

<b>0331 BRICK AND BLOCK CONSTRUCTION</b>
--

**Worksection abstract**

This worksection *Template* is applicable to internal and external, load bearing and non-load bearing brick and block construction in buildings and associated structures using brick and block masonry units manufactured from clay, calcium silicate, concrete or autoclaved aerated concrete (AAC). It includes details on mortar, reinforcement, wall ties and other accessories, lintels, damp-proof courses and flashings.

**How to use this worksection**

Customise this worksection *Template* for each project. See [A guide to NATSPEC worksections \(www.natspec.com.au\)](http://www.natspec.com.au) for information on *Template* structure, word styles and completing a worksection.

**Related material located elsewhere in NATSPEC**

If a listed worksection is not part of your subscription package and you wish to purchase it, contact NATSPEC.

Related material may be found in other worksections, including:

- *0181 Adhesives, sealants and fasteners* for sealants in external masonry joints.
- *0182 Fire-stopping.*
- *0184 Termite management.*
- *0332 Stone masonry.*
- *0361 Monolithic stabilised rammed earth walls.*
- *0362 Mud brick and pressed earth block walls.*
- *0383 Decking, sheet and panel flooring*, for holding down requirements against wind uplift.
- *0421 Roofing - combined*, for holding down requirements against wind uplift.
- *0523 Partitions - brick and block*, for interior fitout masonry walls.
- *0611 Rendering and plastering.*

Related branded worksections include:

- *0192p ANCON structural components.*

**Cross references**

Worksections that cross reference this worksection are:

- None.

**Material not included in NATSPEC**

Some projects may include items not covered by NATSPEC. For these you may need to create new text or modify this text or a suitable worksection.

**Documenting this and related work**

You may document this and related work as follows:

- Masonry is normally fully detailed. See AS 3700 (2018) clause 1.4 for information to be provided.
- For masonry in small buildings (Class 1 and Class 10a buildings), the AS 4773 series may be used. See AS 4773.1 (2015) clause 1.4 for minimum information to be provided.
- Document details related to durability, fire-resistance, masonry growth, differential movements, earthquake and wind design, lateral stability design and robustness.
- Weatherproofing: Conform to BCA (2022) F3D5 for Class 2 to Class 9 buildings or BCA (2022) H2D4 for Class 1 and 10 buildings. Alternatively, document a performance solution. Consider adding a requirement for evidence of conformance from the contractor. Refer to NATSPEC TECHnote DES 044 for information on weatherproofing of external walls.
- In bushfire-prone areas, document bushfire protection requirements to AS 3959 (2018) and the NCC. See NATSPEC TECHnote DES 018 for information on bushfire protection.

The *Normal* style text of this worksection may refer to items as being documented elsewhere in the contract documentation. Make sure they are documented.

For example:

- Flexible masonry ties.

Search [acumen.architecture.com.au](http://acumen.architecture.com.au), the Australian Institute of Architects' practice advisory subscription service, for notes on the following:

- Guarantees and warranties.
- Thermal mass in building design.

**Specifying ESD**

The following may be specified by retaining default text:

- Minimum durability classification for steel components, including reinforcement.

The following may be specified by including additional text:

- Re-use of reclaimed masonry units.
- Recycled material content, e.g. recycled glass aggregate.
- Concrete blocks incorporating recycled concrete, fly ash content as a replacement of more energy intensive cement.
- Corrosion protection with the appropriate durability for metallic components to extend material/product life.
- Lightweight blocks with high recycled material content.

Refer to NATSPEC TECHreport TR 01 on specifying ESD.

**1 GENERAL****1.1 RESPONSIBILITIES****General**

Requirement: Provide brick and block construction, as documented.

*Documented* is defined in *0171 General requirements* as meaning contained in the contract documents.

**1.2 CROSS REFERENCES****General**

Requirement: Conform to the following:

- *0171 General requirements*.

*0171 General requirements* contains umbrella requirements for all building and services worksections.

List the worksections cross referenced by this worksection. *0171 General requirements* references the *018 Common requirements* subgroup of worksections. It is not necessary to repeat them here. However, you may also wish to direct the contractor to other worksections where there may be work that is closely associated with this work.

NATSPEC uses generic worksection titles, whether or not there are branded equivalents. If you use a branded worksection, change the cross reference here.

**1.3 STANDARDS****General**

Materials and construction: To AS 3700 (2018).

AS 3700 (2018) Section 3 covers design properties for masonry units, masonry, ties and accessories, grout, reinforcement and tendons. AS 3700 (2018) Section 11 covers the requirements for materials for masonry construction including masonry, masonry units, mortar, wall ties, connectors, accessories, lintels, damp-proof courses, flashings, weatherings, grout, reinforcement and tendons.

AS 3700 (2018) Section 12 covers both general requirements for masonry construction and additional requirements for special masonry.

CMAA publications *CMAA CM01 (2019)*, *CMAA CM02 (2020)* and *CMAA MA55 (2016)* available from [www.cmaa.com.au](http://www.cmaa.com.au) provide more information on the design and construction of concrete masonry.

Think Brick Australia publishes technical manuals covering a range of clay masonry design and construction topics including the properties of clay masonry units in *Think Brick Manual 02 (2024)* and detailing of clay masonry in *Think Brick Manual 09 (2024)*. The technical manuals are available from [www.thinkbrick.com.au](http://www.thinkbrick.com.au).

For restoration work, see also BS 6576 (2005) on rising damp in walls and the installation of chemical damp-proof courses.

Only particular requirements for the project should be added to this worksection.

**Materials and construction: To the AS 4773 series.**

For building designs conforming to the AS 4773 series, consider including this *Optional* style text by changing to *Normal* style text and deleting "Materials and construction: To AS 3700 (2018)" in the line above.

**1.4 INTERPRETATION****Definitions**

General: For the purposes of this worksection, the definitions in AS 3700 (2018) clause 1.5.2, AS/NZS 4455.1 (2008) clause 1.4 and the following apply:

- Facework: Masonry intended to be exposed in a wall.
- Special mortar: Mortar with compositions not covered in AS 3700 (2018) Table 11.1.

Edit the **Definitions** subclause to suit the project or delete if not required. List alphabetically.

## 1.5 TOLERANCES

### General

Requirement: To AS 3700 (2018) clause 12.5 and Table 12.1.

Specify more stringent tolerances for specific architectural requirements including facework. Consider adding facework tolerances for the horizontality, regularity and verticality of edges, joints etc.

## 1.6 SUBMISSIONS

### Fire performance

Fire-resistance level: Submit evidence of conformity to **FIRE PERFORMANCE, Fire-resistance of building elements**.

### Products and materials

Type tests: Submit test results of the following:

- Characteristic unconfined compressive strength of masonry unit: To **MATERIALS, Masonry units**.

Type tests are carried out off-site. However, submission of evidence of a successful type test may be called up here for requirements specified in PRODUCTS.

Environmental Product Declaration (EPD): Submit an EPD to ISO 14025 (2006) with a Product Category Rule (PCR), used to calculate environmental impact indicators, to EN 15804 (2012) or ISO 21930 (2017).

If the submission of an EPD is a project requirement, change this *Optional* style text to *Normal* style text.

Nominate which products are required to have an EPD either here or in PRODUCTS.

An EPD is an independently verified and registered document that quantifies environmental information on the life cycle of a product to enable comparisons between products fulfilling the same function. EPDs can support carbon emission reduction by allowing a fair and equitable comparison of the impacts of different materials and products within specific product categories.

### Samples

Requirement: Submit samples to PRODUCTS, **GENERAL, Samples**.

### Tests

Detail the tests required in EXECUTION and list the submissions required here.

Site tests: Submit results for special mortar and masonry as follows:

- Characteristic compressive strength.
- Characteristic flexural tensile strength.
- Scratch index for mortar joints.

On-site testing of masonry is required only in rare cases when special mortar (outside the scope of AS 3700 (2018) Table 11.1) or special masonry is specified. See AS 3700 (2018) clause 11.4 and AS 3700 (2018) clause 12.7 for testing requirements. Delete this subclause if on-site testing is not required.

### Warranties

Requirement: Submit warranties to **COMPLETION, Warranties**.

## 1.7 INSPECTION

### Notice

Inspection: Give notice so that inspection may be made of the following:

- Set-out.
- Structural steelwork, including bolts and shelf angles, in position.
- Unit type, colour and texture.
- Bottoms of cavities, after cleaning out.
- Bottoms of core holes, before grouting.
- Reinforcement type and diameter.
- Positioning of reinforcement before grouting.
- Control joints, ready for insertion of joint filler.
- Damp-proof courses, in position.

- Flashings, in position.
- Lintels, in position.

Edit to suit the project, adding critical stage inspections required.

**Hold points**, if required, should be inserted here.

## 2 PRODUCTS

### 2.1 GENERAL

#### Samples

Particular samples required may include accessories such as wall ties, ant caps, damp-proof course, flashing, sill bricks, squints and vents. Edit this subclause, as required.

Requirement: Provide samples, as follows:

- Each type of face unit, showing the range of variation available, including colour, texture, surface irregularities, defective arrises, and shape.
  - . Number of each type: 6.
- 2 kg sample of each type of sand required to be of a particular colour, grade or source.

Samples of sand may be required where a particular source or colour is required, and for major works, where testing for grading is necessary.

- Each type of sealant, showing the finished colour.
  - . Quantity: Minimum two of each colour.

**Wall ties: Provide samples of the following wall ties:**

- [complete/delete]

Nominate the proprietary item specified or select from the following:

- Standard external cavity tie.
- Extended external cavity tie.
- Control joint flexible tie.
- Control abutment tie.
- Head restraint tie.

Sample panel: Provide a sample panel for each type of facework, including face or pointing mortar and a finished vertical control joint in a suitable location.

- Size: Minimum 1200 mm high x 1190 mm or closest unit module long.

If final design decisions have not been made about mortar colour and joint finish, it may be necessary to specify several trial sample panels illustrating different combinations. However, to reduce cost, consider locating sample panels so that they may be retained if approved and incorporated into the works. Rely on these panels for definition of quality, e.g. accuracy, neatness.

### 2.2 FIRE PERFORMANCE

#### Fire-resistance of building elements

Fire-resistance level: Tested to AS 1530.4 (2014).

Refer to NATSPEC TECHnote DES 020 for information on fire-resistance levels.

### 2.3 DURABILITY

#### General

**Exposure environment:** [complete/delete]

Select exposure environment from: mild, moderate, industrial, marine or severe marine to AS 3700 (2018) clause 5.3. Exposure environment is project specific and applies to all masonry materials, accessories and built-in items. Refer to the documented atmospheric corrosivity categories in 0171 *General requirements*. See NATSPEC TECHnote DES 010 for information on atmospheric corrosivity categories.

For building designs conforming to AS 4773, see AS 4773.1 (2015) clause 4.3.

Exposure locations: To AS 3700 (2018) clause 5.4.

There might be different exposure locations within one project: exterior, exterior-coated or interior. Nominate in SELECTIONS or show on the drawings.

Exposure locations: To AS 4773.1 (2015) clause 4.4.

For building designs conforming to the AS 4773 series, consider including this *Optional* style text by changing to *Normal* style text and deleting "Exposure locations: To AS 3700 (2018) clause 5.4" in the line above.

## 2.4 MATERIALS

### Masonry units

Selections: As documented.

Standard: To AS/NZS 4455.1 (2008) and AS/NZS 4455.3 (2008).

Document the name, type, category, size and fire-resistance level of masonry units in SELECTIONS or show on the drawings. Identify face units and selected commons specified to be used as face units, either as a proprietary item (brand name, manufacturer) or by reference to preselected samples. Preferably use clay commons with clay face units. If using different types in close proximity, e.g. in the two leaves of a cavity wall, make sufficient provision for differential movement between them.

Salt attack resistance grade: To AS 3700 (2018) Table 5.1.

Use AS 3700 (2018) Table 5.1 to select the salt attack resistance grade (protected, general purpose or exposure) for different exposure locations within the project and nominate in SELECTIONS.

The means for demonstrating conformance with the required salt attack resistance grade of masonry units is given in AS/NZS 4455.1 (2008) and AS/NZS 4455.3 (2008).

Salt attack resistance grade: To AS 4773.2 (2015) Table 2.1.

For building designs conforming to the AS 4773 series, consider including this *Optional* style text by changing to *Normal* style text and deleting "Salt attack resistance grade: To AS 3700 (2018) Table 5.1" in the line above.

Characteristic unconfined compressive strength: To AS/NZS 4456.4 (2003).

Unconfined compressive strength of masonry units is required for load bearing masonry and should be obtained from the manufacturer. See AS/NZS 4455.1 (2008) clause 2.3.2.

Minimum age of clay bricks: 7 days.

The strength values used in the masonry design are based on an age of 7 days. See *Think Brick Manual 10 (2018)* for further information about the minimum age of clay bricks.

### Mortar materials

Mortar class: To AS 3700 (2018) Table 5.1.

Use AS 3700 (2018) Table 5.1 to select mortar class (M1 to M4) for different exposure locations within the project and nominate in SELECTIONS or show on the drawings.

Consider the benefits of adopting one class of mortar for the project versus the cost of using a higher class of mortar than would normally be required for internal work. Consider soil conditions and other exposure issues carefully.

Mortar class: To AS 4773.2 (2015) Table 3.1.

For building designs conforming to the AS 4773 series, consider including this *Optional* style text by changing to *Normal* style text and deleting "Mortar class: To AS 3700 (2018) Table 5.1" in the line above.

Cement: To AS 3972 (2010).

Cement type: [complete/delete]

Cement type is normally Type GP. See AS 3972 (2010) for other types of cements. Consider using Type GB or Type GL cement if fly ash additions are favourable or Type SR for possible sulfate attack protection.

See AS 1316 (2003), if masonry cement is used.

White cement: With not more than 1% iron salts content.

If required, specify as a proprietary item.

Lime: To AS 1672.1 (1997).

Sand: Fine aggregate with a low clay content, free from efflorescing salts and deleterious matter, selected for colour and grading.

If possible, mortar colour should be achieved by the natural colour of the sand (including blended sands), if necessary in combination with white or off-white cement, rather than by the addition of colouring pigments.

Water: Clean and free from any deleterious matter.

Admixtures: To AS 3700 (2018) clause 11.4.2.4.

Plasticisers are not recommended as a substitute for lime. Adding more than the recommended amount of admixtures may result in low bond strength and durability. Document limits to suit the project.

Admixtures: To AS 4773.2 (2015) clause 3.2.6.

For building designs conforming to the AS 4773 series, consider including this *Optional* style text by changing to *Normal* style text and deleting "Admixtures: To AS 3700 (2018) clause 11.4.2.4" in the line above.

Pigment: To EN 12878 (2014), and as follows:

- Integral pigment mix proportion: Not more than 10% by weight of cement.

See MPA Data Sheet 17 (2021) for information on pigments at [www.mortar.org.uk](http://www.mortar.org.uk).

#### Masonry cement mortar mix proportions table (cement:lime:sand), by volume

Mortar class to AS 3700 (2018)	Clay	Concrete	Calcium silicate	Water thickener
M3	1:0:4	1:0:4	N/A	Yes
M4	1:0:3	N/A	N/A	Yes

#### Cement (GP/GB) mortar mix proportions table (cement:lime:sand), by volume

Mortar class to AS 3700 (2018)	Clay	Concrete	Calcium silicate	Water thickener
M2	1:2:9	N/A	N/A	No
M3	1:1:6	1:1:6	N/A	Optional
M3	1:0:5	1:0:5	1:0:5	Yes
M4	1:0.5:4.5	1:0.5:4.5	N/A	Optional
M4	1:0:4	1:0:4	1:0:4	Yes
M4	1:0-0.25:3	1:0-0.25:3	N/A	Optional

Edit for the mortar mixes required for the project. Schedule the location where each is to be used and show in SELECTIONS or on the drawings.

Where options exist within a Mortar class, the choice of a mix containing lime increases the chance of post demolition re-use of reclaimed masonry units. For M1 mortar mix options, refer to AS 3700 (2018) Table 11.1.

Thin bed mortars for autoclaved aerated concrete (AAC) are proprietary materials purpose-made and are not covered by this table. AS 3700 (2018) clause 11.4.1 deems this mortar to be class M3.

For works including building designs conforming to the AS 4773 series, edit the table above to make sure the mortar mix conforms to AS 4773.2 (2015) clause 3.1 and AS 4773.2 (2015) Table 3.2.

#### Grout

Standard: To AS 3700 (2018) clause 11.7.

Standard: To AS 4773.2 (2015) clause 4.2.

For building designs conforming to the AS 4773 series, consider including this *Optional* style text by changing to *Normal* style text and deleting "Standard: To AS 3700 (2018) clause 11.7" in the line above.

Maximum aggregate size: 12 mm.

Minimum cement content: 300 kg/m<sup>3</sup>.

Characteristic compressive strength: Minimum 12 MPa.

See AS 3700 (2018) clause 11.7.3. If a higher compressive strength is required, document the required strength and edit the text above.

Nominal slump: 200 mm.

## 2.5 BUILT-IN COMPONENTS

### General

Durability class of built-in components: To AS 3700 (2018) Table 5.1.

Use AS 3700 (2018) Table 5.1 or AS 4773.1 (2015) Table 4.1, as appropriate, to select durability class (R1 to R5) for built-in components for different exposure locations within the project and nominate in SELECTIONS. All steel lintels, wall ties, reinforcement, connectors and accessories in the same exposure location within the project will have same durability class.

On the other hand, the built-in components in different exposure locations throughout the project will usually have different durability classes. For example, all components built into the external masonry walls will have a higher durability class than the components built into the internal walls. However, consider the benefits of adopting one durability class for the whole project versus the cost of using a higher durability class than would normally be required for internal work.

**Durability class of built-in components:** To AS 4773.1 (2015) Table 4.1.

For building designs conforming to the AS 4773 series, consider including this *Optional* style text by changing to *Normal* style text and deleting "Durability class of built-in components: To AS 3700 (2018) Table 5.1" in the line above.

### Steel lintels

Angles and flats: To AS/NZS 3679.1 (2016).

Cold-formed proprietary lintels: Designed to AS/NZS 4600 (2018).

Corrosion protection: To AS 2699.3 (2020).

AS 2699.3 (2020) provides a means for demonstrating conformance with the required durability class.

Use AS 2699.3 (2020) Table 3.1 to select the corrosion protection method for a particular durability class. If different corrosion protection requirements apply throughout the project, make a list in SELECTIONS or show on structural drawings. For example:

- Hot-dip galvanized lintels to AS/NZS 4791 (2006) ILG300 for internal walls (durability class R1).
- Stainless steel lintels ASTM A240/A240M (2024) 316L for external walls (durability class R4).

Cutting: Do not cut after galvanizing.

### Reinforcement

Standard: To AS/NZS 4671 (2019).

Corrosion protection: To AS 3700 (2018) clause 5.9.

Minimum cover: To AS 3700 (2018) Table 5.1.

### Wall ties

Standard: To AS 2699.1 (2020).

Type: A.

Corrosion protection: To AS 2699.1 (2020).

AS 2699.1 (2020) provides a means for demonstrating conformance with the required durability class of wall ties. This standard is based on a wall tie life of not less than 50 years, see AS 2699.1 (2020) clause 2.2 (b).

Use AS 2699.1 (2020) Table 3.1 to select corrosion protection method for a particular durability class. If different corrosion protection requirements for wall ties apply in the project, nominate in SELECTIONS or show on drawings.

**Duty classification rating:**

- Masonry veneer: [complete/delete]
- Normal cavity construction and at abutments: [complete/delete]
- Cavities more than 60 mm and less than 200 mm wide: [complete/delete]
- Cavities more than 200 mm wide: [complete/delete]

Document strength classification, e.g. light duty, medium duty or heavy duty. Alternatively, document on the drawings and delete this subclause. See AS 2699.1 (2020) Table 2.1 for minimum mean tie strength values. See AS 3700 (2018) clause 4.10 for design principles.

If resilient ties are needed for NCC sound insulation conformance, nominate in SELECTIONS.

For building designs conforming to the AS 4773 series, see AS 4773.1 (2015) Tables 7.1 and 8.3.

### Connectors and accessories

Standard: To AS 2699.2 (2020).

Corrosion protection: To AS 2699.2 (2020).

**Durability classification to AS 2699.2 (2020):** [complete/delete]

AS 2699.2 (2020) provides a means for demonstrating conformance with the required durability class of connectors and accessories, including masonry anchors, fixings and tie-downs.

Use AS 2699.2 (2020) Table 3.1 to select corrosion protection method for a particular durability class. If different corrosion protection requirements for connectors and accessories apply throughout the project, make a list in SELECTIONS or show on drawings.

**Design criteria for flexible masonry ties:** [complete/delete]

If accommodation of movement is required at control joints and where masonry abuts structural elements such as column faces and slab soffits, document here. Alternatively, document on the drawings and delete this subclause.

If selection is left to the contractor, provide requirements for movement and associated load transfer. See AS 3700 (2018) Section 10 for design of masonry for earthquake actions.

### Flashings and damp-proof courses

Standard: To AS/NZS 2904 (1995).

For works including building designs conforming to the AS 4773 series, see AS 4773.2 (2015) Table 5.2 for suitable materials for flashings and damp-proof courses.

### Weepholes

Weephole formers/guards: As documented.

Nominate in SELECTIONS or show on the drawings.

### Slip joints

Standard: To AS 3700 (2018) clause 4.14.

Standard: To AS 4773.2 (2015) clause 10.5.2.

For building designs conforming to the AS 4773 series, consider including this *Optional* style text by changing to *Normal* style text and deleting "Standard: To AS 3700 (2018) clause 4.14" in the line above.

Material: [complete/delete]

Preferably show on the drawings. Alternately show the slip joint material here. When nominating material consider if masonry walls support exposed concrete slabs or not. Coordinate with 0310 Concrete - combined or 0314 Concrete in situ.

### Air vents

Blockwork: Select from the following:

- Concrete framed: Bronze wire mesh in concrete frame, 390 x 190 mm.
- Vent blocks: Purpose-made vent blocks.

Brickwork: Select from the following:

- Concrete framed: Bronze wire mesh in concrete frame, 455 x 160 mm.
- Cut brick: Two cut bricks laid vertically and evenly spaced in a 230 mm wide x two course high opening, backed with bronze wire mesh built in.
- Terracotta: Perforated, 230 x 160 mm.

See AS 3959 (2018) for building in bushfire-prone areas; vents require a corrosion-resistant wire mesh with a maximum allowable aperture size of 2 mm to prevent ingress of embers.

## 3 EXECUTION

### 3.1 GENERAL

#### Mortar mixing

General: Measure volumes accurately to the documented proportions. Machine mix for at least six minutes. If the initial set of the cement has taken place, discard the mortar. Do not retemper.

Think Brick Manual 10 (2018) provides detailed information on mortar mixing. See also CMAA CM01 (2019).

#### Storage and handling

Masonry units: Store above the surface of the ground and cover to prevent entry of rainwater and contaminants. Locate away from surface and ground water runoff.

See Think Brick Manual 19 (2024) for more guidance on brick storage.

Mortar materials: Protect from contamination and as follows:

- Sand: Store away from surface and ground water runoff and allow for free drainage of rainwater.
- Cement and lime: Store bags in a dry, under cover and above ground environment.

#### Bond

Type: Stretcher bond.

Other options include English, Flemish or Stack.

Existing work: Rod and bond to match existing.

For existing work, consider including this *Optional* style text by changing to *Normal* style text.

AAC units: [complete/delete]

Nominate the bond pattern and the required minimum block overlap. Refer to manufacturer's recommendations. Typically minimum 80 to 100 mm.

### Building in

Embedded items: Build in wall ties and accessories as the construction proceeds. If not practicable to obtain the required embedment within the mortar joint in cored or hollow masonry units, fill appropriate cores with grout or mortar.

Steel door frames: Fill the backs of jambs and heads solid with mortar as the work proceeds.

Heads of some steel door frames may be used as lintels. Consult manufacturer.

### Minimum clearance for timber frame shrinkage

General: In timber framed masonry veneer construction, provide clearances to allow for long-term shrinkage of timber including at windows, doors, thresholds, at the underside of eaves where the masonry and soffit meet and as follows:

- Single storey (slab on ground): 10 mm.
- Two storey (slab at ground floor): 32 mm
- Additional clearance: Accommodate additional shrinkage of unseasoned floor timbers.

Edit the minimum clearance above to suit the type of frame/construction adopted for the project. AS 4773.2 (2015) Table 9.1 provides minimum clearance for timber framing shrinkage for different frame/construction.

### Monolithic structural action

Construction at different rates or times: If two or more adjoining sections of masonry, including intersecting walls, are constructed at different rates or times, rake back or tie the intersections between those sections to obtain monolithic structural action in the completed work.

Header units: Except in stretcher bond facework, provide masonry header units, to AS 3700 (2018) clause 4.11.2 and as follows:

- Spacing: 600 mm maximum.
- Location: Provide header units in the following locations:
  - . At engaged piers.
  - . At engagement of diaphragms with the leaves in diaphragm walls.
  - . At intersections of flanges with shear walls.
  - . At intersections with supporting walls and buttresses.
  - . Between leaves in solid masonry construction.

### Joining to existing

General: Provide a control joint where joining to existing structures. Do not tooth new masonry into existing work unless approved by a professional engineer.

If differential movement across the vertical control joint is expected, the joint should be detailed (e.g. with flexible masonry anchors) by the structural engineer. See AS 3700 (2018) clause 12.4.10. Tothing-in may be acceptable in some situations e.g. infilling an existing window opening, with the approval of the structural engineer.

### Mortar joints

General: Set out masonry with joints of uniform width and minimum cutting of masonry units.

Solid and cored units: Lay on a full bed of mortar. Fill perpends solid. Cut mortar flush.

Hollow units: Face-shell bedded. Fill perpends solid. Cut mortar flush.

Joint thickness: 10 mm.

Finish: Conform to the following:

- Externally: Tool to give a dense water-shedding finish.
- Internally: If wall is to be plastered, do not rake more than 10 mm to give a key.

For mortar jointing, see AS 3700 (2018) clause 4.9.

### Rate of construction

General: Regulate the rate of construction to eliminate joint deformation, slumping or instability.

### Rods

Set-out: Construct masonry to the following rods:

- 75 mm high units: 7 courses to 600 mm.
- 90 mm high units: 6 courses to 600 mm.

- 190 mm high units: 3 courses to 600 mm.

For work to autoclaved aerated concrete blocks and perforated clay blocks, refer to manufacturer's details.

### Temporary support

General: If the final stability of the masonry is dependent on construction of (structural) elements after the masonry is completed, provide proposals for temporary support or bracing.

## 3.2 FACEWORK

### Cleaning

General: Clean progressively as the work proceeds to remove mortar smears, stains and discolouration. Do not erode joints if using pressure spraying.

Appropriate detailing, protection, careful finishing and progressive cleaning reduces the need for subsequent cleaning. AS 4773.2 (2015) Appendix B, provides extensive guidance on this topic. Choice of correct cleaning method is the contractor's responsibility.

### Acid solution: [complete/delete]

Only specify acid cleaning as a last resort. Acids can damage mortar joints, metal and plastic items, such as window frames and damp-proof courses. Incorrect acid cleaning can also cause secondary staining in the future.

See *Think Brick Manual 13 (2024)* and *CMAA CM03 (2024)* for guidance on other types of masonry cleaning.

Nominate if permitted or not as follows:

- Do not use.
- Strictly follow the manufacturer's recommendations and AS 4773.2 (2015) Appendix B.

### Colour mixing

Distribution: In facework, distribute the colour range of units evenly to prevent colour concentrations and banding.

### Below ground

Facework: Commence facework at least one full course for blockwork, or two full courses for brickwork, below the adjacent finished surface level.

Delete or edit if facework commences at a higher level.

### Double face walls

Selection: Select face units for uniform width and double-face qualities in single-leaf masonry with facework both sides.

Preferred face: Before starting, obtain approval of the preferred wall face, and favour that face should a compromise be unavoidable.

Delete if shown on the drawings.

### Perpends

General: If other than vertically aligned perpends in alternate courses are proposed, provide details.

Delete if already covered on the drawings.

### Sills and thresholds

General: Solidly bed sills and thresholds and lay them with the top surfaces draining away from the building.

Minimum size of cut unit: Three quarters full width.

Add here clauses specifying other trim items, if required; e.g. copings, string courses, corbel courses, parapets, if not shown on the drawings.

Sill units: Detail or schedule on the drawings (e.g. squint bricks, brick on edge, purpose-made blocks, tiles).

Threshold units: Detail or schedule on the drawings. Schedule type of unit (e.g. brick on edge, purpose-made blocks, tiles).

## 3.3 SUBFLOOR WORK

Delete this clause if the building does not have a subfloor area. Otherwise, show support layout for the suspended floor on the drawings and coordinate with *0383 Decking, sheet and panel flooring*.

### Access openings

General: In internal walls, provide door-width openings beneath doorways to give access to underfloor areas.

**Air vents**

Minimum subfloor openings and ground clearance: To BCA (2022) F1D8.

For subfloor ventilation, BCA (2022) F1D8 and BCA (2022) Table F1D8 provides minimum requirements for various climatic zones. See also AS 1860.2 (2006) Section 5 on subfloor ventilation. Air vents may also be used for cavity ventilation at, say, 2000 mm<sup>2</sup> free area per metre run of storey-height brickwork. For Class 1 and 10 buildings, see BCA (2022) H2D5.

For building designs conforming to the AS 4773 series, see also AS 4773.2 (2015) clause 6.2.

Cavity walls: Provide matching vents in the internal leaves located as near as practicable to the vents in the external leaves.

Location: Below damp-proof course to internal and external walls.

Show on the drawings. Location of air vents is often a critical design issue.

**Underpinning**

Requirement: Install underpinning, without causing damage to the building.

Grouting: Pack dry mix M4 mortar between the top of the underpinning and the underside of the existing structure at the completion of each panel of underpinning.

Confirm with the structural engineer and edit as required.

**3.4 CAVITY WORK****Cavity clearance**

General: Keep cavities clear at all times.

**Cavity fill**

General: Fill the cavity with mortar to one course above the adjacent finished (ground) level. Fall the top surface towards the outer leaf.

**Cavity width**

General: Minimum 40 mm for cavity masonry walls and masonry veneer walls, in conformance with AS 3700 (2018) clause 4.7.1.

For building designs conforming to the AS 4773 series, see AS 4773.2 (2015) clauses 9.2 and 10.2:

- Masonry veneer walls: Minimum 25 mm between the masonry leaf and any insulation or services placed within the cavity.
- Cavity masonry walls: Minimum 35 mm between the masonry leaf and any insulation or services placed within the cavity.

Delete if shown on the drawings or edit the text above to suit.

**Openings**

Jambs of external openings: Do not close the cavity.

Delete if drawings indicate closed cavities.

**Wall ties, connectors and accessories**

Protection: Install to prevent water passing across the cavity.

For information on vapour barriers see NATSPEC TECHnote DES 004 and AS 4200.2 (2017) clause 3.9 on cavity walls.

**3.5 DAMP-PROOF COURSES**

See AS 3700 (2018) clauses 4.7.3 and 11.6. BCA (2022) F1D6(2) permits two options for damp-proof courses - to AS/NZS 2904 (1995) or impervious termite shields to AS 3660.1 (2014). This is varied in South Australia to address the effects of salt damp. See AS 3700 (2018) clause 11.6.2 for mortar weatherings.

The Master Builders Association of NSW *Guide to flashing and damp-proof courses (2017)* is a useful source of details and advice on good installation practice.

**Location**

The defaults are not comprehensive. Typical damp-proof course and flashing applications should be shown on the drawings. If they are, delete the following as appropriate. Coordinate damp-proof courses with slip joints and with termite shields.

General: Locate damp-proof courses, as follows:

- Timber floors: In the first course below the level of the underside of ground floor timbers in internal walls and inner leaves of cavity walls.
- Cavity walls built off slabs on ground: In the bottom course of the outer leaf, continuous horizontally across the cavity and up the inner face bedded in mortar, turned 30 mm into the inner leaf one course above. Project 10 mm beyond the external slab edge and turn down at 45°.
- Internal walls built off slabs on ground: In the first course above floor level.

- Masonry veneer construction built off slabs on ground: In the bottom course of the outer leaf, continuous horizontally across the cavity. Fasten to the inner frame 75 mm above floor level.
- Walls adjoining infill floor slabs on membranes: In the course above the underside of the slab in internal walls and inner leaves of cavity walls. Project 40 mm and dress down over the membrane turned up against the wall.

Height: Not less than:

- 150 mm above the adjacent finished ground level.
- 75 mm above the finished paved or concrete areas that slope away from the wall.
- 50 mm above the finished paved or concreted areas that slope away from the wall and are protected from the direct effect of the weather.

Refer to AS 4773.2 (2015) for more details and illustrated examples for damp-proof courses.

### Installation

General: Lay in long lengths. Sandwich damp-proof courses between mortar.

Joints: Locate away from weepholes.

Junctions: Preserve continuity of damp-proofing at junctions of damp-proof courses and waterproof membranes.

Laps: Lap full width at angles and intersections and at least 150 mm at joints.

Lap sealing: Seal with a bituminous adhesive and sealing compound.

Steps: Step as necessary, but not exceeding two courses per step for brickwork and one course per step for blockwork.

## 3.6 FLASHINGS

### Location

These defaults are not comprehensive. The locations, profiles and fixings of flashings are best shown on the drawings. If they are shown there, delete the following as appropriate. See 0421 Roofing - combined for roof flashings.

General: Locate flashings, as follows:

- Floors: Full width of outer leaf immediately above slab or shelf angle, continuous across cavity and up the inner face bedded in mortar, turned 30 mm into the inner leaf two courses above for brick and one course above for block. If the slab supports the outer skin and is not rebated, bed the flashing in a suitable sealant.

Position depends upon masonry support detail - shelf angle, slab or rebated slab.

- Under sills: 30 mm into the outer leaf bed joint one course below the sill, extending up across the cavity and under the sill in the inner leaf or the frame for masonry veneer. Extend at least 150 mm beyond the reveals or each side of the opening.
- Over lintels to openings in cavity walls: Full width of outer leaf immediately above the lintel, continuous across cavity, turned 30 mm into the inner leaf two courses above for brick and one course above for block or turned up at least 150 mm against the inner frame and fastened to it. Extend at least 150 mm beyond the lintels.
- At abutments with structural frames or supports: Vertically flash in the cavity using 150 mm wide material, wedged and grouted into a groove in the frame opposite the cavity.
- At jambs: Vertically flash jamb, extending 75 mm into the cavity, interleaved with the sill and head flashing at each end. Fix to jambs.
- At roof abutments with cavity walls: Cavity flash immediately above the roof and over-flash the roof apron flashing.

Refer to AS 4773.2 (2015) for more details and illustrated examples for flashings.

### Installation

Any significant interruption of the cavity, including at conduits, should be flashed. Head and sill flashings should not be taut across the cavity and threshold flashings should be bedded in mortar to run vertically and horizontally, not diagonally.

General: Sandwich flashings between mortar except where on lintels or shelf angles. Bed flashings, sills and copings in one operation to maximise adhesion.

Laps: If required, lap full width at angles and intersections and at least 150 mm at joints.

Lap sealing: Seal with a bituminous adhesive and sealing compound.

Pointing: Point up joints around flashings, filling voids.

Steps: Step as necessary, but not exceeding two courses per step for brickwork and one course per step for blockwork.

### Weepholes

See AS 3700 (2018) clause 4.7.2 and clause 12.4.14. Preferably indicate location and detail on the drawings, and delete this subclause. See AS 3959 (2018) for building in bushfire-prone areas; weepholes require a corrosion-resistant wire mesh with a maximum allowable aperture size of 2 mm to prevent ingress of embers.

Requirement: Locate weepholes to external leaves of cavity walls as follows:

- Generally:
  - . Spacing: 1200 mm maximum.
  - . In the course above damp-proof courses, flashing and cavity fill.
  - . At the bottom of unfilled cavities.
- Openings exceeding 1200 mm: Provide weepholes above the opening at maximum 1200 mm centres and at both ends of the opening in the following situations:
  - . If there is no roof overhang directly above the opening.
  - . If the roof overhang does not extend more than three times the distance between the top of the opening and the roof soffit.

Form: Open perpend or proprietary weephole former.

Nominate in SELECTIONS or show on the drawings.

Weephole guards: Provide mesh insect barrier.

Nominate in SELECTIONS or show on the drawings.

Rendered walls: Install weephole formers with mortar protection caps, set in line with the final finished surface. Remove caps on completion of the render.

For weepholes in rendered walls, consider including this *Optional* style text by changing to *Normal* style text.

## 3.7 WALL TIES

### Location

General: Space wall ties in conformance with AS 3700 (2018) clause 4.10 and at the following locations:

General: Space wall ties in conformance with AS 4773.2 (2015) clause 5.3 and at the following locations:

For building designs conforming to the AS 4773 series, consider including this *Optional* style text by changing to *Normal* style text and deleting "General: Space wall ties in conformance with AS 3700 (2018) clause 4.10 and at the following locations:" in the line above.

- Not more than 600 mm in each direction.
- Within 300 mm from the line of horizontal or vertical lateral supports, control joints or the perimeter of openings.

For cavities exceeding 80 mm width, closer horizontal spacing may be necessary. If spacings other than those given in the standard are required, specify them here. Wall ties for cavity walls and masonry veneer require design to transfer the appropriate loads, also see AS 3700 (2018) clause 7.7 and clause 7.8 or AS 4773.2 (2015) clause 9.7 and clause 10.6, as appropriate.

### Installation

See AS 3700 (2018) clause 4.10 for general design principles. For structural steel frames, detail on the drawings or specify fixing of masonry veneer ties here: e.g. Welded or Drilled and bolted.

Embedment: At least 50 mm into mortar. Provide at least 15 mm of mortar cover to any exposed surface.

Fixing of masonry veneer ties:

- To timber frames: Screw fix to outer or side face of timber frames with fasteners to AS 3566.1 (2002).
- To concrete: Masonry anchors.
- To steel frames: Screw fix to outer or side face of steel members with fasteners to AS 3566.1 (2002).

See AS 3700 (2018) clause 4.10 for limits on nail fixing of ties.

### 3.8 CONTROL JOINTS

#### General

Location and spacing: Provide control joints to AS 3700 (2018) clause 4.8.

Location and details of control joints are best shown on the drawings. Provide all masonry supporting or supported by concrete floors with vertical joints to match any control joints in the concrete.

AS 3700 (2018) clause 4.8, AS 4773.1 (2015) Section 13 and AS 4773.2 (2015) Section 7 have principles for locations, spacing, detailing and installation of control joints in masonry.

Contraction joints in concrete masonry prevent cracking caused by contraction of masonry units and shrinkage of supporting structure.

Expansion joints in clay masonry prevent cracking caused by expansion of masonry units (brick growth). Expansion is a particular problem with polychromatic brickwork – detail accordingly. Refer to the manufacturer's recommendations and consider the coefficient of thermal expansion.

For articulation joints in articulated walling on reactive sites, see CCAA TN61 (2008).

Location and spacing: Provide control joints to AS 4773.2 (2015) Section 7.

For building designs conforming to the AS 4773 series, consider including this *Optional* style text by changing to *Normal* style text and deleting "Location and spacing: Provide control joints to AS 3700 (2018) clause 4.8" in the line above.

#### Control joint filling

Filler material: Provide compatible sealant and bond breaking backing materials that are non-staining to masonry. Do not use bituminous materials with absorbent masonry units.

- Bond breaking materials: Non-adhesive to sealant, or faced with a non-adhering material.
- Foamed materials: Closed cell or impregnated, not water-absorbing.

Consult manufacturers for proprietary sealants e.g. external neutral cure silicone, and for joint fillers e.g. compressible closed cell polyethylene foam. Rigid fillers such as pulp board, cork or semi-rigid foam should not be specified.

For sealants in external masonry joints, see 0181 *Adhesives, sealants and fasteners*.

Installation: Clean the joints thoroughly and insert an easily compressible backing material before filling with a gun-applied flexible sealant.

Control joints are frequently rendered useless during construction by mortar droppings. Inspection before filling is therefore provided for in **INSPECTION**.

Sealant joint depth to width ratio (depth:width): 1:2.

Minimum sealant depth: 6 mm.

Details of joints are best shown on the drawings. If they are shown there, modify the above.

#### Fire-resisting control joints

See NATSPEC TECHnote DES 020 on fire behaviour of building materials and assemblies. For service penetrations, coordinate with the services worksections.

General: If a control joint is located in an element of construction required to have a fire-resistance level (FRL), construct the control joint with fire-stopping materials that maintain the FRL of the element.

Fire-stopping: To AS 4072.1 (2005).

AS 4072.1 (2005) is cited in BCA (2022) C4D15(2)(a), on openings in fire-resisting elements for service installations.

### 3.9 BRICKWORK AND BLOCKWORK DUCT RISERS

#### General

Buildings with unreinforced masonry chimneys or parapets cantilevering higher than 600 mm, with a height to overall thickness exceeding 3:1 or in wind categories stronger than N3 are outside the scope of the AS 4773 series.

Location: Build a one-piece corrosion-resistant metal tray to the masonry duct risers at roof level to shed water from the duct above roof flashing level.

Material: [complete/delete]

Material: e.g. 0.6 mm metallic-coated steel sheet, 20 kg/m<sup>2</sup> sheet lead, 0.6 mm copper sheet.

**Installation**

General: Cut an opening for the riser. Turn tray edges up 25 mm around the opening, 13 mm clear of the walls. Externally turn the tray up 100 mm under the stepped flashing and down 100 mm over the apron flashing. Lap and solder joints.

**Weepholes**

General: Provide two weepholes through the masonry duct riser walls on opposite sides immediately above the tray.

**3.10 BED JOINT REINFORCEMENT**

Refers to light-gauge mesh or fabric, used in the horizontal bed joints of masonry. It is used to increase the tensile capacity of masonry walls and is required for stack bonded masonry. It may also be used for crack control and to hold together fractured masonry. See AS 3700 (2018) clause 4.12 for more information on stack bonded masonry and AS 3700 (2018) clause 5.9.3 for reinforcement embedded in mortar joints.

**Location**

Stack bonded masonry: Conform to AS 3700 (2018) clause 4.12 and the following:

- Spaced vertically at centres not exceeding six times the thickness of the stack bonded leaf.
- In the first bed joint above or below an unrestrained horizontal edge of the masonry.
- One bed joint minimum, within 300 mm above or below a horizontal line of lateral support.

**Installation**

General: Lap 450 mm at splices. Fold and bend at corners so that the longitudinal wires are continuous. Stop 50 mm short of control joints. Extend 450 mm beyond each side of openings.

**Reinforcement**

Material: Galvanized welded wire mesh.

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

**3.11 REINFORCED AND GROUTED BLOCKWORK**

Design reinforced masonry including bond beams in conformance with AS 3700 (2018) Section 8 and, if applicable, Section 6. The sizes and locations of reinforcement should be shown on the drawings.

**Reinforcement**

Cover: Maintain cover to vertical and horizontal steel reinforcement using plastic clips or wheels, as appropriate.

Vertical reinforcement: Tie vertical steel reinforcement to the starter bars through cleanout holes in each reinforced hollow masonry unit and fix in position at the top of the wall with plastic clips.

Horizontal: Lay horizontal steel reinforcement in contact with rebated webs. Hold in position using plastic clips if vertical steel is subsequently positioned to wall construction.

**Cleaning core holes**

General: Provide purpose-made cleanout blocks or machine cut a cleaning hole at the base of each grouted core.

Location: Locate on the side of the wall that is to be rendered or otherwise concealed.

Cleaning: Rod cores to dislodge mortar fins protruding from the blocks and mortar droppings from reinforcement. Remove through the cleanout blocks.

**Grouting**

Commencement: Do not commence until grout spaces have been cleaned out and the mortar joints have attained sufficient strength to resist blow-outs.

Height of lift: Limit the height of individual lifts in any pour to make sure that the grout can be thoroughly compacted to fill all voids.

Compaction: Compact by vibration or by rodding.

Topping up: On the completion of the last lift, top up the grout after 10 minutes and within 30 minutes, and vibrate or rod to mix with the previous pour.

**3.12 LINTELS****Location**

General: Install one lintel to each wall leaf, as documented.

Document lintels in SELECTIONS or show on the drawings.

**Installation**

General: Do not cut on site. Keep lintels 10 mm clear of heads of frames.

Steel lintels: Pack mortar between any vertical component and supported masonry units. For angles, install the long leg vertically.

Minimum bearing each end:

- Span not more than 1000 mm: 100 mm.
- Span more than 1000 mm and not more than 3000 mm: 150 mm.
- Span more than 3000 mm: To structural drawings.

Propping: Provide temporary props to lintels to prevent deflection or rotation.

- Minimum propping period: 7 days.

**3.13 CONNECTORS AND ACCESSORIES****Slip joints**

General: Install slip joints to top of all unreinforced masonry walls supporting concrete slabs and other concrete elements.

Protection: Keep the slip joints in place and protect from displacement.

If slip joints are displaced during concrete placement and wet concrete comes in contact with the masonry wall, severe horizontal cracking may occur as a result of differential horizontal movements between the concrete slab and masonry.

**Flexible masonry ties**

General: Install stabilising ties at control joints and abutting structural elements, including columns, beams and slab soffits.

Locations and details: As documented.

**3.14 ARCHES**

Show radius, number of voussoirs, springing, and so on, on the drawings. For designs conforming to the AS 4773 series, see AS 4773.2 (2015) clause 8.4 for unreinforced masonry arches.

**Arch voussoirs**

General: Cut units using a masonry saw.

**Shapes and dimensions**

General: Form arches using solid or cored masonry units.

**3.15 BAGGING****Preparation**

General: Cut joints flush before bagging.

Select from **Dry bagging** or **Textured bagging**.

**Dry bagging**

Application: Apply laying mortar to the surface using a hessian bag or similar. Flush up irregularities, but leave a minimum amount of mortar on the surface.

**Textured bagging**

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

**3.16 TESTING**

0171 *General requirements* defines different tests in **INTERPRETATION**, **Definitions** and calls for an inspection and testing plan in **TESTING - GENERALLY, Inspection and testing plan**.

**Special mortar**

Mortar testing is required for mortars not conforming to AS 3700 (2018) Table 11.1 or AS 4773.2 (2015) Table 3.2, as appropriate. See AS 3700 (2018) clause 11.4. It is also carried out when there is doubt that the required mortar properties have been achieved. See AS 3700 (2018) clause 12.6.

Durability: Scratch index test to AS 3700 (2018) Appendix E.

Scratch index test described in AS 3700 (2018) Appendix E is designed to be easily applied on site to finished work.

Compressive strength: To AS 3700 (2018) Appendix C.

Flexural strength: To AS 3700 (2018) Appendix D.

### Special masonry

Special masonry is defined in AS 3700 (2018) clause 1.5.2.23(h), as structural masonry construction with design strengths higher than those specified in the masonry standard. Delete this subclause if no special masonry is used. Special masonry is outside the scope of the AS 4773 series.

Sampling and testing: To AS 3700 (2018) clause 12.7.

Performance: As documented.

Document performance for special masonry in SELECTIONS.

## 3.17 COMPLETION

### Warranties

Refer to 0171 *General requirements* for appropriate warranty type and the terms covered in the warranty.

Selection of warranty type: Check warranty type is suitable for intended purpose for selected product or material.

Type: [complete/delete]

Refer to **Warranty types** in 0171 *General requirements* and nominate the appropriate warranty type here.

Period: [complete/delete]

Use only if warranties are available for the product. Insert the required warranty period, if applicable, which should be negotiated beforehand.

## 4 SELECTIONS

**Schedules** are a tool to specify properties required for products or systems. If the principal permits documentation of the product or system by proprietary name, some of the properties may be unnecessary and can be deleted. Document the product or system's location or application here and/or on the drawings with a matching project code. Refer to NATSPEC TECHnote GEN 024 for guidance on using and editing schedules.

### 4.1 SCHEDULES

This schedule refers to the selection of the product/material by its properties, but does not locate it within the project. For this you should prepare a separate document e.g. a Finishes schedule or a notated elevation to locate the various finishes by reference to a designation code or abbreviation of the finish.

#### Masonry performance schedule

	A	B	C
Fire-resistance level (FRL)			
Characteristic unconfined compressive strength (MPa)			
Coefficient of contraction			
Coefficient of expansion			
Salt attack resistance category grade			
Solar absorptance			

The codes in the header row of the schedule designate each application or location of the item scheduled. Edit the codes to match those in other contract documents.

For building designs conforming to the AS 4773 series, make sure all assigned properties do not contradict with the Deemed-to-Satisfy values in the AS 4773 series.

Fire-resistance level (FRL): Specify the FRL as required by the NCC. The FRL for different masonry construction can be determined using tabulated values in AS 3700 (2018) Section 6. Alternatively, request a certificate from the supplier, stating the FRL for the particular type of masonry. Consider using special fire-resisting masonry if a higher FRL is required.

Characteristic unconfined compressive strength (MPa): If load bearing masonry is used, check structural engineering drawings for minimum characteristic unconfined compressive strength of masonry units. Request certificate from the supplier, stating the characteristic unconfined compressive strength of the selected masonry unit. See AS/NZS 4455.1 (2008) Appendix D for purchasing guidelines of masonry units.

Coefficient of contraction: Check with the structural engineer for requirements regarding the coefficient of contraction for concrete masonry.

Coefficient of expansion: Check with the structural engineer for requirements regarding the coefficient of expansion for clay masonry.

Salt attack resistance category grade: e.g. Exposure, General purpose or Protected as described in AS/NZS 4455.1 (2008) Table 2.3 or AS/NZS 4455.3 (2008) Table 2.4.

Solar absorptance: Select from manufacturer's range. Light (< 0.40), Medium (0.40 to 0.60), Dark (> 0.60). See BCA (2022) J3D8 for external walls to a Class 2 building or a Class 4 part of a building.

### Special masonry performance schedule

	A	B	C
Scratch index upper limit (mm)			
Characteristic compressive strength (MPa)			
Characteristic flexural tensile strength (MPa)			

The codes in the header row of the schedule designate each application or location of the item scheduled. Edit the codes to match those in other contract documents.

Delete this schedule if there is no special masonry in the project.

Scratch index upper limit: The durability of masonry mortar is determined based on an in situ controlled scratch test of the mortar surface. Use AS 3700 (2018) Table 11.2 to specify the upper limit of the scratch index corresponding to the required mortar class for durability. See also AS 3700 (2018) Table 5.1 for durability requirements and AS 3700 (2018) Appendix E for the testing method.

Characteristic compressive and flexural tensile strength: Testing for strength of special masonry is mandatory in AS 3700 (2018). Deemed-to-Satisfy masonry is normally not tested except where doubt exists whether the required properties are being achieved on site, see AS 3700 (2018) clause 12.6.

### Masonry schedule

	A	B	C
Name or type			
Work size (mm)			
Category			
Air vent units			
Sill units			
Threshold units			
Mortar: Cement			
Mortar: Colour			
Mortar: Mix proportions or mortar class			
Mortar: Sand			
Unit mortar joints: Bond			
Unit mortar joints: Depth (mm)			
Unit mortar joints: Shape or profile			
Grout: Compressive strength (MPa)			

The codes in the header row of the schedule designate each application or location of the item scheduled. Edit the codes to match those in other contract documents.

For building designs conforming to the AS 4773 series, make sure all assigned properties do not contradict with the Deemed-to-Satisfy values in the AS 4773 series.

For proprietary systems such as AAC blockwork, manufacturer's recommendations and CSIRO Appraisal limitations, if any, should be applied. Repair of AAC blockwork, which is easily damaged in handling, requires careful documentation.

Name or type: Verify that the nominated manufacturer can supply the selected bricks or blocks in the necessary quantities, including purpose-made specials if required, in time to meet the construction program. Alternative sources may be given where practicable. See AS 3700 (2018) clause 1.5.2.24(b).

Work size (mm): Commonly 230 x 110 x 76 mm for bricks and 390 x 190 x 190 mm for blocks, but many other sizes are available (e.g. for blocks: 90, 140 and 290 mm thick). For AAC blocks and perforated clay blocks, check with manufacturers. For AAC units the wall blocks are all 200 mm high and 600 mm long - thickness ranges from 75 to 300 mm.

Category: To AS 3700 (2018) clause 1.5.2.24(a); e.g. solid unit, cored unit, hollow unit etc.

Air vent units: Nominate the type and size, e.g. bronze wire in concrete frame, 390 x 190 mm.

Sill units: e.g. Squint bricks, brick on edge, purpose-made blocks, tiles.

Threshold units: e.g. brick on edge, purpose-made blocks, tiles.

Mortar: Cement: Nominate type.

Mortar: Colour: Nominate pigment.

Mortar: Mix proportions or mortar class: Use AS 3700 (2018) Table 5.1 to select mortar class (M1 to M4) for different exposure environments.

Mortar: Sand: Nominate supplier where essential for the selected colour.

Unit mortar joints: Bond: e.g. Stretcher, English, Flemish, Stack.

Unit mortar joints: Depth: Nominate the depth of the joint.

Unit mortar joints: Shape or profile: e.g. Ironed with a 12 mm diameter rod, cut and struck, weatherstruck, flush jointed, raked out 5 mm deep and ironed square (or half round), broomed, to match existing, or as documented on the drawings. Raked joints are generally not recommended for use in saline environments or areas subject to heavy industrial airborne pollution. The exposed mortar face should be compressed. Tuck pointing, if required, should be clearly documented.

Grout: Compressive strength (MPa): Minimum 12 MPa. See AS 3700 (2018) clauses 3.5 and 11.7.3.

### Built-in components schedule

	A	B	C
Durability class			
Damp-proof course type			
Flashing material			
Lintel type			
Wall ties			
Weephole formers/guards			

The codes in the header row of the schedule designate each application or location of the item scheduled. Edit the codes to match those in other contract documents.

Durability class: Different locations within the project may require different durability classes. For example, lintels in external walls may have higher durability class than the lintels in internal walls. See AS 3700 (2018) clause 5.3 and Table 5.1. For building designs conforming to the AS 4773 series, see AS 4773.1 (2015) clause 4.3 and Table 4.1.

Damp-proof course type: e.g. Bitumen coated and flashing material, metal, polyethylene. See AS/NZS 2904 (1995) Section 7.

Flashing material: e.g. PVC membrane, copper, stainless steel.

Lintel type: e.g. steel angle or product name. Refer to **Lintel schedule**.

Wall ties: Specify resilient wall ties if sound insulation is required.

Weephole formers/guards: Nominate proprietary product or nominate the material required, such as corrosion-resistant steel, bronze, aluminium or polymer.

### Control joint schedule

	A	B	C
Type			
Backing rod			
Primer			
Sealant			
Width (mm)			

The codes in the header row of the schedule designate each application or location of the item scheduled. Edit the codes to match those in other contract documents.

Type: e.g. contraction joint, expansion joint, articulation joint.

Backing rod: e.g. compressible closed cell polyethylene foam.

Primer: If a proprietary sealant is nominated, check the manufacturer's recommendations for suitable primers.

Sealant: e.g. silicone, polyurethane, proprietary sealant.

Width (mm): Nominate the width of the control joint.

#### Lintel schedule

Opening dimensions (mm)	Lintel type	Depth (mm)	Width (mm)	Thickness (mm)

Note: Lintel length required is equal to sum of the opening dimension plus two times the bearing length.

Opening dimensions (mm): Nominate the opening size.

Lintel type: e.g. steel angle or product name.

Lintel types include steel, precast reinforced concrete or prestressed concrete and reinforced terracotta. Precast proprietary concrete lintels are also available and may be documented as an alternative to steel. Consult the structural engineer before using proprietary lintels with concrete or calcium silicate bricks, or clay bricks with more than 25% perforation. If proprietary lintels are required, nominate manufacturer. Heads of some steel door frames may be used as lintels. Consult manufacturer.

Depth (mm): Nominate the depth. Omit depth for flat steel lintels.

Width (mm): Nominate the width.

Thickness (mm): Nominate the thickness if steel lintels are used.

#### REFERENCED DOCUMENTS

The following documents are incorporated into this worksection by reference:

AS 1530		Methods for fire tests on building materials, components and structures
AS 1530.4	2014	Fire-resistance tests for elements of construction
AS 1672		Limes and limestones
AS 1672.1	1997	Limes for building
AS 2699		Built-in components for masonry construction
AS 2699.1	2020	Wall ties
AS 2699.2	2020	Connectors and accessories
AS 2699.3	2020	Lintels and shelf angles (durability requirements)
AS/NZS 2904	1995	Damp-proof courses and flashings
AS 3566		Self-drilling screws for the building and construction industries
AS 3566.1	2002	General requirements and mechanical properties
AS/NZS 3679		Structural steel
AS/NZS 3679.1	2016	Hot-rolled bars and sections
AS 3700	2018	Masonry structures
AS 3972	2010	General purpose and blended cements
AS 4072		Components for the protection of openings in fire-resistant separating elements
AS 4072.1	2005	Service penetrations and control joints
AS/NZS 4455		Masonry units, pavers, flags and segmental retaining wall units
AS/NZS 4455.1	2008	Masonry units
AS/NZS 4455.3	2008	Segmental retaining wall units
AS/NZS 4456		Masonry units and segmental pavers and flags - Methods of test
AS/NZS 4456.4	2003	Determining compressive strength of masonry units
AS/NZS 4600	2018	Cold-formed steel structures
AS/NZS 4671	2019	Steel for the reinforcement of concrete
BCA F1D8	2022	Health and amenity - Surface water management, rising damp and external waterproofing - Subfloor ventilation
EN 12878	2014	Pigments for the colouring of building materials based on cement and/or lime - Specifications and methods of test

The following documents are mentioned only in the *Guidance* text:

AS 1316	2003	Masonry cement
AS 1860		Particleboard flooring
AS 1860.2	2006	Installation
AS 3660		Termite management
AS 3660.1	2014	New building work
AS 3959	2018	Construction of buildings in bushfire-prone areas
AS 4200		Pliable building membranes and underlays
AS 4200.2	2017	Installation
AS 4773		Masonry in small buildings
AS 4773.1	2015	Design
AS 4773.2	2015	Construction

AS/NZS 4791	2006	Hot-dip galvanized (zinc) coatings on ferrous open sections, applied by an in-line process
BCA C4D15	2022	Fire resistance - Protection of openings - Openings for service installations
BCA F1D6	2022	Health and amenity - Surface water management, rising damp and external waterproofing - Damp-proofing
BCA F3D5	2022	Health and amenity - Roof and wall cladding - Wall cladding
BCA H2D4	2022	Class 1 and 10 buildings - Damp and weatherproofing - Masonry
BCA H2D5	2022	Class 1 and 10 buildings - Damp and weatherproofing - Subfloor ventilation
BCA J3D8	2022	Energy efficiency - Elemental provisions for a sole-occupancy unit of a Class 2 building or a Class 4 part of a building - External walls of a sole-occupancy unit of a Class 2 building or a Class 4 part of a building
BCA Table F1D8	2022	Health and amenity - Surface water management, rising damp and external waterproofing - Subfloor ventilation - Subfloor openings and ground clearance
CCAA TN61	2008	Articulated walling
CMAA CM01	2019	Concrete masonry - Handbook
CMAA CM02	2020	Concrete masonry - Single-leaf masonry design manual
CMAA CM03	2024	Concrete masonry cleaning manual - Cleaning and maintenance guide
CMAA MA55	2016	Design and construction of concrete masonry buildings
MBA (NSW) Book 4	2017	Guide to flashing and damp-proof courses (Book 4)
NATSPEC DES 004		Air, moisture and condensation
NATSPEC DES 010		Atmospheric corrosivity categories for ferrous products
NATSPEC DES 018		Bushfire protection
NATSPEC DES 020		Fire behaviour of building materials and assemblies
NATSPEC DES 044		Weatherproofing of external walls
NATSPEC GEN 024		Using NATSPEC selections schedules
NATSPEC TR 01		Specifying ESD
TBA Manual 02	2024	The properties of clay masonry units
TBA Manual 09	2024	Detailing of clay masonry
TBA Manual 10	2018	Construction guidelines for clay masonry
TBA Manual 13	2024	Clay masonry cleaning manual
TBA Manual 19	2024	Industry reference guide
BS 6576	2005	Code of practice for diagnosis of rising damp in walls of buildings and installation of chemical damp-proof courses
MPA Data Sheet 17	2021	Pigments for mortar
ASTM A240/A240M	2024	Standard specification for chromium and chromium-nickel stainless steel plate, sheet and strip for pressure vessels and for general applications
EN 15804	2012	Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
ISO 14025	2006	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 21930	2017	Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services