# BRISBANE CITY COUNCIL

# REFERENCE SPECIFICATIONS FOR ENGINEERING WORK

# S210 MASONRY

## AMENDMENT REGISTER

|  |  |  |  |
| --- | --- | --- | --- |
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| 1.2 and 1.3 | Reference list expanded to show all referenced documents |
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## GENERAL

### Section Content

Specified in this section: Masonry supply and construction.

### Standards

|  |  |  |
| --- | --- | --- |
| Australian Standard | AS 1672.1 | Limes and limestones – Limes for building |
| Australian/New Zealand Standard | AS/NZS 2699.1 | Built-in components for masonry construction – Wall ties |
| Australian/New Zealand Standard | AS/NZS 2699.2 | Built-in components for masonry construction – Connectors and accessories |
| Australian/New Zealand Standard | AS/NZS 2699.3 | Built-in components for masonry construction – Lintels and shelf angles (durability requirements) |
| Australian Standard | AS 3700 | Masonry structures |
| Australian Standard | AS 3972 | General purpose and blended cements |
| Australian Standard | AS/NZS 4455.1 | Masonry units, pavers, flags and segmental retaining wall units – Masonry units |
| Australian Standard | AS/NZS 4455.2 | Masonry units, pavers, flags and segmental retaining wall units – Pavers and flags |
| Australian Standard | AS/NZS4455.3 | Masonry units, pavers, flags and segmental retaining wall units – Segmental retaining wall units |
| Australian/New Zealand Standard, International Standards Organization | AS/NZS ISO 9001 | Quality management systems – Requirements |

### References

Refer to the following other Reference Specifications for Engineering Work:

|  |  |
| --- | --- |
| S110 | General Requirements |
| S180 | Unit Paving |
| S200 | Concrete Work |

### Interpretation

**Definitions**

Bricks: Masonry units of fired clay, calcium silicate or concrete, of generally rectangular prismatic shape and not exceeding 4x106mm3 in gross volume.

Brickwork: Masonry constructed with bricks.

Blocks: Masonry units of fired clay, calcium silicate, concrete or other materials (excluding glass), hollow or solid, exceeding 4x106mm3 in gross volume.

Block work: Masonry constructed with blocks.

Reinforced masonry: Masonry required to be strengthened with embedded steel reinforcement (other than nominal reinforcement such as bed joint mesh).

Face units: Masonry units used in facework, including purpose-made units such as squints and sills. The term “face units” includes “face bricks” and “face blocks”.

Facework: Masonry required to be visible in the completed works.

Commons (includes the terms “seconds” and “reject face”): Masonry units used in work other than facework.

## QUALITY

### Quality System

The supplier must maintain a Quality Assurance System with third party accreditation to *AS/NZS ISO 9001*.

### Inspection

*Refer annexure*. Give sufficient notice so that inspection may be made at the following stages:

* Items to be built in are located in their correct positions, including bolts and structural steelwork.
* Bottoms of core holes before grouting.
* Control joints ready for insertion of joint filler.

### Samples

Sample submission

Masonry units: Not less than six (6) units of each face type, representing the total range of variation of colour, texture, surface irregularities (including defective arrises), and regularity of shape.  *Refer annexure*.

Sand: A 2 kg sample of sand, where required to be from a particular source or of a particular colour.  *Refer annexure*.

Sample panels

Facework: Prepare in a suitable position, or where directed, a sample panel of each type of facework. *Refer annexure*.

Incorporation into the works: An approved panel, if suitably located, may be incorporated into the works. Otherwise remove all traces on completion.

### Contractor’s Submissions

Before installation commences, obtain and submit the following data:

* Manufacturer’s data: The manufacturer's published product data, including technical specifications, recommendations for installation; and type test or factory test data.
* Testing authority’s reports: Test reports certified by an independent testing authority showing compliance with the criteria of specified tests.
* Product warranties: The manufacturer's written statement certifying that the product complies with the specification and is suitable for the intended use.
* Delivery docket: For each delivery, submit a docket that records the manufacturer’s product identification.

## MATERIALS AND COMPONENTS

**Mortar**

Cement: Type GP to *AS 3972*.

White cement: Iron salts content ≤1%.

Lime: To *AS 1672.1*.

Sand: Fine aggregate with a low clay content and free from efflorescing salts.

Composition: Mix proportions to comply with Table 3.1.

Face or pointing mortar: Match colour and texture to the approved sample*. Refer annexure*.

Table 3.1 – Mortar mix

|  |  |  |
| --- | --- | --- |
| Mortar type to *AS 3700* | Cement: lime: sand (proportions by volume) | Location |
| M3 | 1:0:5+water thickener | Concrete or calcium silicate masonry |
| M4 | 1:0:4+water thickener | Grouted and reinforced masonry |
| M4 | 1:0-0.25:5 | Underpinning, high strength masonry |
| M3 | 1:1:6 | Other masonry |

Units

Face units: General good appearance free from defects outside the range of approved samples. Use solid masonry units in facework where perforations would otherwise be visible. *Refer annexure*.

Wall ties

Wall tie duty classification: To *AS 2699*.

Category: Cavity ties or masonry veneer ties as appropriate to the service conditions.

Light duty tie: To suit masonry veneer.

Medium duty tie: To suit normal cavity construction and at abutments.

Heavy duty tie: To suit cavities >60 mm wide.

## EXECUTION

### General

“Grassing” of bricks: Do not lay clay bricks until they have been out of the kiln for at least 14 days.

Chases: Do not chase masonry without prior approval.

Cleaning: Clean masonry progressively as the work proceeds. Clean facework to remove mortar smears, stains, discolouration, and the like.

Bonding pattern: Stretcher bond generally in single leaf construction.

Tightening: Tighten bolts, screws and other fixings so that joints and anchorages are secure at practical completion.

### Setting out

Rod and bond: Set out masonry so as to maintain the specified rod and bond with bed joints and vertical joints of uniform width and with the minimum cutting of masonry units.

Trial setout: Make a trial setout of two courses for each panel of facework and obtain approval before laying.

### Wall ties

Embedment

Cavity >60 mm wide: 75 mm minimum.

Reinforced masonry: Locate the ties in the unreinforced courses.

Anchorage

Fixing of masonry veneer ties at abutments: Generally to the requirements of *AS 2699.1*.

Masonry veneer ties to timber frames: Galvanised clouts or integral spikes.

Masonry veneer ties to concrete: Non-corrosive masonry anchors.

### Flexible ties

Ties or anchors required to extend across control joints must transfer the forces necessary to maintain the stability of the masonry without impairing the effectiveness of the joint.

### Bed joint reinforcement

Material: Galvanised welded wire mesh.

Width: Equal to the width of the masonry leaf, less 15 mm cover from each exposed surface of the mortar joint.

Placement locations: In the third bed joint above the bottom of the wall, in the second bed joint from the top of the wall, and in the first two bed joints above and below openings and fixtures. Vertical spacing not to exceed 500 mm.

Installation: Lap reinforcement 450 mm at splices. Fold and bend at corners so that the longitudinal wires are continuous. Stop 200 mm short of control joints.

In brickwork: Extend 450 mm beyond each side of openings.

### Reinforced masonry

Designation: Masonry strengthened with embedded steel reinforcement, other than bed joint reinforcement.

Cleaning core holes: In blockwork use purpose made cleanout blocks or machine cut a cleaning hole at the base of each reinforced core. Locate on the side of the wall which is to be rendered or otherwise concealed. After cleaning out has been inspected and approved, cover the hole with formwork and grout the core.

### Arches

Shapes and dimensions: Form masonry arches to the required shapes and dimensions using solid or cored (not hollow) masonry units.

Arch voussoirs: Cut masonry units to the required shape with masonry saw.

### Underpinning

Installation: Construct underpinning in alternate panels, each panel not exceeding 1200 mm in length. Maintain bond and coursing in adjoining panels. Set out rod to leave 13 mm maximum between top of underpinning and bottom of existing footing.

Grouting: Pressure grout between underpinning and footing with 1:0.25:3 (proportions of cement:lime:sand) mortar within 48 hours of completion of each panel.

### Control joints

Filler material

Joint filler: Sealant and bond breaking back up material, recommended by the material manufacturers for the location and service conditions, compatible when used together, and non-staining to masonry. Do not use bituminous materials on absorbent masonry units.

Priming: Apply the appropriate primer to masonry surfaces in contact with jointing materials unless priming is not recommended by the jointing material manufacturer.

Foamed materials (compressible filler, backing rods and the like): Closed-cell or impregnated types that do not absorb water.

Bond breaking materials: Non-adhesive to sealant, or faced with non-adhering material.

Jointing

Cleaning: Clean joints thoroughly before sealing.

Sealant depth: 0.67 to 1 times the joint width.

Pointing: Point up joints around flashings as necessary to fill voids.

Concealed work: Cut the joints flush but leave them unstruck in masonry not visible in the completed works.

Facework joints: Work with a jointing tool to a dense smooth surface of the profile shown or specified.  *Refer annexure*.

### Facework

Commencement position: Commence at least one full course for blockwork or two full courses for brickwork or 175 mm, whichever is the greater, below adjacent finished ground level.

Perpends: Keep perpends in alternate courses vertically aligned.

Colour mixing: Distribute the approved colour range of face units evenly throughout the facework. Prevent colour concentrations and “banding”.

Double face walls: Select masonry units for uniform width and double face qualities in single leaf masonry with facework both sides. Before commencement, obtain a ruling as to which side is the preferred face.

### Bagging

Preparation: Cut joints flush prior to bagging.

Dry bagging: Apply laying mortar to the surface using a hessian bag or the like. Flush up irregularities, but leave the minimum possible amount of mortar on the masonry surface.

Textured bagging: Apply laying mortar to the surface using a sponge float. Flush up irregularities and leave approximately 2 mm of mortar on the surface. When initial set is reached, texture to approval using a hand bristle brush.