD SIZE AND SPACING | MAXIMUM BUILDING WIDTH (ft) |
|--|------------------------|--------------------------------|-------------------|--|-----------------------------|
| 90 | B | 50 | 1 | 2 x 4 @ 16" o.c. 2 x 4 @ 12" o.c. | 24 32 |
| | | | 2 | 2 x 6 @ 16" o.c. | 36 |
| | | | 3 | 2 x 6 @ 16" o.c. 2 x 6 @ 12" o.c. | 24 36 |
| 110 | B | 50 | 1 | 2 x 4 @ 12" o.c. 2 x 6 @ 24" o.c. 2 x 6 @ 16" o.c. | 24 32 36 |
| | | | 2 | 2 x 6 @ 16" o.c. | 36 |
| | | | 3 | 2 x 6 @ 12" o.c. | 36 |

For **SI**: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mph = 0.44 m/s, 1 psf = 47.9 N/m².

¹Minimum stud quality is spruce-pine-fir, surface dry, No. 3 or stud grade.

²Maximum stud clear height is 8 feet between stories. Maximum mean roof height is 40 feet.

³Minimum roof slope shall be ¹/₂:12; maximum roof slope shall not exceed 12:12.

⁴Interior face of stud wall to have minimum ¹/₂-inch gypsum board, attached in accordance with IRC Section R702.3.

⁵Building design loads:

Floor live load: 40 psf

Roof live load: 20 psf

Attic live load: 10 psf

NovaBrik dead load: 27 psf

TABLE 2—REQUIRED HEIGHT OF PLYWOOD LINTEL^{1,2,3,4,5,6} (inches)

| NO. ROWS OF NOVABRIK SUPPORTED ABOVE OPENING | WIDTH OF OPENING ⁶ (feet) | | | | | | | |
|--|--------------------------------------|----|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 |
| 2 | 5 | 5 | 5 | 5 | 5 | 6 | 8 | 8 |
| 3 | 5 | 5 | 5 | 5 | 6 | 8 | 8 | 10 |
| 4 | 5 | 5 | 5 | 5 | 6 | 8 | 8 | 10 |
| 5 | 5 | 5 | 5 | 5 | 8 | 8 | 10 | 10 |
| 6 | 5 | 5 | 5 | 6 | 8 | 8 | 10 | 12 |
| 7 | 5 | 5 | 5 | 6 | 8 | 10 | 10 | 12 |
| 8 | 5 | 5 | 5 | 6 | 8 | 10 | 12 | 12 |
| 9 | 5 | 5 | 5 | 6 | 8 | 10 | 12 | 12 |
| 10 | 5 | 5 | 5 | 8 | 8 | 10 | 12 | 14 |
| 11 | 5 | 5 | 5 | 8 | 10 | 10 | 12 | 14 |
| 12 | 5 | 5 | 6 | 8 | 10 | 12 | 12 | 14 |
| 13 | 5 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
| 14 | 5 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
| 15 | 5 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
| 20 | 5 | 5 | 8 | 10 | 12 | 14 | 16 | 18 |
| 25 | 5 | 5 | 8 | 10 | 14 | 16 | 18 | 20 |
| 30 | 5 | 6 | 10 | 12 | 14 | 18 | 20 | 22 |
| 35 | 5 | 6 | 10 | 12 | 16 | 18 | 22 | 24 |
| 40 | 5 | 8 | 10 | 14 | 16 | 20 | 22 | * |
| 45 | 5 | 8 | 10 | 14 | 18 | 20 | 24 | * |
| 50 | 5 | 8 | 12 | 14 | 18 | 22 | * | * |
| 55 | 5 | 8 | 12 | 16 | 20 | 24 | * | * |
| 60 | 5 | 10 | 14 | 18 | 22 | * | * | * |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

¹Length of plywood lintel to extend a minimum of 12 inches beyond either side of opening.

²Plywood shall be ²³/₃₂- or ³/₄-inch-thick APA rated sheathing or better. Plywood grain to be oriented horizontally.

³Plywood lintel fastening requirements

Screw fasteners:

Minimum No 10 × 2.5-inch-long corrosion-resistant steel wood screws with spacing dependent on the number of NovaBrik rows supported:

Up to 24 rows of NovaBrik: two rows of screws at 12 inches on center into the wood header.

25 to 39 rows of NovaBrik: two rows of screws at 8 inches on center into the wood header.

40 to 60 rows of NovaBrik: three rows of screws at 8 inches on center into the wood header.

Screw fasteners shall penetrate header framing a minimum of 1³/₈ inches. Screw fasteners shall be installed in accordance with Section 11.1.4 of the National Design Specification (NDS).

Nail fasteners:

10d × 3" long, 0.128" diameter, corrosion-resistant nails with spacing dependent on the number of NovaBrik rows supported:

Up to 24 rows of NovaBrik: two rows of nails at 9 inches on center into the wood header.

25 to 39 rows of NovaBrik: two rows of nails at 5 inches on center into the wood header.

40 to 60 rows of NovaBrik: three rows of nails at 5 inches on center into the wood header.

Nail fasteners shall penetrate the header framing a minimum of 2 inches. Nails shall be installed in accordance with Section 11.1.5 of the NDS.

⁴Header to be minimum 2× nominal lumber, Douglas fir–larch, hem-fir, southern pine or spruce-pine-fir, No. 2 grade.

⁵Blocking over opening shall be required when the depth of the wood header is not adequate to accommodate the appropriate fastener row spacing and fastener end and edge distances.

⁶The wood header and trimmer and king studs supporting the header shall be sized in accordance with IRC Section R502.5.

*The plywood lintel shall be analyzed and designed in accordance with Section 4.2.1 of this report. The calculations shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

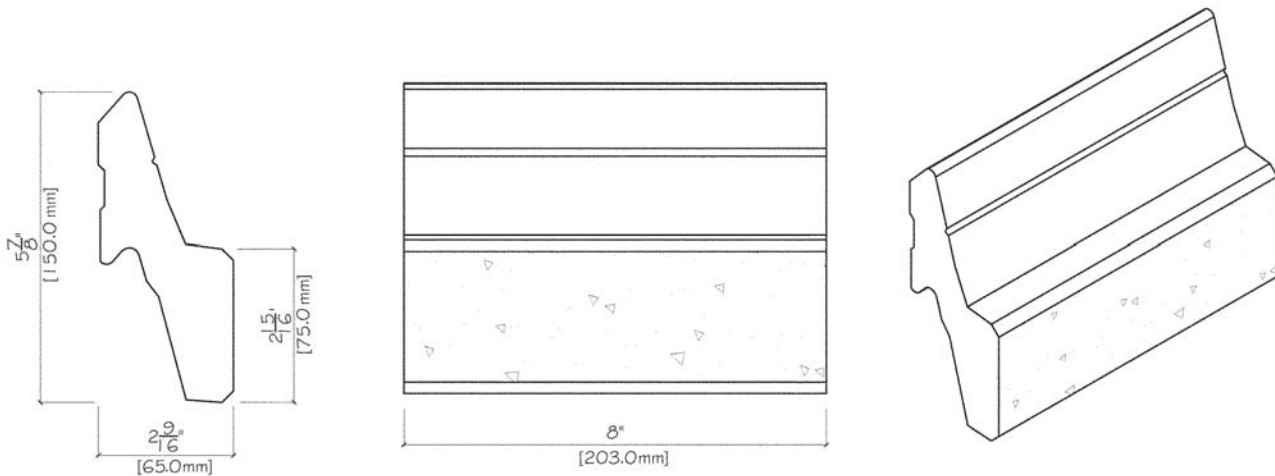


FIGURE 1—NOVABRIK MORTARLESS BRICK SIDING

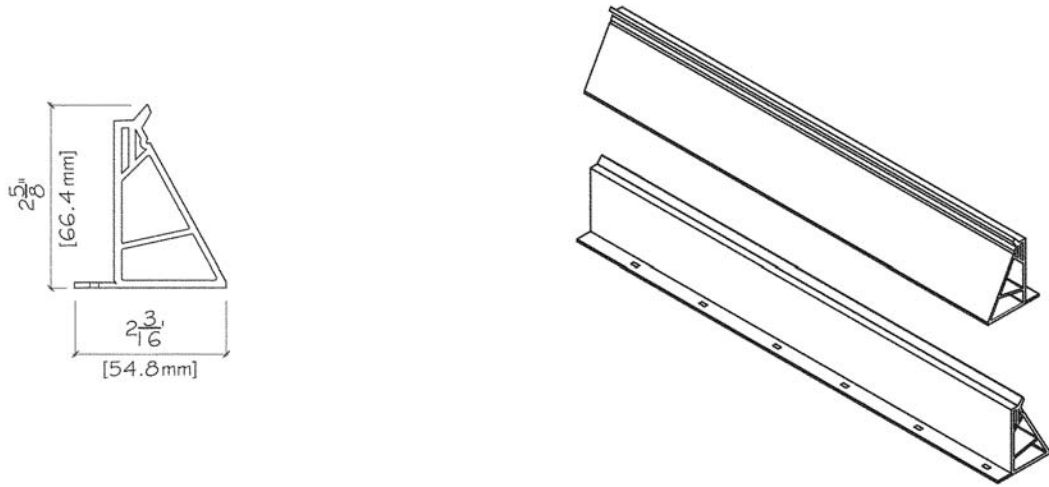


FIGURE 2—STARTER STRIP

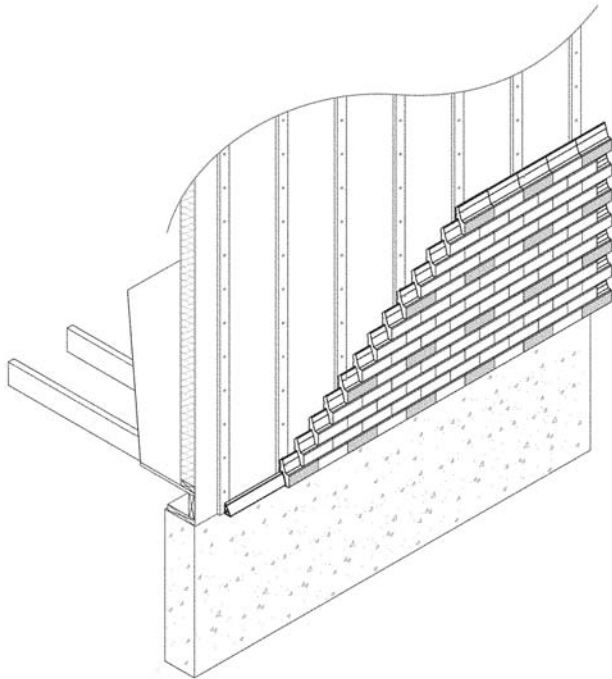


FIGURE 3—NOVABRIK TYPICAL SCREW PATTERN

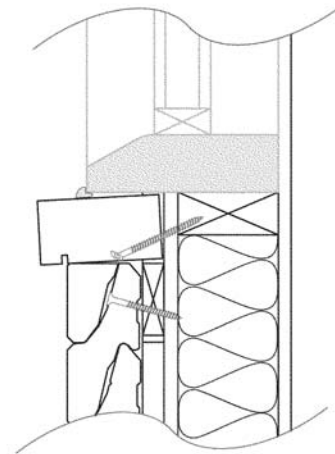


FIGURE 4—WINDOW SILL INSTALLATION

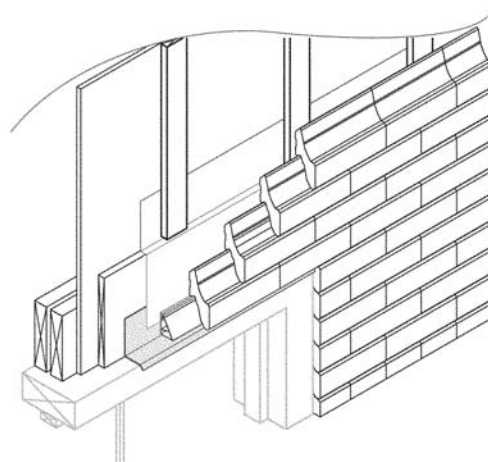


FIGURE 5—LINTEL INSTALLATION