OBECO GLASS BLOCKS
SPECIFICATION

obeco glass blocks

INSTALLATION OF GLASS BLOCKS

1 Scope

This specification covers the supply and installation of Obeco glass blocks and associated materials. Specific requirements will be as detailed in the contract drawings, the schedule of work and the purchase order.

2 Referenced standards, documents and drawings

AS
1231 – 2000, Aluminium and aluminium alloys – Anodic oxidation coatings
1449 – 1994, Wrought alloy steels – Stainless and heat-resisting steel plate, sheet and strip 1530 – 2014, Methods for fire tests on building components, materials and structures,
1530.4 – 2014, Part 4: Fire resistance tests of elements of building construction
2758 .1 – 2014, Aggregates and rock for engineering purposes, Part 1: Concrete aggregates, 3715 – 2002, Metal finishing – Thermoset powder coatings for architectural applications 3700 – 2018, Masonry structures
3972 – 2010, Portland and blended cements

AS/NZS
1866 - 1997, Aluminium and aluminium alloys – Extruded rod, bar solid and hollow shapes 4534 - 2006, Zinc and zinc-aluminium-alloy coatings on steel wire

AS/NZS/ISO
9001:2000, Quality management systems – Requirements

International Standard
EN1051-1 Glass in building. Glass blocks and glass pavers.

Obeco
Obeco Glass Block Coursing Charts Obeco Glass
Block Technical Data Sheets Obeco Glass Block
Drawings

3 Contract drawings

The Builder shall supply drawings, details and specifications of sufficient detail to define the extent and location of the work.

When detailed drawings or schedules are required to execute the work, copies of these detailed drawings or schedules shall be submitted to the Builder by the contractor, for approval before the work commences.

4 Dimensions and set-out

All work shall be installed in accordance with the contract drawings, which show the general layout. The main building dimensions shown on the architectural drawings take precedence over those shown on the engineering drawings, which have been included to assist the detailing.

Dimensions for straight glass block panels in all block sizes and frame options using standard 10mm joints, are as specified in the Obeco Glass Block Coursing Charts. Joint sizes can be varied up to 30mm. Curved and corner glass block panels should be set out on site. Minimum radii for curved panels are as specified in Obeco Drawing No.08.

5 Supervision

The contractor shall ensure that the work is performed and directly supervised by appropriately experienced personnel. NOTE: Glass Block Experts Pty Ltd, a wholly owned subsidiary of Obeco Glass Blocks Pty Ltd, is an installation contractor that is deemed to comply with these requirements.

6 Quality assurance

Suppliers and contractors shall provide assurance of the quality of all goods, materials and services to be provided. The following are deemed to meet this requirement:

- a quality assurance system complying with AS/NZS ISO 9001, or
- a quality control system approved by the Builder.

7 Commencement

7.1 Builder

Work shall commence as soon as practical after, but not before, the Builder has issued:

- a written order;
- the relevant contract drawings, specifications and schedule of work; and
- written approval of any details provided by the Contractor.

7.2 Openings

Openings need to be prepared with correct flashing and lintels to suit glass block installation. This work is not the responsibility of the glass block installer. Sizing of openings shall allow enough clearance to accommodate the frame sizes as set out in the Obeco Coursing Charts.

7.3 Access

The Builder shall provide adequate and safe access to both sides of the panels.

8 Inspection and completion

Glass block installation shall be inspected after the first course of the first panel is completed. The inspection shall verify that the following are correct and to the specification:

- the fixing of the frame;
- fitting of expansion joints to the jambs and head; and
- installation of reinforcement.

When work has reached this inspection stage, the Contractor shall advise the Builder before covering, closing or completing the work.

On completion of all works, the Contractor shall formally advise the Builder of practical completion. Where the contract is staged, this advice shall be given on completion of each major stage.

9 Mortar jointed panels

9.1 Glass blocks

Obeco glass blocks shall be used for compliance with this specification, Obeco Glass Blocks are manufactured to the International Standard EN 1051-1 by LA ROCHERE GLASS BLOCKS® and MULIA GLASS BLOCKS®.

LA ROCHERE GLASS BLOCKS® and MULIA GLASS BLOCKS® comply with Class 1 provisions of EN 1051-1 i.e allowing a dimensional tolerance of max.+/- 1.00mm only.

Glass block panels are not load-bearing & adequate provision for support must be made around the panel.

Glass blocks shall be stored in a dry place, in their protective packing until required for installation. Care shall be taken in handling to avoid damage to edges or chipping. Damaged or imperfect blocks shall not be used.

9.2 Aluminium frames

Glass block panels shall be supported on all sides by fabricated aluminium frames of nominal dimension 80 x 40 x 2 for 80mm glass blocks and 100 x 40 x 2 for 100mm glass blocks. Aluminium frames shall not be load-bearing and shall be fixed to the jambs of the surrounding structure at maximum 450mm centres. Fixing materials and methods shall be compatible with the surrounding material.

Aluminium shall comply with AS/NZS 1866.

Powder coated aluminium frames shall comply with AS 3715. The finished paint thickness shall be not less than 65µm.

Anodised aluminium frames shall comply with AS 1231. The anodised coating shall be 25µm unless otherwise specified.

9.3 Reinforcement

Steel reinforcement shall be nominal 5mm stainless steel round bar.

Reinforcing rods shall be placed in pairs at maximum 500mm centres both vertically and horizontally (see Obeco Drawing No.01).

Where possible, reinforcement shall be continuous in the shortest span. Where it is necessary to join reinforcement, the lap shall be a minimum length of 250mm.

Reinforcing shall be laid into the perimeter mortar bed (inside the frame) on all sides. All vertical and horizontal reinforcing shall overlap the perimeter reinforcing.

Horizontal reinforcing that bridges an expansion joint shall overlap the joint 250mm to either side and shall be encased in a plastic sleeve to allow free movement.

Mortar cover to reinforcement shall be 15mm minimum external and 10mm minimum internal. Reinforcement shall not be in contact with glass blocks at any location.

In all areas except for a “marine environment” (between 100m – 1000m from sheltered bays) as defined by AS 3700, all steel reinforcement shall be treated with a protective coating in accordance with AS/NZS 4534. Coating mass (min) 290g/m2. In a “severe marine environment” (with 100m of water in sheltered bays and within 1000m of surf beaches) stainless steel grade 316 or 316L to AS 1449 shall be used.

9.4 Mortar

Cement shall be slow setting Portland cement with low shrinkage, complying with AS 3972 unless specified otherwise.

Sand shall be clean, sharp and free from salts, vegetable matter and impurities. It shall conform to AS 2758.1, be well graded with a grain size of 0–4mm.

Water shall be clean and potable.

Mortar shall be a stiff, homogenous mix of 1 part cement to 3 parts sand, mixed as dry as practicable. Anti-freeze and accelerators shall not be used.

For external applications add a stearate waterproofing agent. The waterproofing agent shall be added to the mixing water for even dispersion.

The minimum compressive strength shall be 12Mpa at 28 days.

9.5 Mortar joints

Joints shall be equal thickness. Standard joint thickness is 10mm.

Joints shall be raked to 10mm for grout where specified. Joints at top, bottom and vertical edge of each panel (between glass block and framing) shall be recessed to 10mm for a silicone perimeter joint.

9.6 Expansion joints and slip joints

Expansion material shall be closed cell waterproof type, nominal 10mm thick and shall be installed into the jambs and head of the perimeter framing. A separating membrane shall be placed in the sill and on the inside flanges of the framing on all sides.

Vertical expansion joints shall be located at a minimum 6 metre intervals horizontally. Horizontal slip joints shall be located at a minimum 6 metre intervals vertically.

(See Obeco Drawing No.09).

9.7 Grout

Where specified, grout shall be sanded and comply with the appropriate standards for mortar listed in 10.4 and shall comprise:

- 3 parts 30 micron mineral sand, soda ash or silica type
- 1 part cement
- 1 part pure silica
- add a stearate waterproofing agent

Iron joints smooth and sponge off excess grout.

When grout has dried, use a dry cloth to remove the light film remaining. Keep the cloth clean of sand particles to avoid scratching.

9.8 Maintenance

Glass block panels need little maintenance. They should be washed occasionally with soapy water and then rinsed off. Powder coated and anodised aluminium should be cleaned regularly with a pH-neutral detergent solution (see AS 3715 and AS 1231) and thoroughly rinsed. Solvents or abrasive solutions should not be used.

Do not use harsh cleaners, acids or abrasives.

10 Fire rated panels

10.1 General

Fire-resistant glass block structures are made of one or more translucent space enclosing elements in conjunction with seals and fastening materials. When they function as space enclosing elements, they need to prevent the spread of fire and smoke [and in some cases - heat] for the nominated period of time.

Glass blocks used in fire-resistant glass structures are not load-bearing, however they offer great versatility where fire protection is required and where natural light and either privacy or transparency are desirable.

All interior and exterior fire inhibiting or fire-proof glazing required by the BCA can be carried out using glass block elements to Fire Resistance Levels (FRLs) of -/60/-, -/90/-, -/120/-, -/60/30, -/90/60 and -/120/120.

FRLs are expressed in terms of:

- STRUCTURAL ADEQUACY – Structural adequacy is a measure of an element to be load bearing. As glass block elements are not load bearing the criteria for 'Structural Adequacy' is not relevant.
- INTEGRITY – Integrity is the ability of a glass block element to restrict the passage of flames and hot gases.
- INSULATION – Insulation is the ability of a glass block element to prevent the penetration of thermal radiation.

These properties are measured in minutes and expressed as xx/yy/zz. See Technical Data Figure1 in the Obeco Technical Data Sheets for FRLs of different glass blocks.

10.2 Fixing for integrity rated glass blocks

This work instruction covers glass block installation to achieve FRLs of -/60/- (see clause 10.3), -/90/- (see clause 10.4) and -/120/- [see Clause10.5]. The standard details set out in clauses 1 to 9 above apply, except where modified below.

Modifications to standard fixing details are as follows:

a) Frames to be in accordance with clause 9.2, except for the addition of steel anchor pins at 400mm centres from the glass block joint (150mm depth) into the jambs of the surrounding structure (50mm depth). [See Obeco Drawing Nos. 01, 02, 03 and 07] The steel anchor pins are pieces of the reinforcing rods cut to 200mm lengths.

b) Reinforcing to comprise two 5mm nominal diameter rods in each horizontal joint and one in every second vertical joint, its position changing between inside and outside. Refer to Obeco Drawing Nos. 01, 02, 03 and 07.

c) Expansion material to be compressible fire-approved type.

10.3 FRL -/60/-

When installed in accordance with this specification, including clause 10, all La Rochere® 190 x 190 x 80mm (La Rochere 198) glass blocks with a nominal face thickness of 8mm would be capable of achieving a FRL of -/60/- when tested in accordance with the requirements of AS 1530.4. (see CSIRO Opinion Number FCO-2779 RevC and Obeco Drawing Nos 01 and 02).

10.4 FRL -/90/-

When installed in accordance with this specification, including clause 10, all La Rochere® 190 x 190 x 100mm (La Rochere 1910) and 300 x 300 x 100 [La Rochere 3010] glass blocks with a nominal face thickness of 8mm would be capable of achieving a FRL of -/90/- when tested in accordance with the requirements of AS 1530.4. (see CSIRO Opinion Number FCO-2779 RevC and Obeco Drawing No 03).

10.5 FRL -/120/-

When installed in accordance with this specification, including clause 10, all La Rochere® 190 x 190 x 100mm (La Rochere 1910) glass blocks with a nominal face thickness of 8mm when laid in a double skin with a minimum 50mm cavity would be capable of achieving a FRL of -/120/- when tested in accordance with the requirements of AS 1530.4. (see CSIRO Opinion Number FCO-2779 RevC and Obeco Drawing No 07).

10.6 Fixing for integrity and insulation rated glass Blocks

This work instruction covers glass block installation to achieve FRLs of -/60/30 (see clause 10.7), -/90/60 (see clause 10.8) and -/120/120 (see clause 10.9). The standard details set out in clauses 1 to 10 above apply, except where modified below.

Modifications to standard fixing details are as follows:

a) Frames to be in accordance with clause 9.2, except that the framing shall be 100 x 40 x 2.2mm, 150 x 40 x 2.2mm and 200 X 40 X 2.2mm respectively, with the addition of steel anchor pins at 400mm centres from the glass block joint (150mm depth) into the jambs of the surrounding structure (50mm depth) as per clause 10.2. [See Obeco Drawing No.s 04,05 and 06]

b) Reinforcing to comprise two, three or four respectively 5mm nominal diameter rods in each horizontal joint and two in every second vertical joint, their position changing between inside and outside. Reinforcing of the mortar in the perimeter framing to be two 5mm nominal diameter rods on all sides.

c) Expansion material to be compressible fire-approved type.

10.7 FRL -/60/30

When installed in accordance with this specification, including clause 10, all La Rochere® 190 x 190 x 100mm (La Rochere TF30) glass blocks would be capable of achieving a FRL of -/60/30 when tested in accordance with the requirements of AS 1530.4. (see CSIRO Opinion Number FCO-2779 RevC and Obeco Drawing No 04).

10.8 FRL -/90/60

When installed in accordance with this specification, including clause 10, all La Rochere® 190 x 190 x 150mm (La Rochere TF60a) glass blocks would be capable of achieving a FRL of -/90/60 when tested in accordance with the requirements of AS 1530.4. (see CSIRO Opinion Number FCO-2779 RevC and Obeco Drawing No 05)

10.9 FRL -/120/120

When installed in accordance with this specification, including clause 10, Fuchs Design® 190 x 190 x 200mm (Fuchs Design F120) glass blocks would be capable of achieving a FRL of -/120/120 when tested in accordance with the requirements of AS 1530.4. (see CSIRO Opinion Number FCO-2779 RevC and Obeco Drawing No 06)