

Venetian Glass

TECHNICAL MANUAL



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1.0

PRELIMINARY COMMENT

The purpose of this document is to provide a guideline for the building industry, including architects, builders, bricklayers and building officials on the correct use and installation of the Venetian glass bricks.

This Technical Manual is part of the manufacturer's instructions and as such, should be made familiar to all involved.

1.1 Applications

The brilliant translucence of Venetian glass bricks characterizes their primary usage and prominence as feature walls found in areas requiring an enhancement of interior space or an increase in natural light. As such, these walls are generally free-standing and non-load bearing and are typically not tied to a structural frame in the fashion of standard clay bricks.

1.2 Design Fundamentals

Venetian Glass brick are classified by TMS 402, *Building Code Requirements for Masonry Structures*, as "thin" units, based on their thickness being less than $3\frac{7}{8}$ ".

The general guidance in this manual summarizes requirements for glass unit masonry that are applicable to interior, non-loadbearing, straight wall Venetian glass brick applications. For complete guidance related to construction requirements for glass unit masonry and other applications, please refer to TMS 402, *Building Code Requirements for Masonry Structures*.

- For interior, straight wall applications, TMS 402 limits the maximum area of each individual thin-unit panel to 150 ft.² and the maximum dimension between horizontal and vertical structural supports to 15 ft. and 10 ft. respectively.
- Coat surfaces on which Venetian glass brick panels are placed with a water-based asphaltic emulsion or other elastic waterproofing material before laying the first course.
- Isolate Venetian glass brick panels with perimeter movement joints so that in-plane loads are not imparted to the panel.
- Laterally support Venetian glass brick panels more than one unit in height or width along the top and sides with panel anchors or channel/angle-type restraints.
- Space panel anchors no more than 16 in. on-center. Embed panel anchors at least 12 in. into mortar joints and secure to the support with at least two fasteners per panel anchor.
- Recess Venetian glass brick panels at least 1 in. within channel/angle-type restraints. Oversize channel/angle-type restraints to accommodate expansion material and sealant between restraints and brick.
- Provide expansion joints at least $\frac{3}{8}$ " in thickness along the top and sides of Venetian glass brick panels at structural supports.
- Place horizontal joint reinforcement (with at least two parallel longitudinal wires of size W1.7 (MW11) and welded cross wires of size W1.7 (MW11)) in mortar bed joints at no more than 16 in. on-center. Extend joint reinforcement along the entire length of the panel, (but not across expansion joints) and bed joints immediately above and below openings in the Venetian glass brick panel.

1.3 Responsibilities

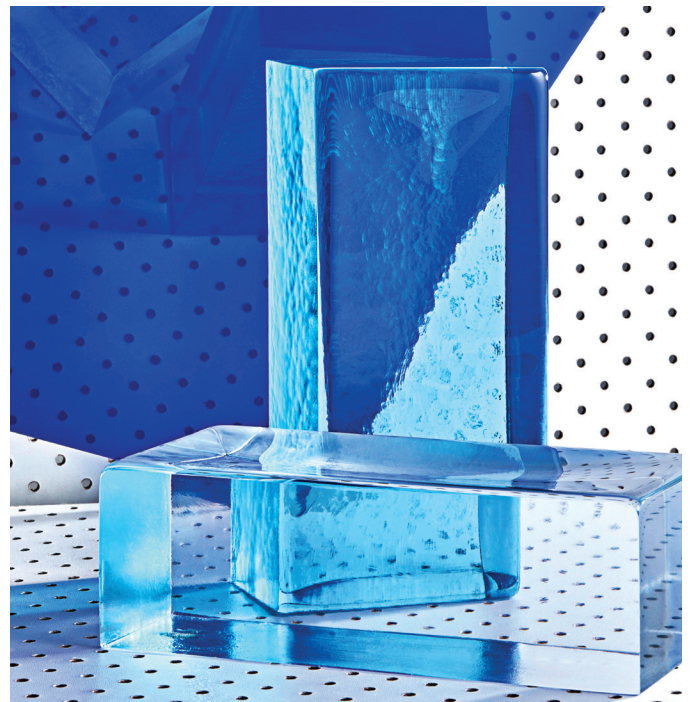
Like any product or cladding system, it is essential to have a clear understanding of the product and its installation; this applies to all involved in the process from the designer, the builder, to the bricklayer.

1.4 Color Variation

Venetian glass brick are individually handmade and will vary in color and texture. It is important to remember that samples, brochures and other marketing avenues, provide an indicative example of the selected product and its color. Glen-Gery makes every endeavor to maintain a constant standard, however, if you are not satisfied with the color of the product upon delivery, you must advise Glen-Gery prior to the laying of the product. Once the product has been laid, it is deemed to have been accepted.

1.5 Technical Details

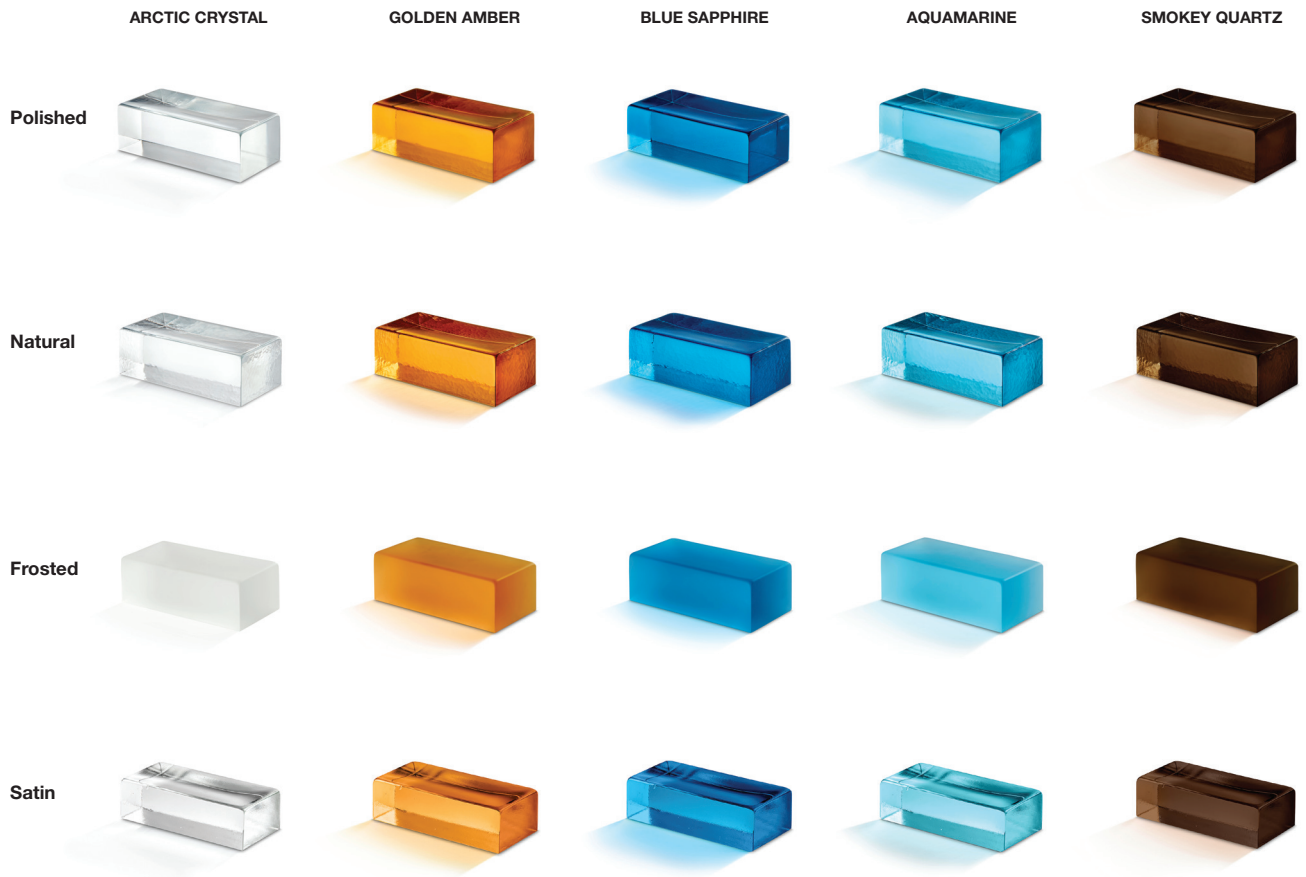
The technical details and information in this document correspond to the best of our knowledge, with all legislative requirements and good trade practice. They are provided as a guide only and all detailing should be site specific and completed by a competent designer.



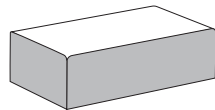
2.0

PRODUCT SPECIFICATIONS

2.1 The Range

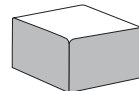


Dimensions



STANDARD BRICK

3⁵/₈" x 2¹/₄" x 7⁵/₈"



HALF BRICK

3⁵/₈" x 2¹/₄" x 3⁵/₈"

All colors and finishes are available in both standard and half brick sizes.

2.2 Technical Specifications

CRITERIA	RESULT
Length (in.)	7 ⁵ / ₈
Width	3 ⁵ / ₈
Height	2 ¹ / ₄
Dimensional Tolerances	FBX*
Average Weight / Unit (lb.)	5.5
Stretcher Units/ft ²	6.75
Pack Size	3
Avg. Compressive Strength (psi)	>5000
Max. Cold Water Absorption (%)	0.0
Initial Rate of Absorption (g/min/30in ²)	0.0
Coefficient of Expansion	-5 x 10 ⁻⁶ /°F
Freeze/Thaw Resistance	SW*
Core Volume (%)	0, uncored
Efflorescence Rating	Not effloresced*
R-Value (BTU/ft ² ·°F·hr)	0.49
Combustibility (ASTM E136)	Pass No flame, 0% Mass loss
Smoke Developed Index	10
Flame Spread Index	0

* Meets or exceeds requirements for listed classification as found within ASTM C216

Note: This product does not have a fire rating.



3.0

INSTALLATION AND HANDLING INSTRUCTIONS

3.1 Storage

- Keep crates in dry storage.
- Do not stack pallets.
- Once crate straps are broken, minimize movement of crate.
- Avoid crates being exposed to the weather for long periods.
- Keep the top of the crates covered with plastic.

3.2 Handling

- Keep bricks apart to avoid damage when moving.
- Always stack bricks on their edge, not the face.
- Use gloves and avoid using all metal carrying devices to move bricks.
- Ensure that surfaces where bricks are moved are clean and dry.

3.3 Materials Required for installation

- Full and half glass brick (cutting brick by means other than water jet is discouraged and unlikely to achieve satisfactory results)
- Glen-Gery Preblended Type S Mortar (Meeting ASTM C270 Type S by property and proportion).¹
- Trowel, level and plumb bob.
- Mechanical mixer.
- Bucket of clean water and cloth for cleaning.
- Weldcrete® untinted, available from Glen-Gery.

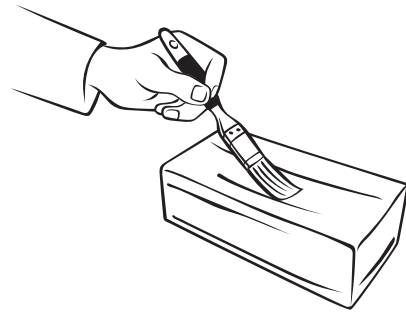
3.4 Preparation of Product

- Bricks should be dry and clean with no debris on any of the brick.
- If bricks are dirty, wash clean using water and leave to completely dry before using.
- Examine bricks to ensure there are no cracks or that they are damaged in any way.

3.5 Laying of Product

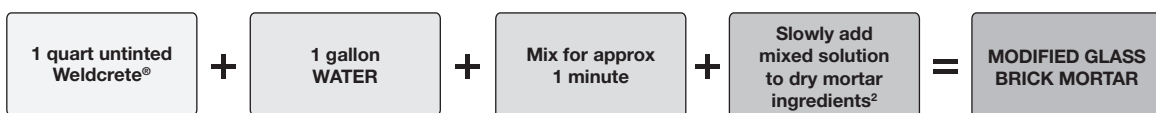
Glass bricks have no water absorption therefore a bonding agent is required to be added to the mortar to ensure adequate bond strength of the brickwork.

- Mortar joints should be $\frac{3}{8}$ " +/- $\frac{1}{16}$ ".
- Weldcrete® bonding agent must be added to the mortar to achieve adequate bond strength.
- Add 1 part Weldcrete® to 4 parts mortar mixing water.
- Brush neat Weldcrete® onto all surfaces of the brick that will be bonded by mortar, per manufacturers instructions. Allow at least one hour to dry.



- One bedding surface of the brick is slightly concave and has rounded edges. All brick should be consistently laid with this surface either up or down as desired, to achieve a uniform appearance.
- Bricklaying should proceed in the same manner as standard masonry work.
- During installation, use clean water promptly and remove any fresh mortar droppings or smears using a cloth.
- Install movement joints as required.

Figure 1: Weldcrete® must be added to mortar to achieve adequate bond strength



1. Glen-Gery Color Mortar Blend or other mortars conforming to ASTM C270 Type S by proportion may also be used.
2. Adjust mixed solution amount to achieve a workable consistency.

3.6 Construction Requirements

- For interior straight wall applications, TMS 402 limits the maximum area of each individual thin-unit panel to 150 ft.² and the maximum dimension between horizontal and vertical structural supports to 15 ft. and 10 ft. respectively.
- Coat surfaces on which Venetian glass brick panels are placed with a water-based asphaltic emulsion or other elastic waterproofing material before laying the first course.
- Isolate Venetian glass brick panels with perimeter movement joints so that in-plane loads are not imparted to the panel.
- Laterally support Venetian glass brick panels more than one unit in height or width along the top and sides with panel anchors or channel/angle-type restraints. Provide expansion joints at least $\frac{3}{8}$ " in thickness along the top and sides of Venetian glass brick panels at structural supports.
- Space panel anchors no more than 16 in. on-center. Embed panel anchors at least 12 in. into mortar joints and secure to the support with at least two fasteners per panel anchor.
- Recess Venetian glass brick panels at least 1 in. within channel/angle-type restraints. Oversize channel/angle-type restraints to accommodate expansion material and sealant between restraints and brick.

- Place horizontal joint reinforcement (with at least two parallel longitudinal wires of size W1.7 [MW11] and welded cross wires of size W1.7 [MW1]) in mortar bed joints at no more than 16 in. on-center. Extend joint reinforcement along the entire length of the panel, (but not across movement joints) and bed joints immediately above and below openings in the Venetian glass brick panel.

3.7 Cleaning

- During installation, use clean water and promptly remove any fresh mortar splashed using a cloth.
- Do not allow mortar to dry on the face of the bricks.
- Do not use acid to clean the brickwork.

3.8 Maintenance

One of the great advantages in building with Venetian glass brick is that it is virtually maintenance free, however, an annual check should be made and a cloth used to clean the surfaces. A standard glass cleaner can be used if required.



4.0 DETAILS

The diagrams below illustrate common restraint and assembly details that are suitable for the Venetian glass brick walls for interior, non-loadbearing applications and are examples only. All restraint details must be confirmed by a structural engineer.

Examples of horizontal lateral top and bottom restraints are shown in Figures 1 through 4. An example of vertical lateral restraint is shown in Figure 5. Assemblies showing typical required components are illustrated in Figures 6 and 7.

4.1 Restraint Details

Figure 1: Channel top restraint detail

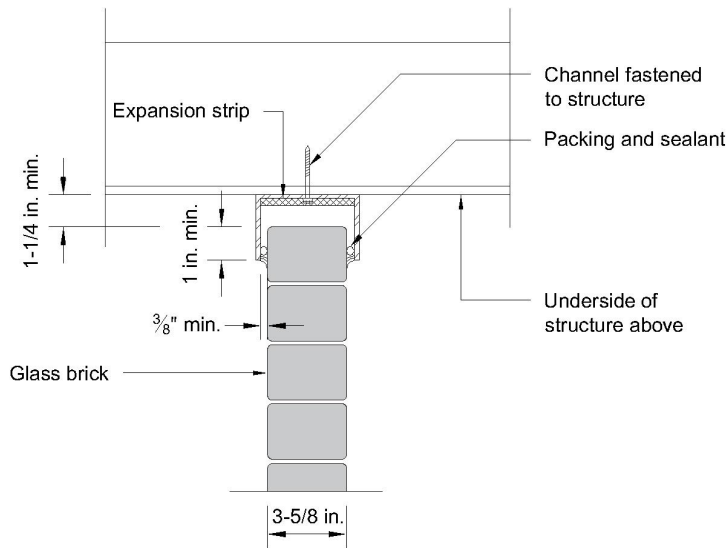


Figure 2: Angle top restraint detail

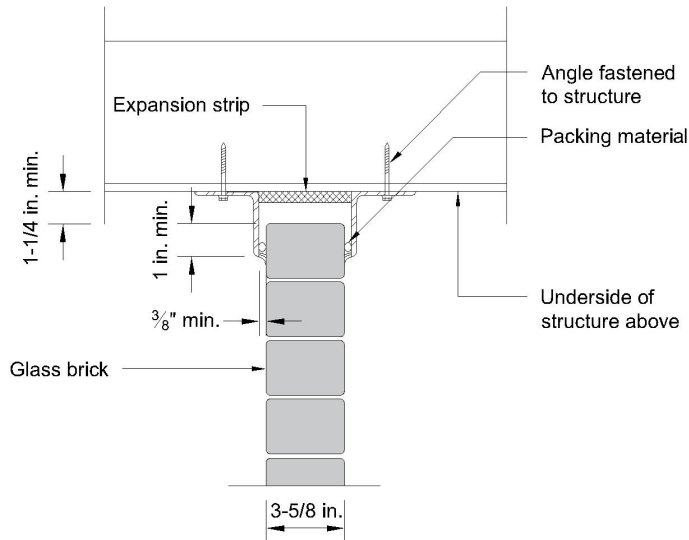


Figure 3: Channel base restraint detail

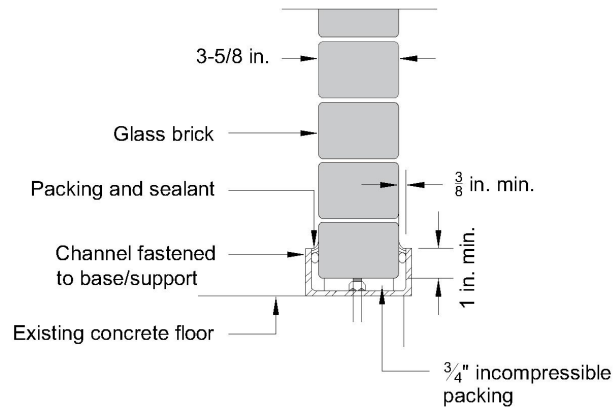


Figure 4: Bonded base detail

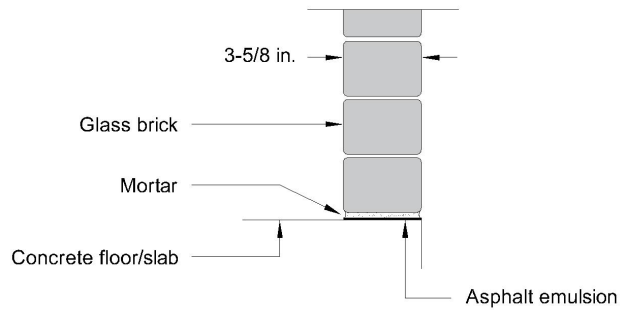
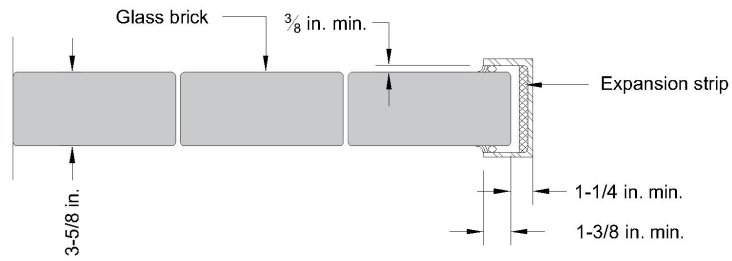


Figure 5: Channel side restraint detail



4.2 Assembly Details

Figure 6: Running bond assembly with channel and anchor restraints

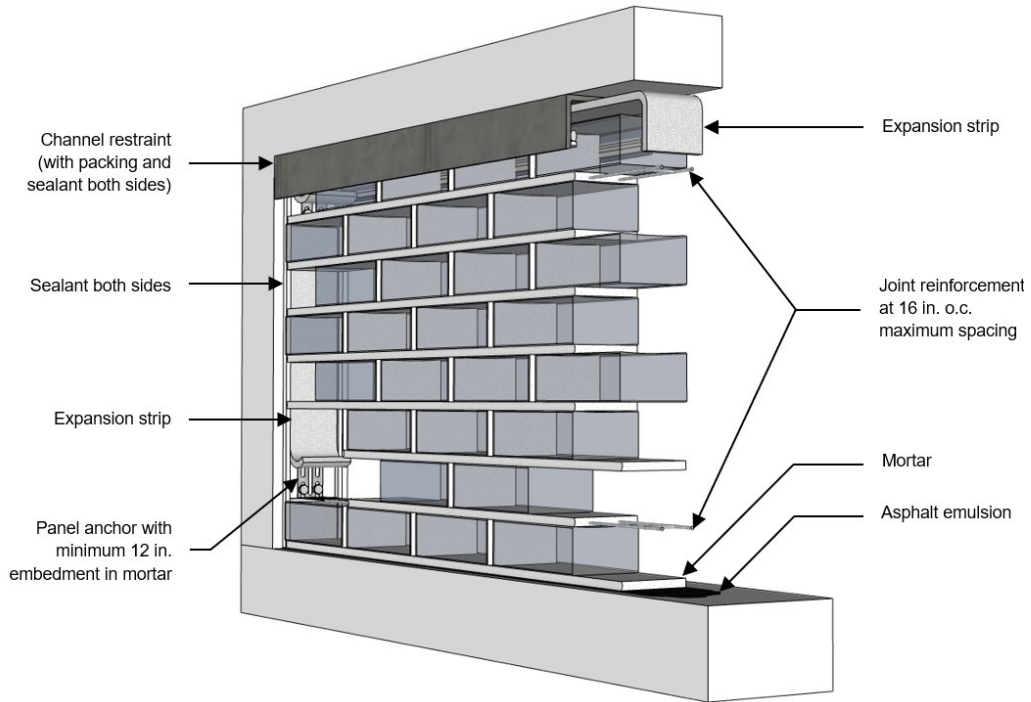
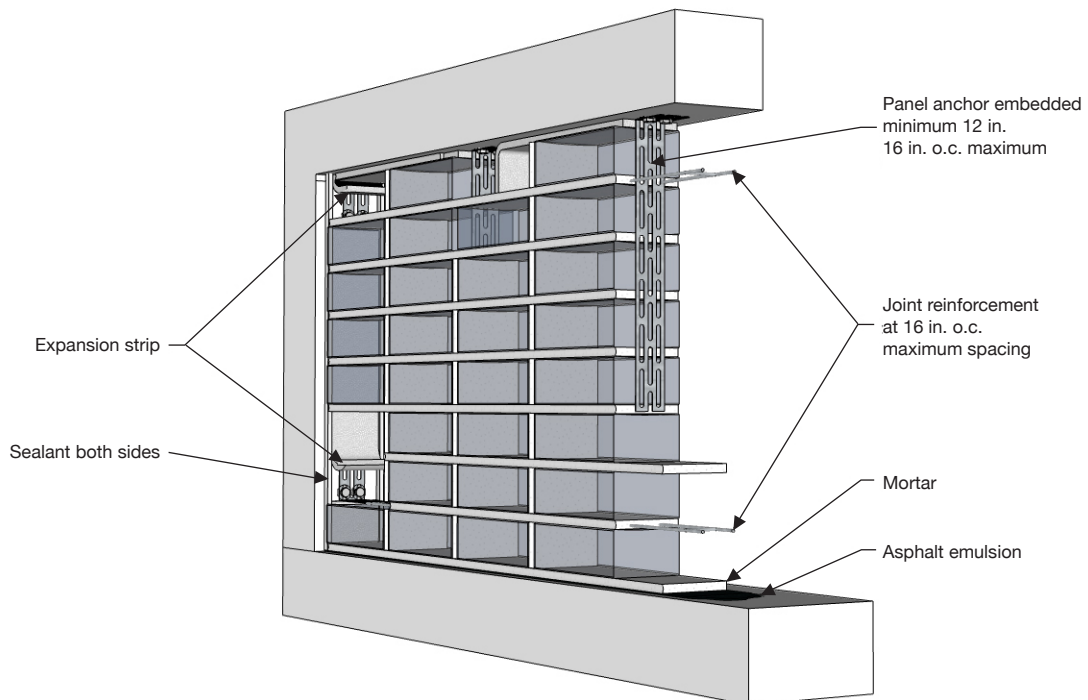


Figure 7: Stack bond assembly with panel anchor restraints







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