



MULIA
GLASSBLOCK
ARCHITECTURAL SPECIFICATION



MULIA

**GLASS
BLOCK**

GLASSBLOCK

ARCHITECTURAL SPECIFICATION

WWW.MULIAINC.INFO



OUR PRODUCT



WAVE

- 7902: 7-3/4 X 7-3/4 X 3-1/8"
- 7912: 5-3/4 X 7-3/4 X 3-1/8"
- 7922: 5-3/4 X 5-3/4 X 3-1/8"
- 7932: 3-3/4 X 7-3/4 X 3-1/8"
- 9802: 7-3/4 X 7-3/4 X 3-7/8"
- 9812: 5-3/4 X 7-3/4 X 3-7/8"
- 9822: 5-3/4 X 5-3/4 X 3-7/8"
- 9832: 3-3/4 X 7-3/4 X 3-7/8"



ICEBERG

- 7906: 7-3/4 X 7-3/4 X 3-1/8"
- 7916: 5-3/4 X 7-3/4 X 3-1/8"
- 7926: 5-3/4 X 5-3/4 X 3-1/8"
- 7936: 3-3/4 X 7-3/4 X 3-1/8"
- 9806: 7-3/4 X 7-3/4 X 3-7/8"
- 9816: 5-3/4 X 7-3/4 X 3-7/8"
- 9826: 5-3/4 X 5-3/4 X 3-7/8"



QUADRA

- 9801: 7-3/4 X 7-3/4 X 3-7/8"



WAVE END BLOCK

- FINISHING END
- 7902 : 7-3/4 X 7-3/4 X 3-1/8"
 - 9802 : 7-3/4 X 7-3/4 X 3-7/8"



WAVE ANGLE BLOCK

- Use for both 3-1/8 & 3-7/8 thickness
Allow 90 Degree Turns 9802-AB



22 DEGREE VARIANT

- 9832 VB : 3-3/4 X 7-3/4 X 3-7/8"
- ALLOW 22 AND 45 DEGREE TURNS



| WAVE 3-7/8 THICK | | | | | | |
|------------------------------|-------------------------------|------------------|-------------------------|-----------------------|---------------------------|-----------------|
| Actual Size/ Nominal Size | Compressive Strength (psi) | Weight (lbs.) | Shading co-efficient | Light Transmission | Sound level Loss (Stc) | R-value/ btu |
| 7-3/4 x 7-3/4 8 x 8 x4 | 400-700 | 5.9 | 0.655 | 60 | 41 | 1.95/ .51 |
| 5-3/4 x 7-3/4 6 x 8 x4 | 400-700 | 4.5 | 0.655 | 65 | 35 | 1.75/ .55 |
| 5-3/4 x 5-3/4 6 x 6 x4 | 400-700 | 4.0 | 0.655 | 65 | 35 | 1.75/ .55 |
| 3-3/4 x 7-3/4 4 x 8 x4 | 400-700 | 3.5 | 0.655 | 65 | 35 | 1.75/ .55 |

| WAVE 3-7/8 THICK FACE | | | | | | |
|------------------------------|-------------------------------|------------------|-------------------------|-----------------------|---------------------------|-----------------|
| Actual Size/ Nominal Size | Compressive Strength (psi) | Weight (lbs.) | Shading co-efficient | Light Transmission | Sound level Loss (Stc) | R-value/ btu |
| 7-3/4 x 7-3/4 8 x 8 x4 | 400-700 | 11 | 0.655 | 60 | 50 | 1.96/ .51 |

| QUADRA 3-7/8 THICK | | | | | | |
|------------------------------|-------------------------------|------------------|-------------------------|-----------------------|---------------------------|-----------------|
| Actual Size/ Nominal Size | Compressive Strength (psi) | Weight (lbs.) | Shading co-efficient | Light Transmission | Sound level Loss (Stc) | R-value/ btu |
| 7-3/4 x 7-3/4 8 x 8 x4 | 400-700 | 5.9 | 0.655 | 60 | 41 | 1.95/ .51 |

| ICE (TOBA) 3-7/8 THICK | | | | | | |
|------------------------------|-------------------------------|------------------|-------------------------|-----------------------|---------------------------|-----------------|
| Actual Size/ Nominal Size | Compressive Strength (psi) | Weight (lbs.) | Shading co-efficient | Light Transmission | Sound level Loss (Stc) | R-value/ btu |
| 7-3/4 x 7-3/4 8 x 8 x4 | 400-700 | 5.9 | 0.655 | 59 | 41 | 1.95/ .51 |

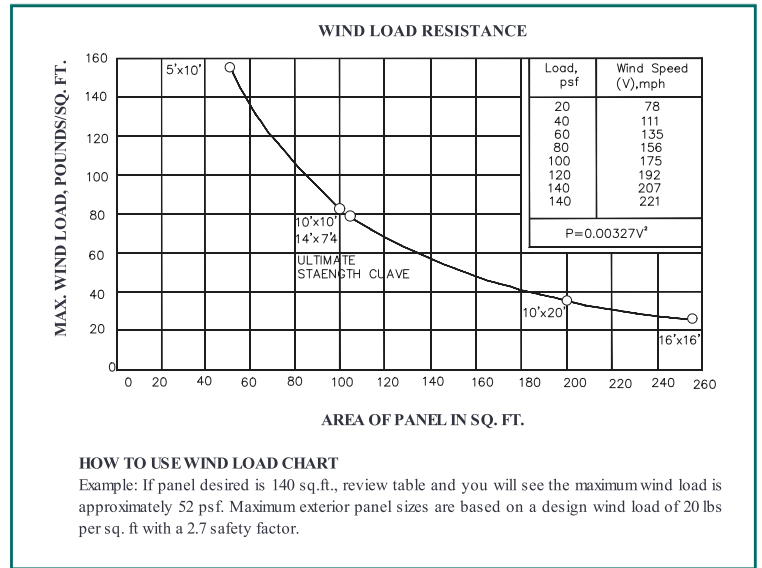
| WAVE, PRISTAL, ICEBERG 3-1/8 THICK | | | | | | |
|------------------------------------|-------------------------------|------------------|-------------------------|-----------------------|---------------------------|-----------------|
| Actual Size/ Nominal Size | Compressive Strength (psi) | Weight (lbs.) | Shading co-efficient | Light Transmission | Sound level Loss (Stc) | R-value/ btu |
| 7-3/4 x 7-3/4 8 x 8 x3 | 400-700 | 5.3 | 0.655 | 65 | 35 | 1.95/ .51 |
| 5-3/4 x 7-3/4 6 x 8 x3 | 400-700 | 4.4 | 0.655 | 65 | 35 | 1.75/ .55 |
| 3-3/4 x 7-3/4 4 x 8 x3 | 400-700 | 3.2 | 0.655 | 65 | 35 | 1.75/ .55 |
| 5-3/4 x 5-3/4 6 x 6 x3 | 400-700 | 3.0 | 0.655 | 65 | 35 | 1.75/ .55 |

| QUADRA 3-1/8 THICK | | | | | | |
|------------------------------|-------------------------------|------------------|-------------------------|-----------------------|---------------------------|-----------------|
| Actual Size/ Nominal Size | Compressive Strength (psi) | Weight (lbs.) | Shading co-efficient | Light Transmission | Sound level Loss (Stc) | R-value/ btu |
| 7-3/4 x 7-3/4 8 x 8 x3 | 400-700 | 5.3 | 0.655 | 65 | 35 | 1.75/ .51 |

MAXIMUM PANEL DIMENSIONS*

| Perimeter Support Method | | Thick Series Area (sq. ft.) | Thin Series Area (sq. ft.) |
|--------------------------|---|--------------------------------|-------------------------------|
| exterior | Channel Type Restraint | 144 | 85 |
| | Panel Anchors | 144 | 85 |
| | Channels or Panel Anchors w/ Intermediate Stiffener | 250 | 150 |
| interior | Channel Type Restraint | 250 | 150 |
| | Panel Anchors | 250 | 150 |

* uniform building code (ubc) limits height and width to 15 feet



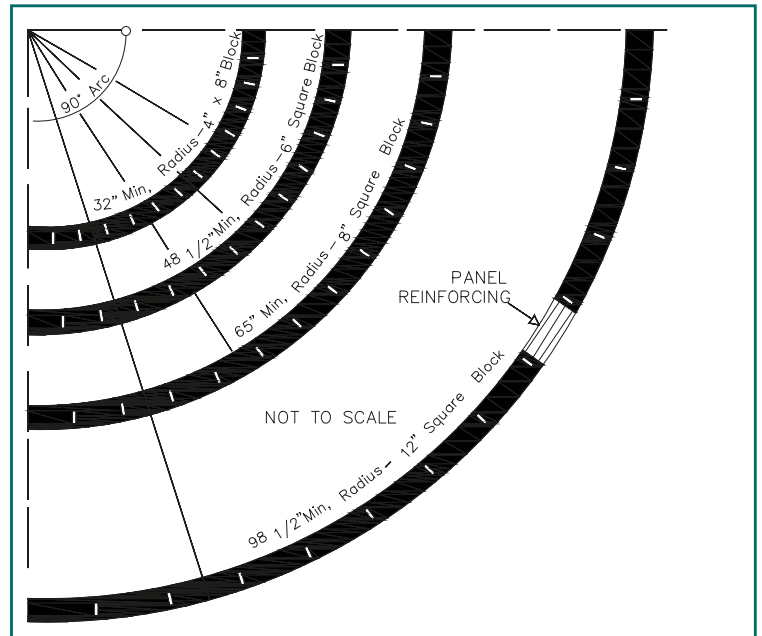
HOW TO USE WIND LOAD CHART

Example: If panel desired is 140 sq.ft., review table and you will see the maximum wind load is approximately 52 psf. Maximum exterior panel sizes are based on a design wind load of 20 lbs per sq. ft with a 2.7 safety factor.

NUMBER OF BLOCKS USING FOR 100 SQ. FT. PANEL

| Block Size (Nominal) | 6" | 8" | 12" | 4"x8" | 6"x8" |
|----------------------|-----|-----|-----|-------|-------|
| Number of Blocks | 400 | 225 | 100 | 450 | 300 |

INSIDE RADIUS MINIMUMS FOR CURVED PANEL CONSTRUCTION USING SQUARE BLOCKS



| Block Size | Inside Radius Inches | Number of Blocks in 90° arc Block | Joint Thickness in Inches | |
|------------|----------------------|-----------------------------------|---------------------------|---------|
| | | | inside | outside |
| 4" x 8" | 32 | 13 | 1/8 | 5/8 |
| 6" x 8" | 48 1/2 | 13 | 1/8 | 5/8 |
| 8" x 8" | 65 | 13 | 1/8 | 5/8 |
| 12" x 12" | 98 1/2 | 13 | 1/8 | 5/8 |



Specification and Installation Guidelines for Mulia Glass Block Products

Division 4 – Section 04270 Glass Unit Masonry

Mulia Inc. specifications are intended to serve as a guide and are not solely relied upon as the specification source. Considering Mulia Inc. has no control over the installation of the products specified, we therefore assume no potential liability resulting from the application or misapplication of these products.

- Basic Facts for Installation of Mulia Glass Block:
 - a.** All types of glass block panels are to be non-structural.
 - b.** The maximum deflection rate for any structural member supporting glass block panels should not exceed $L/575$.
 - c.** Where mortar comes in contact with wood, a water base asphalt emulsion should be sufficiently applied and allowed to dry. This creates a contact barrier to which the mortar will adhere.
 - d.** The heads of all glass block panels must allow for expansion and movement. Mortar must not cross over the expansion spaces. In panels exceeding 25 sq. ft., expansion material must be also used at the jamb locations (refer to details).
 - e.** Mulia Inc. recommends the use of a pre-mix white type-s mortar for all installations that do not require colored mortar. When using colored mortar, the white latex paint should be removed from glass blocks and a colored latex paint that matches the mortar should be applied.
 - f.** Never use a steel trowel or any other sharp device to tap glass blocks into place. This could cause slight cracks that won't be visible until later! A mallet (of wood, rubber or leather) can be used for this purpose.
 - g.** Always use a Plexiglas striking iron to tool the mortar joints. This protects the mortar joints and will help seal them. Tooling, along with use of an internal type water - repellent, should prevent water leakage from occurring through the mortar joints.
 - h.** Weather protection also requires use of proper caulking that will adhere to the surfaces at the expansion points.



PART I

GENERAL



Work Included

- Mulia Inc. Hollow Glass Block Units
- Reinforcing of Joints with Hot-Dipped Steel
- Pre-Mix white Type-S Mortar and Required Sealant

Related Work

- Jambs, Heads, Lintels and Sills
- Anchoring ties or Steel Channels
- Required Sealant and Packing Material

Product Submittals

- Submit Mulia Inc. literature
- Submit two samples of desired units

Environmental Concerns at Job Site

- Never install glass block units when temperature is at or less than 40 degrees.
- Always store glass block units in a clean, dry, cool area that can maintain a temperature not less than 40 degrees 40 hours prior to installation.

References

- ASTM C-150 Portland Cement
- ASTM C-144 Aggregate for Masonry
- ASTM C-153-82 Zinc (hot dipped)
Coatings Applied to Steel
- ASTM C-207 Hydrated Lime for Masonry
- ASTM C-207 Mortar for Unit Masonry
- Underwriters Laboratories Inc.
Building Materials 1998 Edition
- UL 1 Hour Fire Rating #R18224
- ACI 530/ASCE 5/TMS 402 Chapter - 11.3.1 Glass
Unit Masonry Design Wind Load Requirements
- ASTM E-163 Fire Test Window Assembly
- S.B.C.C.I. Testing Requirements
- South Florida Testing Requirements Miami-Dade
Approval NOA #04-0520.02

PART II

PRODUCTS

☞ *Acceptable Manufacturers*

Mulia Inc.

☞ *Glass Block Units*

Shall be hollow units created with a partial vacuum sized to the nominal dimension of ___x___x___ inches thick.



Accessories

- Hot dipped joint panel reinforcing - with a cross Wire at 16" on center made out of 9-gauge steel. 1-5/8" width for 3-1/8" blocks or 2" width for 3-7/8" blocks.
- Panel anchor ties - 20 gauge hot dipped galvanized steel perforated strips that are 24" long and 1-3/4" wide.
- Expansion strips - 3-1/2" wide x 3/4" thick polyethylene foam.
- Asphalt emulsion
- Sealant - Urethane or silicone caulk recommended by Sealant Manufacturer.
- Backer Rod - As suggested by Sealant Manufacturer.

Mortar Materials

- Use a Type-S Mortar as described in ASTM (-270, should have 1 part white Portland cement, 3/4 parts of fine white sand that can pass through a #8 sieve. Make sure the sand is free from iron contaminants which could cause stains. Do not retemper mortar, mix only as needed. Internal type waterproofer.
- Plexiglas striking irons - Seal mortar joints by tooling with Plexiglas striking iron, so as not to burn the white mortar joints, while providing a smooth concave water protected face.

PART III

EXECUTION



Preparation

- Establish that all components needed are on-site and installed properly.
- Prepare mortar for use by only mixing the amount that can be used within 1 hour. Never add any antifreezes or accelerators.

Installation

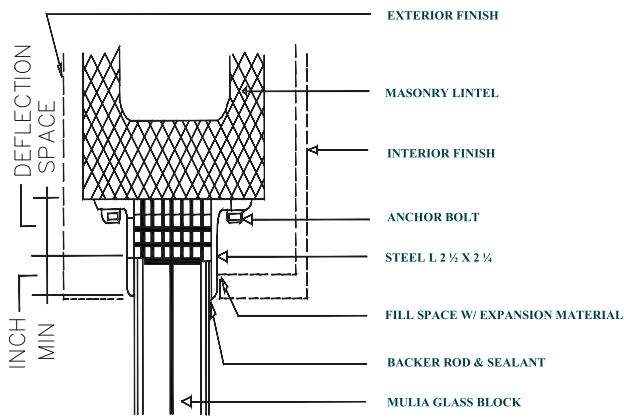
- Verify opening is sized and ready for proper installation. When using panel anchor ties assembly, a minimum 1/2" wider than nominal size and 1/2" taller than nominal size should be sufficient if joints are uniform. C-Channel assembly must allow for the thickness of steel.
- Place asphalt emulsion on sill area and allow to dry.
- Attach all panel expansion materials and panel anchor ties as needed to panel heads and jambs.
- Place mortar onto sill creating a bed joint. Make sure bed joint is full.
- Level first course of blocks while maintaining a joint of 1/4" width plus or minus 1/8".
- Install second bed joint full of mortar, do not furrow!
Gently push panel reinforcing into the middle of mortar.
- Install the second row of glass blocks levelling and maintaining full, uniform joints. When panel anchor ties are being used, install at 16" on center at the jambs and head locations. Overlay panel reinforcing horizontally, with a 6" overlap from the panel anchor ties that are attached to the jambs. Repeat this installation process every 16" in the height of your panel. If using channel construction, panel reinforcing is needed horizontally for every 16" of height only.
- The head joint should be free from all mortar to allow for the sealant desired.
- Strike all mortar joints with Plexiglas striking iron when joints are fingerprint hard.
- After 24 hours setup, install all packing material and sealant pursuant to manufacturer recommendations.

Cleaning

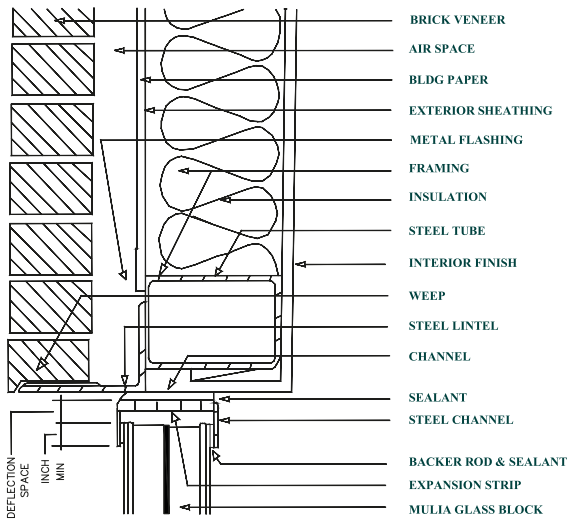
- Remove excess mortar squeezed out while laying glass block. At the time the joints are being struck use a dry cloth or burlap to remove excess smears on the face of the block.
- Never use acids or abrasive cleaners on glass block.
- Sealant excess should be removed according to sealant manufacturer directions.
- Use the finest of steel wool (no larger than a #4 size is appropriate) to remove any excess mortar off the face of the glass block. This is recommended for hard to remove spots only, not on overall cleaning!



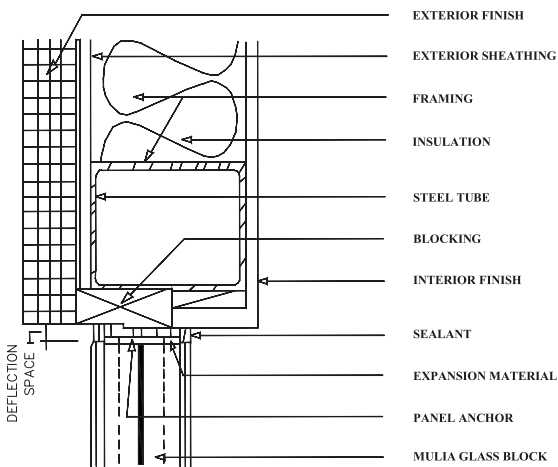
Typical Head Details Exterior Openings



Head - Detail of Glass Block in Masonry Wall

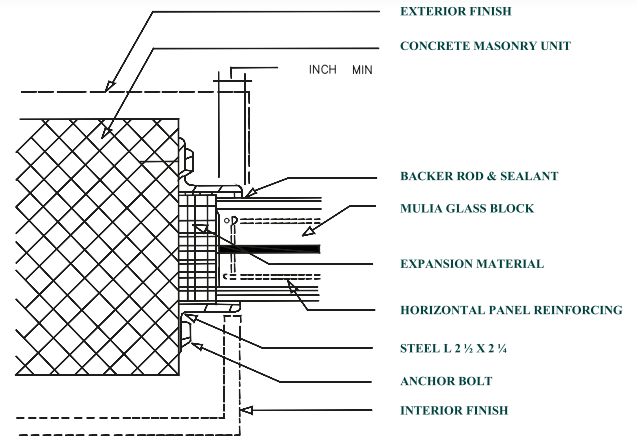


Head - Detail of Glass Block in Steel Stud Wall

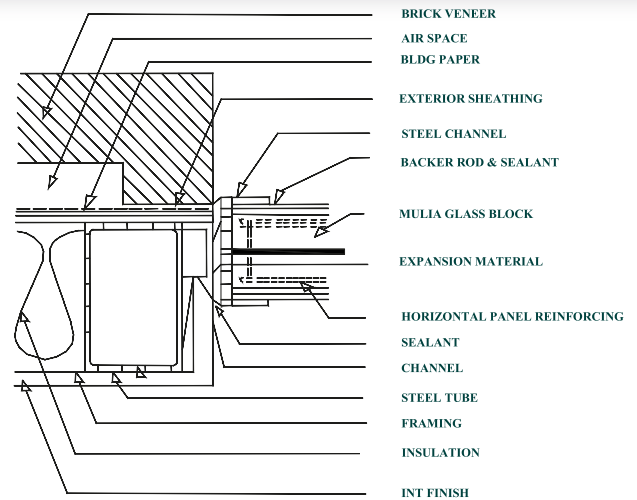


Head - Detail of Glass Block in Steel Stud Wall

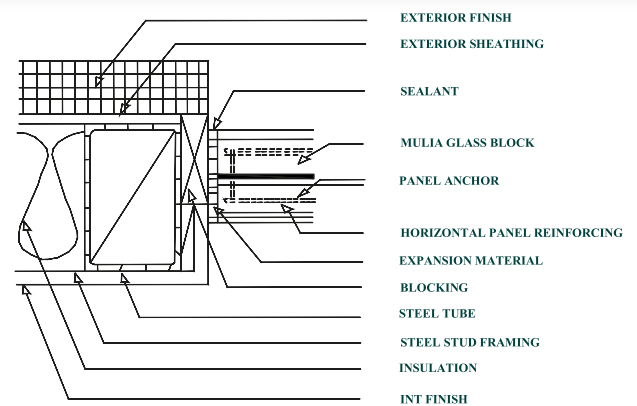
Typical Jamb Details Exterior Openings



Jamb - Detail of Glass Block in Masonry Wall

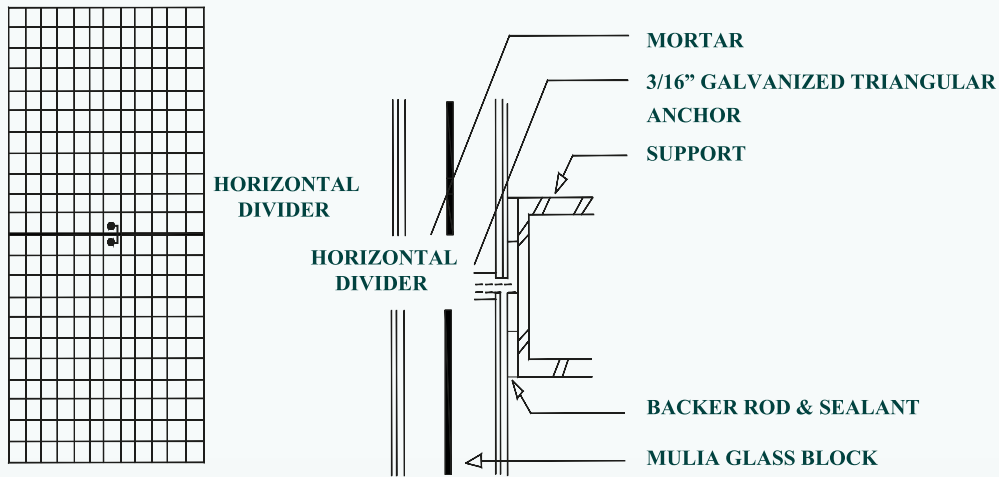


Jamb - Detail of Glass Block in Steel Stud Wall

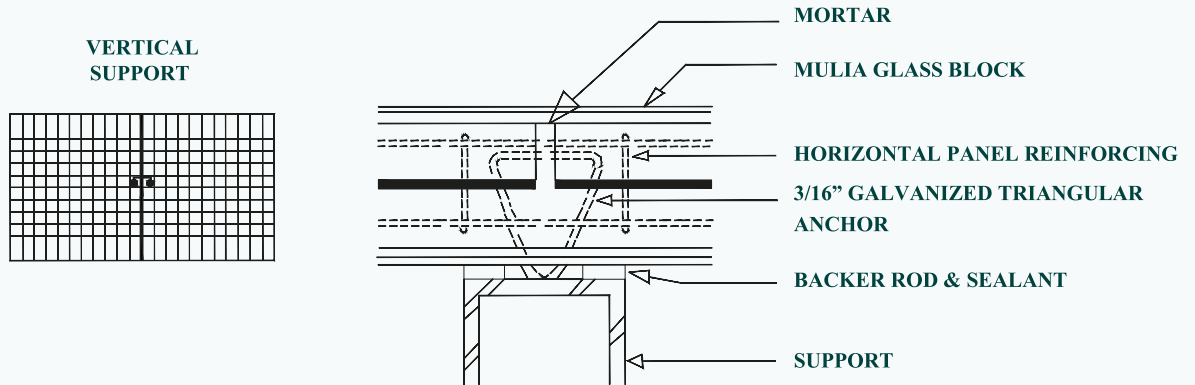


Jamb - Detail of Glass Block in Steel Stud Wall

Typical Mortared Stiffener Details
Continuous Panels

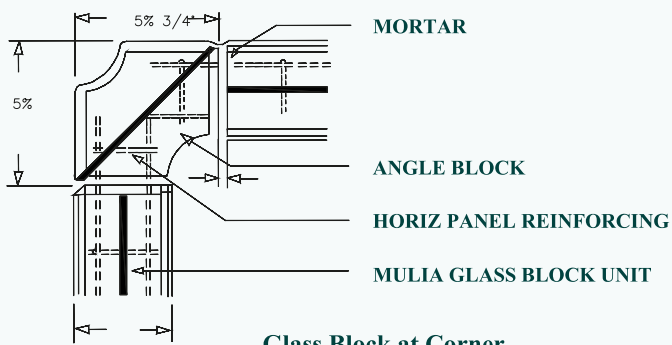


Horizontal Support In Glass Block Panel



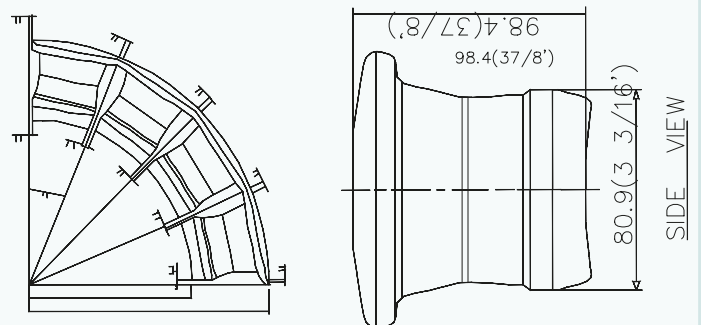
Vertical Divider in Glass Block Panel
All Panels using Vertical Dividers should not exceed 10 ft. in height

Corner Detail



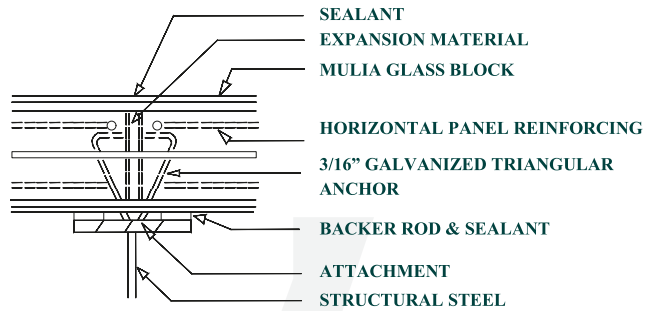
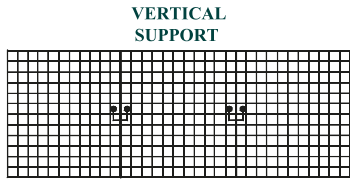
Glass Block at Corner

22 Degree Arch Detail

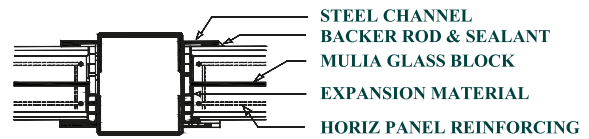
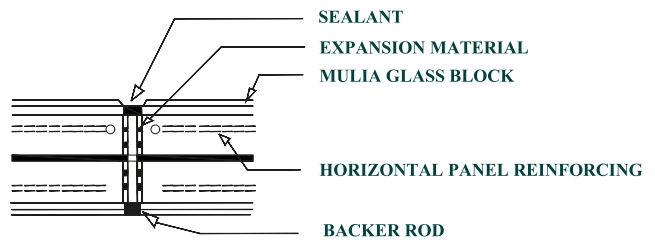




Typical Stiffener Details Continuous Panels

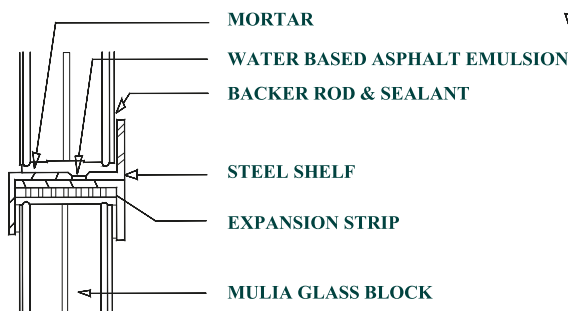
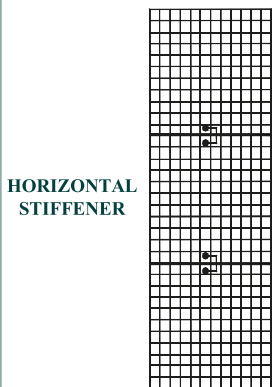


Vertical Support between Horizontal Panels

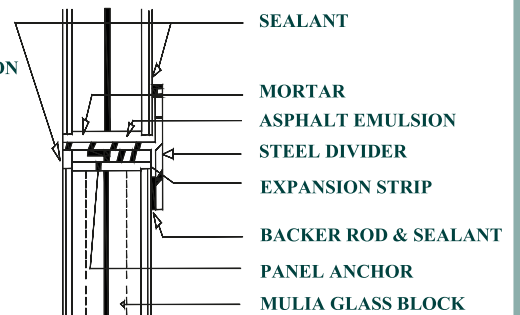


Jamb - Detail of Steel Dividers Between Horizontal Panels
All Panels using Vertical Dividers should not exceed 10 ft. in height

Typical Shelf Angle Details Continuous Panels

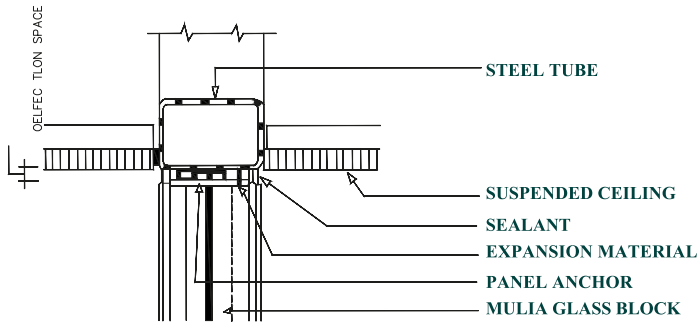


Structural Steel Dividers Between Vertical Panels

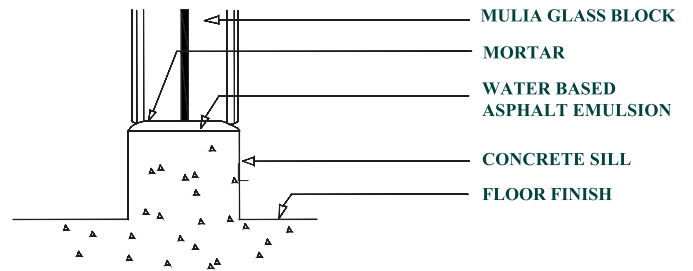


Finishing End

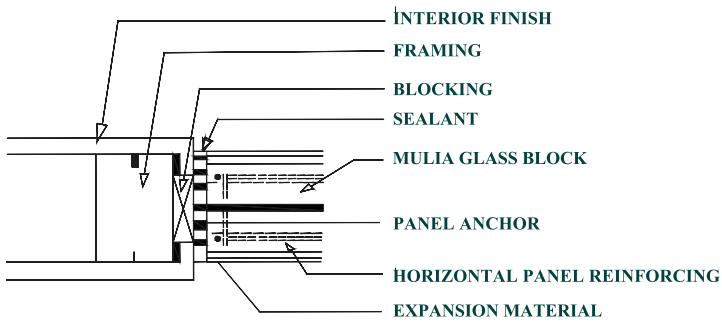
Interior Details



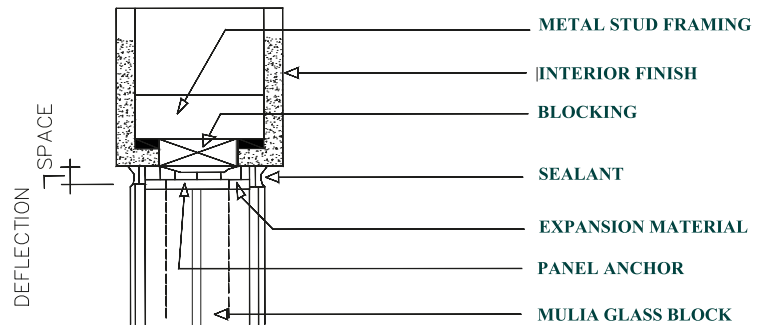
Head - Detail of Glass Block at Suspended Ceiling



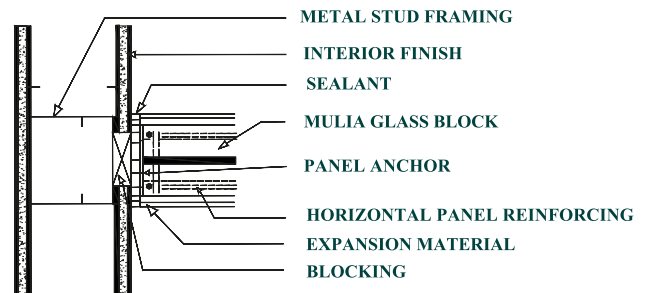
Sill - Detail of interior Concrete floor Slab



Jamb - Detail of Glass Block in Partition

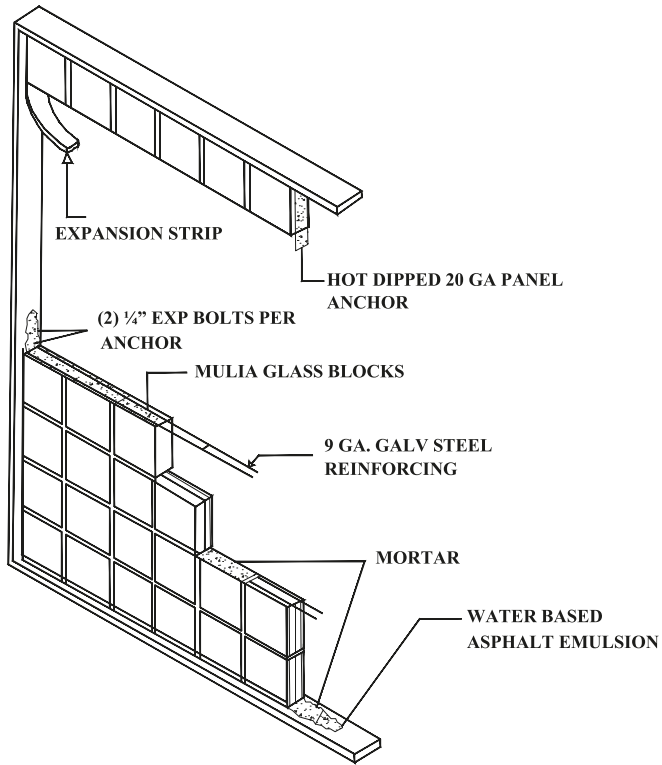


Jamb - Detail of Glass Block in Partition

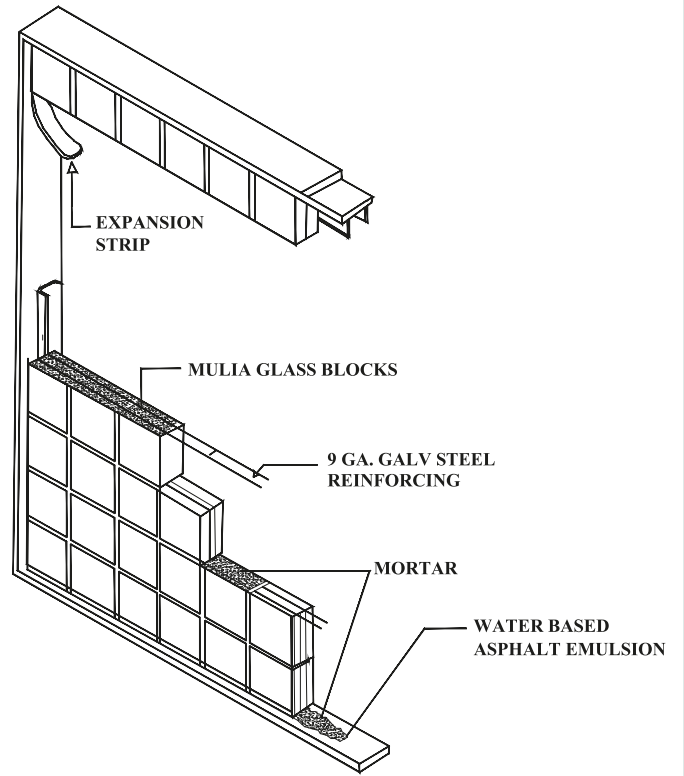


Jamb - Detail of Glass Block Perpendicular to Partition

Panel Anchor Construction



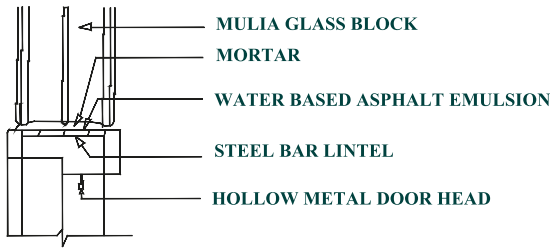
Channel Anchor Construction



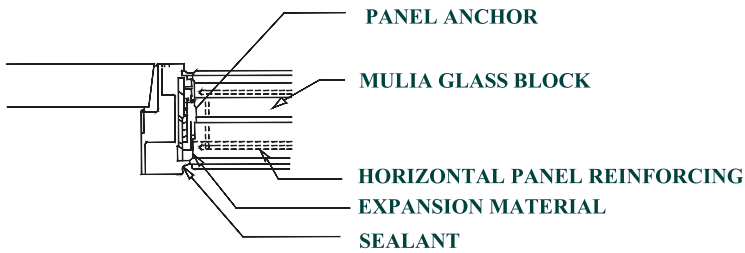
Detail Shown are available in CAD, call Mulia for further information



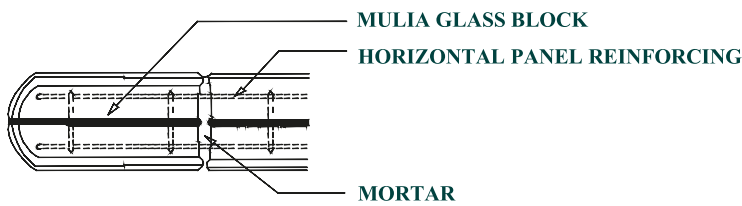
Hollow - Metal Door Frame Details



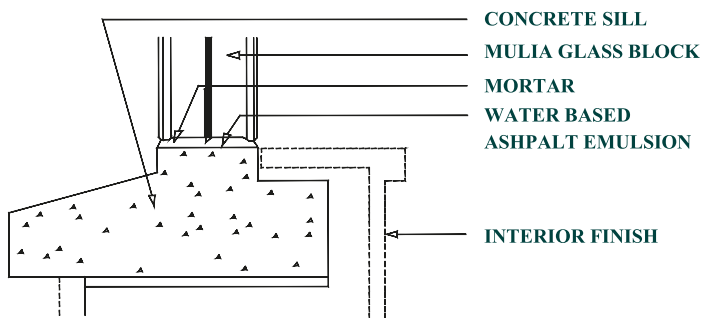
Head - Hollow Metal Door Frame at Glass Block



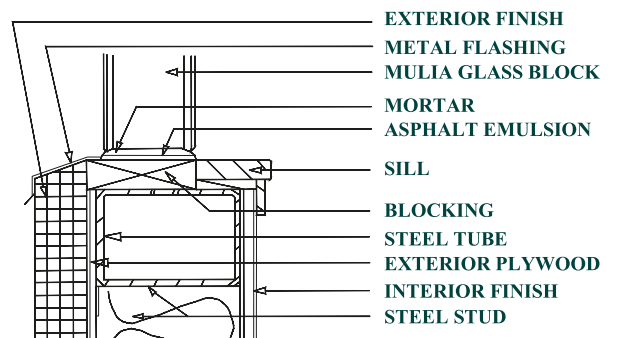
Jamb - Hollow Metal Door Frame at Glass Block



Typical Sill Details
Exterior Openings



Sill - Detail of Glass Block in CMU Wall



Sill - Detail of Glass Block in Steel Stud Wall

Detail Shown are available in CAD, call Mulia for further information

Five-year Limited Warranty

Mulia warrants its first quality glass block products to be free from manufacturing defects for a period of five years from the date of purchase. If a product is found to be defective, Mulia will supply new products of the same similar grade (at the manufacturers discretion) sufficient to repair or replace the defective materials. Mulia does NOT warrant installers workmanship and will not replace blocks damaged as a result of faulty installation.

Mulia glass block should be professionally installed by contractors who have demonstrated expertise in installing this product. Workmanship errors should be addressed to the installation contractor. EXCLUDED ARE EXPRESSED OR IMPLIED WARRANTIES OF ANY KIND, INCLUDING THOSE OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE RELATING TO THE PERFORMANCE OF AN INSTALLATION containing Mulia glass block. In no event shall Mulia be held liable for labor, lost profits or any other indirect, incidental, special, consequential or punitive damages resulting from defective products or installation, regardless of the theory of liability upon which any such damages are claimed.

Also excluded from warranty are the following situations:

- Dissatisfaction due to improper maintenance or installation with materials and adhesives that are not recommended by Mulia.
- Products sold as non-regulars, irregulars or not first quality.
- Products installed with an obvious defect visible prior to installation.

The only remedy available is replacement of defective blocks, excluding labor. Some states do not allow limitations or exclusions of incidental or consequential damages or limitations on length of implied warranties, so specific rights may vary from state to state.

If a defect is discovered, send written notice to Mulia Inc., 17506 Studebaker Road, Cerritos, CA 90703. Include proof of purchase, a sample of a defective block if possible, and photographs of the installation. Upon receipt of these items, Mulia will investigate the claim and replace any block found to be defective.

The information contained in this brochure is accurate and reliable based upon facts available at the time of printing.



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