



Guide to Specifying Glass Blocks - General considerations:

1. Glass block walls are self supporting, but not load bearing. In addition to their own weight, they can withstand wind loads, horizontal live loads and impact loads. A detail provides the head for the panel to be anchored into whilst ensuring no downward pressure is placed on the glass blocks.
2. Openings must be square and perpendicular and the opening dimensions must be designed to suit glass block modules. Glass blocks cannot be cut like masonry bricks or tiles. To calculate the minimum opening size based on using 190 x 190 x 80mm blocks with 10mm joints, multiply the number of blocks by 200mm (190 block + 10mm joint) then add 10mm for the other mortar joint. This is the minimum opening requirement. Stone mortar joints are the most commonly used. Stone spacers can also be used for thinner joints, if openings have been prepared incorrectly or if re-installing glass blocks, or to create a tighter radii, when building a curved glass block panel.
3. Glass block walls are connected to the surround by reinforcement bars being inserted into pre-drilled holes for panel anchors. For best integral strength, panels should be installed into a four sided pre-prepared opening. The opening can be timber, brick, steel, concrete or block-work.
4. Between the opening and glass blocks it is essential to incorporate expansion joints to the perimeter to allow the panel to expand and contract freely with temperature change. The foam must not be bridged by mortar (render/plaster etc.) and coated with Buds & Mortar expansion joint sealer (fire-retardant in fire-rated applications).
5. Glass blocks should not be installed when the surrounding temperature is 5°C and falling or 38°C and rising.
6. Using standard glass blocks the maximum panel size without intermediate support or slip joints is 25m², with no dimension exceeding 6m in either direction. For TFS and TFS6 fire blocks, the maximum panel size permissible is 9m² in line with test specification.

Connection details are purely representative to demonstrate the principals how glass blocks can be constructed with channels, or box sections, either for structural and practical purposes, i.e. interfaces of glass blocks and render or mechanical use.

The channel, PFC and box section dimensions are illustrative only and not necessary to scale.

Connection detail principles, should be designed and be specific to each project requirement and calculations checked and qualified by independent structural engineers.

Accessories - Perimeter expansion joints

Glass blocks will expand and contract by 0.25mm per 10°C temperature change. Self expansion joints must be incorporated into the perimeter between the substrate opening and block, being caulked with a white silicone for fire-skip mastic. This will usually look similar to a standard mortar joint. For the head and joints at an opening, 10mm thick foam is used. This is a white expansion foam. The horizontal expansion joint between the first row of glass blocks and the base of the opening is formed using high-density bitumen or response material to support the weight of the panel. Alternatively two coats of bitumen emulsion can be applied as the barrier between the bottom course mortar joint and base of opening.

Joint sizes and spacer pegs

10mm is the most common joint size for specifying and building glass blocks. A 190 x 190 block plus 10mm spacer equates to 200mm. Spacer pegs serve multiple functions: They prevent mortar seepage, increasing the number of courses that can be constructed a day. They prevent stainless steel reinforcement bars coming into direct contact with the glass block as metal and glass have different expansion and contraction properties. When a spacer peg is fitted and the wall is finished, the ribs at the end twist off and can then be ground over.

Other spacers are available for the 80mm-thick blocks-6mm x 6mm and 6mm x 10mm and also for 100mm-thick blocks - 10mm x 10mm.

Panel reinforcement and tying back to the perimeter opening

Stainless steel ribbed reinforcement bars are used to tie to the opening. The ribs penetrate the expansion material and anchor the panel in place by connecting to the perimeter frame. This can be located by drilling an over sized hole a minimum depth of 25. Stones are should be fitted with ribs to cushion any movement of the re-bar. Ribs are 600mm long and when the panel is larger than the reinforcement bar, ribs are overlapped by a minimum of 50mm and are connected joined using tie wire/cable tie.

One reinforcement bar should be used in each horizontal and vertical joint as a minimum. More ribs may be required if using and glass blocks or a TFS6 or TFS6.

For situations where connecting the ribs to the opening may prove difficult, panel anchors can be used (similar to the principle secured by either screws or bolt fixing or can mechanically shear fixed).

Glass blocks specifies mortar - Colme Vetromix

Colme Vetromix is a specifically designed and formulated pre-mix mortar for glass block construction ensuring accuracy and consistency of performance. It can be used internally, externally, straight, curved and fire-rated glass block walling. Vetromix has a fine texture, low slump and the whilst mortar available. It is used as bedding and pointing mix. Therefore there are no bonding issues between building and grouting. Pointing instructions are on the reverse of each bag and should be strictly adhered to. It also will add approximately 14mm to a 190 x 80 block. The surrounding temperature should not be 5°C and falling or 38°C and rising and the joint width should not exceed 22mm.

Colme Vetromix joint sealer/sealant

After construction, the perimeter joint should be cleared of any residue mortar and caulked with Buds & Mortar expansion sealer for fire-skip mastic. Bridging the joint will restrict flexibility and movement and negate the expansion force and can cause glass blocks or joints to crack.

How a mortar joint works

Glass Block Technology mortar is a specially formulated pre-mix bedding and finishing compound, available if needed to be used with mortar. It is manufactured under factory controlled conditions so all additives are accurately blended and designed for maximum performance of strength, flexibility and resistance to shrinkage. A mortar joint will cure in reaction to air just like mortar mortars, so it is important that the joint size is not too small. This guarantees total curing and maximum strength. Vetromix will become solid within hours of construction. Total curing is achieved after 21-28 days.

Glass is impermeable unlike brick and concrete, therefore mortar is not absorbed into a glass block. The strength and support of a joint is created by the shape of the mortar profile itself. The edge or collar of a block is concave so when two are laid next to each other an oval joint is created. This oval joint enables the glass block wall to resist impact or applied loads resulting in the panel being stable and self-supporting, but not load bearing. Unless the reinforcement bars are used to restrain the panel to the surrounding structure, whilst also giving the panel integral support and a wind-loading value. The minimum recommended joint is 10mm and the most common used is 10mm. However, this is only the distance on show, the centre of the oval joint is always deeper than the collar or collar. This area houses the stainless steel reinforcement bars, which should never be in direct contact with the glass surface.

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The data sheet connection detail & construction principles, should be designed and be specific to each project requirement or environment & calculations checked and qualified by independent structural engineers.

All information is accurate to the best of our knowledge at time of data sheet production, however Glass Block Technology Ltd. cannot be held liable in any way regarding the usage of glass blocks and the manner in which they are installed. Glass Block Technology Ltd. reserve the right to amend or correct changes at any time.

TYPICAL GLASS BLOCK RODS & MORTAR SYSTEM STAIRWELL LANDING

GBT104 Rev.

Scale 1:7.5 & 1: 2.5