



TYPICAL GLASS BLOCK WALL PANEL  
SUPPORTED ON THREE SIDES  
UNSUPPORTED TOP

**Guide to Specifying Glass Blocks - General considerations:**

- Glass block walls are self-supporting, but not load bearing. In addition to their own weight, they can withstand wind loads, horizontal line loads and impact loads. A lintel provides the head for the panel to be anchored into whilst ensuring no downward pressure is placed on the glass blocks.
- 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 100 x 100 x 60mm blocks with 10mm joints, multiply the number of blocks by 200mm (100 block + 10mm joint) then add 10mm for the other mortar joint. This is the minimum opening requirement. Some mortar joints are the most commonly used: down spacers can also be used for thinner joints. If openings have been prepared incorrectly or if extra installing glass blocks, or to create a lighter rail, when building a curved glass block panel.
- Glass block walls are connected to the surround by reinforcement bars being inserted into pre-drilled holes (or 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.
- Between the opening and glass blocks it is essential to incorporate expansion joints in the perimeter to allow the panel to expand and contract freely with temperature change. The frame must not be bridged by mortar (bedder/plaster etc.), and caulked with Rods & Mortar expansion joint sealer (fire-retardant in fire-rated applications).
- Glass blocks should not be installed when the surrounding temperature is 5°C and falling or 38°C and rising.
- Using standard glass blocks the maximum panel size without intermediate support or slig joints is 25m, with no dimension exceeding 6m in either direction. For TFSB and TFSB fire blocks, the maximum panel size permissible is 10m in line with test specifications.

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. interface of glass blocks and render or mastic sealant.

The channel, PPC and boss section dimensions are illustrative only and not necessarily 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 25°C temperature change. Soft expansion joints must be incorporated into the perimeter between the substrate opening and blocks, being caulked with a white silicone for fire-rating mastic. This will usually look similar to a standard mortar joint. For the head and joints of 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 silicone or neoprene material to support the weight of the panel. Alternatively the use of silicone emulsion can be applied on the barrier between the bottom course mortar joint and base of opening.

**Joint sizes and spacer gaps:**

10mm is the most common joint size for specifying and building glass blocks. A 100 x 100 block plus 10mm spacer modules to 200mm. Spacer gaps serve multiple functions: They prevent mortar spigots, increasing the number of courses that can be constructed in 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 gap is fitted and the wall is finished, the tabs at the end joint off and can then be grouted over.

Other spacers are available for the 80mm-thick blocks-down x 60mm and 60mm x 10mm and also for 100mm-thick blocks - 10mm x 10mm.

**Panel reinforcement and tying back to the perimeter openings:**

Stainless steel ribbed reinforcement bars are used in the opening. The ribs penetrate the expansion material and anchor the panel to place by connecting to the perimeter frame. This can be located by drilling an over sized hole a minimum depth of 25. 10mm are should be fitted with silicone to cushion any movement of the re-bar. Rods are 10mm long and when the panel is larger than the reinforcement bar, rods are overlapped by a minimum of 100mm and are bonded, joined using to wire-cable tie.

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

For situations where connecting the rods to the opening may prove difficult, bolt anchors can be used similar to the pre-drilled principle secured by either screw or bolt fitting or can mechanically shear fixed.

**Glass blocks specifies mortar - Colnet Velcrete:**

Colnet Velcrete is a specially designed and formulated pre-mixed 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. Velcrete has a fine texture, low slump and the widest mortar availability. It is used as bedding and pointing mix. Therefore there are no bonding issues between bedding and grouting. Mixing instructions are on the reverse of each bag and should be strictly adhered to. 10 mins will hold approximately 1/2m<sup>2</sup> of 100 x 100 x 60 blocks. The surrounding temperature should not be 5°C and falling or 38°C and rising and the joint width should not exceed 22mm.

**Expansion joint render sealant:**

After construction, the perimeter joint should be cleaned of any residue mortar and caulked with Rods & Mortar expansion sealer for fire stop mastic. Bridging the joint would restrict flexibility and movement and negate the expansion foam and can cause glass blocks or joints to crack.

**How a mortar joint works:**

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

Glass is impervious 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 end joint is created. This end joint enables the glass block wall to resist repeat or applied loads resulting in the panel being stable and self-supporting, but not load bearing. Besides that reinforcement bars are used to tie 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 end joint is always deeper than side to side. This area houses the stainless reinforcement bar, which should never be in direct contact with the glass surface.

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The date 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 date 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 PANEL SUPPORTED ON THREE SIDES WITH UNSUPPORTED TOP**

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**Scale 1:7.5 & 1:2**