

PART C

Chapter 3

Detailing

This chapter provides detailing requirements for typical building components and is a visual reference and link to the CAD Details contained in the 'Data' Folder.

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 - Galvanised steel mullions**
 - Composite masonry mullions**
- 3.4 BOND BEAMS**
- 3.5 SHEAR WALLS AND CONNECTIONS**
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- 3.6 CONTROL JOINTS**
- 3.7 THERMAL PERFORMANCE**
- 3.8 ANCILLARY DETAILS**
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 - Slip joints**
 - Window frames in different materials**
 - Footings**
 - Corner details for various block combinations**
 - Intersection details for various combinations**
 - Engaged piers**
 - Built-in columns**
 - Flexible wall-to-column connections**
 - Installation of services**

Standard Details

Typical details are shown, along with explanatory notes where necessary, for the following components.

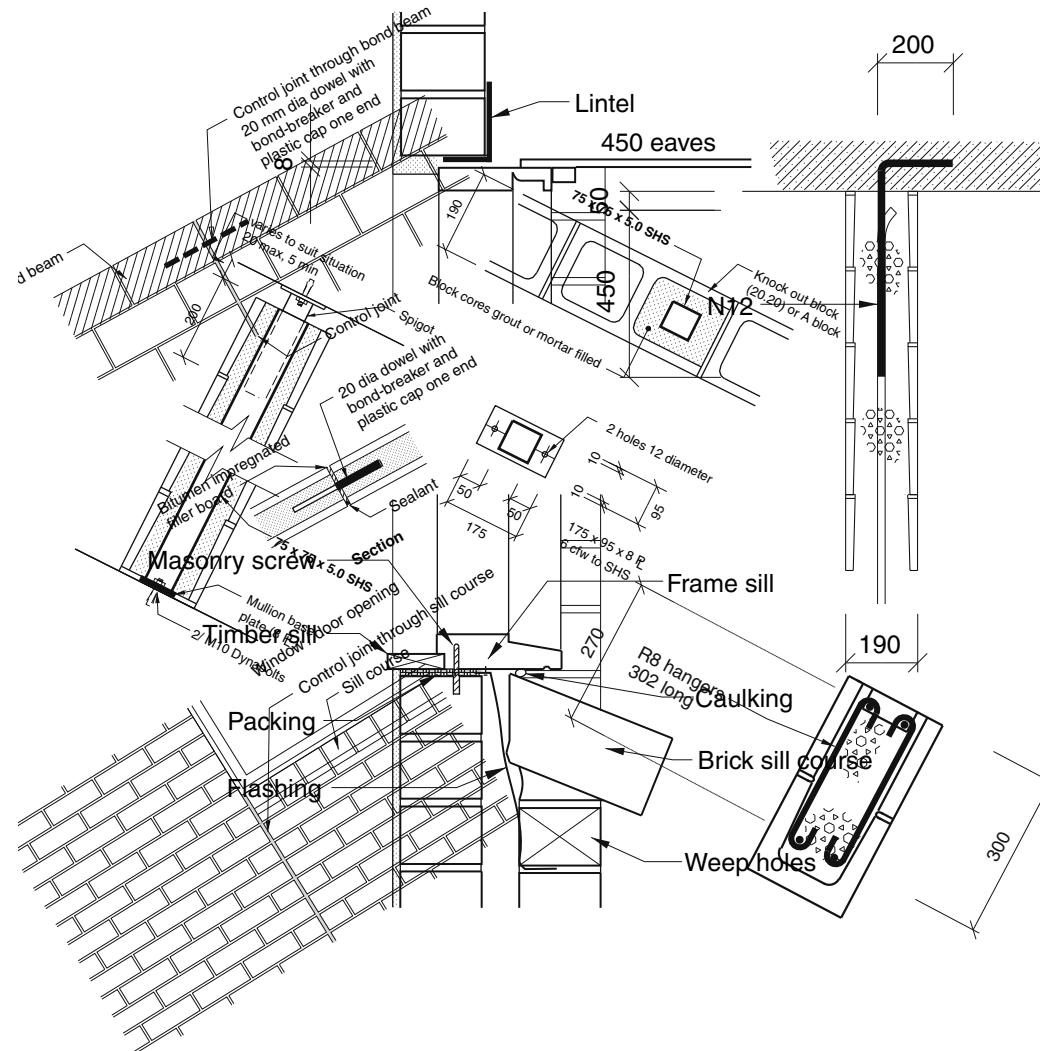
- Lintels, including reinforced-masonry lintels, steel lintels and arch bars.
- Vertical reinforcement and mullions, covering vertically-reinforced masonry, galvanised steel mullions and composite masonry mullions.
- Bond beams of reinforced masonry
- Shear walls and connections covering reinforced masonry shear walls and anchorage at the masonry/concrete interface.
- Control joints for crack control in buildings
- Thermal performance showing typical wall details equivalent to the thermal information in the Design Section of this Manual (**Part B:Chapter 9**).
- Ancillary details including window and door frames in a variety of materials, corner and intersection details, piers, services etc.

CAD Details

This chapter also acts as a visual reference for the CAD details supplied on this CD-ROM.

Each of the details in this chapter has a note below them indicating the file format type and file name, as well as a hyperlink to the file.

If you have an Application Program available to read the file type, you can click on the red file name to open it. If not, or this does not work, you should note the file path and name and locate it on the CD-ROM or your hard disk if you have downloaded the CD-ROM.



3.2

LINTELS

3.2.1 REINFORCED-MASONRY LINTELS

Lintel Construction

Reinforced-masonry lintels can be constructed using U-shaped lintel blocks (eg 2012, 2013, 1512 or 1513 blocks).

A two-block-high lintel can be constructed using double-U blocks (eg 2091 or 1591) or H blocks (eg 2048 or 1548) as the top course.

If knock-out bond-beam blocks (eg 2020 or 1520) are used as the top course, provision must be made for supporting the horizontal reinforcement off the webs.

Number of Reinforcing Bars

In 190-mm blockwork, it is possible to use either one bar, set in the centre of the wall, or two bars, one in each face.

In 140-mm blockwork, only one horizontal bar should be used.

Care must be taken to avoid bar congestion, particularly if the masonry also includes a combination of horizontal and vertical reinforcement.

Support of Reinforcement

Reinforcement should be positioned by using plastic wheel-type reinforcement spacers, galvanised wire hangers or reinforcing ligatures as shown.

Cover and Mortar Type

All drawings are based on 20 mm cover to reinforcement and M3 mortar. However, designers must select an appropriate cover and mortar from AS 3700 and amend the drawings accordingly. See **Part B:Chapter 6**.

Details

The following drawings show common details for horizontally-reinforced masonry lintels.

For load capacity information, see **Part B:Chapter 5** and **Part B:Chapter 6**.



Detail A1

[1 of 7]

Notes:

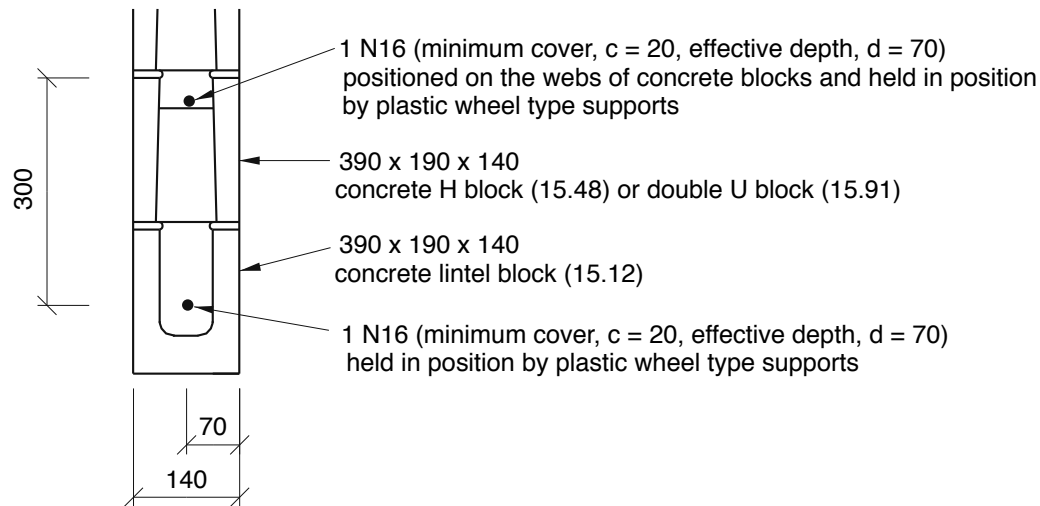
Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support



Reinforced Concrete Masonry Lintel

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/A-Lintels_Masonry/A1.dxf](#)

Detail A2

[2 of 7]

Notes:

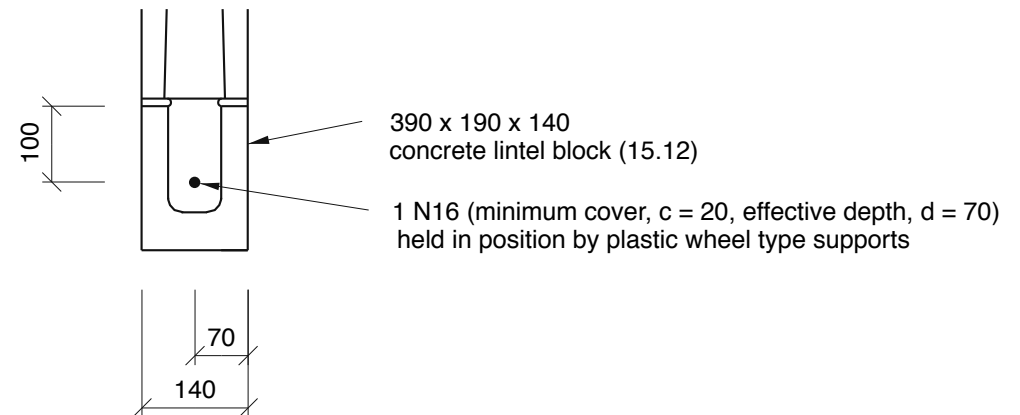
Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support



Reinforced Concrete Masonry Lintel

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/A-Lintels_Masonry/A2.dxf](#)

Detail A3

[3 of 7]

Notes:

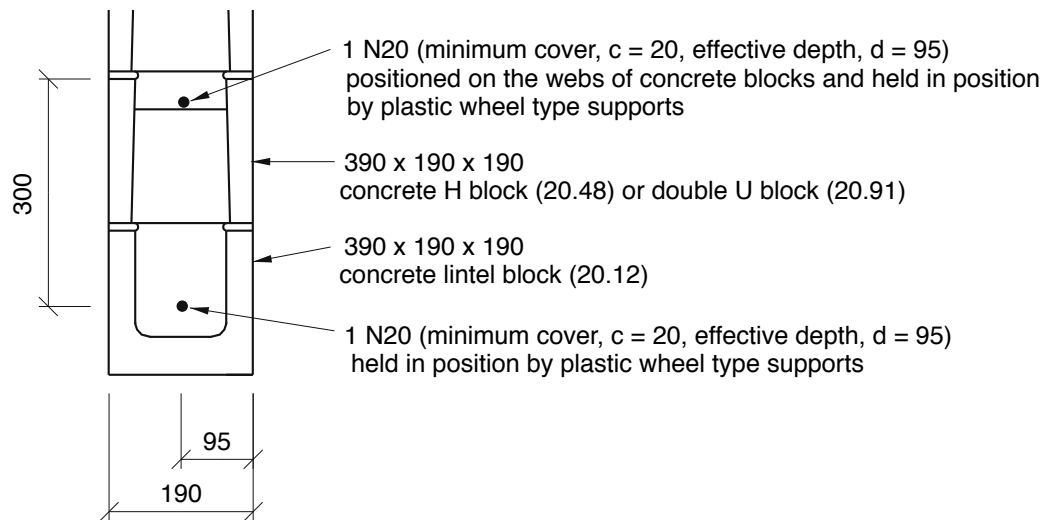
Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support



Reinforced Concrete Masonry Lintel

Scale 1:10

Detail A4

[4 of 7]

Notes:

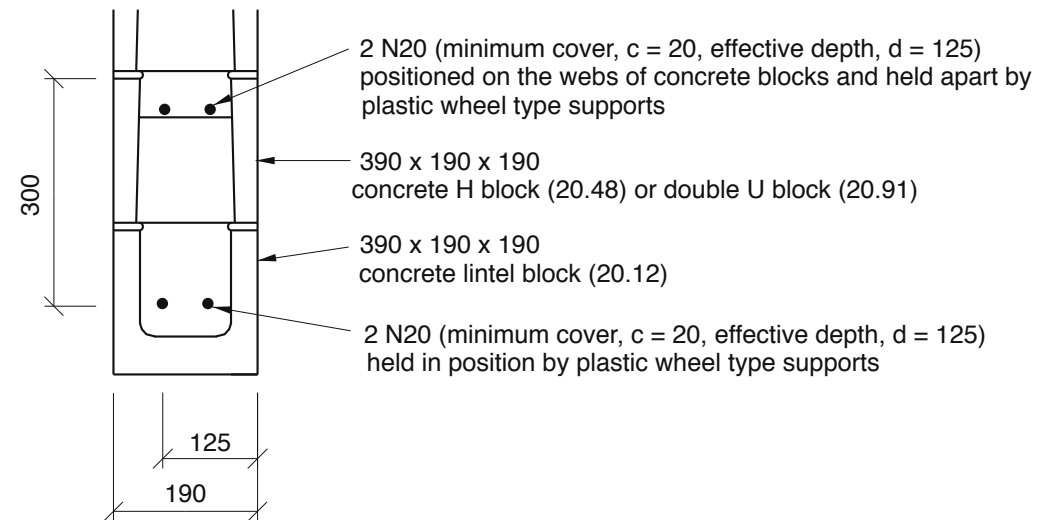
Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support



Reinforced Concrete Masonry Lintel

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/A-Lintels_Masonry/A3.dxf](#)

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/A-Lintels_Masonry/A4.dxf](#)

Detail A5

[5 of 7]

Notes:

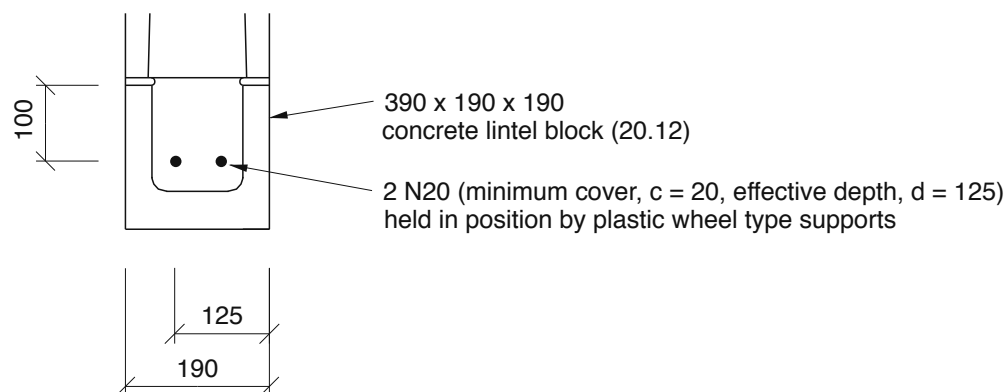
Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support



Reinforced Concrete Masonry Lintel

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/A-Lintels_Masonry/A5.dxf](#)

Detail A6

[6 of 7]

Notes:

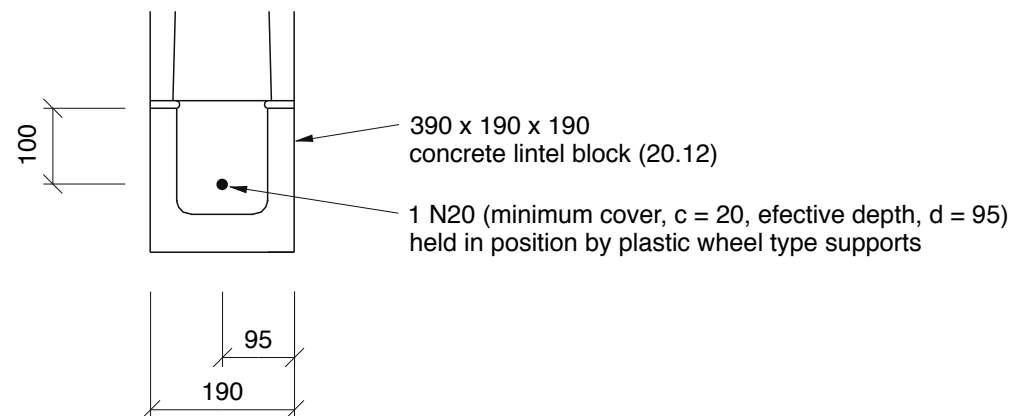
Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

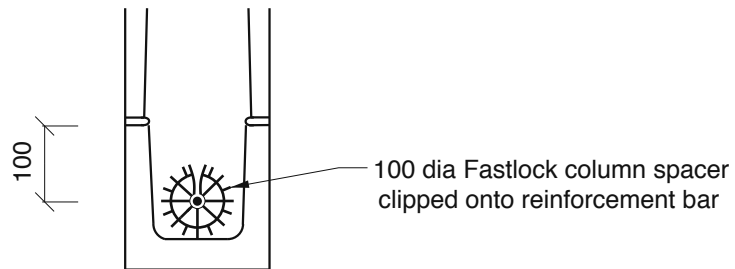
- steel ligatures; or
- steel hangers; or
- plastic wheel type support



Reinforced Concrete Masonry Lintel

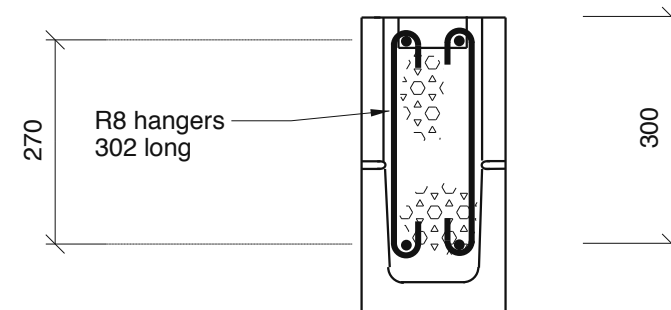
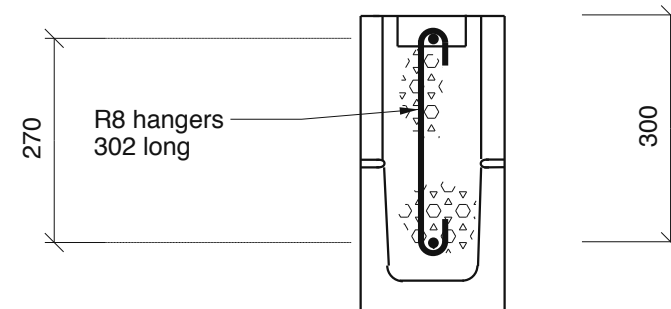
Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/A-Lintels_Masonry/A6.dxf](#)



Steel Positioning Detail - Column Spacers

Scale 1:10



Steel Positioning Detail - Galvanised Wire Hangers

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/A-Lintels_Masonry/A7.dxf](#)

3.2.2 STEEL LINTELS AND ARCH BARS

Loads on Lintels

Masonry constructed in stretcher bond will arch over an opening, provided there are sufficient number of masonry courses above and sufficient strength at the supports. AS 3700 *Commentary* suggests that the load exerted on the lintel can be assumed to be exerted by a triangle of masonry above the opening.

End Support

AS 3700 Clause 4.12 requires that lintels be supported on the masonry abutments for a distance of at least 100 mm.

Corrosion Resistance

Steel lintels and arch bars must comply with the durability requirements of AS 3700 Table 5.1 for the particular exposure classification. AS 3700 Clause 5.2.2 makes it clear that lintels or arch bars supporting the external leaf of a cavity wall or veneer wall are considered to be in an “exterior environment”.

Corrosion protection requirements in AS/NZS 2699.3 are as follows:

R0, R1, R2, R3 – For all applications except as listed for R4 and R5.

- Steel lintels, hot dip galvanised in accordance with AS/NZS 4680 or AS/NZS 4791, except that the minimum coating mass shall be 300 g/m² for R0, R1 and R2 and be 600 g/m² for R3.

- Steel lintels with an inorganic zinc coating, abrasive blast cleaned to a minimum of AS 1627.4 Class 2.5, and a coating of at least 75 microns of inorganic zinc silicate in compliance with AS/NZS 3750.15 Type 3 or Type 4, except that for R3 the average coating thickness shall be not less than 100 microns.
- Steel lintels with a duplex coating, hot-dip galvanised in accordance with AS/NZS 4680 or AS/NZS 4791, except that hot-dip galvanising to be at least 300 g/m² and a coating to be at least 50 microns of two pack non-inhibitive epoxy primer to AS/NZS 3750.13 and at least 125 microns of two-pack high-build epoxy micaceous iron oxide to AS 3750.14.

R4 – For applications subject to saline wetting and drying, in aggressive soils, in severe marine environments.

- Stainless steel lintels manufactured to AS 1449 Grade 316 or AS 1449 Grade 316L (UNS S31600 and UNS S31603 respectively)
- Steel lintels with an inorganic zinc coating, abrasive blast cleaned to a minimum of AS 1627.4 Class 2.5, and a coating of at least 75 microns of inorganic zinc silicate in compliance with AS/NZS 3750.15 Type 3, Type 4 or Type 6, plus at least 125 microns of two-pack high-build epoxy micaceous iron oxide to AS 3750.14

- Steel lintels with a mastic coating, abrasive blast cleaned to a minimum of AS 1627.4 Class 2.5, and a coating of at least 400 microns of two-part high-build epoxy mastic to AS 3750.11
- Steel lintels with a duplex coating, hot-dip galvanised in accordance with AS/NZS 4680 with a coating mass of 600 g/m² and a coating of at least 50 microns of two-pack non-inhibitive epoxy primer to AS/NZS 3750.13 and at least 200 microns of two-pack high-build epoxy micaceous iron oxide to AS 3750.14.

R5 – For applications in saline or contaminated water including tidal splash zones and within 1 km of an industry producing chemical pollutants.

Details

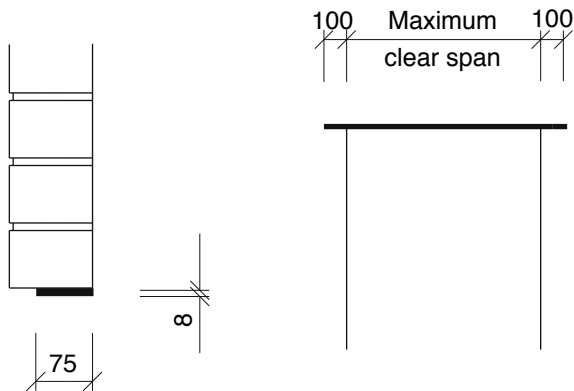
The following drawings show common details of galvanised steel lintels.

For information on capacities, including maximum spans, see **Part B:Chapter 5**.



Detail B1

[1 of 8]



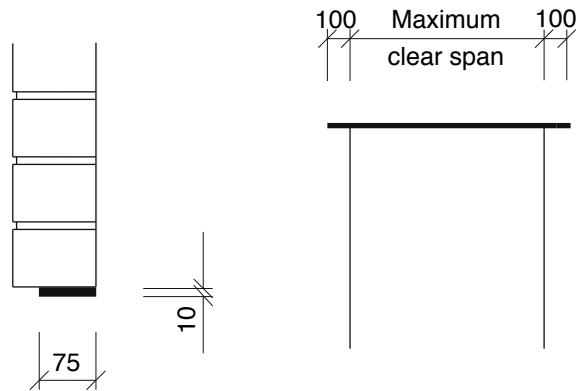
75 x 8 flat (4.71 kg/m)
See notes on Corrosion Resistance Of Lintels And Arch Bars

75 x 8 FMS Arch Bar

Scale 1:10

Detail B2

[2 of 8]



75 x 10 flat (5.89 kg/m)
See notes on Corrosion Resistance Of Lintels And Arch Bars

75 x 10 FMS Arch Bar

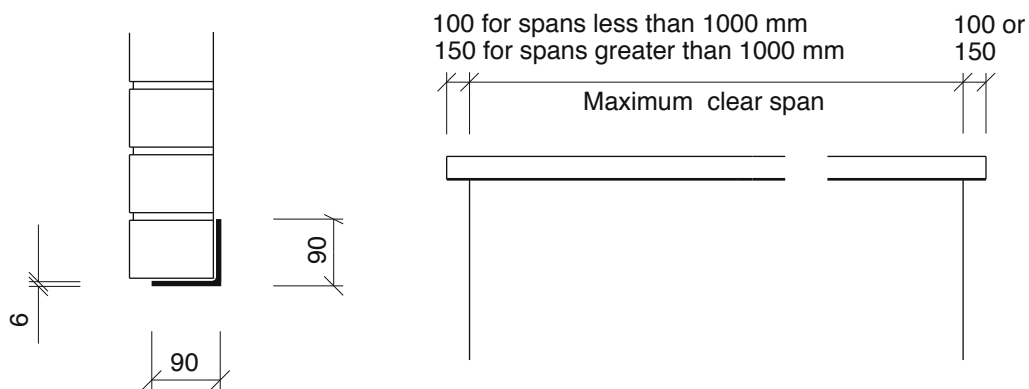
Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/B-Lintels_Steel/B1.dxf](#)

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/B-Lintels_Steel/B2.dxf](#)

Detail B3

[3 of 8]



90 x 90 x 6 equal angle (8.22 kg/m)

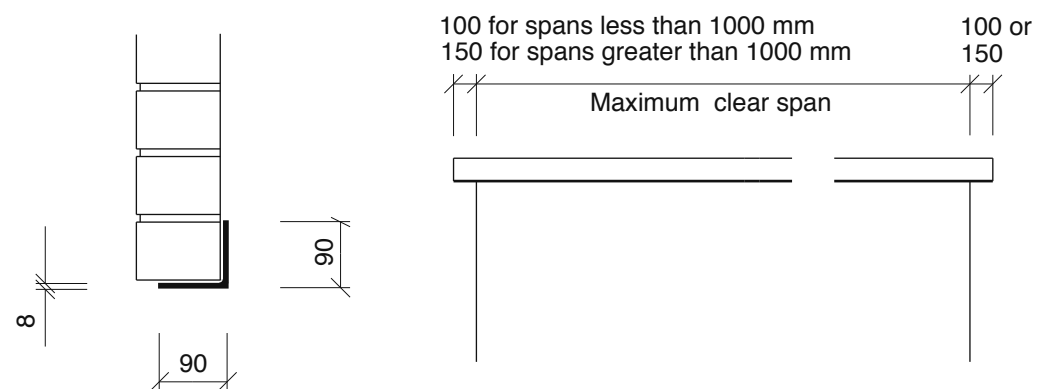
See notes on Corrosion Resistance Of Lintels And Arch Bars

90 x 90 x 6 L Lintel

Scale 1:10

Detail B4

[4 of 8]



90 x 90 x 8 equal angle (10.6 kg/m)

See notes on Corrosion Resistance Of Lintels And Arch Bars

90 x 90 x 8 L Lintel

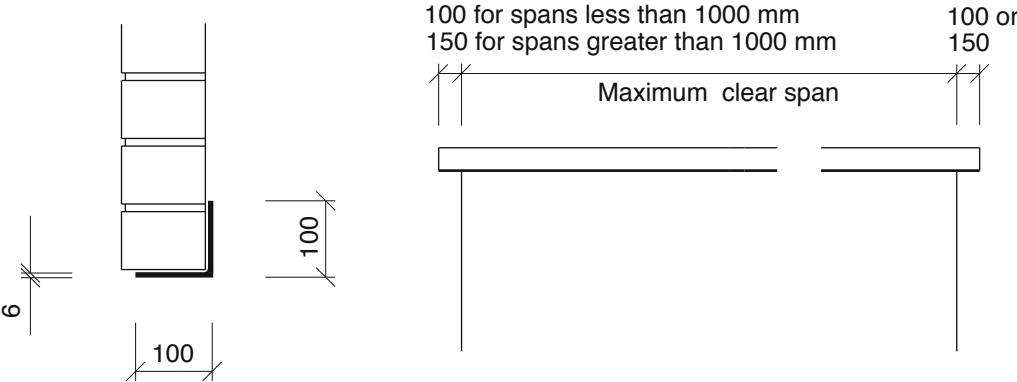
Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/B-Lintels_Steel/B3.dxf](#)

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/B-Lintels_Steel/B4.dxf](#)

Detail B5

[5 of 8]

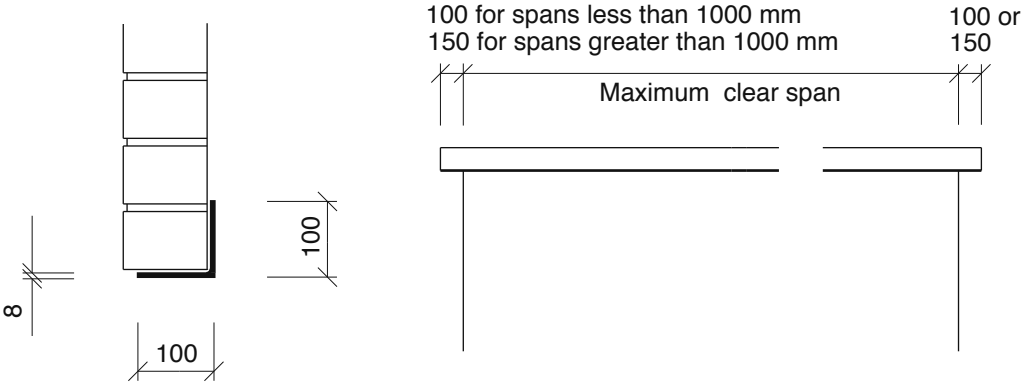


100 x 100 x 6 equal angle (9.16 kg/m)
See notes on Corrosion Resistance Of Lintels And Arch Bars

100 x 100 x 6 L Lintel
Scale 1:10

Detail B6

[6 of 8]



100 x 100 x 8 equal angle (11.8 kg/m)
See notes on Corrosion Resistance Of Lintels And Arch Bars

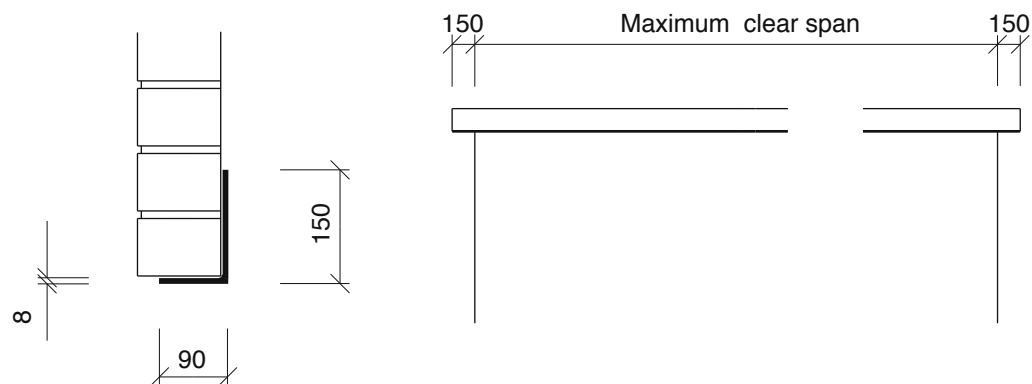
100 x 100 x 8 L Lintel
Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/B-Lintels_Steel/B5.dxf](#)

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/B-Lintels_Steel/B6.dxf](#)

Detail B7

[7 of 8]



150 x 90 x 8 unequal angle (14.3 kg/m)

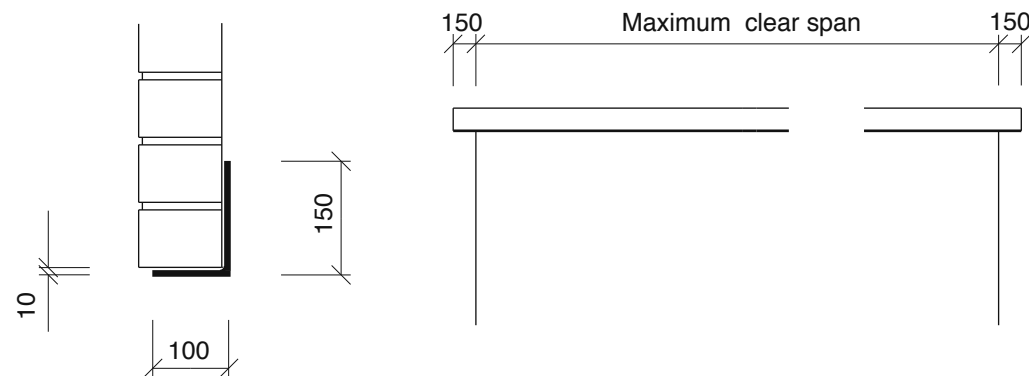
See notes on Corrosion Resistance Of Lintels And Arch Bars

150 x 90 x 8 L Lintel

Scale 1:10

Detail B8

[8 of 8]



150 x 100 x 10 unequal angle (18.0 kg/m)

See notes on Corrosion Resistance Of Lintels And Arch Bars

150 x 100 x 10 L Lintel

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/B-Lintels_Steel/B7.dxf](#)

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/B-Lintels_Steel/B8.dxf](#)

3.3.1 VERTICALLY-REINFORCED MASONRY

Spacing of Reinforcement

Vertical reinforcement placed in the cores of hollow concrete blockwork spans vertically between horizontal supports and provides strength enhancement to large wall panels.

- If the reinforcement is spaced at 800 mm or less, the masonry is regarded as 'close-spaced reinforced masonry', and may be considered ductile. This will have advantages in respect of earthquake loads.
- If the reinforcement is spaced at 2.0 m centres or less, (but wider than 800 mm), the masonry is regarded as 'wide-spaced reinforced masonry', with some advantages in respect of robustness.
- If the reinforcement is spaced further apart than 2.0 m, the masonry is regarded as 'mixed construction', consisting of unreinforced masonry supported between the vertically-reinforced masonry elements.

Wall Construction

The designer should give consideration to how the masonry is to be constructed and the reinforcement placed. One of the following options must be used:

- Provided there are no obstructions such as slabs or beams above, the reinforcement is placed in the finished masonry from the top. Grouting from the top is also feasible.
- If there is restricted access from the top, the reinforcement is placed into open

ended masonry units such as 'H'- or 'A'-shaped blocks, during construction of the masonry.

Starter Bars and Anchorage

It is common to lap the vertical bars with starter bars set in the slab or footings below, thus providing increased shear resistance and perhaps some moment resistance at the base. If the masonry supports a concrete slab, it may also be preferable to continue the wall reinforcement into the slab above (see **Clause 3.5.2**).

Number of Reinforcing Bars in Each Core

In 190-mm blockwork, it is possible to use either one bar set in the centre of the wall or two bars – one in each face. Care must be taken to avoid bar congestion.

The advantages of one vertical bar per core are:

- The starter bars and reinforcement are simpler to place, requiring less site control.
- There can be greater confidence in achieving the specified cover.
- The cores are less congested, making grout filling simpler and more effective.

The advantages of two vertical bars per core are:

- Fewer grouted cores and fewer starter bars are required.
- Although there is a slight increase in the amount of reinforcement used, there is a reduction in the amount of grout and the number of grouted cores. Depending on the relative costs of each component, this

can lead to a net reduction in the total cost of the wall.

- The wall is more ductile and will perform better under cyclical earthquake loading.
- The wall will exhibit reduced cracking and deflection when subjected to lateral loads.

Support of Reinforcement

Reinforcement should be positioned by tying to starters at the base and should be fixed at the top by plastic spacers. The position of the steel should be closely controlled at the region of maximum moment, eg at the mid-height of a wall. This may be achieved by breaking construction at this point and lapping the bars. Care must be taken to ensure continuity of moment resistance at laps.

Details

The following drawings show common details of vertically-reinforced masonry elements.

Moment and shear capacities are available in **Part B:Chapter 6**.



Detail C1

[1 of 11]

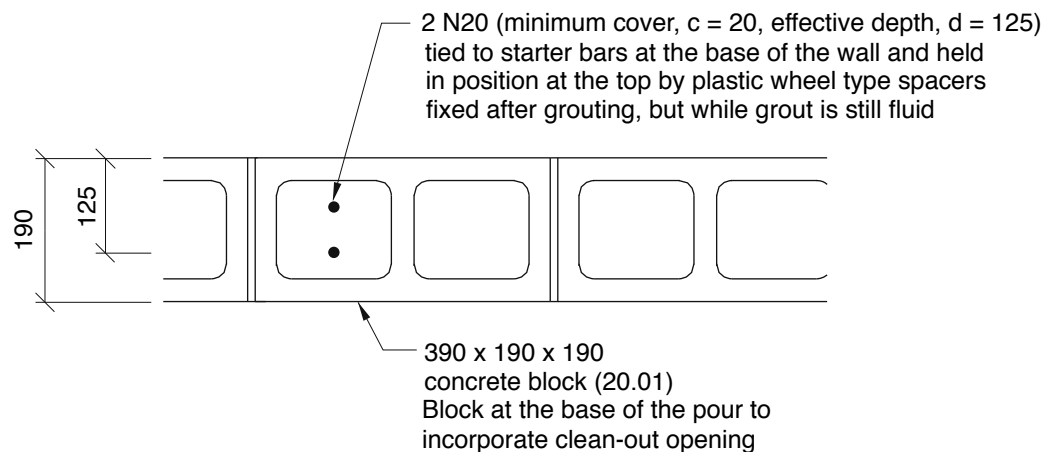
Notes:

Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by plastic wheel type support



Reinforced Concrete Masonry Wall

Scale 1:10

Detail C2

[2 of 11]

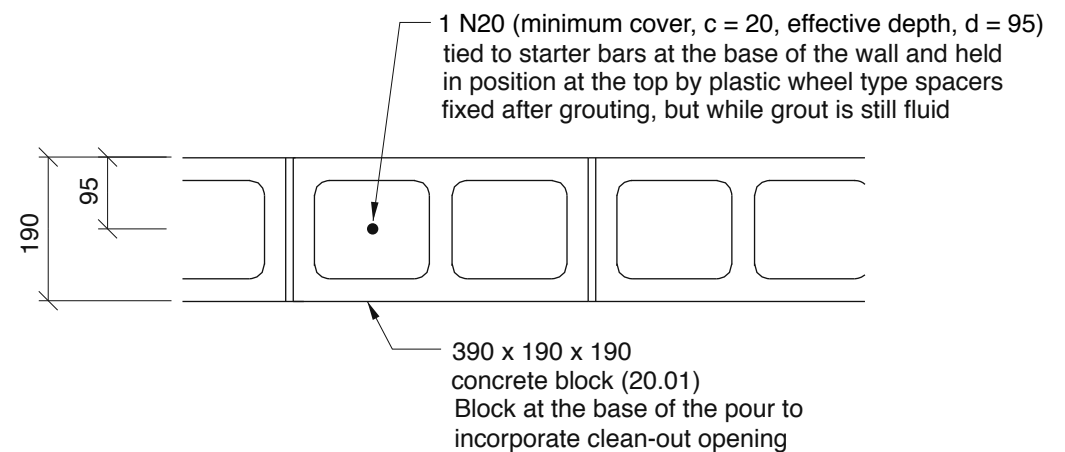
Notes:

Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by plastic wheel type support



Reinforced Concrete Masonry Wall

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/C-Vert_reinf_Masonry/C1.dxf](#)

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/C-Vert_reinf_Masonry/C2.dxf](#)

Detail C3

[3 of 11]

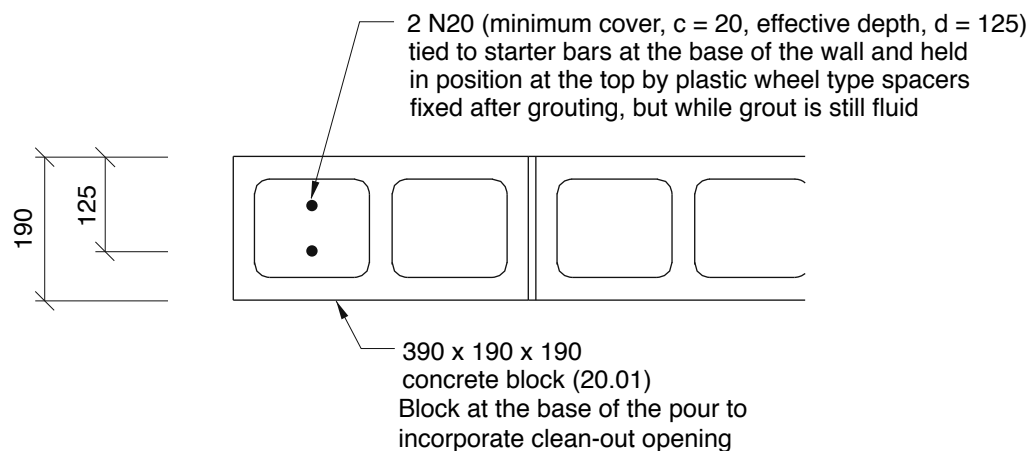
Notes:

Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by plastic wheel type support



Reinforced Concrete Masonry Wall

Scale 1:10

Detail C4

[4 of 11]

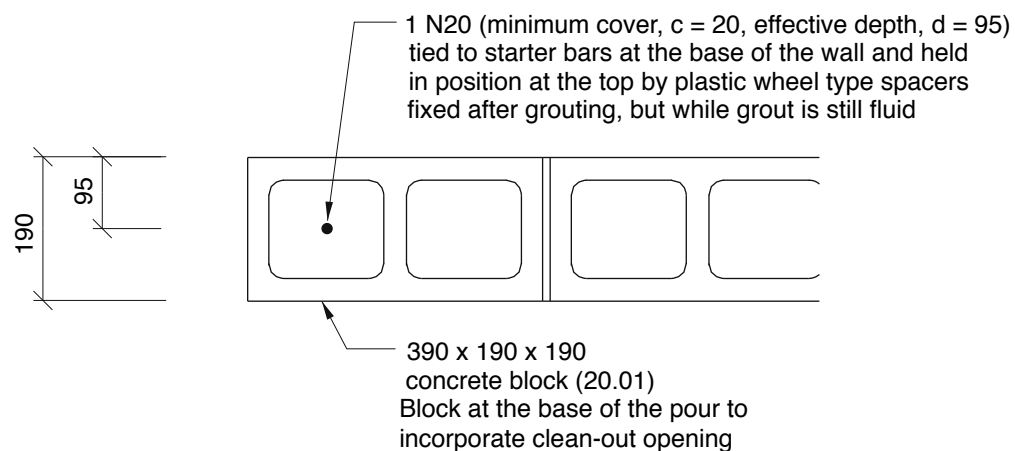
Notes:

Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by plastic wheel type support



Reinforced Concrete Masonry Wall

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/C-Vert_reinf_Masonry/C3.dxf](#)

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/C-Vert_reinf_Masonry/C4.dxf](#)

Detail C5

[5 of 11]

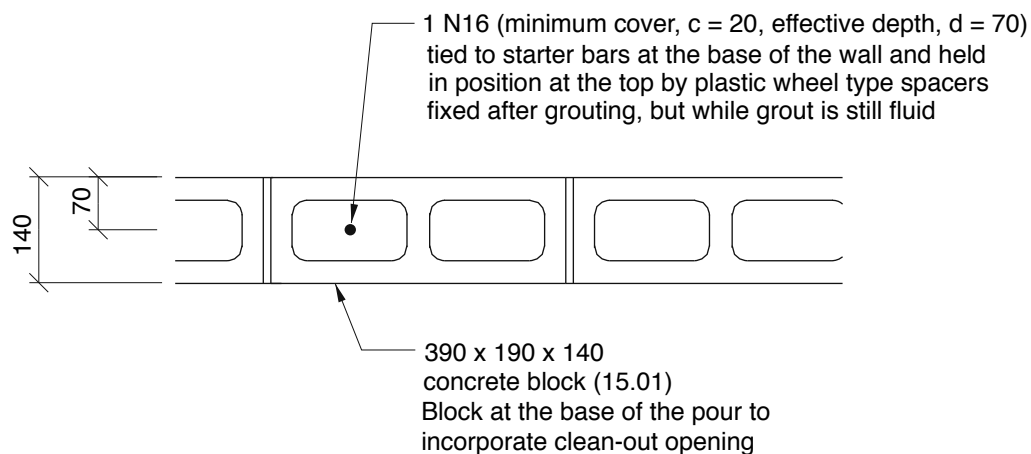
Notes:

Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by plastic wheel type support



Reinforced Concrete Masonry Wall

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/C-Vert_reinf_Masonry/C5.dxf](#)

Detail C6

[6 of 11]

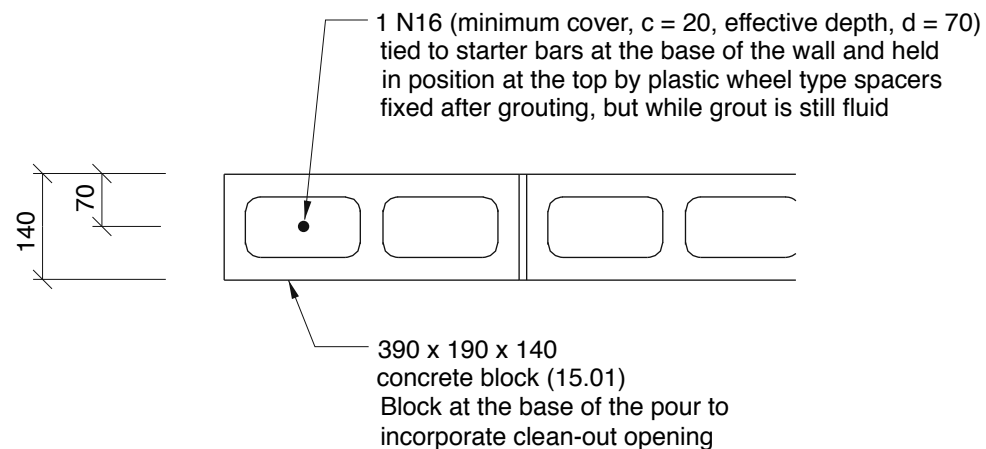
Notes:

Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

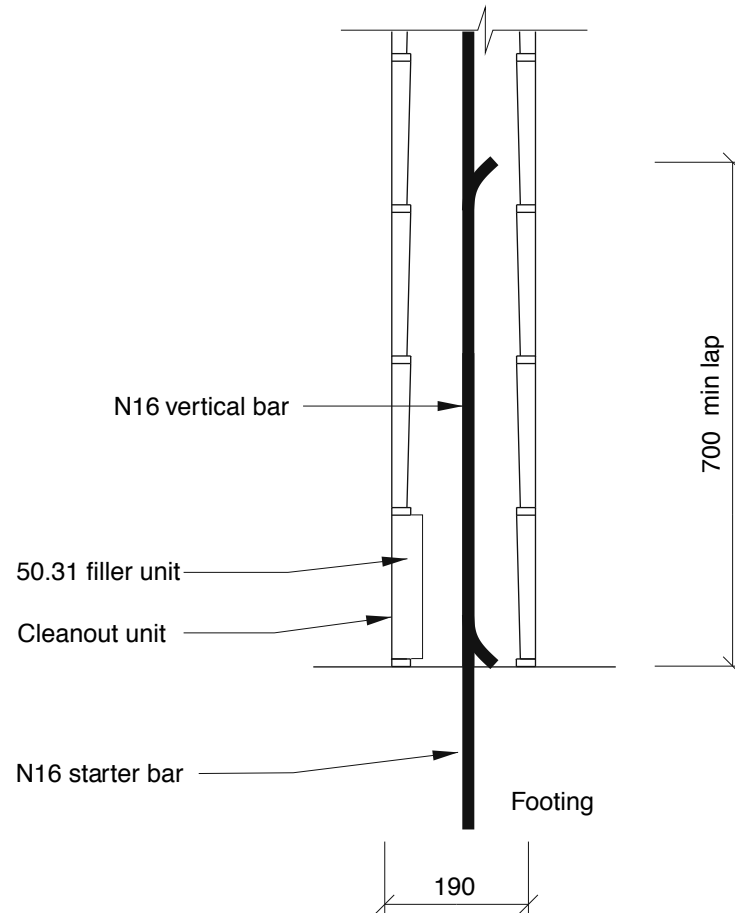
Reinforcement shall be held in position by plastic wheel type support



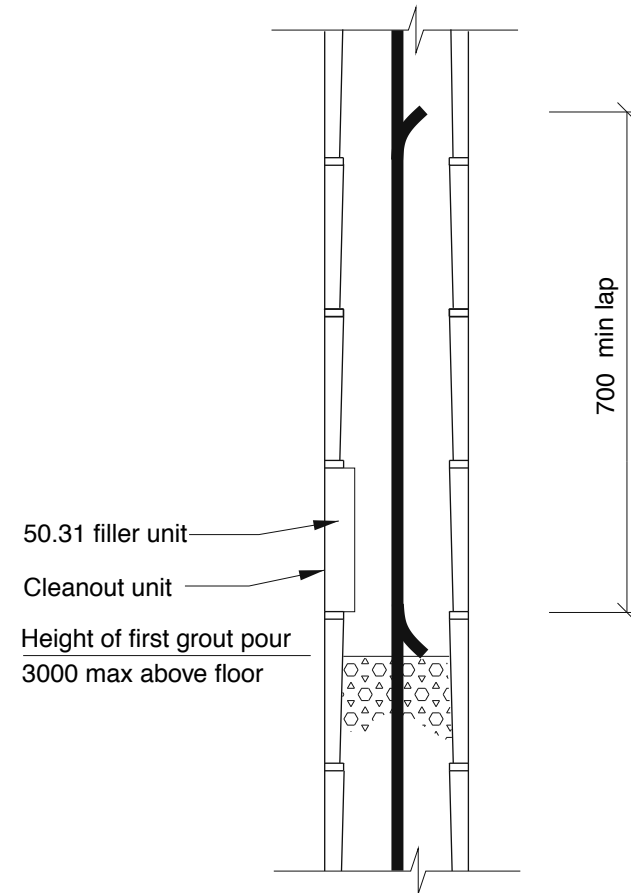
Reinforced Concrete Masonry Wall

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/C-Vert_reinf_Masonry/C6.dxf](#)



Detail At Footing

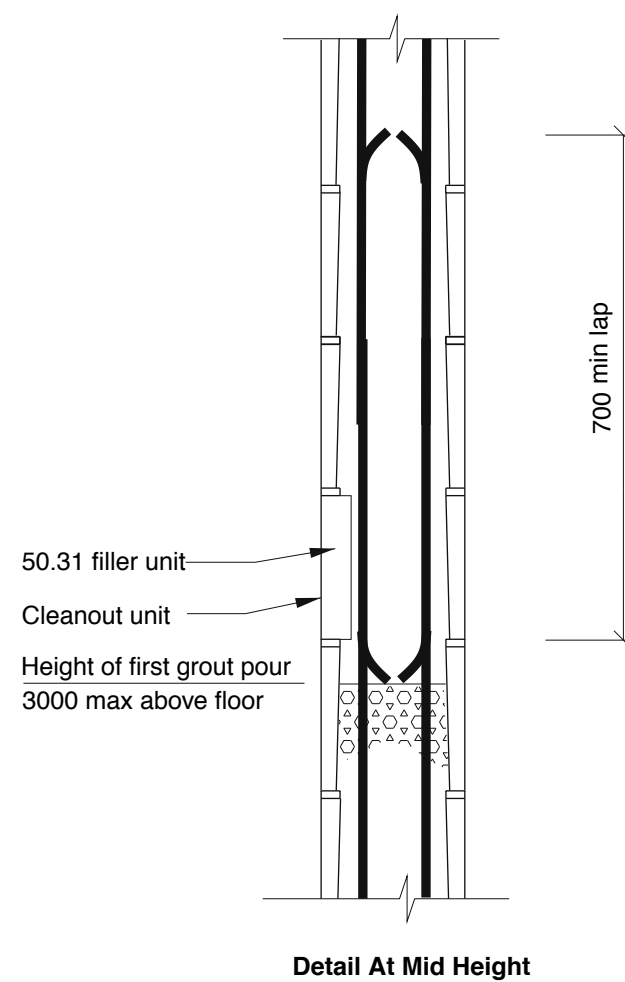
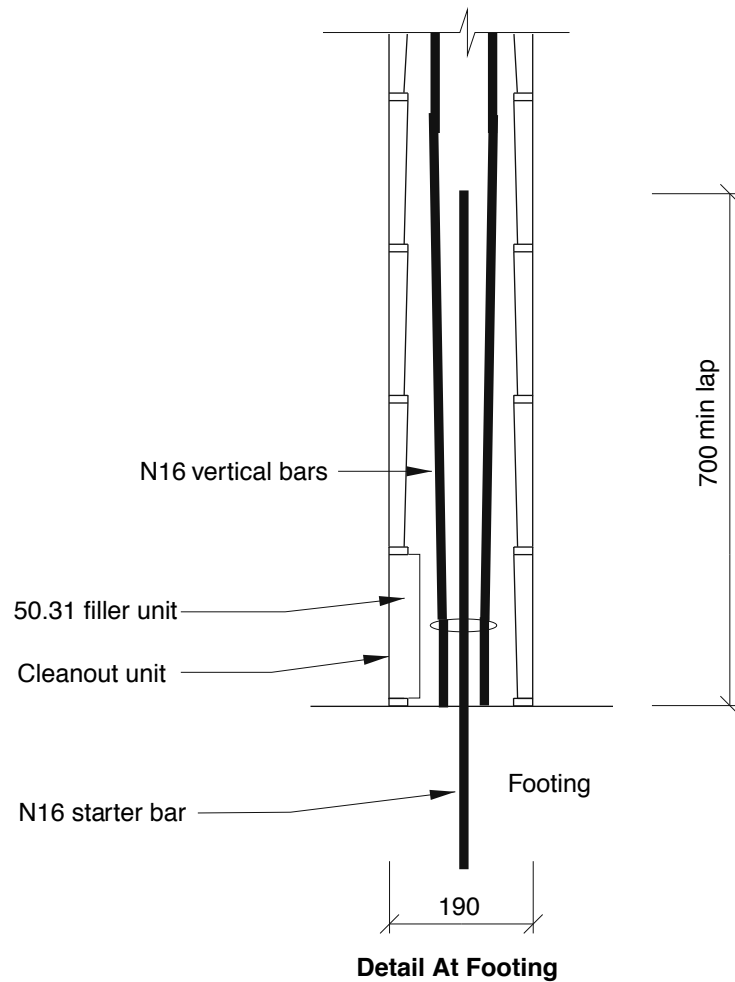


Detail At Mid Height

Single N16 Reinforced Masonry

Scale 1:10

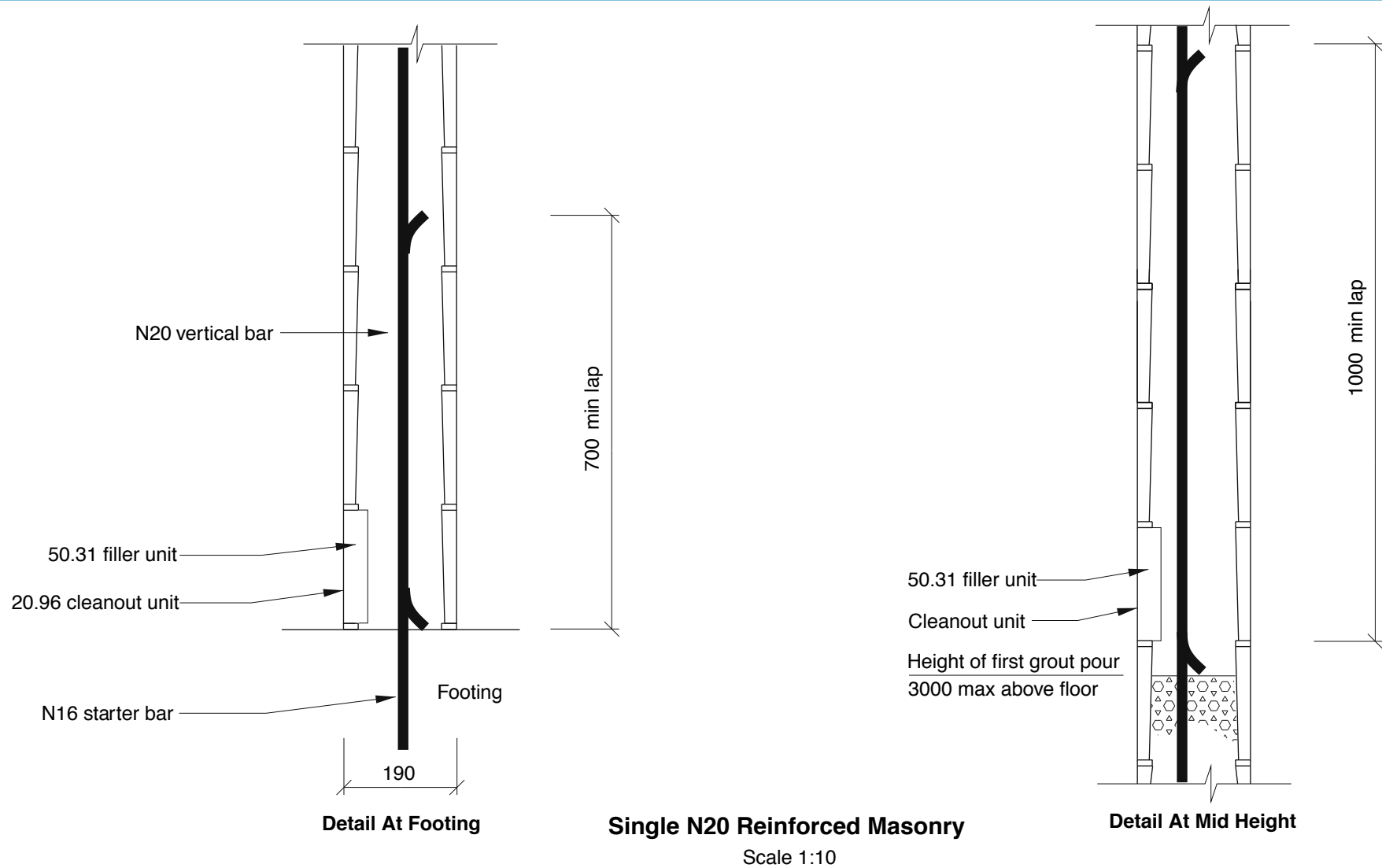
NOTE: This detail is available, in DXF format, in the location: [Data/CAD/C-Vert_reinf_Masonry/C7.dxf](#)



2-N16 Bar Reinforced Masonry

Scale 1:10

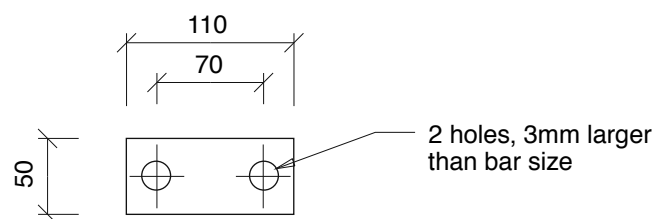
NOTE: This detail is available, in DXF format, in the location: Data/CAD/C-Vert_reinf_Masonry/C8.dxf



NOTE: This detail is available, in DXF format, in the location: [Data/CAD/C-Vert_reinf_Masonry/C9.dxf](#)



NOTE: This detail is available, in DXF format, in the location: [Data/CAD/C-Vert_reinf_Masonry/C10.dxf](#)



If the pouring of grout is closely supervised, the vertical reinforcement may be adjusted while the grout is still wet. Otherwise, temporary steel spacers should be used.

Temporary Steel Spacers For Positioning Reinforcement In 190 mm Blockwork

Scale 1:5

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/C-Vert_reinf_Masonry/C11.dxf](#)

3.3.2 GALVANISED STEEL MULLIONS

Strength and Stiffness

It is increasingly the practice in southern Australia to provide lateral support to unreinforced masonry subject to lateral earthquake, wind or fire loads by building in galvanised steel mullions. Although this is a convenient practice, it is significantly more expensive than reinforced masonry. Furthermore, the stiffness of the mullion is considerably less than the stiffness of the masonry, which will possibly experience some cracking under extreme load.

Wall Construction

Steel mullions must be placed into open-ended masonry units such as "H" or "A"-shaped blocks, during construction of the masonry or between the leaves of cavity masonry.

Anchorage

Steel mullions must be anchored to the supports top and bottom. The following shear capacities assume bolts set into concrete slabs. There should be provision for relative vertical movement between the supporting structure and the masonry wall/mullion combination.

Fire Separation

If required, intumescent seals may be placed on top of the wall, either side of the steel spigot, to provide fire resistance.

Details

The following drawings show common details of galvanised steel mullions.

Moment and shear capacities are given in **PartB:Chapter 6**.

Details of Steel Mullions

Section ⁽¹⁾	Grade ⁽²⁾ MPa	Orientation ⁽³⁾ (depth through wall)	End connection type ⁽⁴⁾
150 x 50 x 5.0 RHS	C450LO	150	2-M12, 8
150 x 50 x 4.0 RHS	C450LO	150	2-M12, 8
125 x 75 x 6.0 RHS	C450LO	75	2-M12, 8
125 x 75 x 5.0 RHS	C450LO	75	2-M12, 8
75 x 75 x 6.0 SHS	C450LO	75	2-M10, 8
75 x 75 x 5.0 SHS	C450LO	75	2-M10, 8
75 x 75 x 4.0 SHS	C450LO	75	2-M10, 8
100 x 50 x 6.0 RHS	C450LO	50	2-M10, 8
100 x 50 x 5.0 RHS	C450LO	50	2-M10, 8
100 x 50 x 4.0 RHS	C450LO	50	2-M10, 8
100 x 50 x 3.5 RHS	C450LO	50	2-M10, 8
100 x 50 x 3.0 RHS	C450LO	50	2-M10, 8
100 x 50 x 2.5 RHS	C450LO	50	2-M10, 8
50 x 50 x 5.0 SHS	C450LO	50	2-M10, 8
170 x 10 FMS	250	170	Nil
120 x 10 FMS	250	120	Nil
90 x 10 FMS	250	90	Nil
70 x 10 FMS	250	70	Nil

Notes:

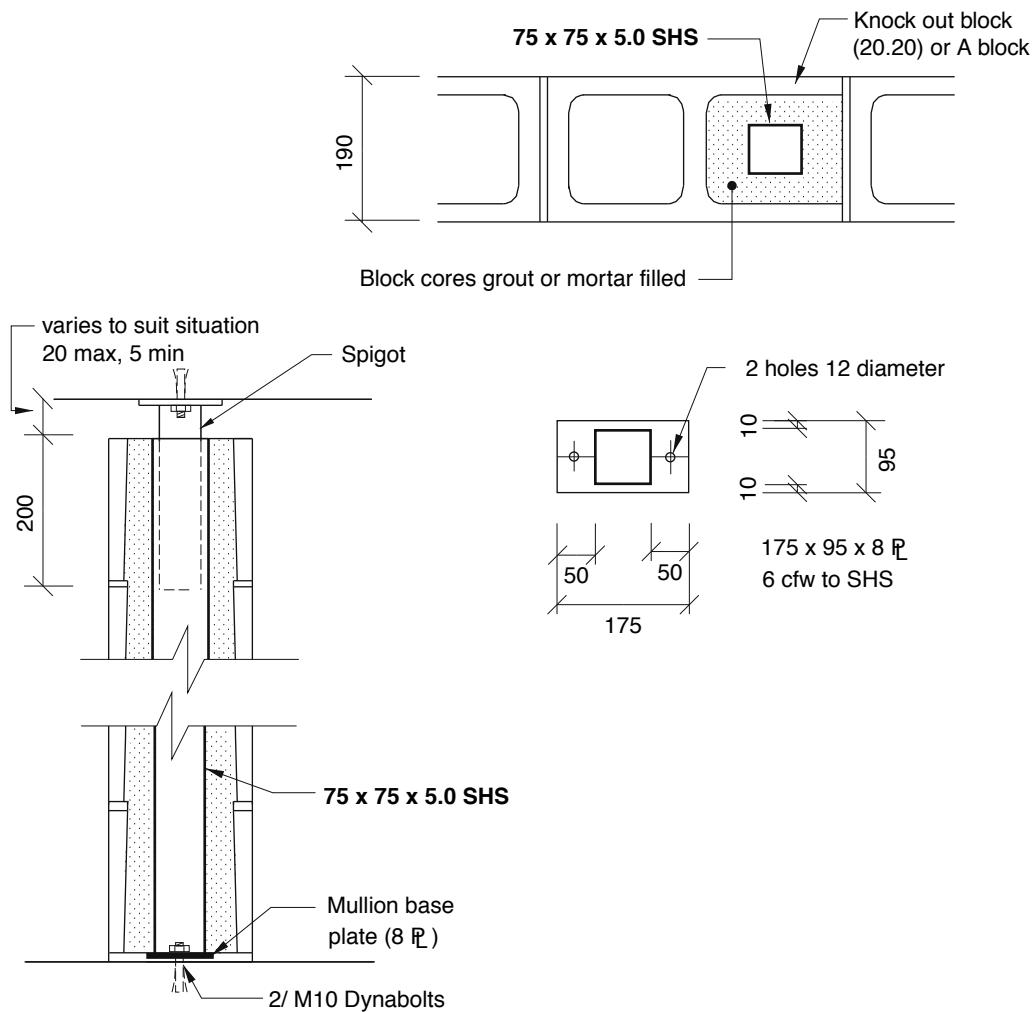
- 1 All hollow sections are BHP Duragal.
- 2 Capacities of all hollow sections are based on Grade C450LO in accordance with AS 1163. All other sections are based on Grade 250 in accordance with AS 3679.
- 3 The orientation shows the dimension of the steel section when measured through the wall. For square hollow sections, this value is the same as the side of the section. For rectangular hollow sections, this value is the same as the smaller of the two sides of the section. It is important to ensure that the steel section will fit into the cores of the blocks.
- 4 The end connections indicated are the ones most likely to lead to efficient design and construction, although other end connections can be used with each section. The nomenclature is as follows:

Designation	Number of Anchors	Anchor type	Plate thickness (mm)
2-M12, 8	2	M12 Dynabolts	8
- 5 Blocks must be of a type and size to enable the mullions to be built into the masonry and the cores packed with mortar.



Detail D1 [1 of 6]

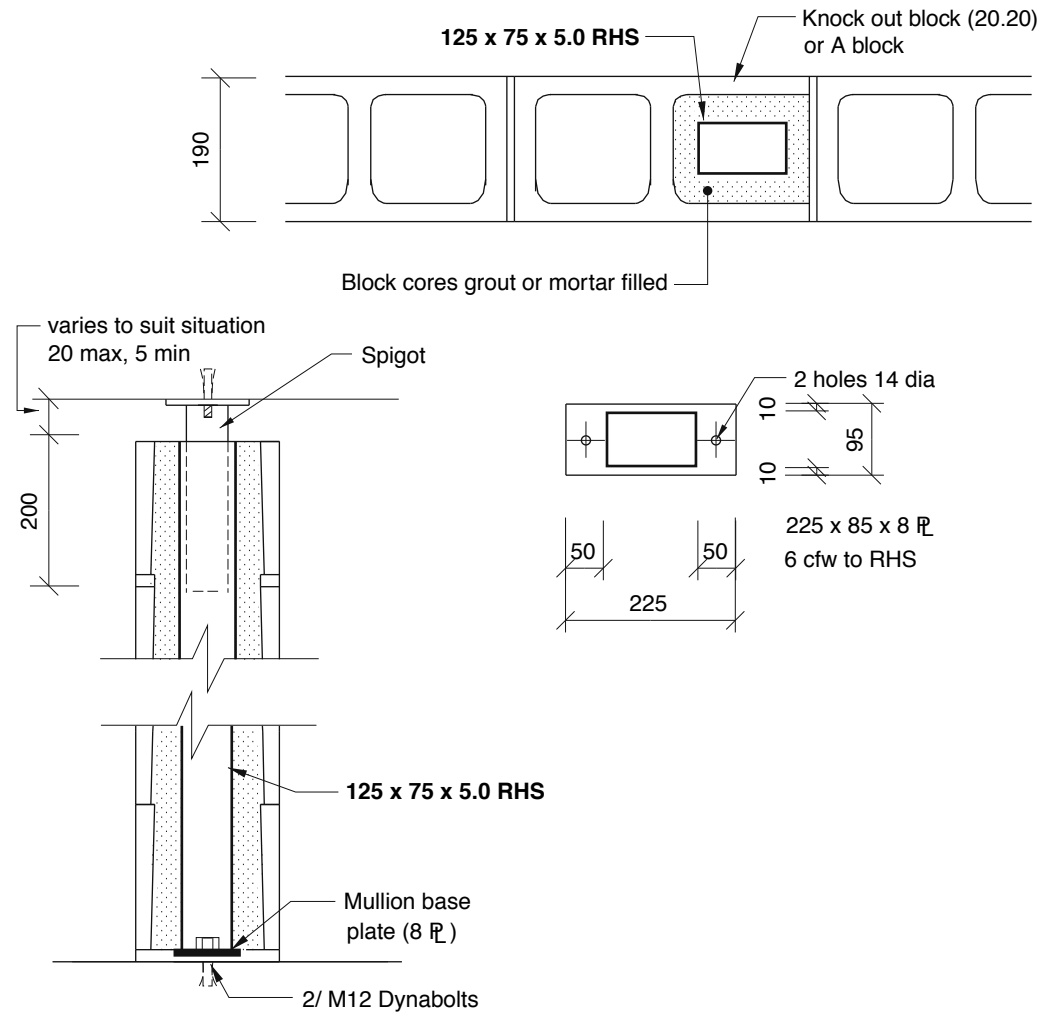
[1 of 6]



NOTE: This detail is available, in DXF format, in the location: *Data/CAD/D-Steel_Mullions/D1.dxf*

Detail D2 [2 of 6]

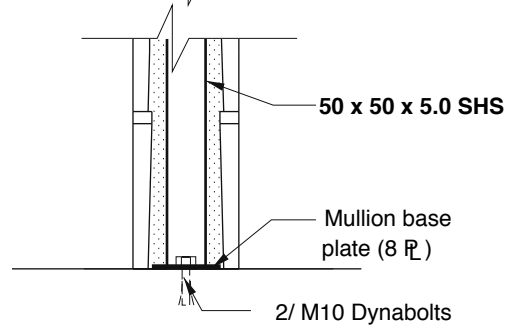
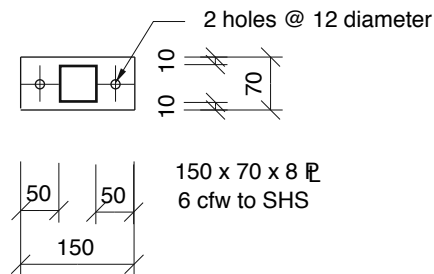
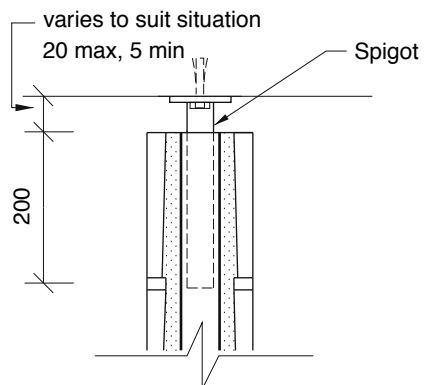
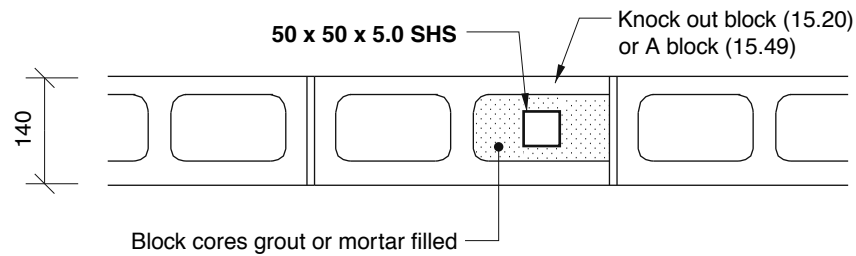
[2 of 6]



NOTE: This detail is available, in DXF format, in the location: *Data/CAD/D-Steel_Mullions/D2.dxf*

Detail D3

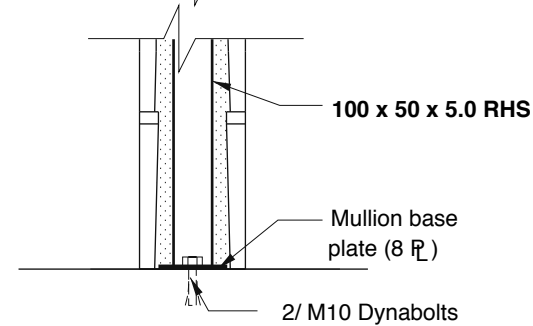
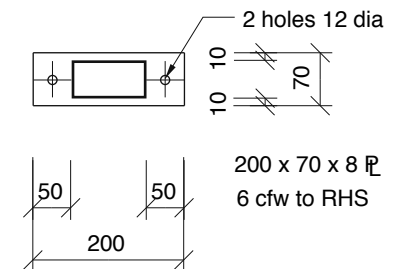
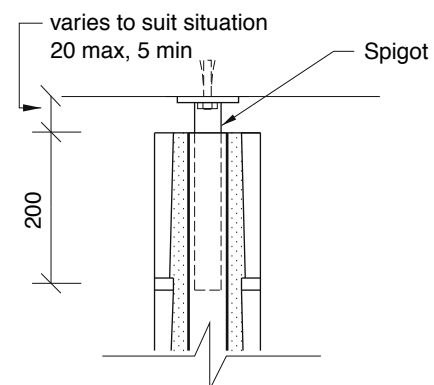
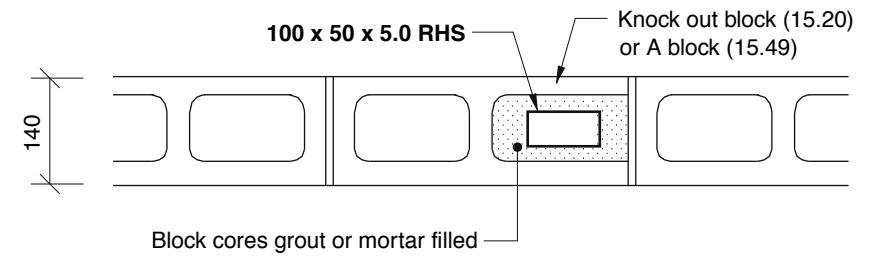
[3 of 6]



NOTE: This detail is available, in DXF format, in the location: [Data/CAD/D-Steel_Mullions/D3.dxf](#)

Detail D4

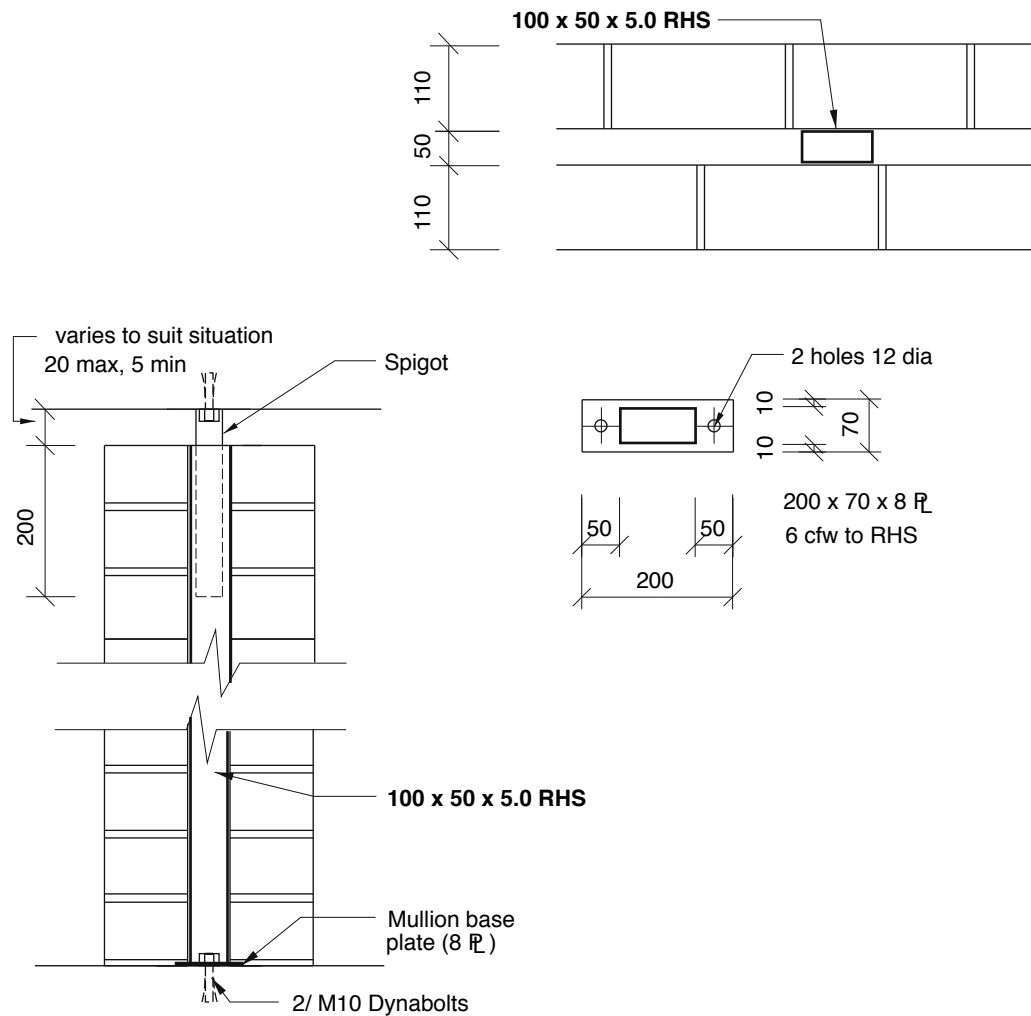
[4 of 6]



NOTE: This detail is available, in DXF format, in the location: [Data/CAD/D-Steel_Mullions/D4.dxf](#)

Detail D5

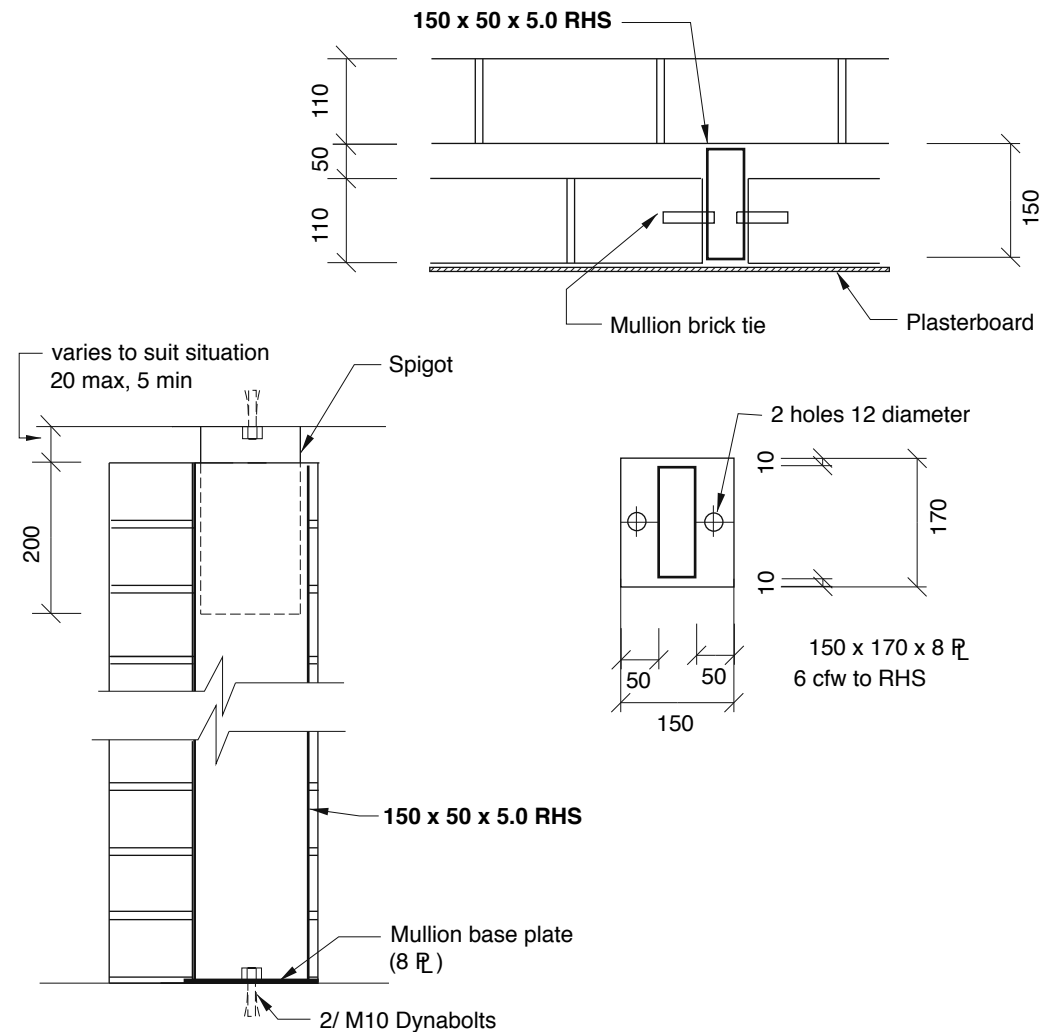
[5 of 6]



NOTE: This detail is available, in DXF format, in the location: [Data/CAD/D-Steel_Mullions/D5.dxf](#)

Detail D6

[6 of 6]



NOTE: This detail is available, in DXF format, in the location: [Data/CAD/D-Steel_Mullions/D6.dxf](#)

3.3.3 COMPOSITE MASONRY MULLIONS

Strength and Stiffness

When cavity walls are subject to lateral earthquake, wind or fire load, the strength of the wall may be increased by tying the two leaves together monolithically, using ties together with either masonry units or mortar packing. This will provide stiffness as well as strength, but is not considered to be ductile.

Weather Resistance

If the walls containing composite masonry mullions are exposed to rainwater, provision to prevent the transfer of moisture across the cavity will need to be made.

Details

The following drawings show common details of composite masonry mullions.

Moment and shear capacities are given in

Part B:Chapter 6.

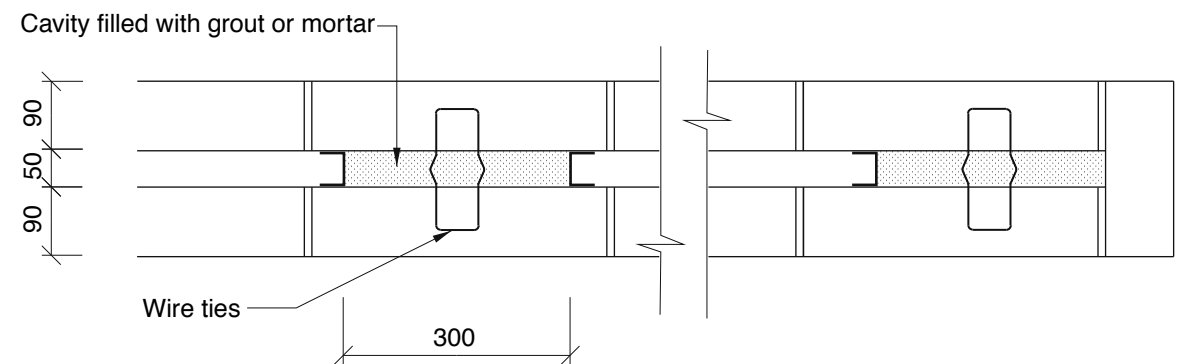
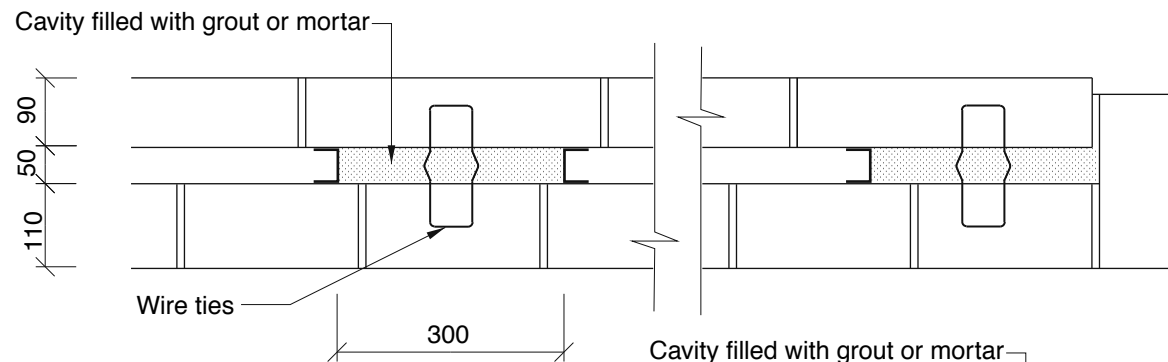
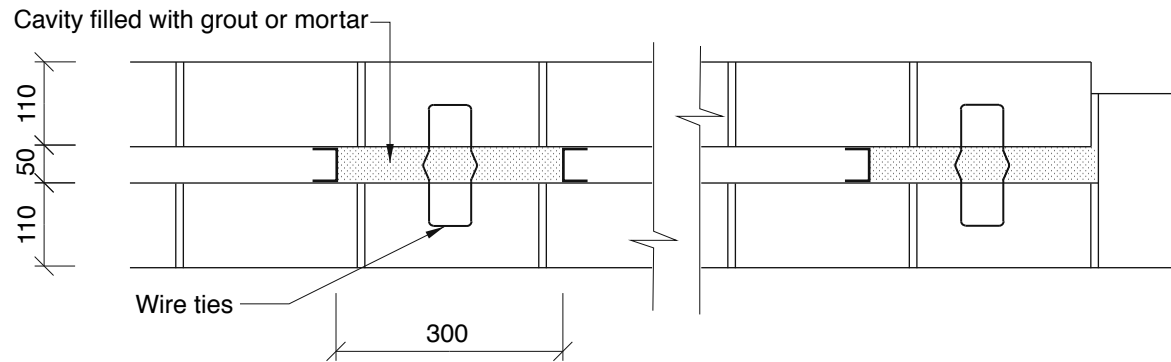
DETAILS OF Composite Masonry Mullions⁽⁷⁾

Inner leaf mm ⁽¹⁾	Cavity width mm ⁽²⁾	Outer leaf mm ⁽³⁾	Web width mm ⁽⁴⁾	Intermediate or End ⁽⁵⁾	Total width, mm ⁽⁶⁾	
					Wall 2700 mm high	Wall 3900 mm high
110	50	110	300	I	840	1080
110	50	110	300	E	570	690
90	50	110	300	I	840	1080
90	50	110	300	E	570	690
90	50	90	300	I	840	1080
90	50	90	300	E	570	690

Notes:

- 1 An inner leaf of 110-mm brickwork has been common for many years, although increasingly 90-mm is being used because of the potential savings in both cost and floor space. Concrete blocks 90 x 119 x 290 mm and 90 x 162 x 290 are available. The 119-mm heights corresponds to 1.5 courses of 76-mm-high brickwork, whilst 162 mm corresponds to two courses of 76-mm-high brickwork.
- 2 These tables are based on the most common cavity width of 50 mm. Capacities may be increased by increasing the cavity width.
- 3 An outer leaf of 110-mm brickwork is common. However, split, ribbed polished or fair-face 90-mm concrete blockwork is sometimes used to provide an attractive economical external face.
- 4 These tables are based on a web width of 300 mm. This can be achieved using a mortar column tied within the leaves by cavity ties. A similar result could be achieved using masonry units bonded to form a diaphragm. In both cases, rainwater must be prevented from crossing the cavity via the diaphragm.
- 5 End mullions are placed near the end of a wall and have masonry cavity walls extending on one side only. Intermediate mullions are placed within a length of wall and have masonry cavity walls extending on both sides.
- 6 The calculation of the effective width of the composite mullion (ie the width of each leaf which acts compositely with a web) is six times the width of the leaf based on AS 3700 Clause 4.5.2. For an end mullion, the effective width is the web width plus up to six times the minimum leaf width on one side only. For an intermediate mullion, the effective width is the web width plus six times the minimum leaf width on both sides of the web (ie up to twelve times).
- 7 Walls higher than the value 3.9 m used in these tables will have shear and moment resistance higher than the tabulated values.



**Composite Masonry Mullions**

Scale 1:10

NOTE: This detail is available, in DXF format, in the location:: [Data/CAD/E-Masonry_Mullions/E1.dxf](#)

3.4

BOND BEAMS

Bond Beam Construction

Bond beams are similar in construction to lintels, except that they are within a wall rather than at an opening and therefore do not necessarily require U-shaped lintel blocks. However, except where vertical reinforcement passes up the cores and through the bond beam from the underside, U-shaped lintel blocks (eg 2012, 2013, 1512 or 1513 blocks) provide the most effective means of preventing grout from filling the whole of the wall.

A two-block-high bond beam can be constructed using H or Double U blocks (eg 2048, 2091, 1548 or 1591) as the top course.

Number of Reinforcing Bars

In 190-mm blockwork, it is possible to use either one bar, set in the centre of the wall, or two bars, one in each face.

In 140-mm blockwork, only one horizontal bar should be used

Care must be taken to avoid bar congestion, particularly if the masonry also includes vertical reinforcement.

Support of Reinforcement

Reinforcement should be positioned by using plastic wheel-type reinforcement spacers, galvanised wire hangers or reinforcing ligatures as shown.

Details

The following drawings show common details of horizontally-reinforced masonry bond beams.

Moment and shear capacities are given in **Part B:Chapter 5** and **Part B:Chapter 6**.



Detail F1

[1 of 11]

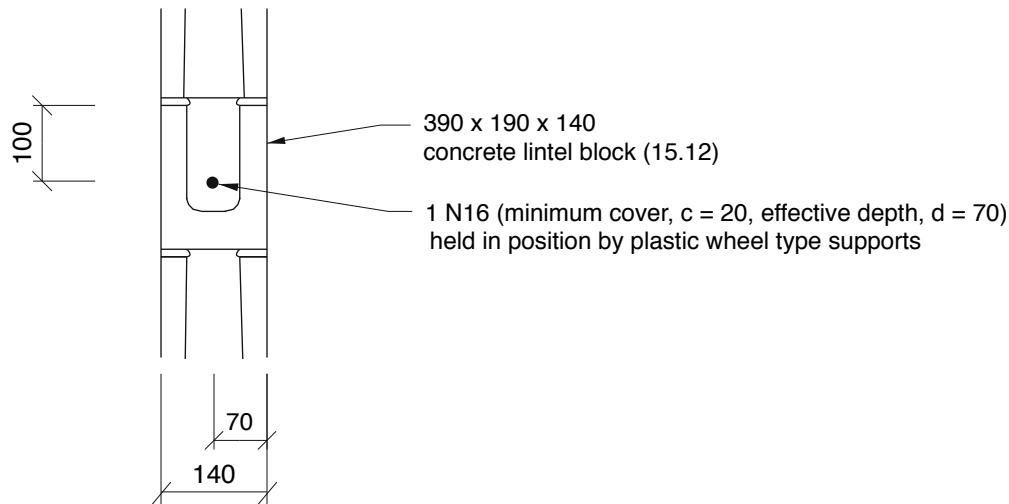
Notes:Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support

**Reinforced Concrete Masonry Bond Beam**

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/F-Bond_Beams/F1.dxf](#)**Detail F2**

[2 of 11]

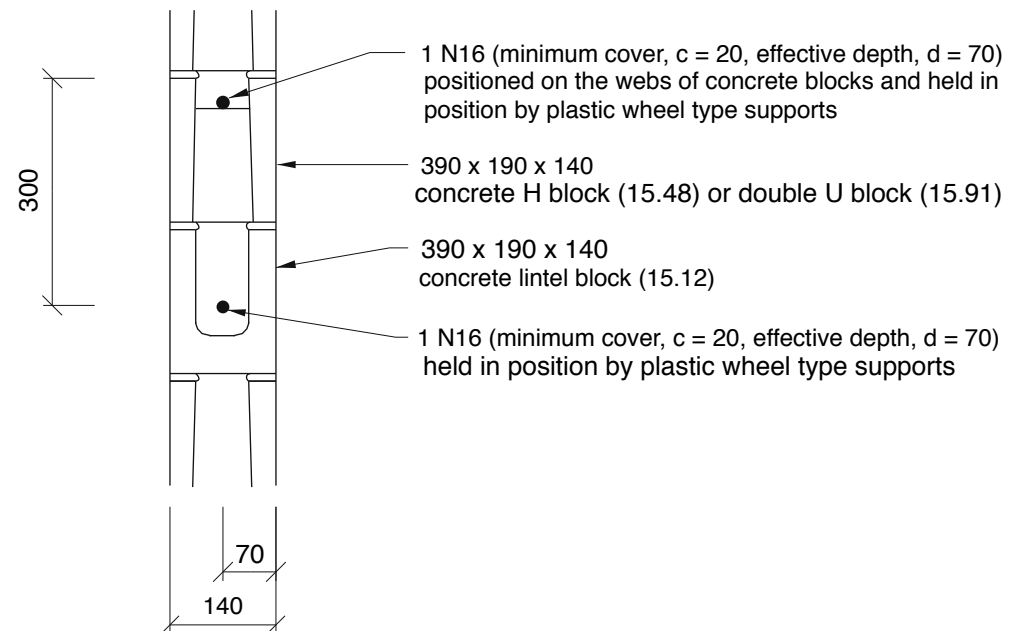
Notes:Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support

**Reinforced Concrete Masonry Bond Beam**

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/F-Bond_Beams/F2.dxf](#)

Detail F3

[3 of 11]

Notes:

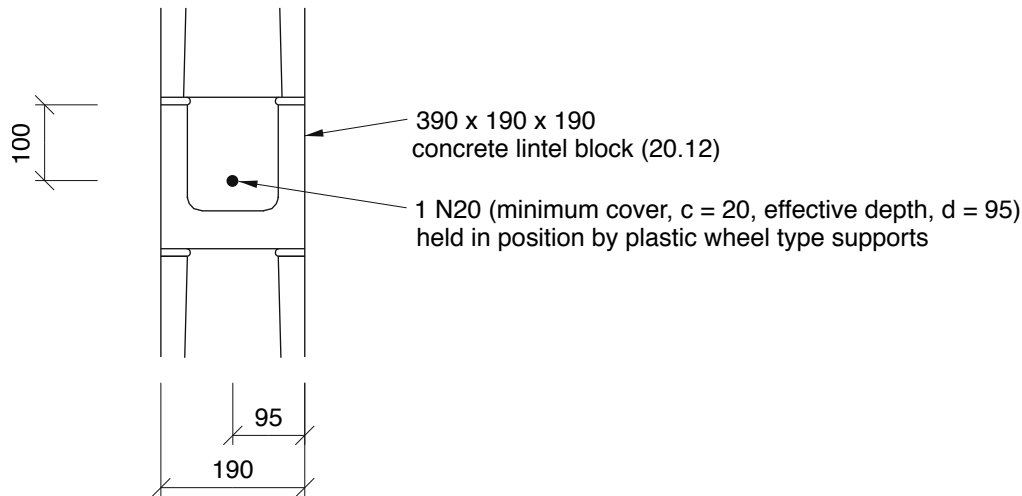
Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support



Reinforced Concrete Masonry Bond Beam

Scale 1:10

Detail F4

[4 of 11]

Notes:

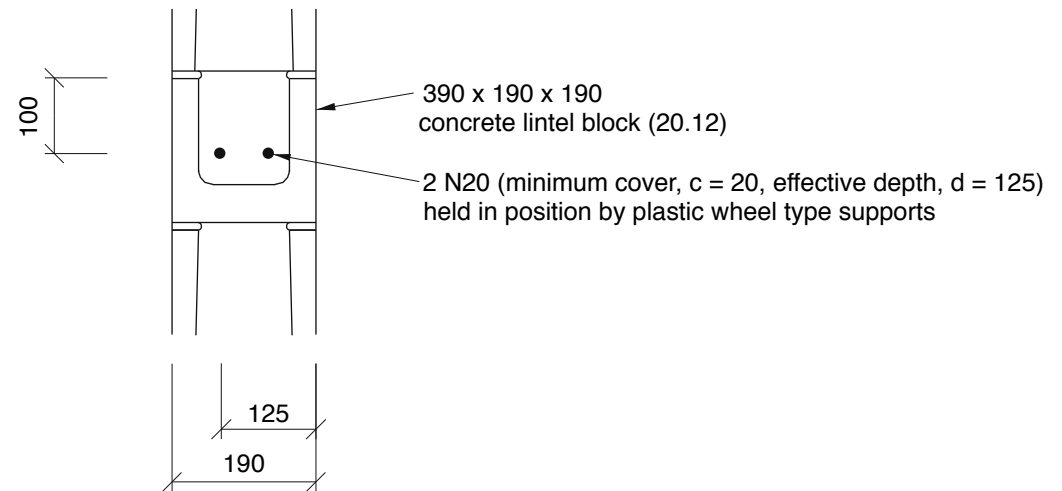
Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support



Reinforced Concrete Masonry Bond Beam

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/F-Bond_Beams/F3.dxf](#)

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/F-Bond_Beams/F4.dxf](#)

Detail F5

[5 of 11]

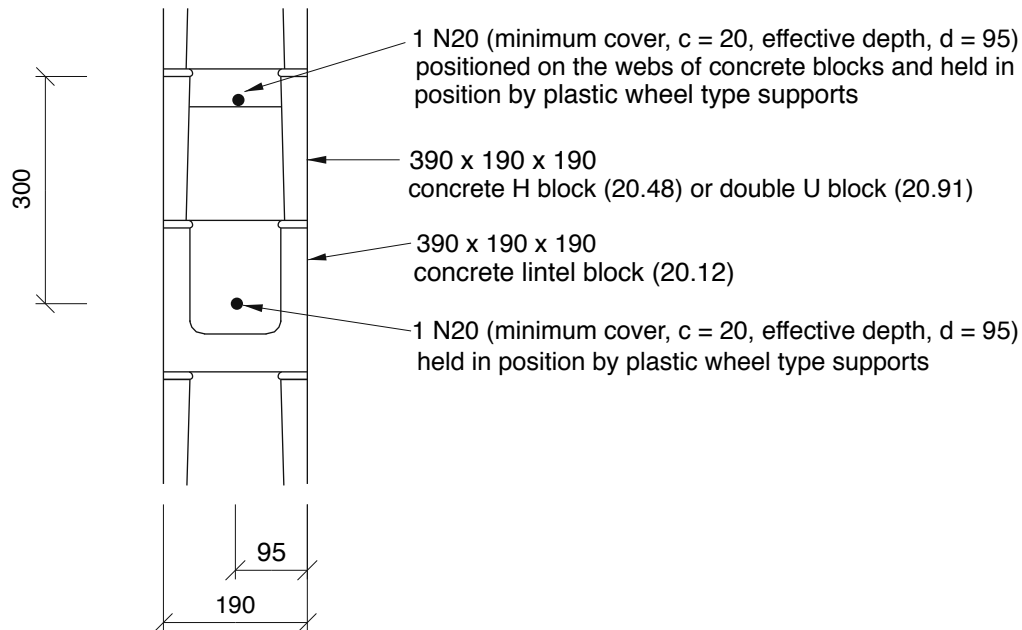
Notes:Concrete blocks f_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support

**Reinforced Concrete Masonry Bond Beam**

Scale 1:10

Detail F6

[6 of 11]

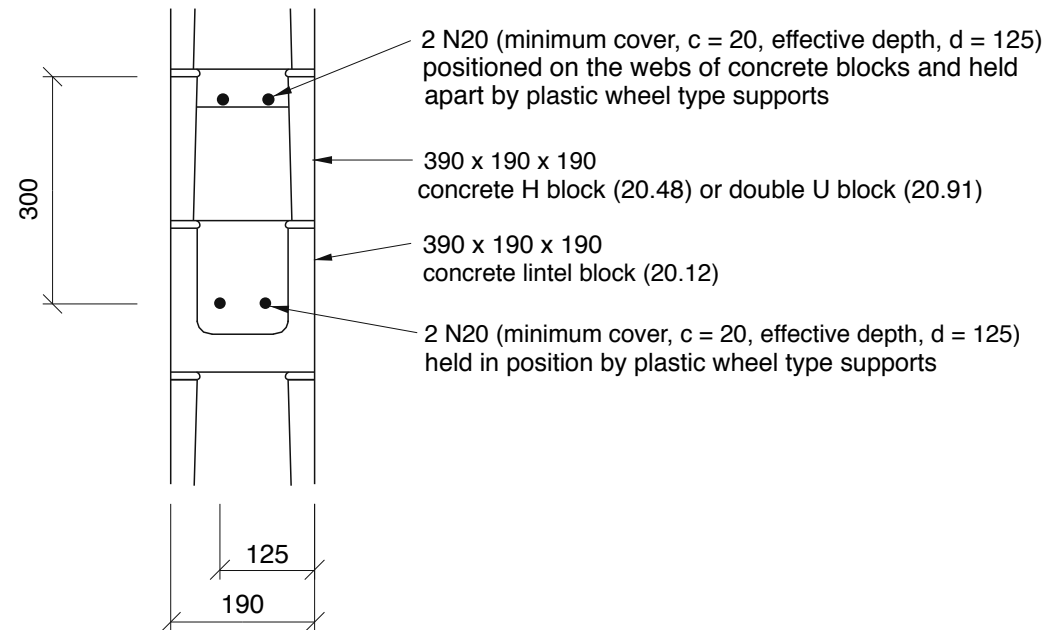
Notes:Concrete blocks f_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

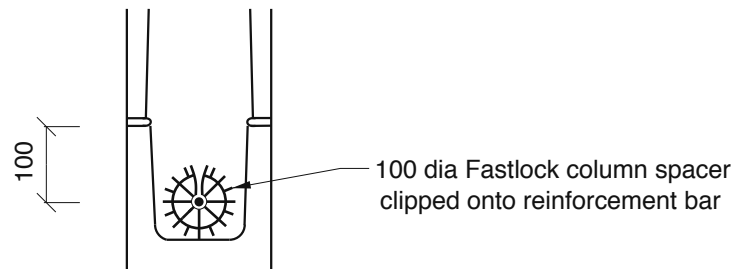
Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support

**Reinforced Concrete Masonry Bond Beam**

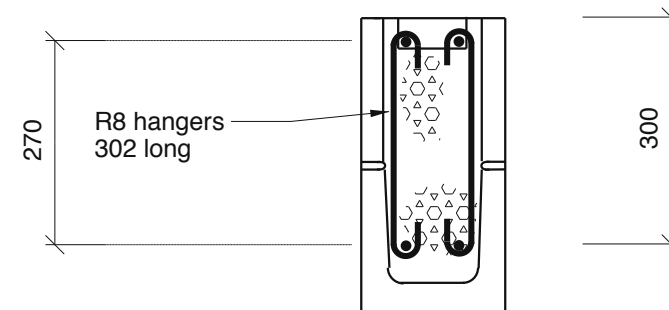
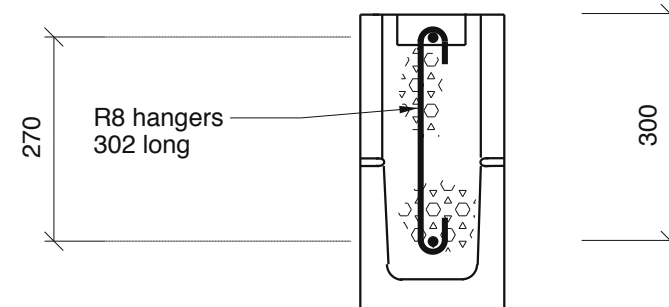
Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/F-Bond_Beams/F5.dxf](#)NOTE: This detail is available, in DXF format, in the location: [Data/CAD/F-Bond_Beams/F6.dxf](#)



Steel Positioning Detail - Column Spacers

Scale 1:10



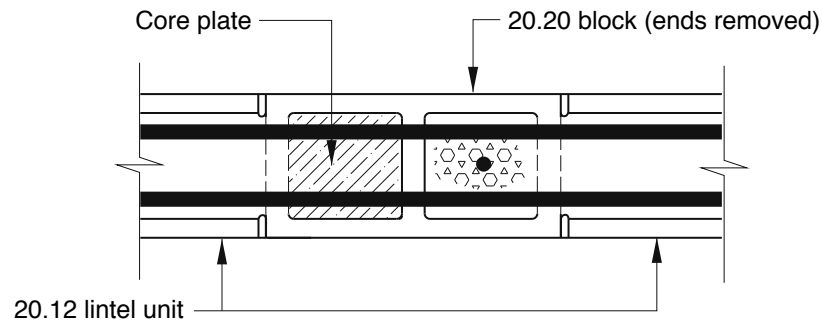
Steel Positioning Detail - Galvanised Wire Hangers

Scale 1:10

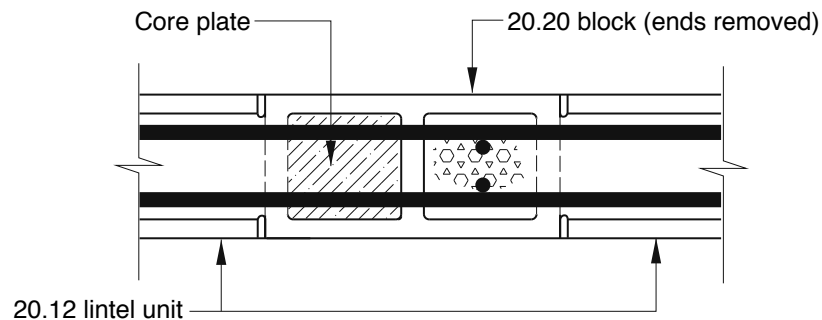
NOTE: This detail is available, in DXF format, in the location: [Data/CAD/F-Bond_Beams/F7.dxf](#)

Detail F8

[8 of 11]

**Single N20 Reinforced Masonry (At Bond Beam)**

Scale 1:10

**2-N20 Bar Reinforced Masonry (At Bond Beam)**

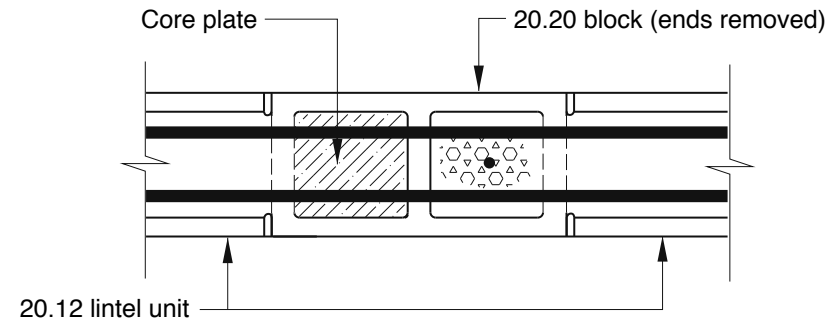
Scale 1:10

Notes:

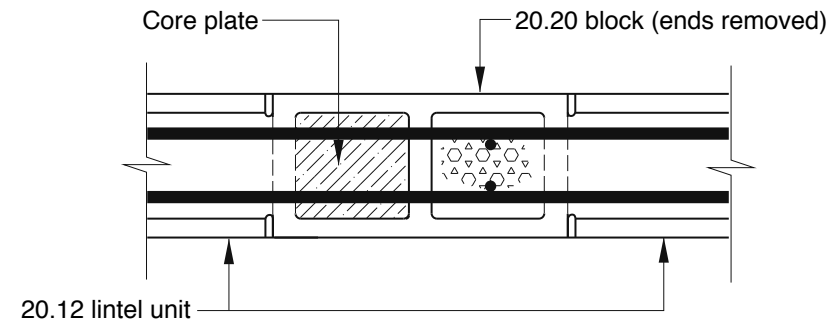
1. All reinforcing bars to be N20
2. All concrete grout to be N20 (minimum cement content 300 kg/m³, maximum aggregate size 10 mm)
3. Mortar to be 1 part portland cement to 5 parts clean sand, plus 0.005 methyl cellulose water thickner
4. For partially-grouted walls, use 20.01 blocks for infill

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/F-Bond_Beams/F8.dxf](#)**Detail F9**

[9 of 11]

**Single N16 Reinforced Masonry (At Bond Beam)**

Scale 1:10

**2-N16 Bar Reinforced Masonry (At Bond Beam)**

Scale 1:10

Notes:

1. All reinforcing bars to be N16
2. All concrete grout to be N20 (minimum cement content 300 kg/m³, maximum aggregate size 10 mm)
3. Mortar to be 1 part portland cement to 5 parts clean sand, plus 0.005 methyl cellulose water thickner
4. For partially-grouted walls, use 20.01 blocks for infill

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/F-Bond_Beams/F9.dxf](#)

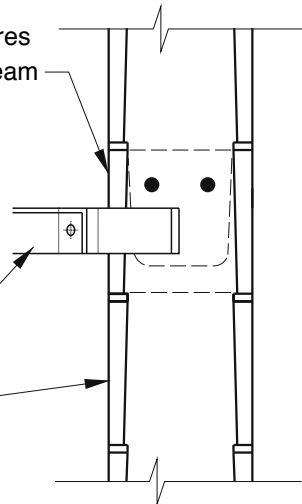
Detail F10

[10 of 11]

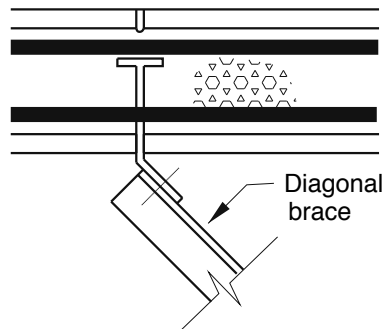
20.91 with core plates at reinforced cores
20.12 (intel unit) elsewhere in bond beam

Set tee bracket in perp joint

20.01 block



Detail At Top Bond Beam



Diagonal Brace Plan

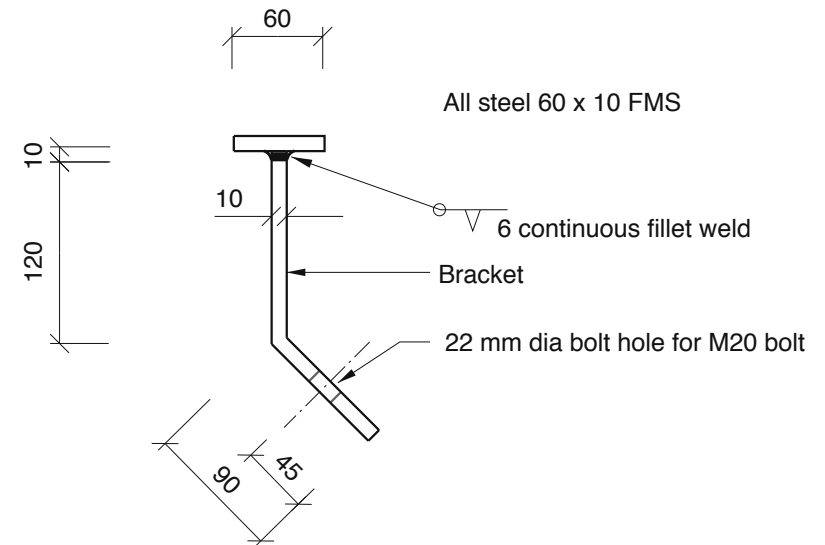
Diagonal Brace Detail

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/F-Bond_Beams/F10.dxf](#)

Detail F11

[11 of 11]



Bracket For Diagonal Bracing

Scale 1:5

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/F-Bond_Beams/F11.dxf](#)

3.5.1 REINFORCED SHEAR WALLS**Purpose**

When masonry walls are subjected to horizontal in-plane shear forces, vertical reinforcement placed in the cores of hollow concrete blockwork, acting together with horizontal reinforcement in bond beams, confines the masonry and enhances shear capacity. If the vertical reinforcement is placed at 2.0 m centres or closer and the horizontal steel at 3.0 metres centres or closer, the masonry wall is classified as a reinforced masonry shear wall.

Details

Reinforced masonry shear walls are a combination of bond beams and vertically-reinforced masonry. All reinforcement must be correctly anchored to ensure that the wall remains intact when being subjected to in-plane shear. At corners of the wall and at openings, vertical reinforcement should be lapped with starter bars at the base and copped into the bond beams and thus lapped with the bond beam reinforcement at the top (see **Clause 3.5.2**).

For information on capacities of reinforced shear walls, see **Part B:Chapter 6**.



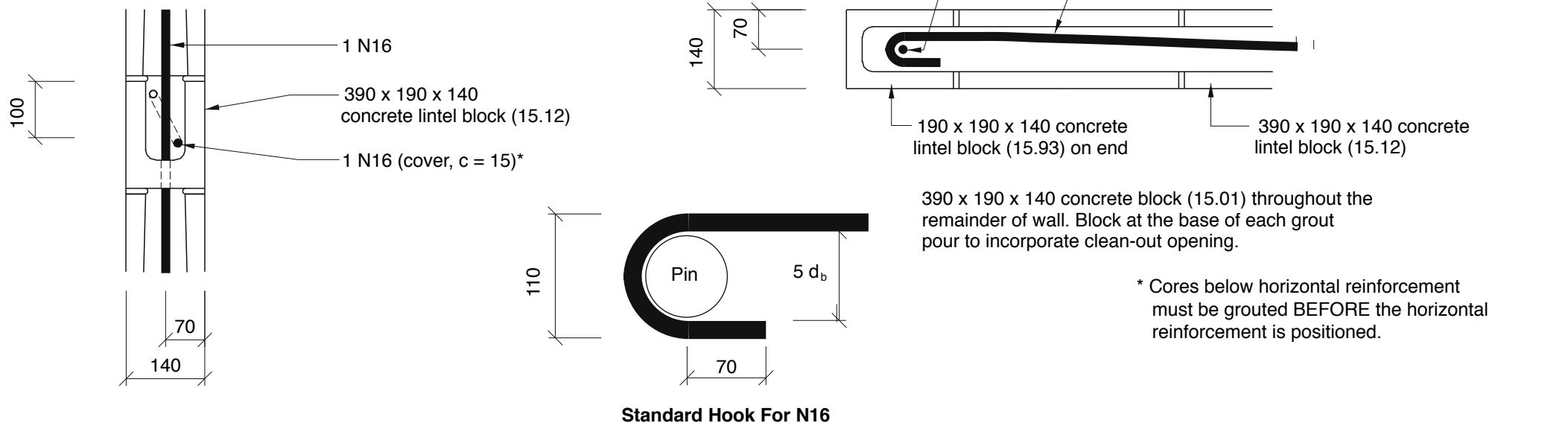
Notes:Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support

**140 mm Reinforced Concrete Masonry Shear Wall With 1-N16 Per End Core**

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/G-Shear_Walls/G1.dxf](#)

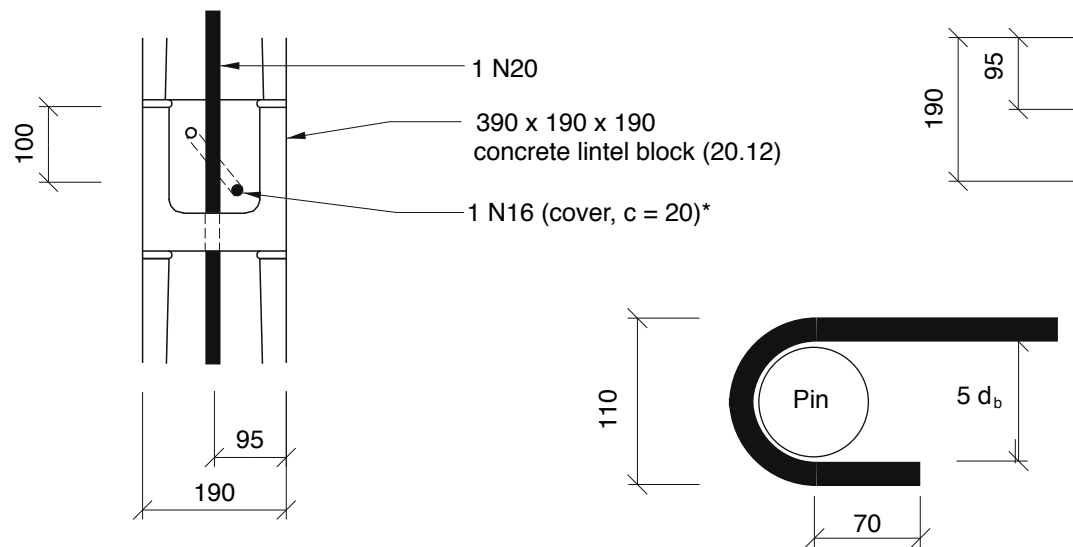
Notes:Concrete blocks f'_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

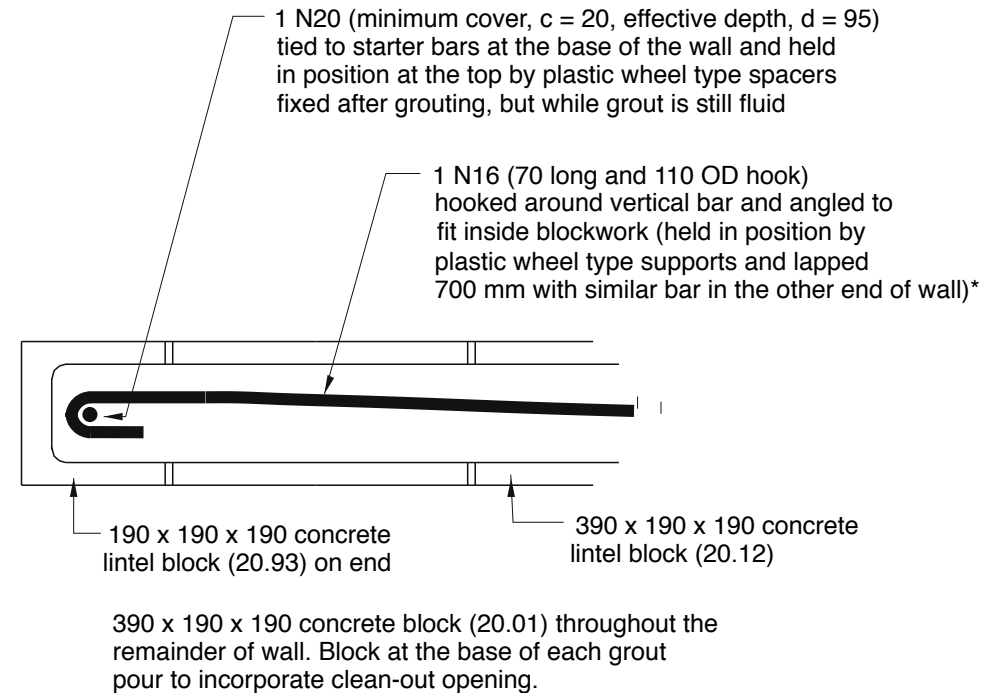
Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support



Standard Hook For N16



390 x 190 x 190 concrete block (20.01) throughout the remainder of wall. Block at the base of each grout pour to incorporate clean-out opening.

* Cores below horizontal reinforcement must be grouted BEFORE the horizontal reinforcement is positioned.

190 mm Reinforced Concrete Masonry Shear Wall With 1-N20 Per End Core

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: Data/CAD/G-Shear_Walls/G2.dxf

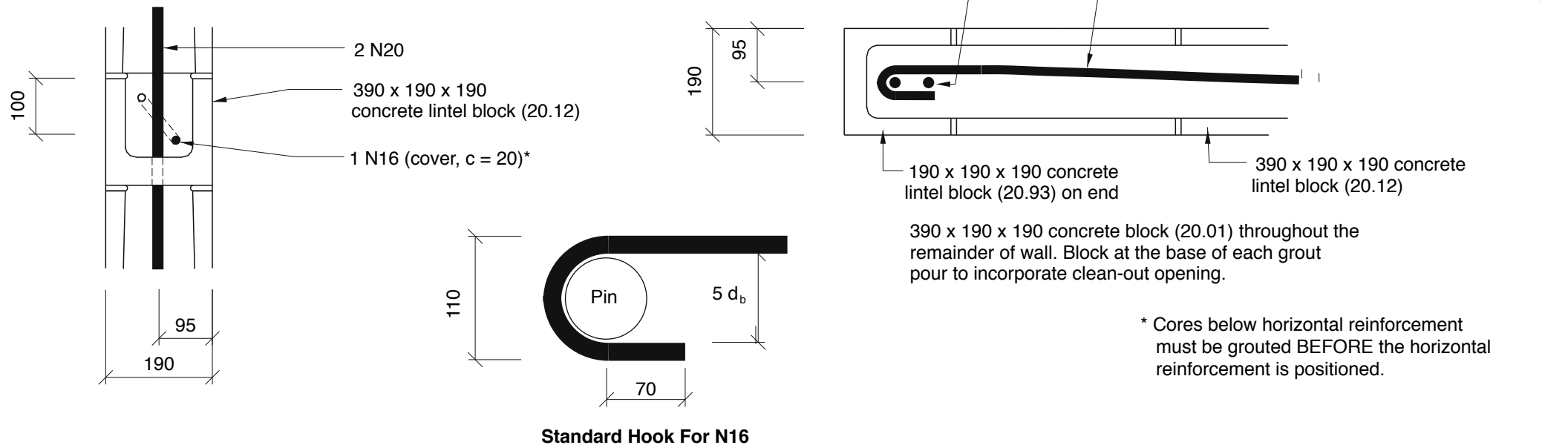
Notes:Concrete blocks f_{uc} 15 MPa

Mortar M3 (1:5 + methyl cellulose water thickener)

Concrete grout N20 (minimum cement 300 kg/m³, maximum aggregate 10 mm)

Reinforcement shall be held in position by

- steel ligatures; or
- steel hangers; or
- plastic wheel type support

**190 mm Reinforced Concrete Masonry Shear Wall With 2-N20 Per End Core**

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/G-Shear_Walls/G3.dxf](#)

3.5.2 ANCHORAGE AT THE MASONRY/CONCRETE INTERFACE

The purpose is to provide sufficient shear resistance and anchorage at the top and bottom of a masonry wall to:

- transfer shear to and from shear walls,
- provide vertical anchorage against overturning of shear walls, and
- provide shear resistance to out-of-plane lateral loads.

Most commercially-available head ties do not have sufficient shear resistance to support large wall panels subject to the out-of-plane and in-plane horizontal loads experienced in earthquakes.

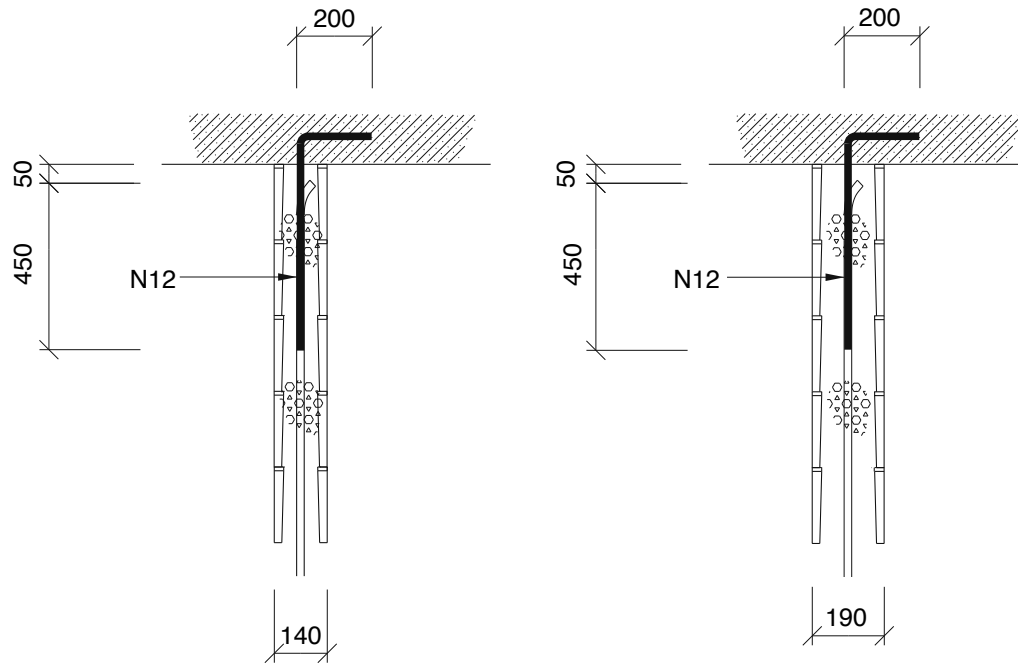
If enhanced shear capacity is required, the masonry must be positively tied to the supporting slabs by grouted starter-bars or similar methods shown in the following details.

For information on capacities of the details, see **Part B:Chapter 6**.



Detail H1

[1 of 3]

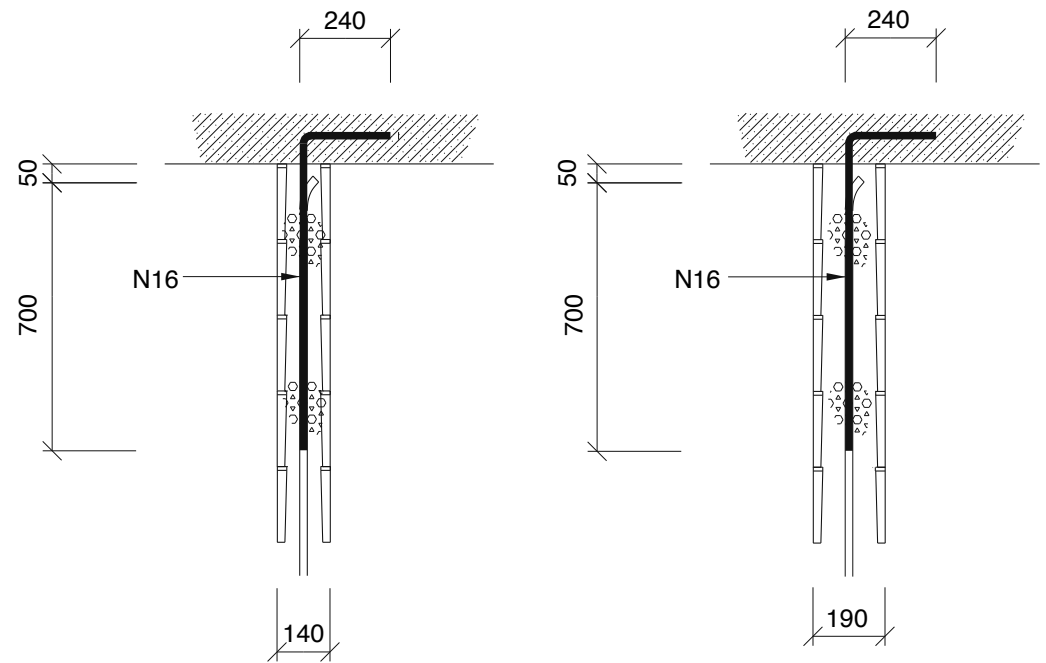


N12 Reinforced Starter Bars
Scale 1:20

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/H-Starter_Bars/H1.dxf](#)

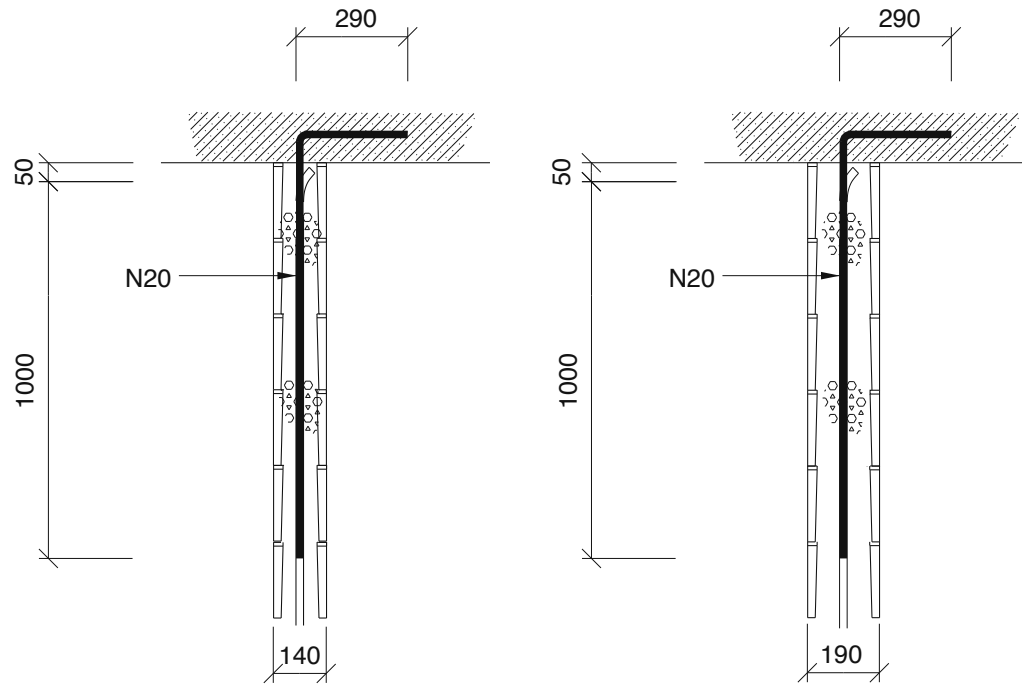
Detail H2

[2 of 3]



N16 Reinforced Starter Bars
Scale 1:20

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/H-Starter_Bars/H2.dxf](#)

**N20 Reinforced Starter Bars**

Scale 1:20

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/H-Starter_Bars/H3.dxf](#)

3.6

CONTROL JOINTS

The strategic placement of control joints will limit the position and width of cracks. Control joints should be detailed so as to maintain resistance to moisture penetration, fire, heat and sound.

Contraction joints are opening joints to cater for shrinkage of the wall. In a wall exposed to the weather, contraction joints must be weather-proof with a flexible sealant at the surface. They may also be filled with a compressible material if required to serve also as expansion joints (for thermal movement) or as articulation joints (for footing or support movement).

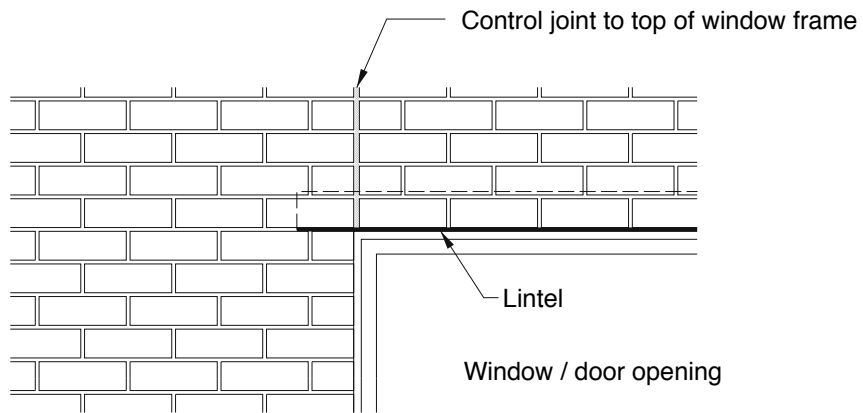
Expansion joints are closing joints. They are usually built into clay masonry to cater for brick growth and find application in concrete masonry only when there is the possibility of high thermal movement. Expansion joints incorporate a compressible material of sufficient thickness to cater for the expansion in the walls adjacent to the joint.

Articulation joints are both opening and closing joints that cater for movement of the footings or supports. The strategic positioning of articulation joints at points of weakness (such as door or window openings) will minimise cracking as the supports move due to foundation movement and similar actions. In some cases, contraction and expansion joints will function as articulation joints.

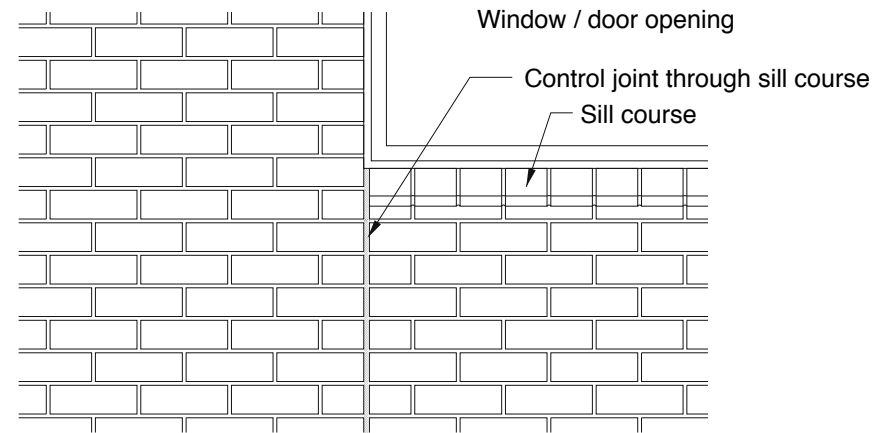
Details

The following details cover a variety of these types of control joints.

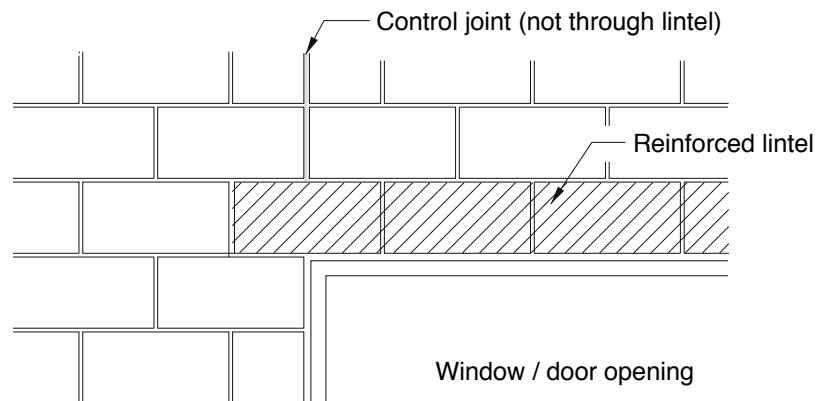


**Control Joints at Lintels**

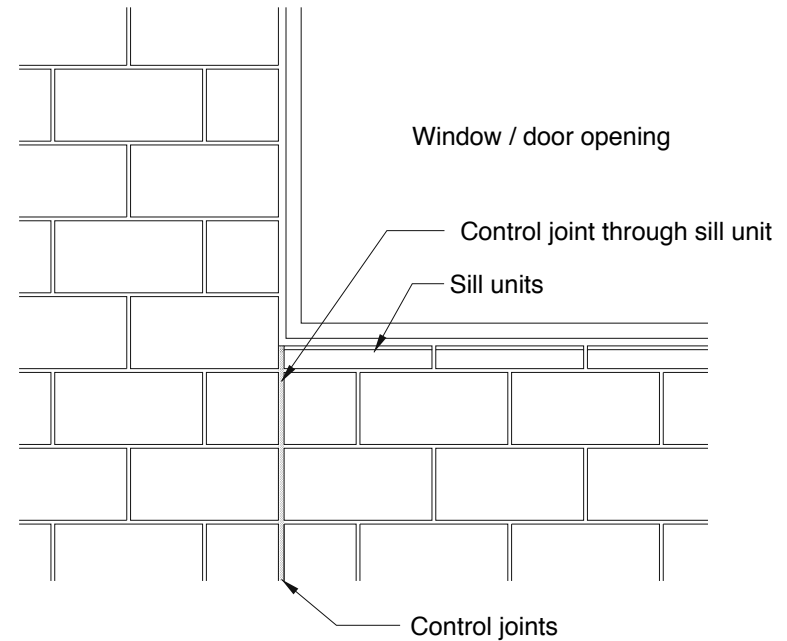
NOTE: This detail is available, in DXF format, in the location: [Data/CAD/J-Control_Joints/J1.dxf](#)

**Control Joints at Windows**

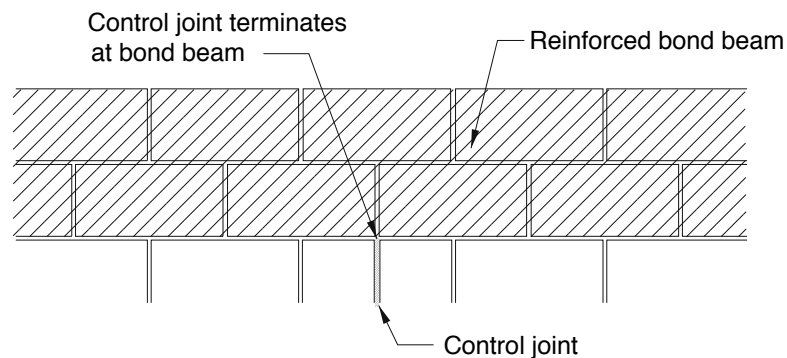
NOTE: This detail is available, in DXF format, in the location: [Data/CAD/J-Control_Joints/J2.dxf](#)

**Control Joints at Lintels**

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/J-Control_Joints/J3.dxf](#)

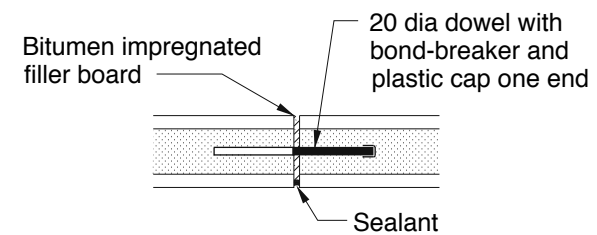
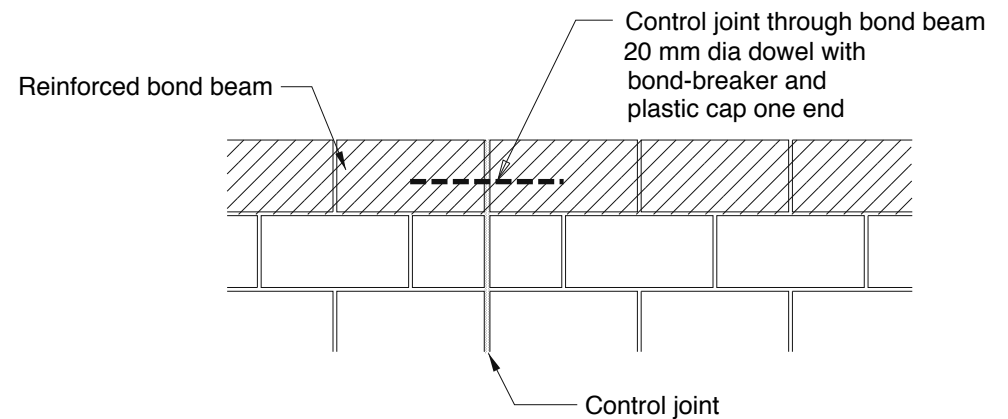
**Control Joints at Windows**

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/J-Control_Joints/J4.dxf](#)



Control Joints Terminating at Bond Beams

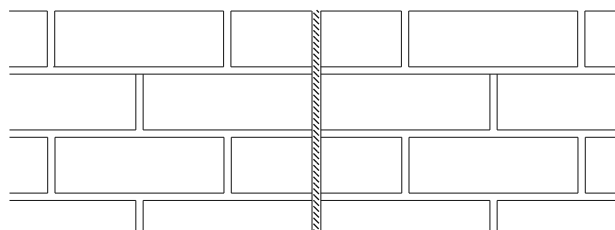
NOTE: This detail is available, in DXF format, in the location: [Data/CAD/J-Control_Joints/J5.dxf](#)



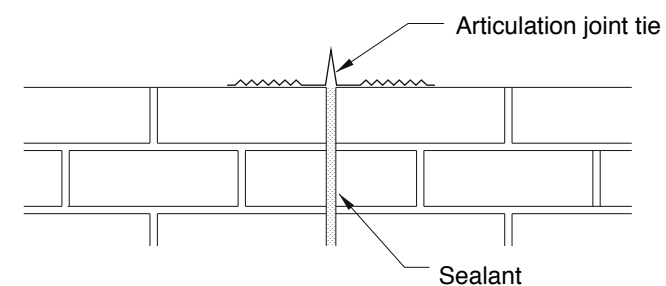
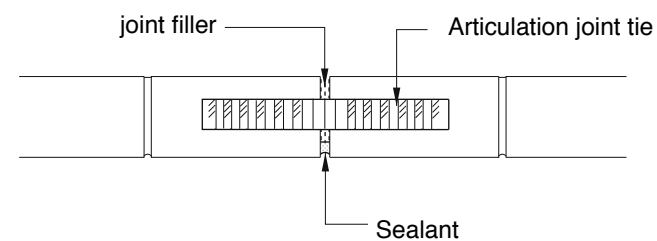
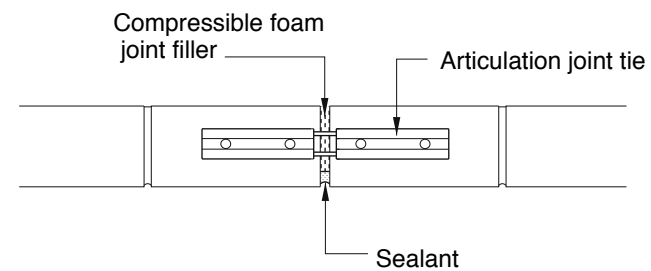
Section

Control Joints Through Bond Beams

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/J-Control_Joints/J6.dxf](#)

**Articulation Joints**

Scale 1:10

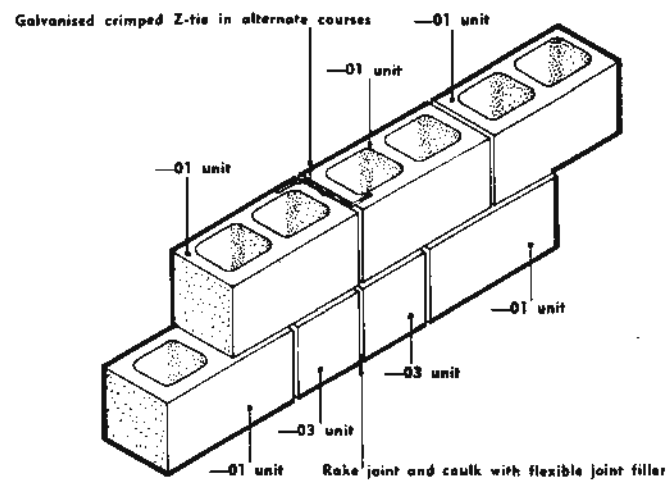
**Articulation Joint Ties**

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: Data/CAD/J-Control_Joints/J7.dxf

Detail J8

[8 of 13]



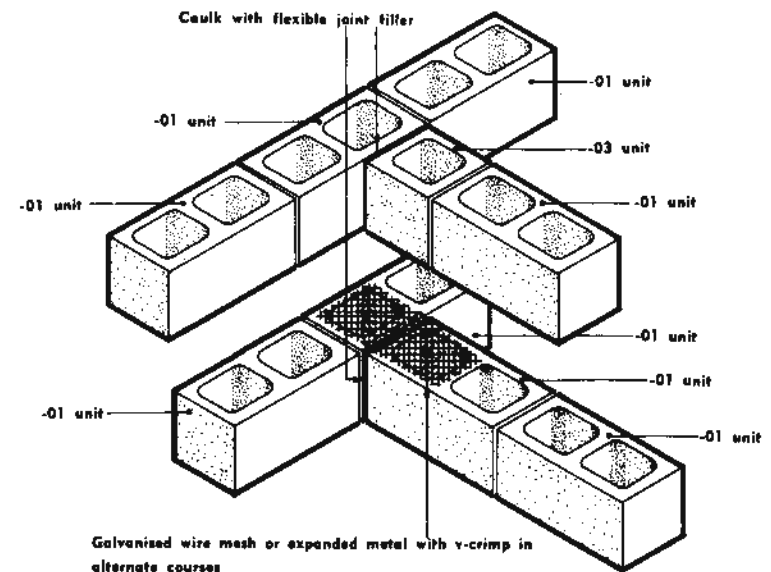
Detail applies to all wall thicknesses

CONTROL JOINT WITH WIRE TIE

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/J-Control_Joints/J8.eps](#)

Detail J9

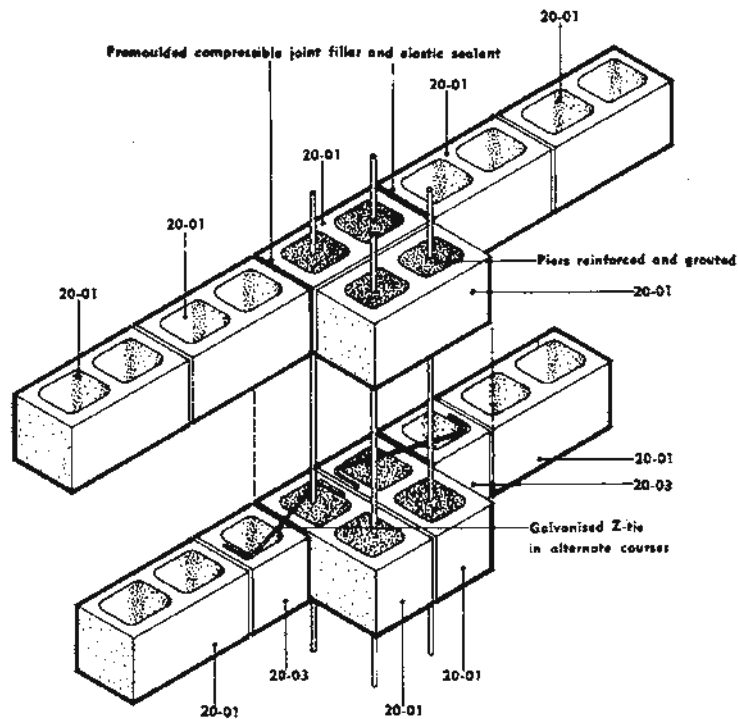
[9 of 13]



Detail applies to all wall thicknesses

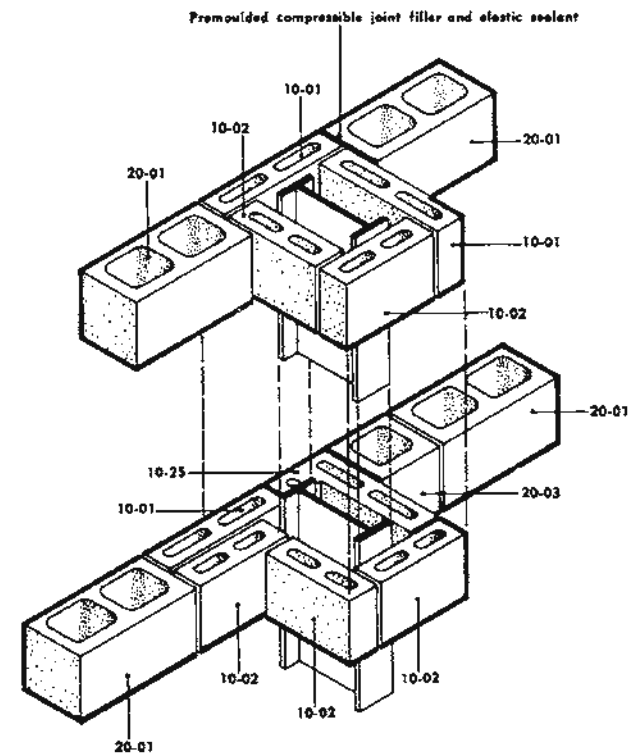
CONTROL JOINT - WALL INTERSECTION

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/J-Control_Joints/J9.eps](#)



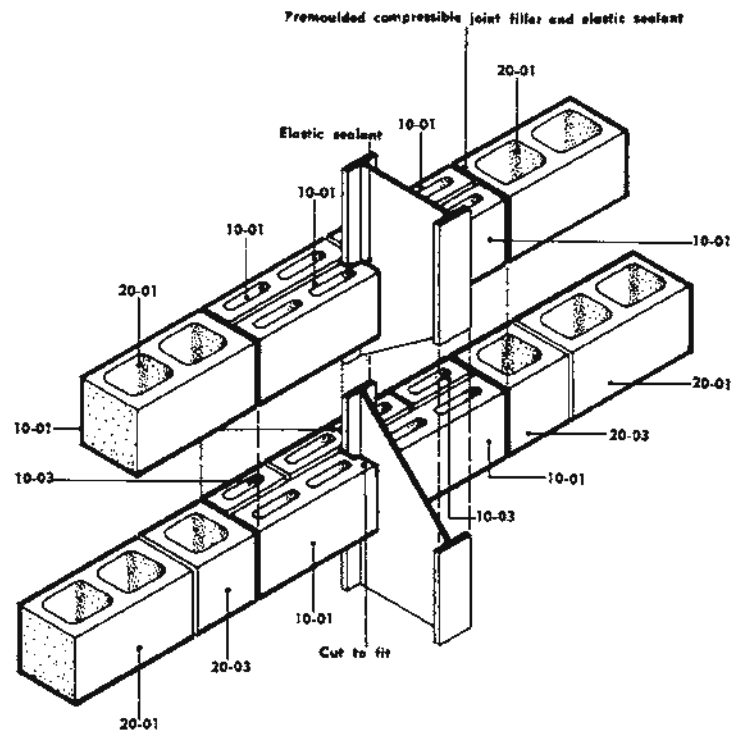
CONTROL JOINT – BONDED PIER

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/J-Control_Joints/J10.eps](#)



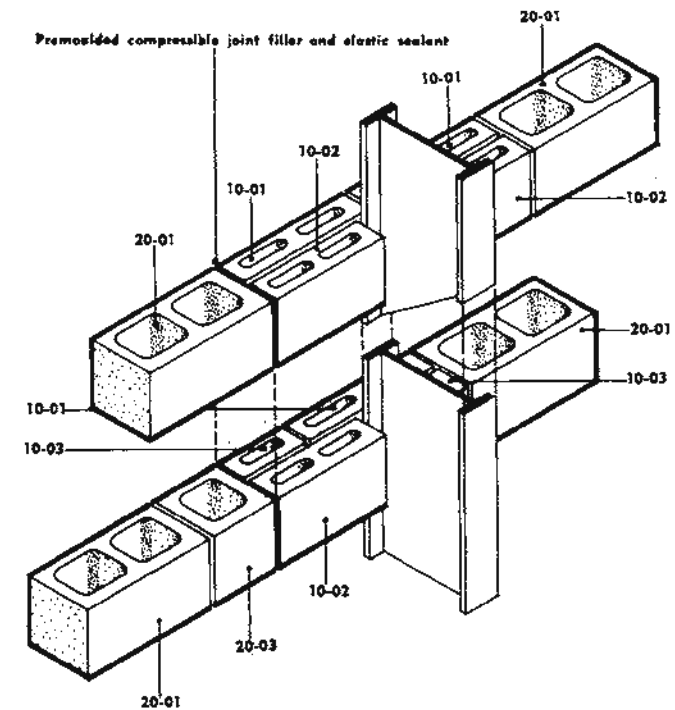
CONTROL JOINT – ENCASED STEEL COLUMN

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/J-Control_Joints/J11.eps](#)



CONTROL JOINT – EXTERIOR STEEL COLUMN

NOTE: This detail is available, in EPS format, in the location: Data/CAD/J-Control_Joints/J12.eps



CONTROL JOINT – INTERIOR STEEL COLUMN

NOTE: This detail is available, in EPS format, in the location: Data/CAD/J-Control_Joints/J13.eps

3.7

THERMAL PERFORMANCE

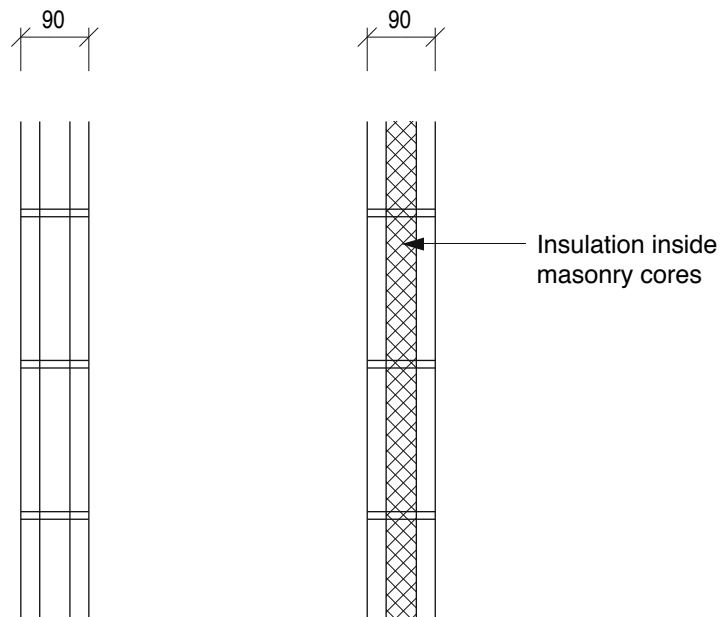
Masonry's resistance to the passage of heat (thermal insulation) and the resistance to gain or loss of heat (thermal mass) form the basis for maximising thermal efficiency in buildings with concrete masonry superstructures.

The following details show typical wall sections which correspond with the walls used in the thermal resistance data given in **Part B:Chapter 9**.



Detail K1

[1 of 15]



Uninsulated

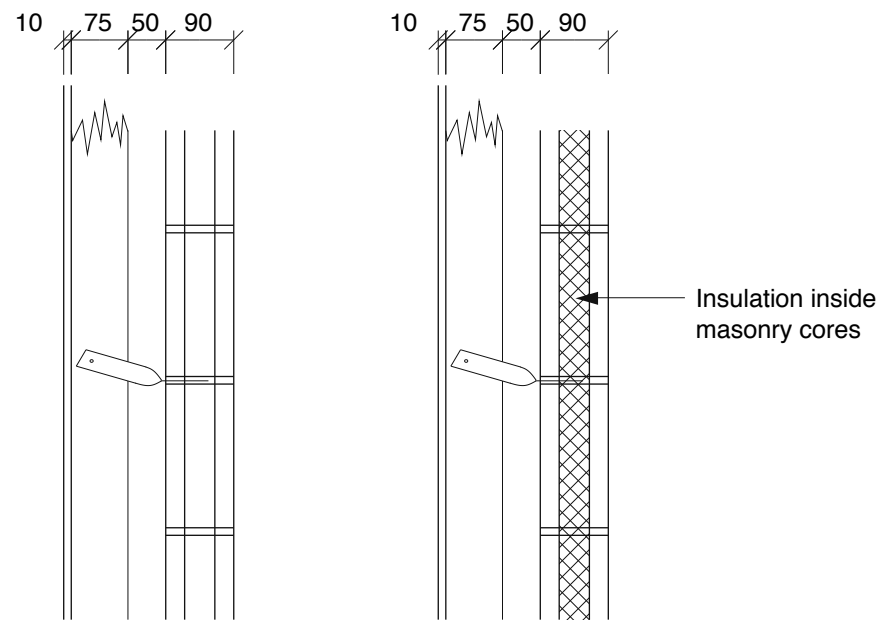
Insulated

90-mm Concrete Masonry Single-Leaf Wall

Scale 1 : 10

Detail K2

[2 of 15]



Uninsulated

Insulated

90-mm Concrete Masonry Veneer Wall

Scale 1 : 10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K1.dxf](#)

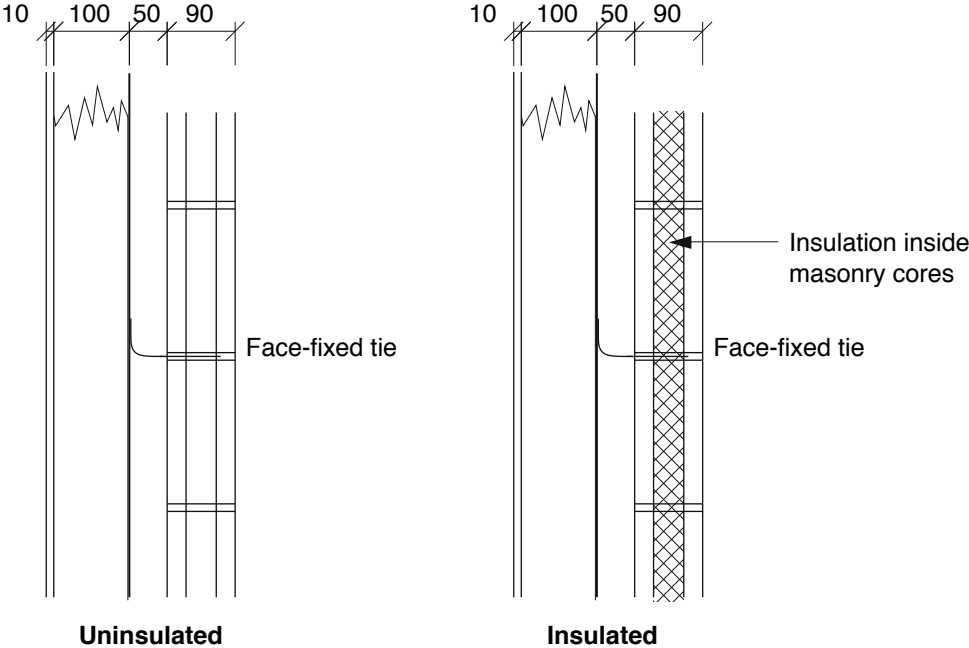
NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K2.dxf](#)

Detail K3

[3 of 15]

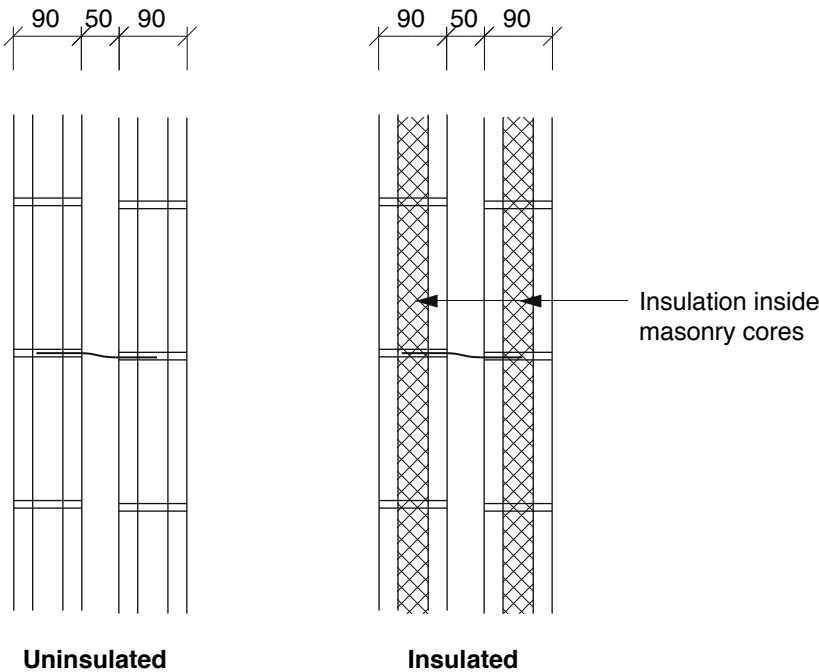
Detail K4

[4 of 15]



90-mm Concrete Masonry Veneer Wall with Reflective Foil Insulation on Frame, 100-mm Airspace and 50-mm Cavity

Scale 1 : 10



90/50/90-mm Concrete Masonry Cavity Wall

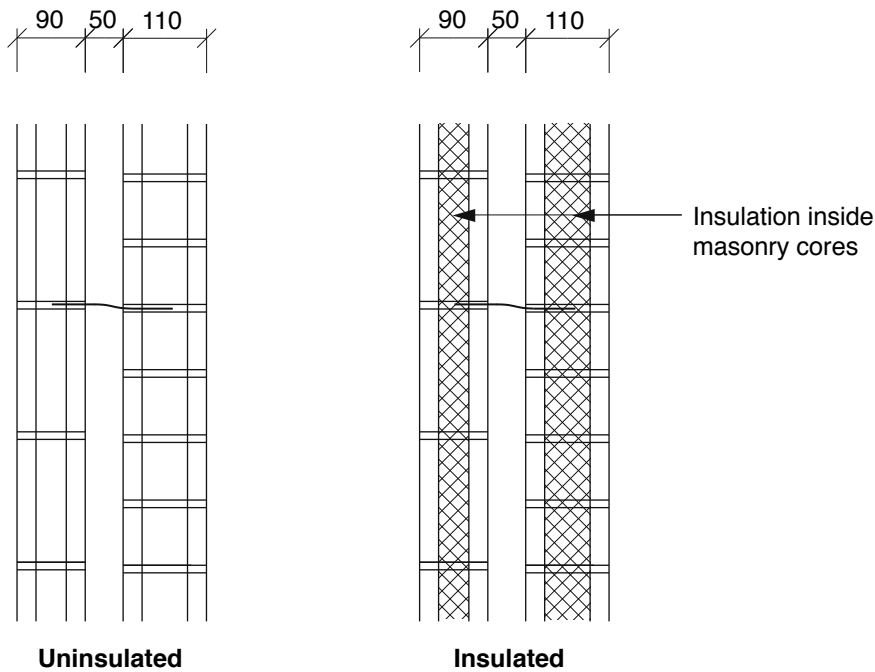
Scale 1 : 10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K3.dxf](#)

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K4.dxf](#)

Detail K5

[5 of 15]

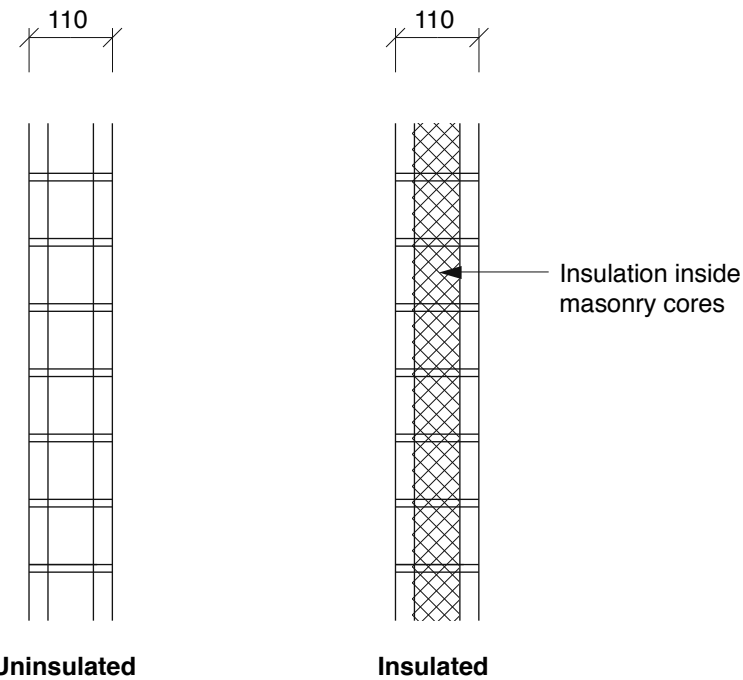


110/50/90-mm Concrete Masonry Cavity Wall

Scale 1 : 10

Detail K6

[6 of 15]



110-mm Concrete Masonry Single-Leaf Wall

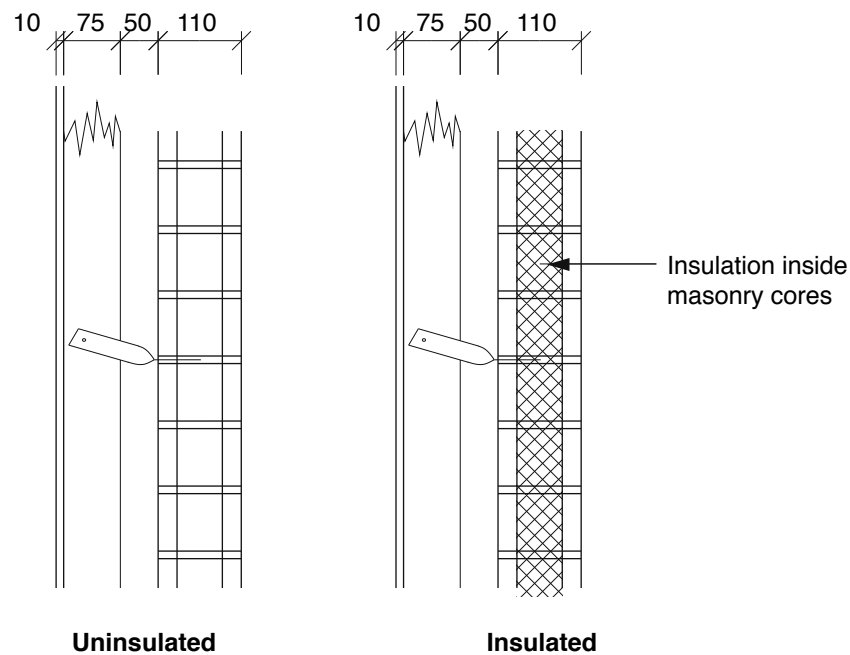
Scale 1 : 10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K5.dxf](#)

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K6.dxf](#)

Detail K7

[7 of 15]



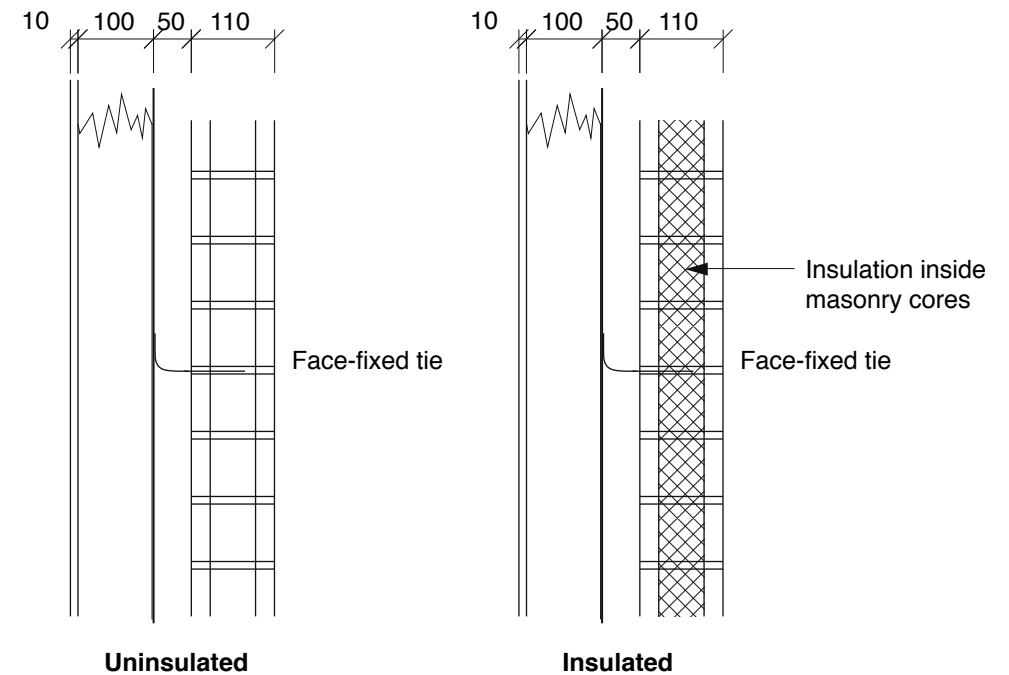
110-mm Concrete Masonry Veneer Wall

Scale 1 : 10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K7.dxf](#)

Detail K8

[8 of 15]



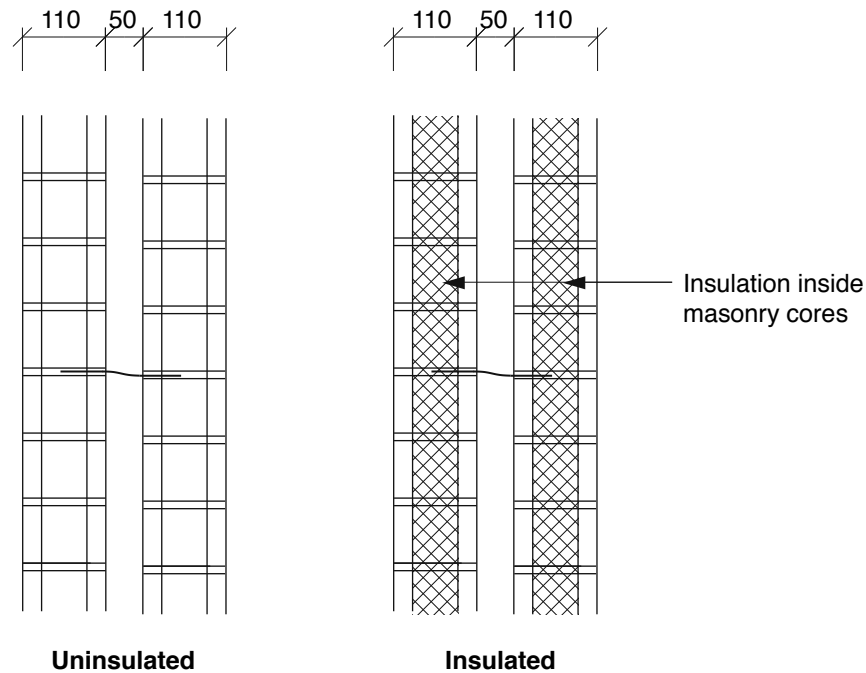
110-mm Concrete Masonry Veneer Wall with Reflective Foil Insulation on Frame and 100-mm Airspace

Scale 1 : 10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K8.dxf](#)

Detail K9

[9 of 15]



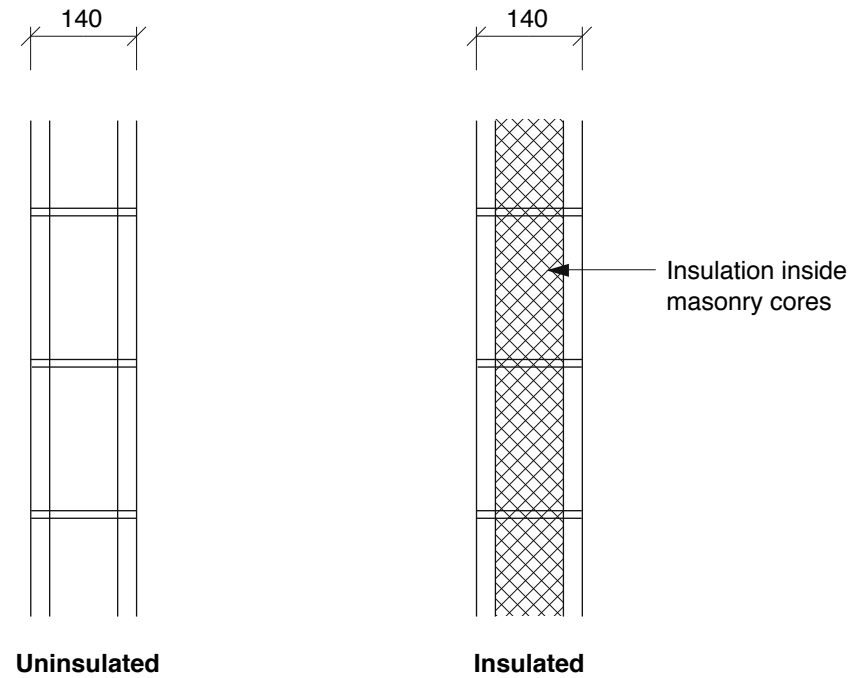
110/50/110-mm Concrete Masonry Cavity Wall

Scale 1 : 10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K9.dxf](#)

Detail K10

[10 of 15]



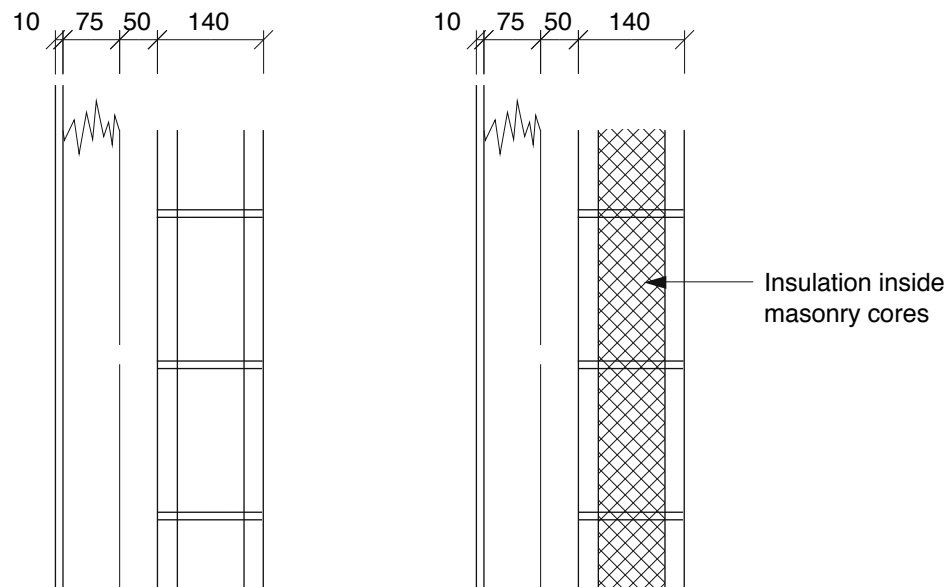
140-mm Concrete Masonry Single-Leaf Wall

Scale 1 : 10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K10.dxf](#)

Detail K11

[11 of 15]



Uninsulated

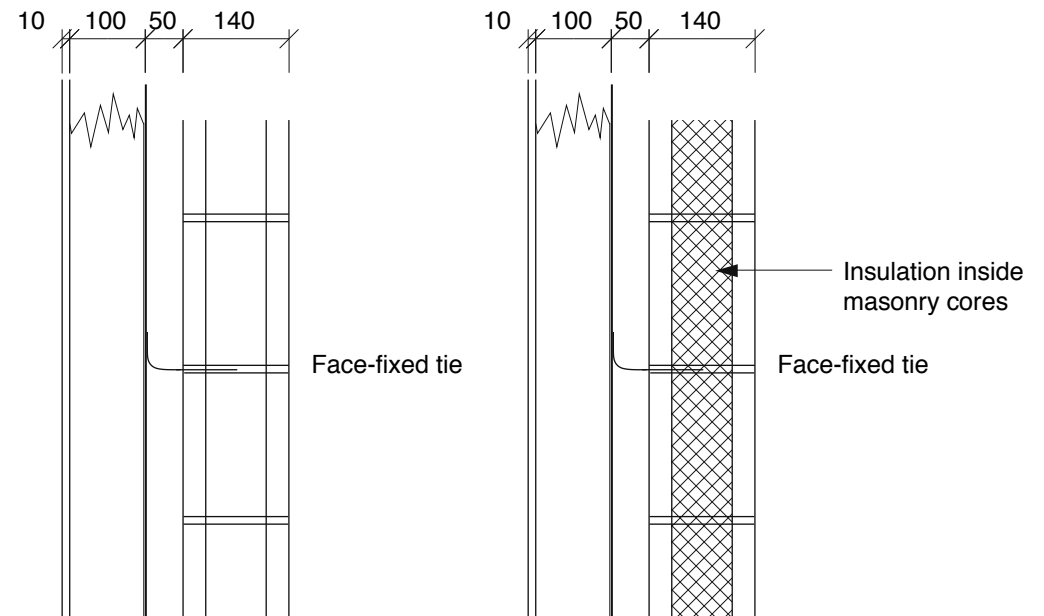
Insulated

140-mm Concrete Masonry Veneer Wall

Scale 1 : 10

Detail K12

[12 of 15]



Uninsulated

Insulated

**140-mm Concrete Masonry Veneer Wall with Reflective Foil
Insulation on Frame and 100-mm Airspace**

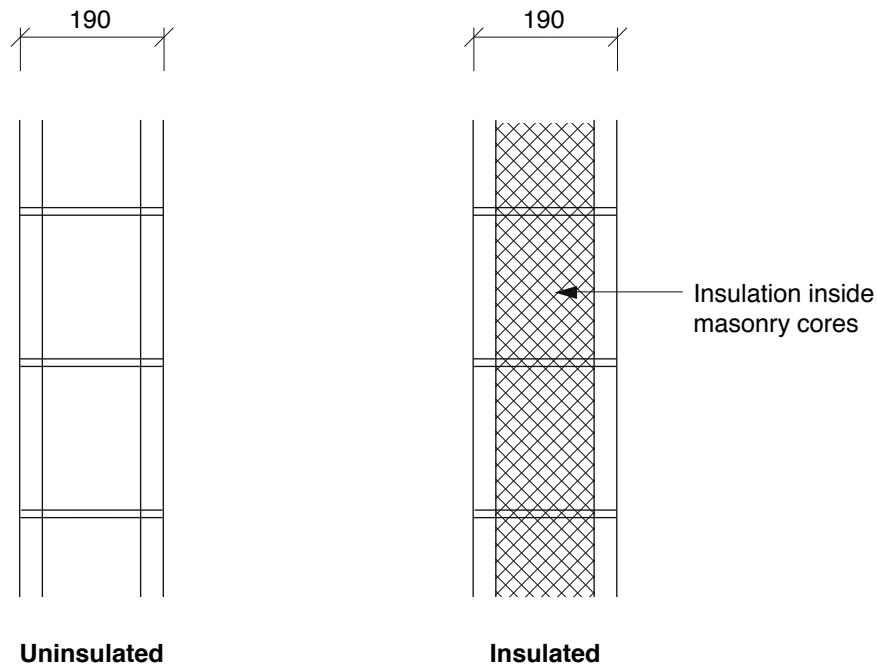
Scale 1 : 10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K11.dxf](#)

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K12.dxf](#)

Detail K13

[13 of 15]

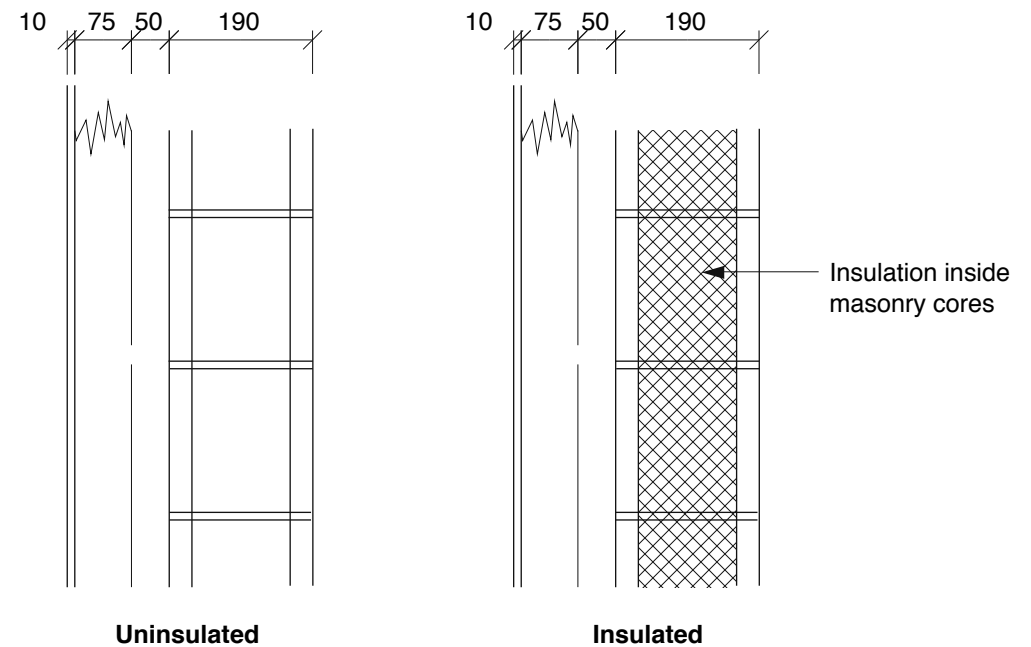


190-mm Concrete Masonry Single-Leaf Wall

Scale 1 : 10

Detail K14

[14 of 15]

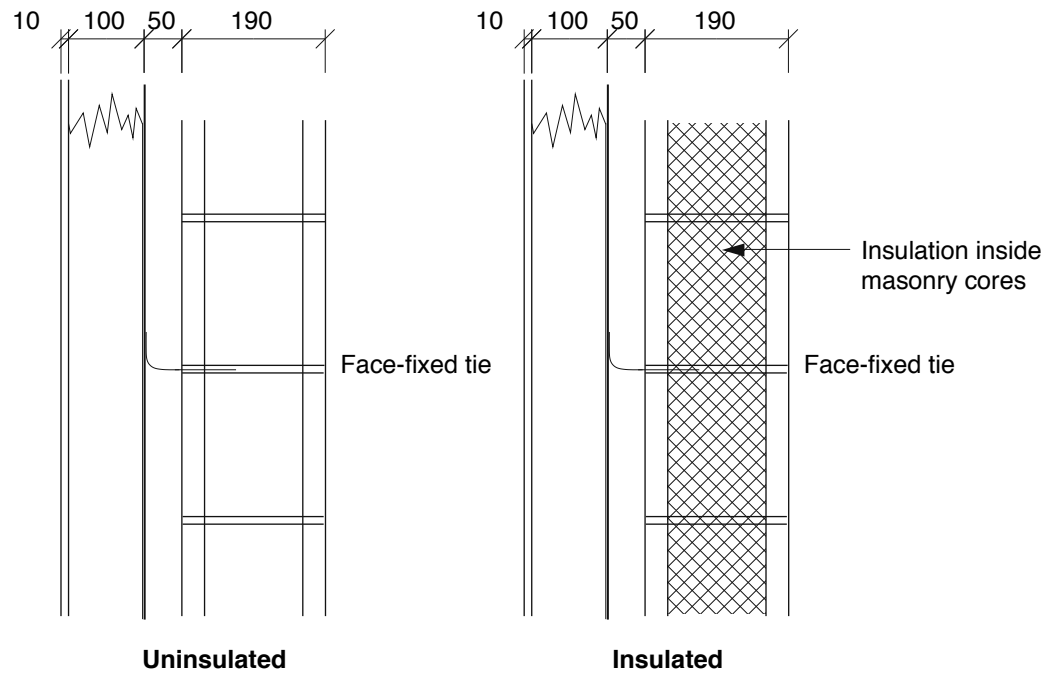


190-mm Concrete Masonry Veneer Wall

Scale 1 : 10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K13.dxf](#)

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K14.dxf](#)



**190-mm Concrete Masonry Veneer Wall with Reflective Foil
Insulation on Frame and 100-mm Airspace**

Scale 1 : 10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/K-Thermal/K15.dxf](#)

3.8

ANCILLARY DETAILS

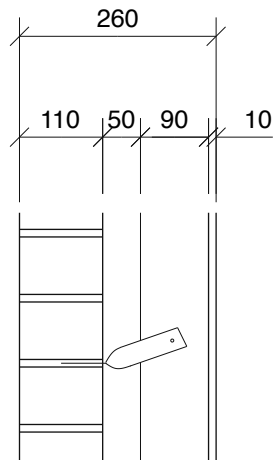
Typical details are given for various components commonly incorporated into concrete masonry buildings. These include the following:

- Ties
- Slip joints
- Window frames in different materials
- Footings
- Corner details for various block combinations
- Intersection details for various block combinations
- Engaged piers
- Built-in columns
- Flexible wall-to-column connections
- Installation of services.

NOTE: Use “Chapter Contents” button below to access individual details.

Detail L1

[1 of 44]



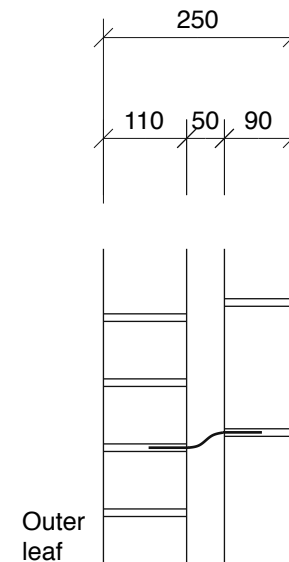
Brick veneer ties set 50 mm into brickwork and fixed to timber stud with one nail. Tie must slope upwards 5 mm (+5,-3) to prevent moisture transfer into the building. Max. slope 10 mm, min slope 2 mm.

Veneer Ties

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/L-Ancillary/L1.dxf](#)

Detail L2

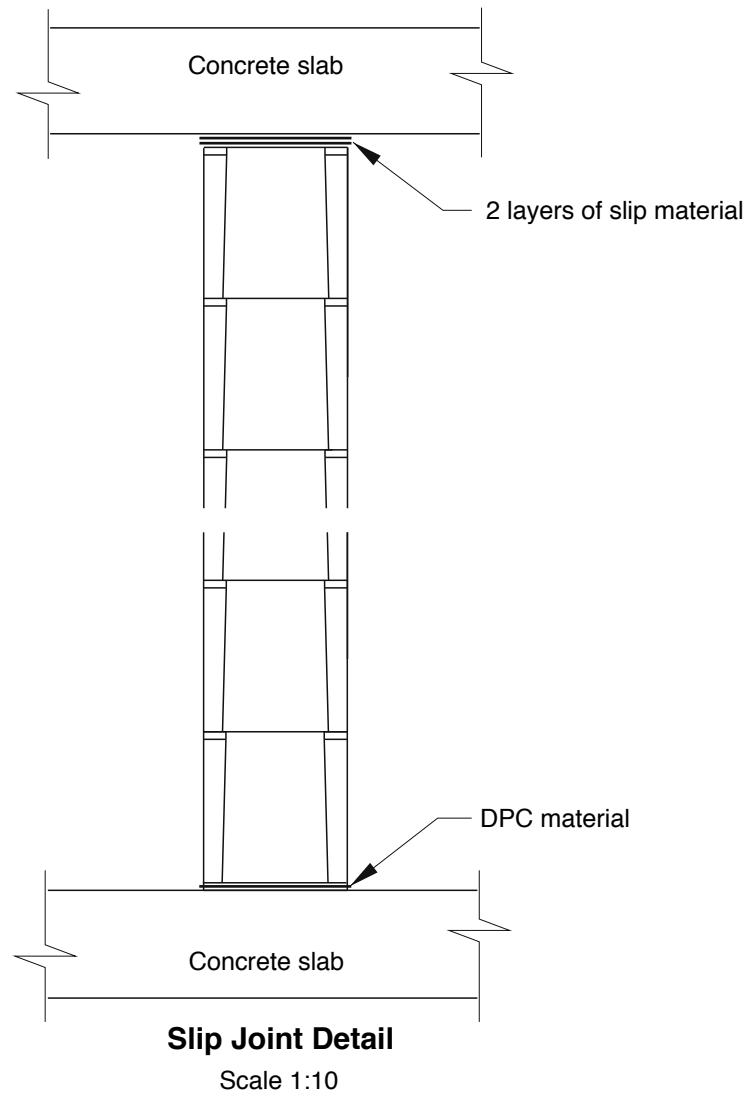
[2 of 44]



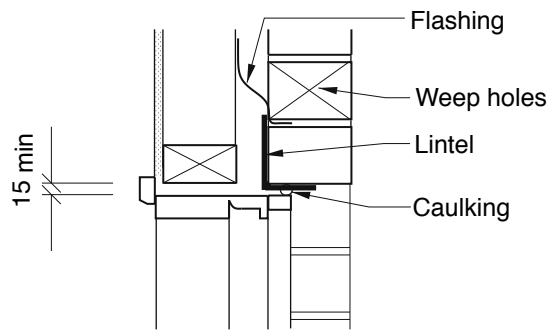
Cavity ties set 50mm into masonry at 600 crs (horizontal) and at 516 crs (vertical). Tie must slope upwards 5 mm (+5,-3) to inner leaf to prevent moisture transfer into the building. Max slope 10 mm, min slope 2 mm

Cavity Block Ties

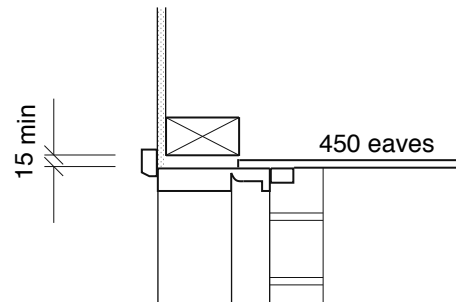
NOTE: This detail is available, in DXF format, in the location: [Data/CAD/L-Ancillary/L2.dxf](#)



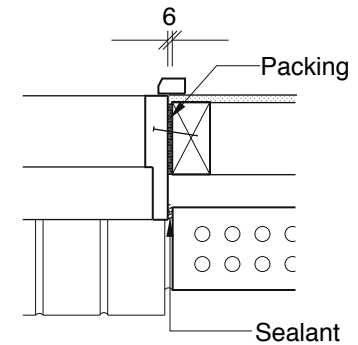
NOTE: This detail is available, in DXF format, in the location: *Data/CAD/L-Ancillary/L3.dxf*



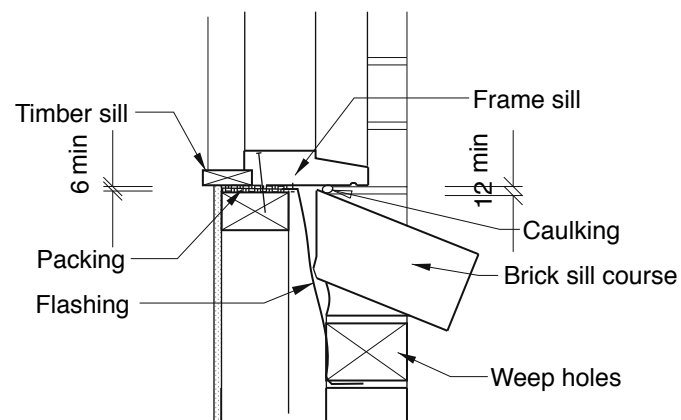
**Timber Window Frame Detail
At Head (Wall Above) - Brick Veneer**



**Timber Window Frame Detail
At Head (Eaves) - Brick Veneer**



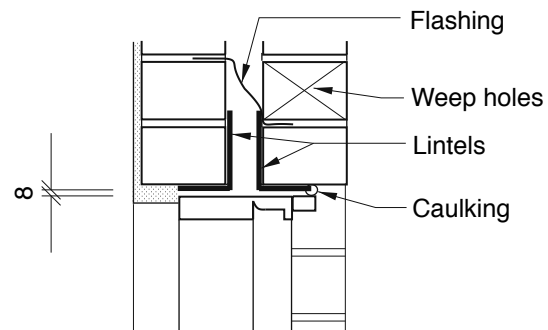
**Timber Window Frame Detail At Jamb
Brick Veneer**



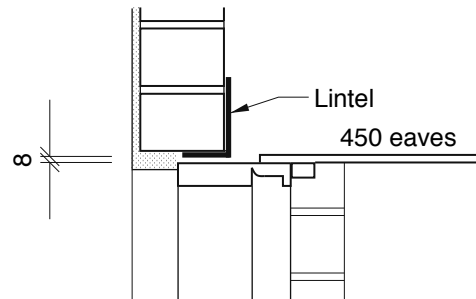
**Timber Window Frame Detail At Sill
Brick Veneer**

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/L-Ancillary/L4.dxf](#)

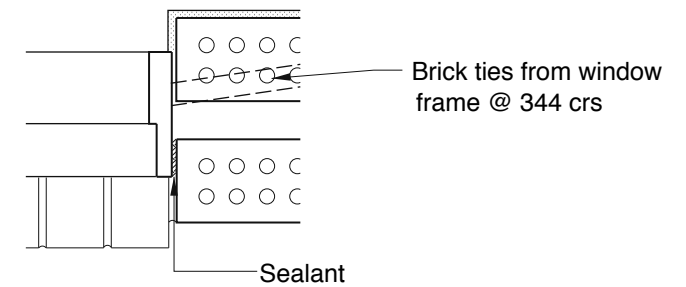




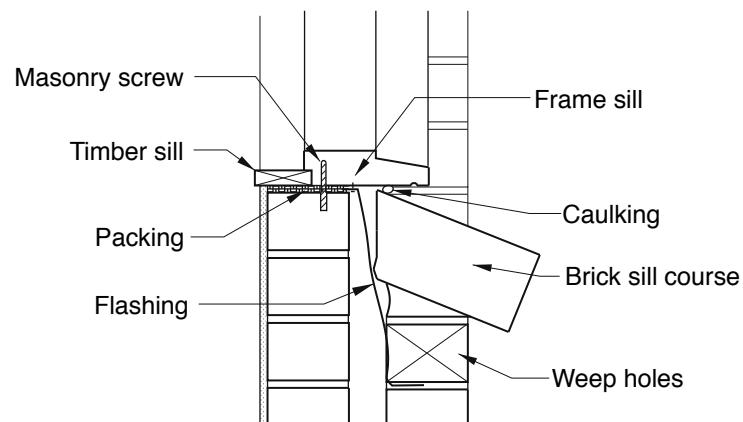
**Timber Window Frame Detail
At Head (Wall Above) - Cavity Brick**



**Timber Window Frame Detail
At Head (Eaves) - Cavity Brick**



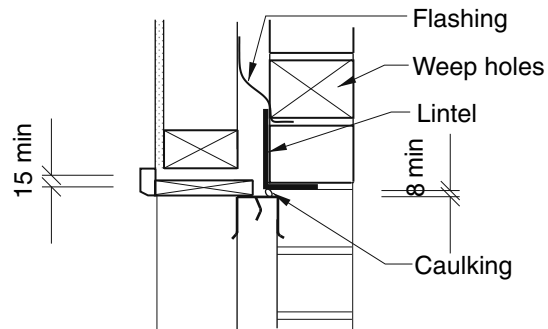
**Timber Window Frame Detail At Jamb
Cavity Brick**



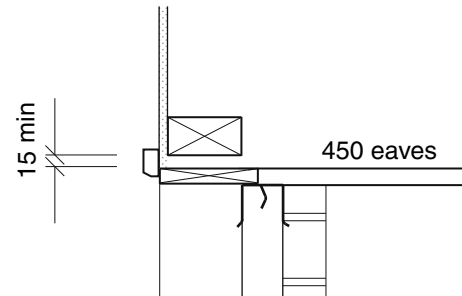
**Timber Window Frame Detail At Sill
Cavity Brick**

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/L-Ancillary/L5.dxf](#)

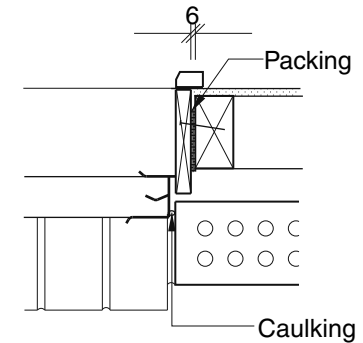




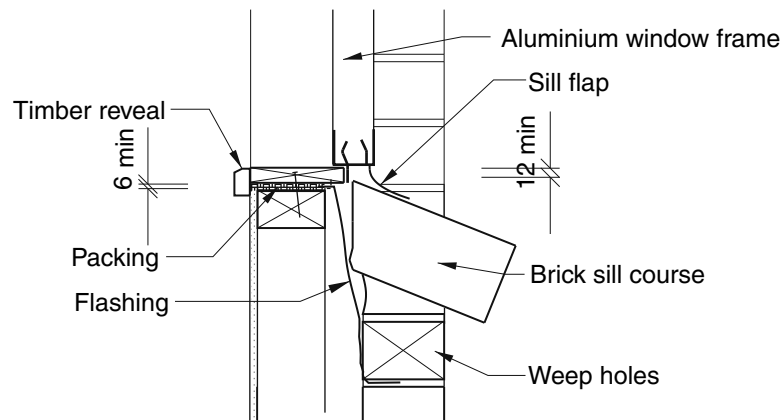
**Aluminium Window Frame Detail
At Head (Wall Above) - Brick Veneer**



**Aluminium Window Frame Detail
At Head (Eaves) - Brick Veneer**



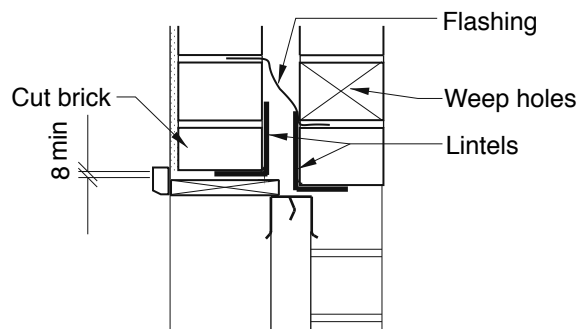
**Aluminium Window Frame Detail At Jamb
Brick Veneer**



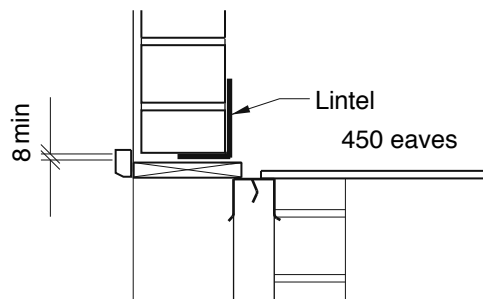
**Aluminium Window Frame Detail At Sill
Brick Veneer**

NOTE: This detail is available, in DXF format, on the CD-ROM in: [Data/CAD/L-Ancillary/L6.dxf](#)

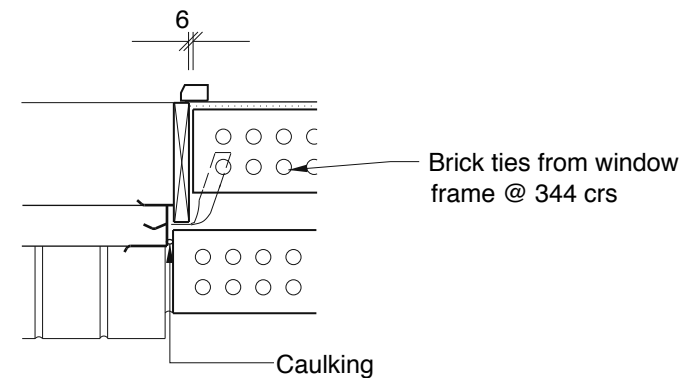




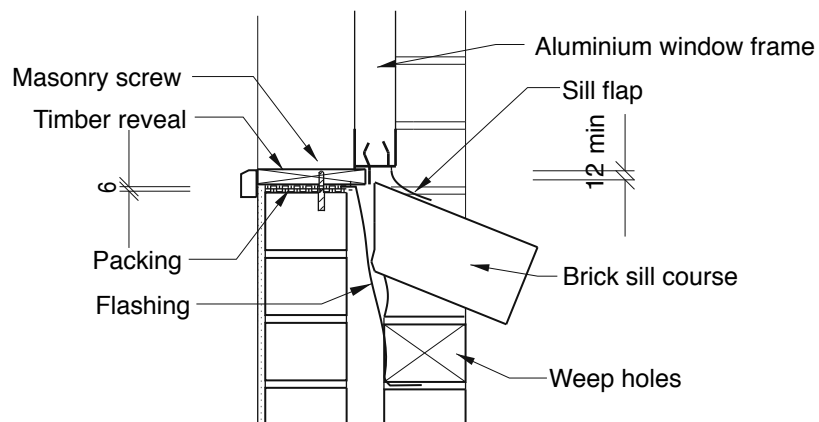
Aluminium Window Frame Detail
At Head (Wall Above) - Cavity Brick



Aluminium Window Frame Detail
At Head (Eaves) - Cavity Brick



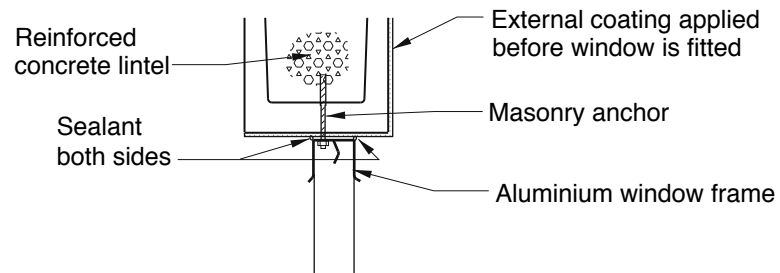
Aluminum Window Frame Detail At Jamb
Cavity Brick



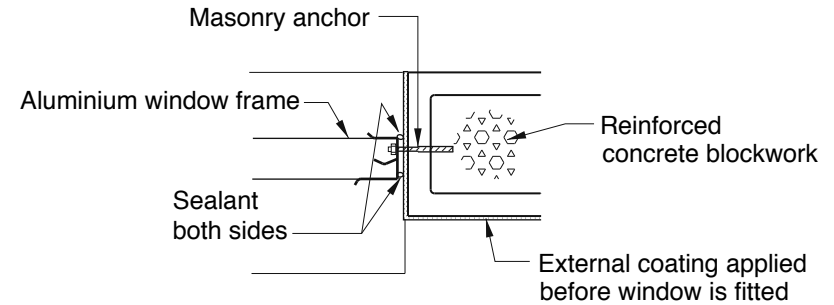
Aluminium Window Frame Detail At Sill
Cavity Brick

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/L-Ancillary/L7.dxf](#)

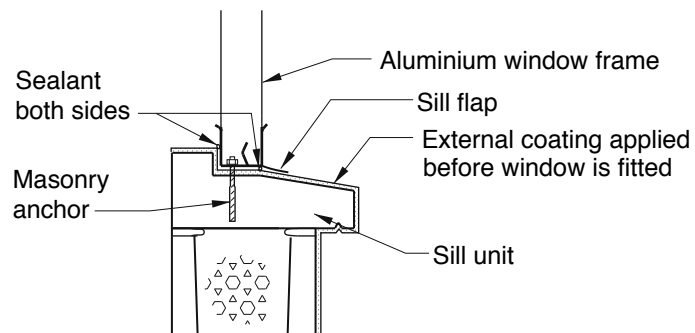




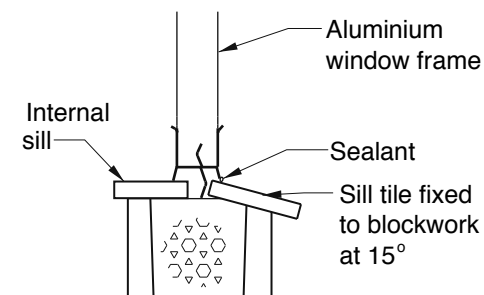
**Aluminium Window Frame Detail
At Head - Single Leaf Reinforced Masonry**



**Aluminium Window Frame Detail
At Jamb - Reinforced Concrete Masonry**

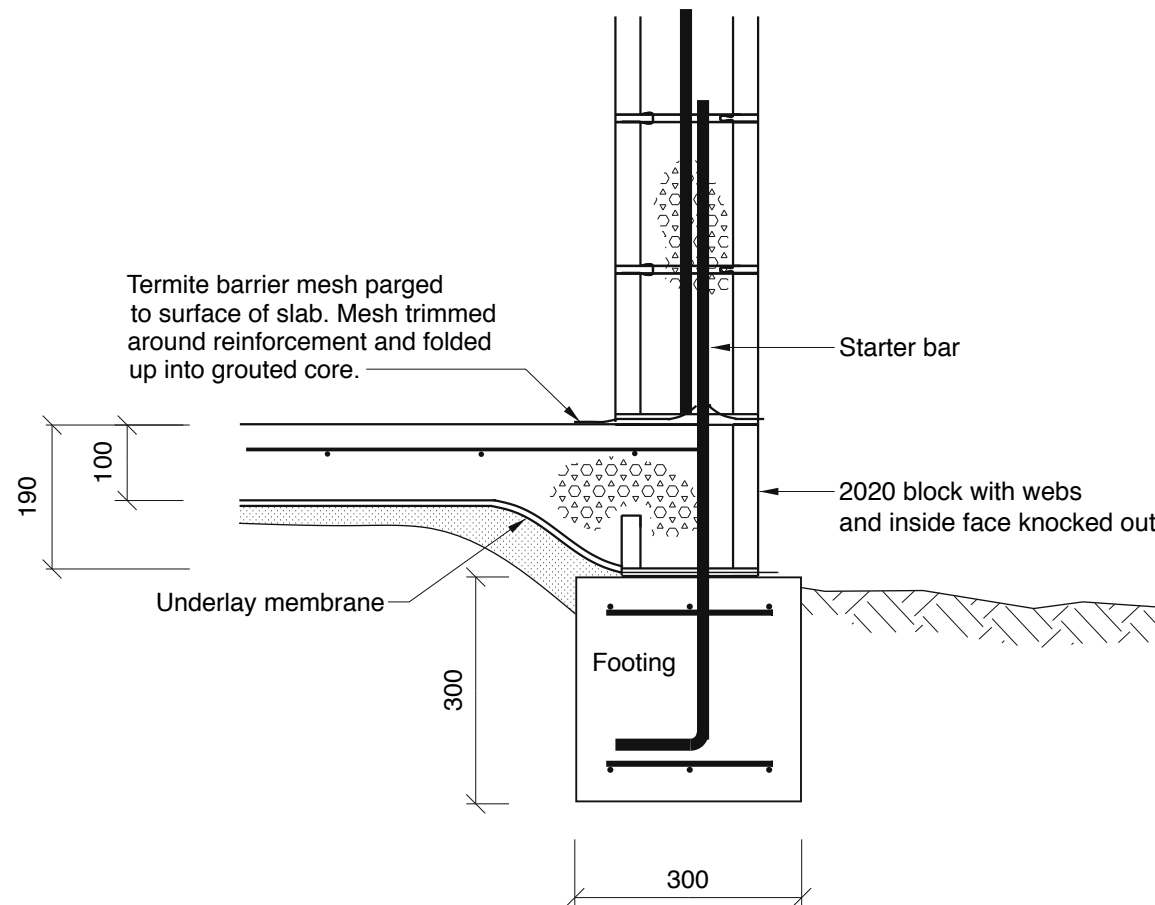


**Aluminium Window Frame Detail
At Sill - Reinforced Concrete Masonry**



**Aluminium Window Frame Detail
At Sill - Reinforced Concrete Masonry**

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/L-Ancillary/L8.dxf](#)



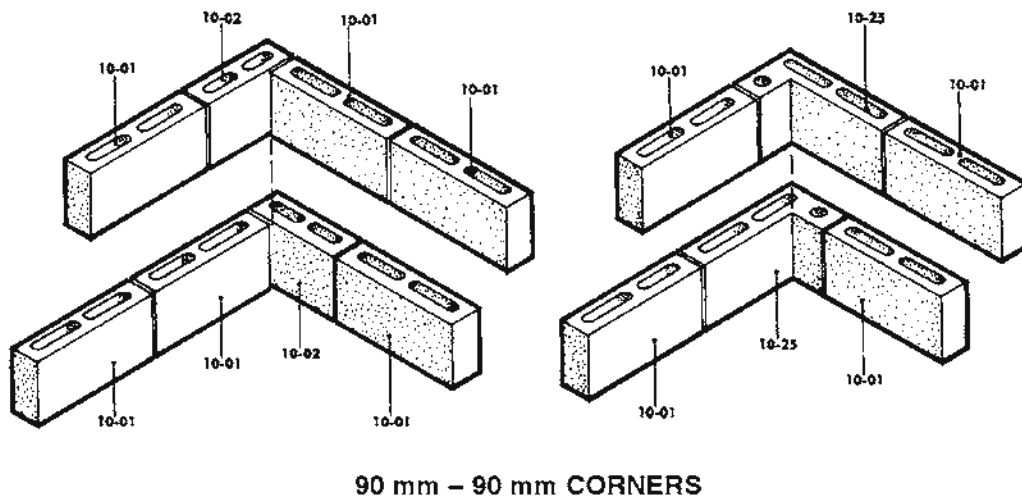
Detail at Footing

Scale 1:10

NOTE: This detail is available, in DXF format, in the location: [Data/CAD/L-Ancillary/L9.dxf](#)

Detail L10

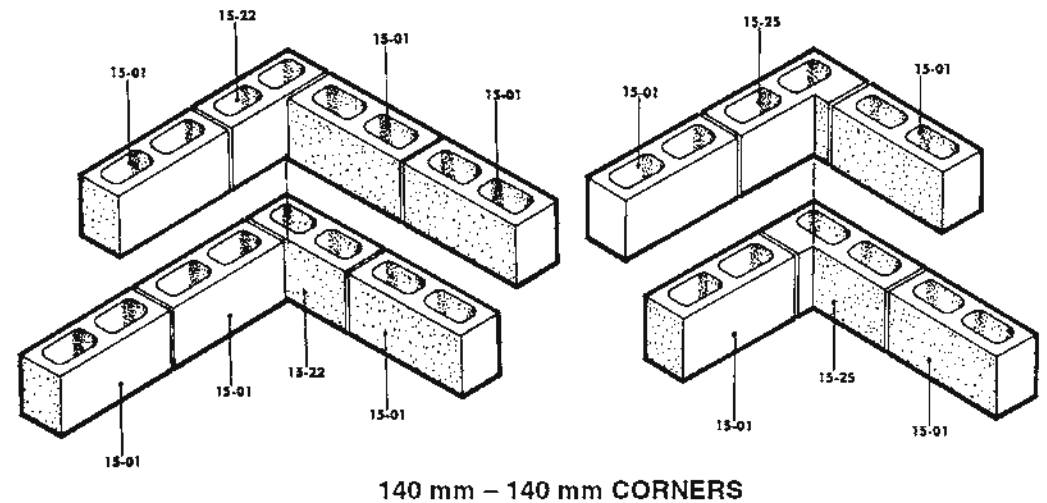
[10 of 44]



NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L10.eps](#)

Detail L11

[11 of 44]

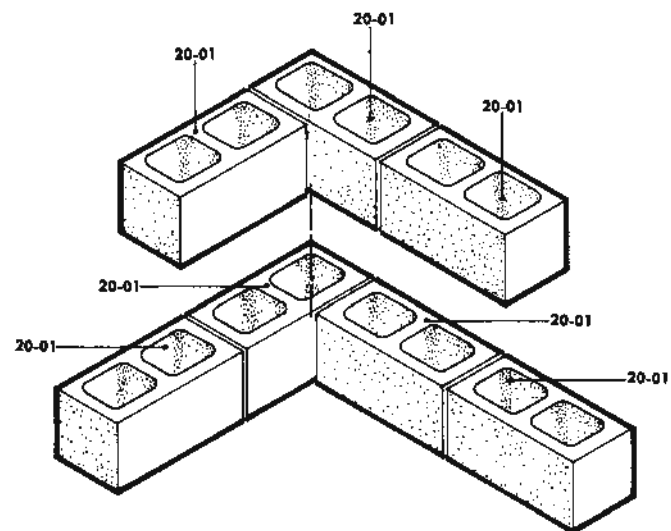


NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L11.eps](#)



Detail L12

[12 of 44]

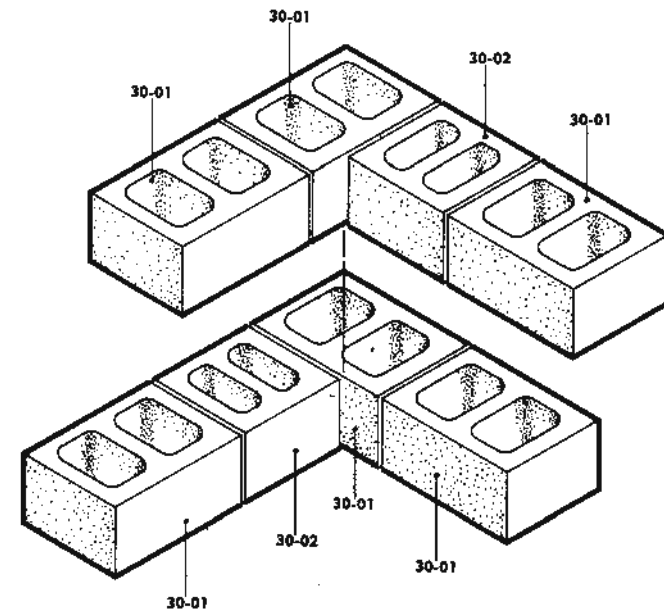


190 mm – 190 mm CORNER

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L12.eps](#)

Detail L13

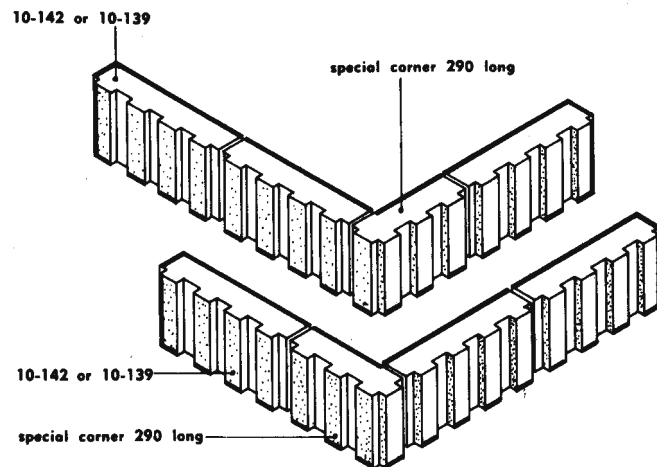
[13 of 44]



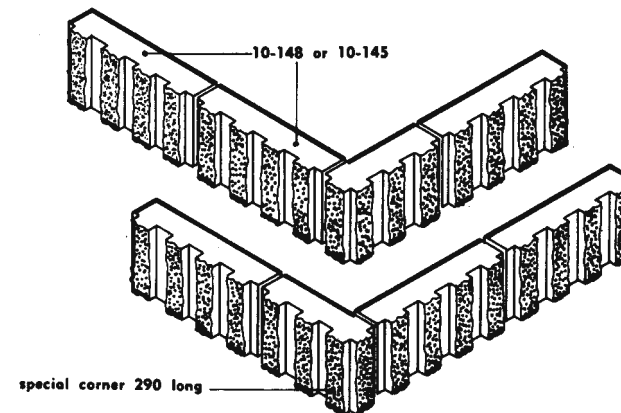
290 mm – 290 mm CORNER

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L13.eps](#)





90 mm PLAIN RIB BLOCK CORNER



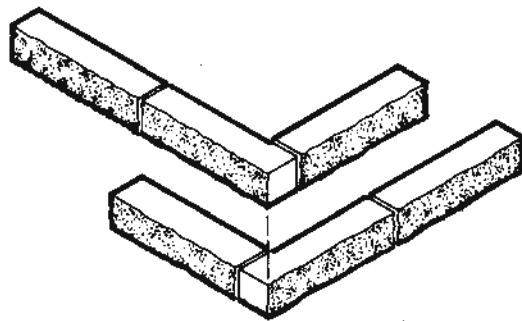
90 mm SPLIT RIB BLOCK CORNER

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L14.eps](#)



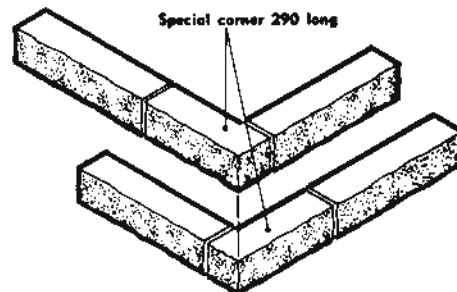
Detail L15

[15 of 44]



10-101 or 10-109 or 10-113 or 10-117

QUARTER-STRETCHER BOND



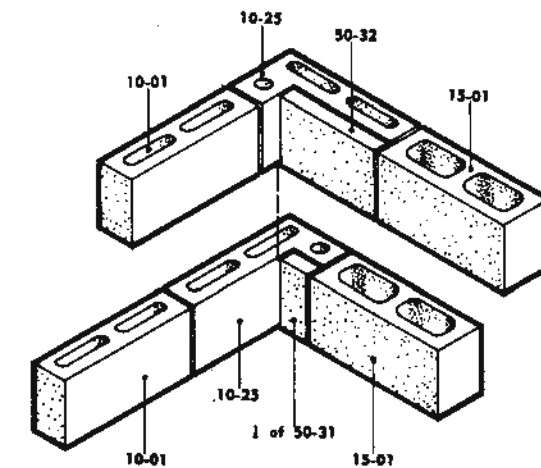
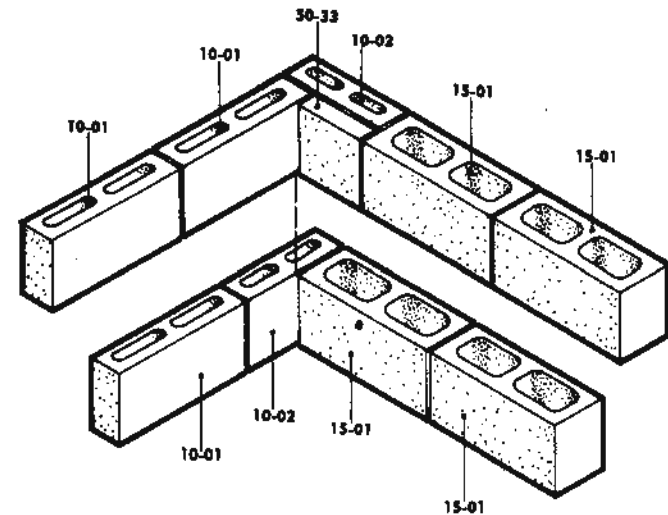
10-101 or 10-109 or 10-113 or 10-117

HALF-STRETCHER BOND

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L15.eps](#)

Detail L16

[16 of 44]



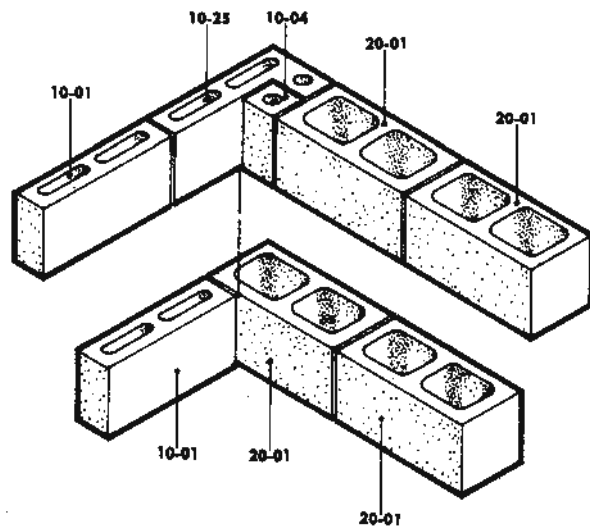
90 mm – 140 mm CORNERS

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L16.eps](#)



Detail L17

[17 of 44]

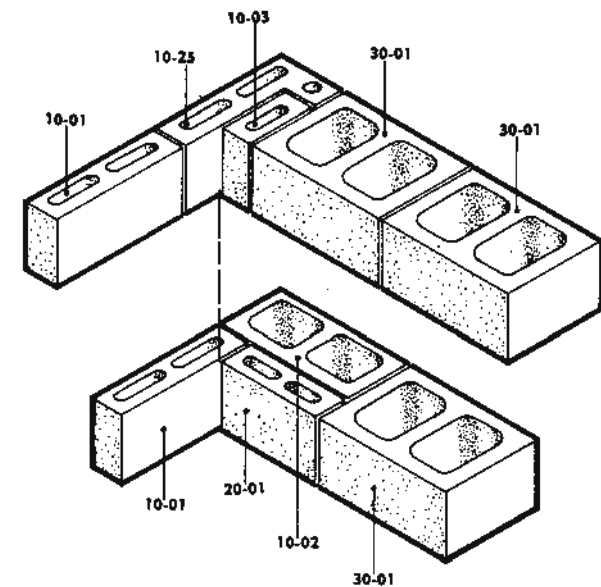


90 mm – 190 mm CORNER

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L17.eps](#)

Detail L18

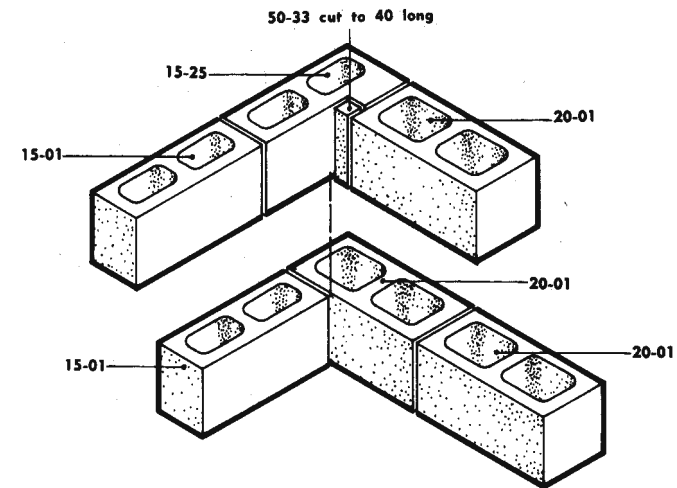
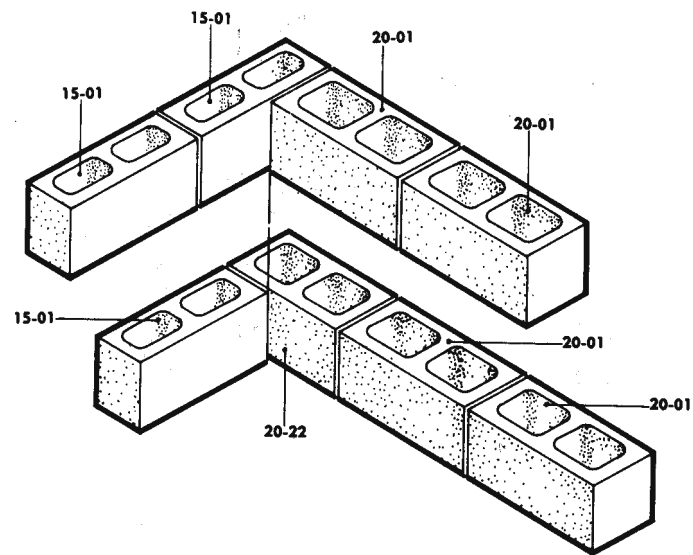
[18 of 44]



90 mm – 290 mm CORNER

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L18.eps](#)

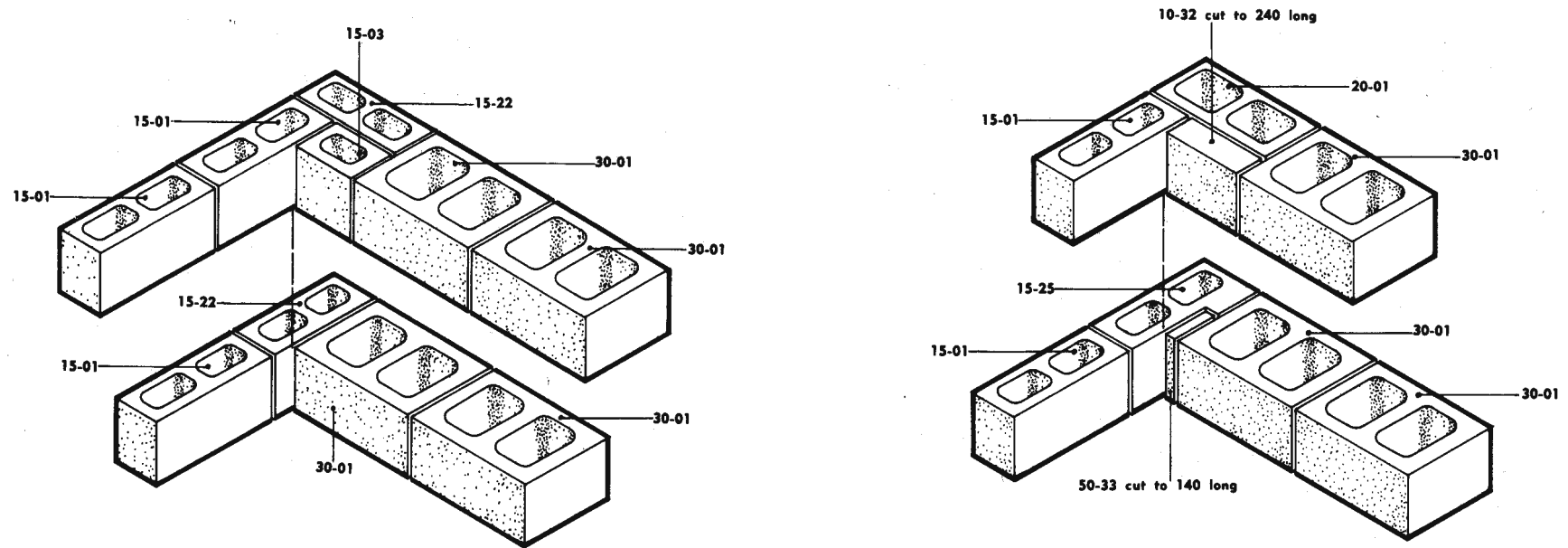




140 mm – 190 mm CORNERS

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L19.eps](#)

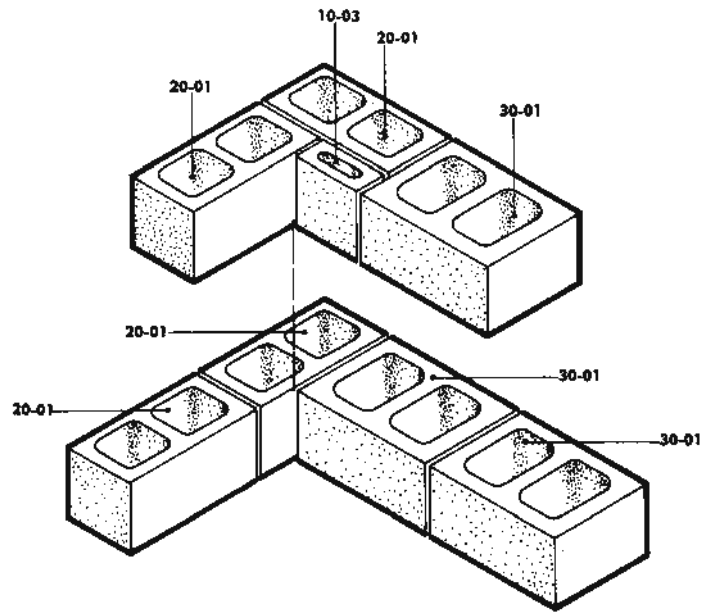




140 mm – 290 mm CORNERS

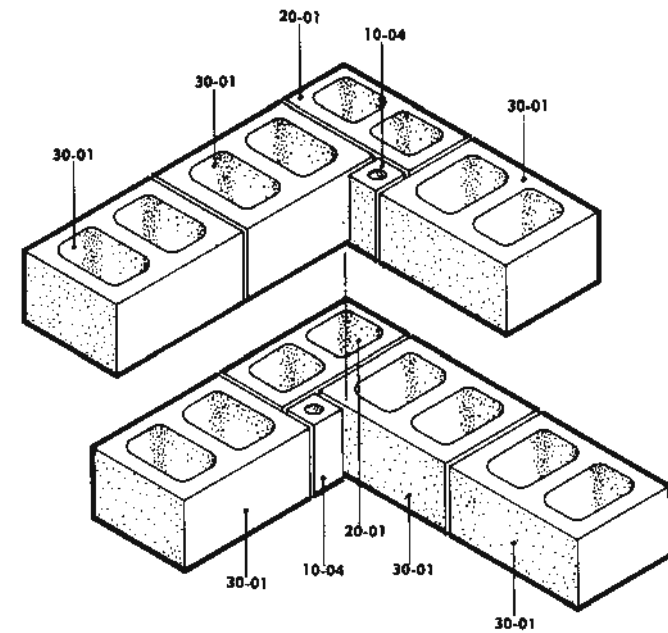
NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L20.eps](#)





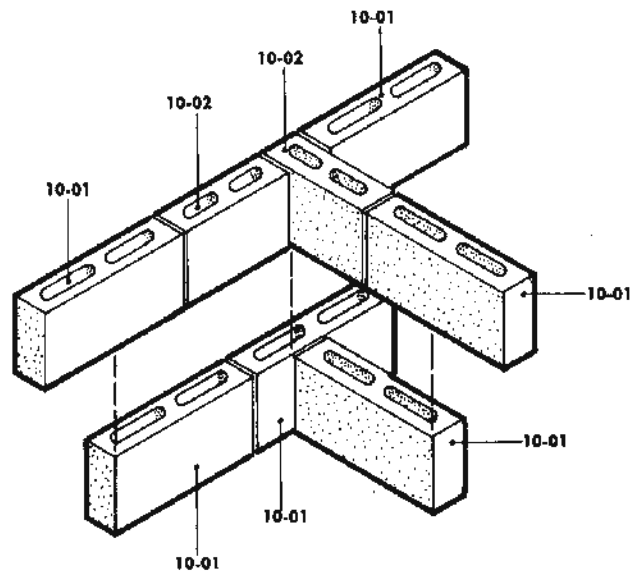
190 mm – 290 mm CORNER

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L21.eps](#)



290 mm – 290 mm CORNER

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L22.eps](#)

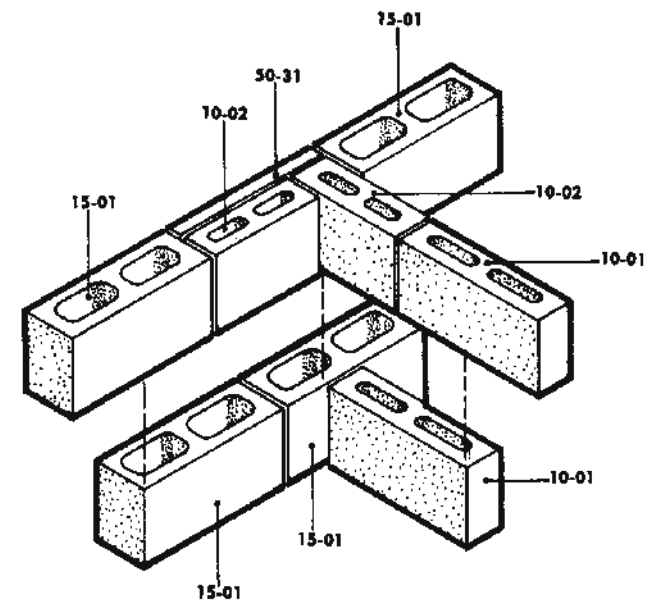


90 mm – 90 mm INTERSECTION

NOTES:

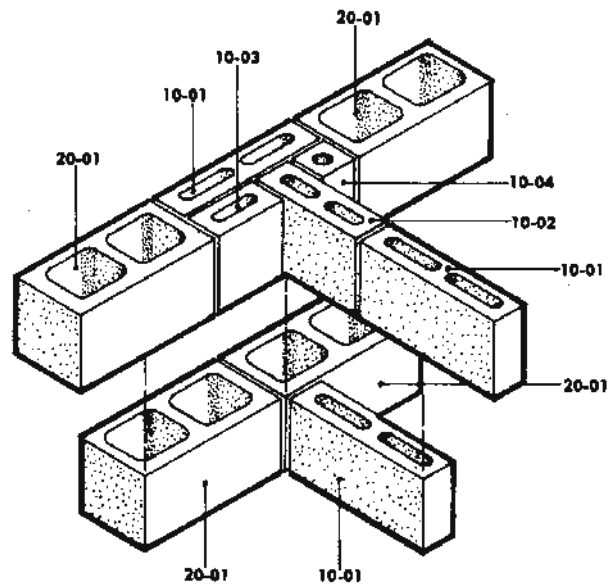
To prevent the formation of cracks, the length of the intersecting wall should be limited to a maximum of 1.2 m. This can be done by means either of a control joint or an opening, such as a full-height door or other opening.

Detail L23, is recommended only in cases where the appearance of headers in alternate courses in the intersected wall is acceptable.



90 mm – 140 mm INTERSECTION

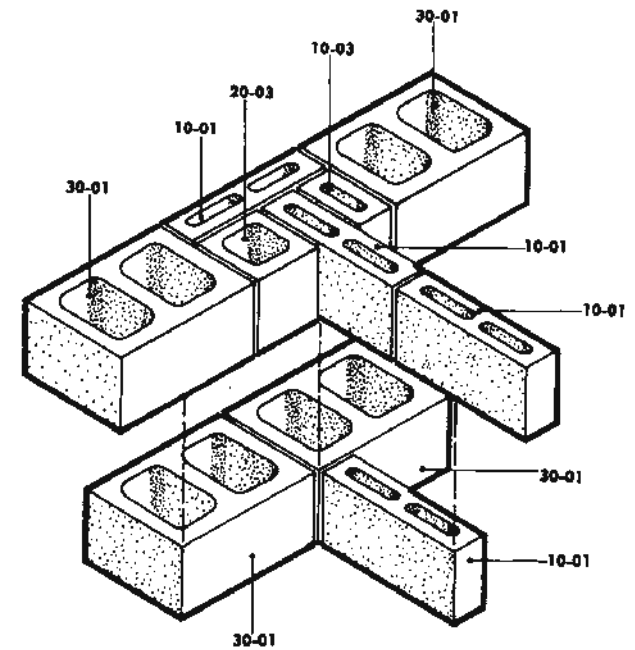




90 mm – 190 mm INTERSECTION

NOTES:

To prevent the formation of cracks, the length of the intersecting wall should be limited to a maximum of 1.2 m. This can be done by means either of a control joint or an opening, such as a full-height door or other opening.

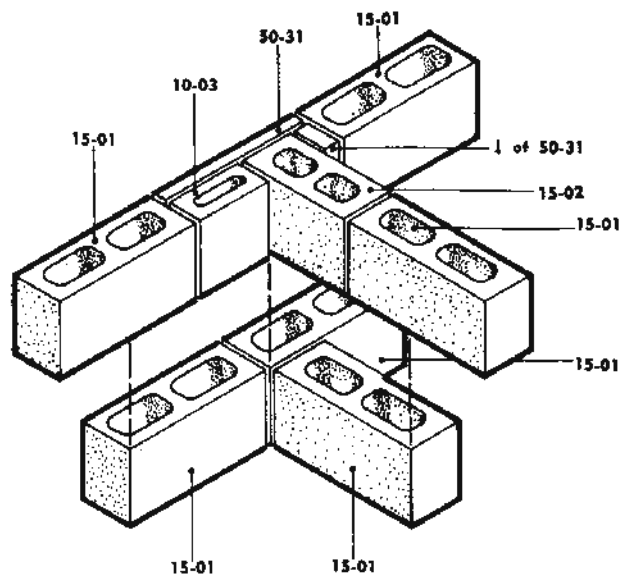


90 mm – 290 mm INTERSECTION

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L25.eps](#)

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L26.eps](#)

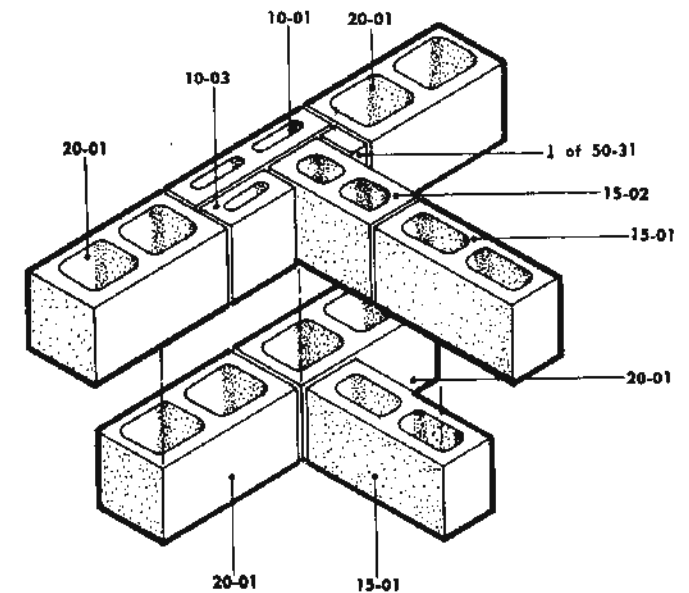




140 mm – 140 mm INTERSECTION

NOTES:

To prevent the formation of cracks, the length of the intersecting wall should be limited to a maximum of 1.2 m. This can be done by means either of a control joint or an opening, such as a full-height door or other opening.

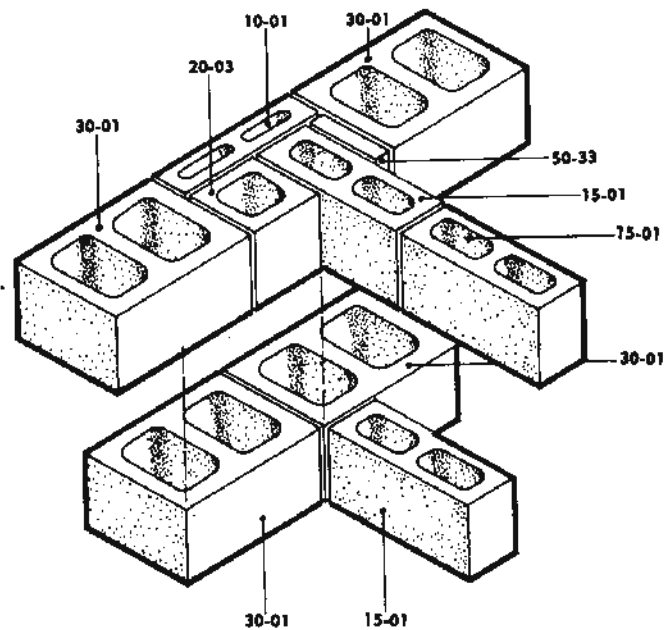


140 mm – 190 mm INTERSECTION

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L27.eps](#)

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L28.eps](#)

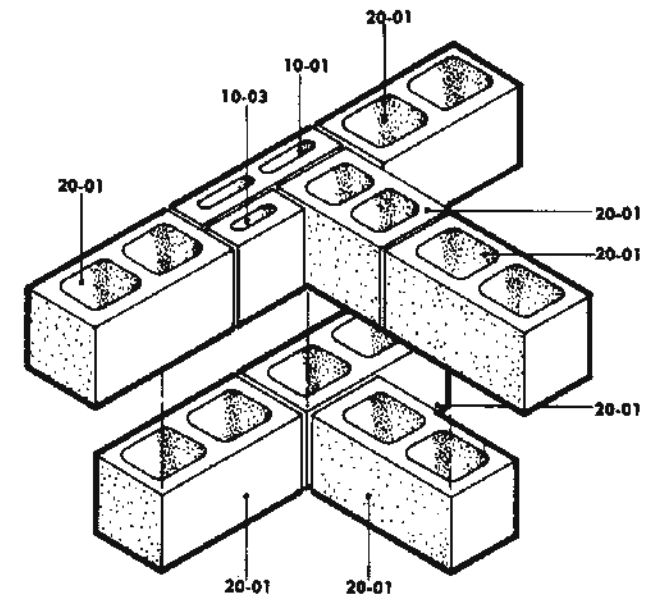




140 mm – 290 mm INTERSECTION

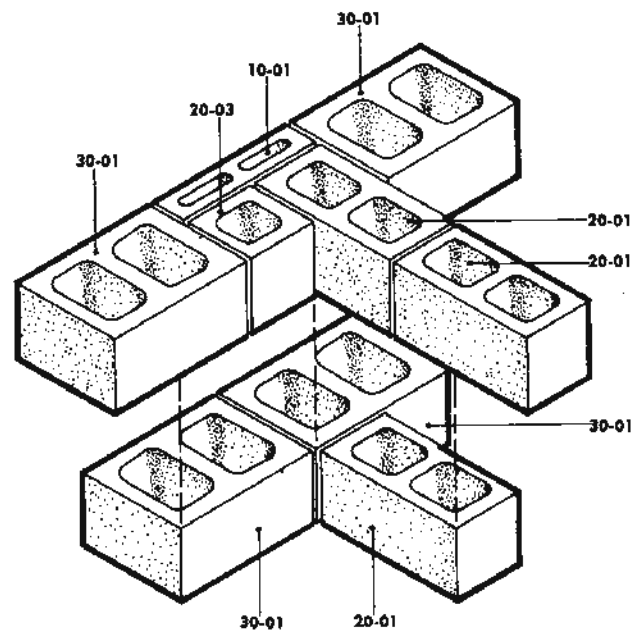
NOTES:

To prevent the formation of cracks, the length of the intersecting wall should be limited to a maximum of 1.2 m. This can be done by means either of a control joint or an opening, such as a full-height door or other opening.



190 mm – 190 mm INTERSECTION

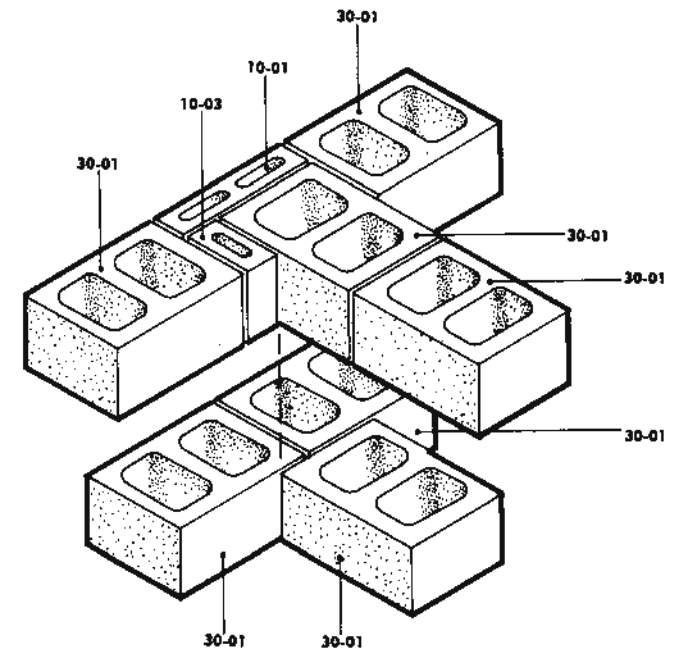




190 mm – 290 mm INTERSECTION

NOTES:

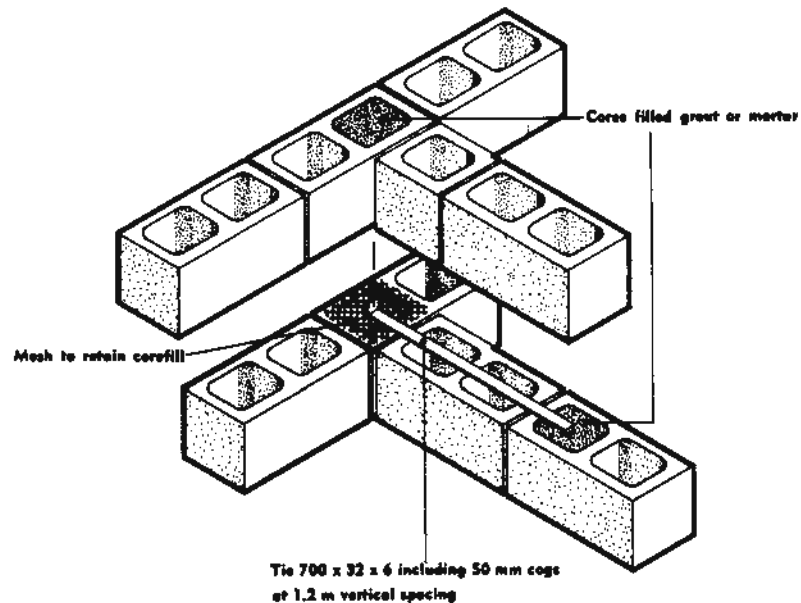
To prevent the formation of cracks, the length of the intersecting wall should be limited to a maximum of 1.2 m. This can be done by means either of a control joint or an opening, such as a full-height door or other opening.



290 mm – 290 mm INTERSECTION

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L31.eps](#)

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L32.eps](#)



UNBONDED INTERSECTION – LOADBEARING WALL

Detail applies to all thicknesses

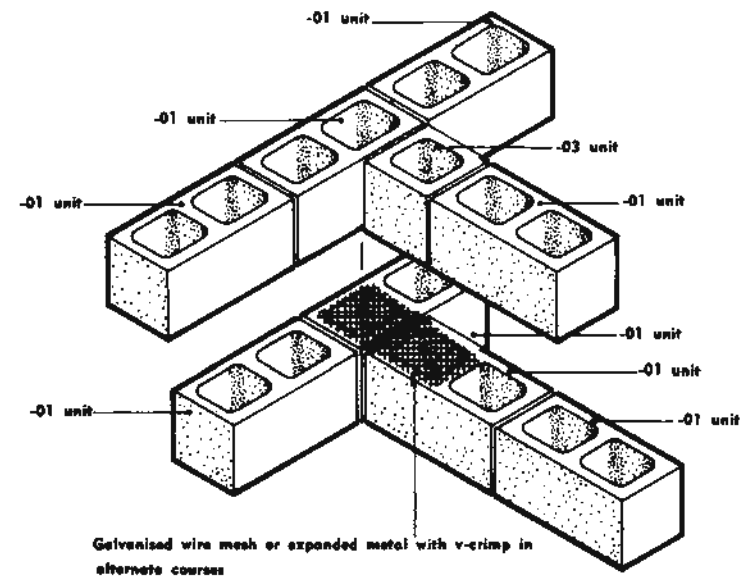
NOTES:

To prevent the formation of cracks, the length of the intersecting wall should be limited to a maximum of 1.2 m. This can be done by means either of a control joint or an opening, such as a full-height door or other opening.

Detail L33 is recommended, in preference to bonding, for loadbearing wall intersections, in walls of all thicknesses.

Detail L34 is recommended, in preference to bonding, for non-loadbearing wall intersections, in walls of all thicknesses.

Each detail produces a stronger joint capable of accommodating a degree of differential movement, does not break bond on the intersected wall and avoids complex solutions involving small units.

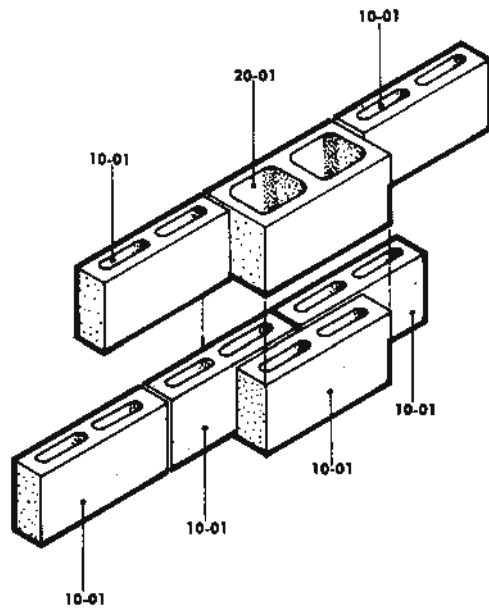


UNBONDED INTERSECTION – NON-LOADBEARING WALL

Detail applies to all thicknesses

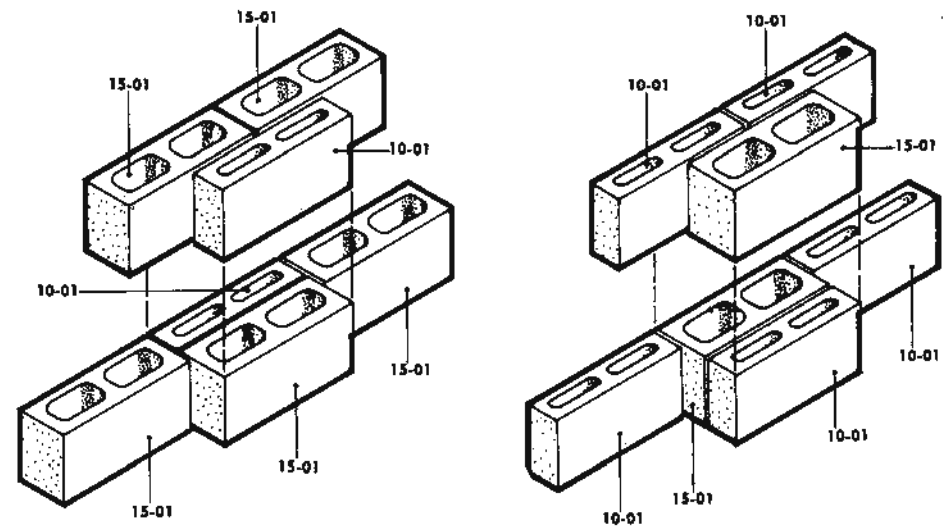
NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L33.eps](#)

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L34.eps](#)



390 mm x 190 mm ENGAGED PIER

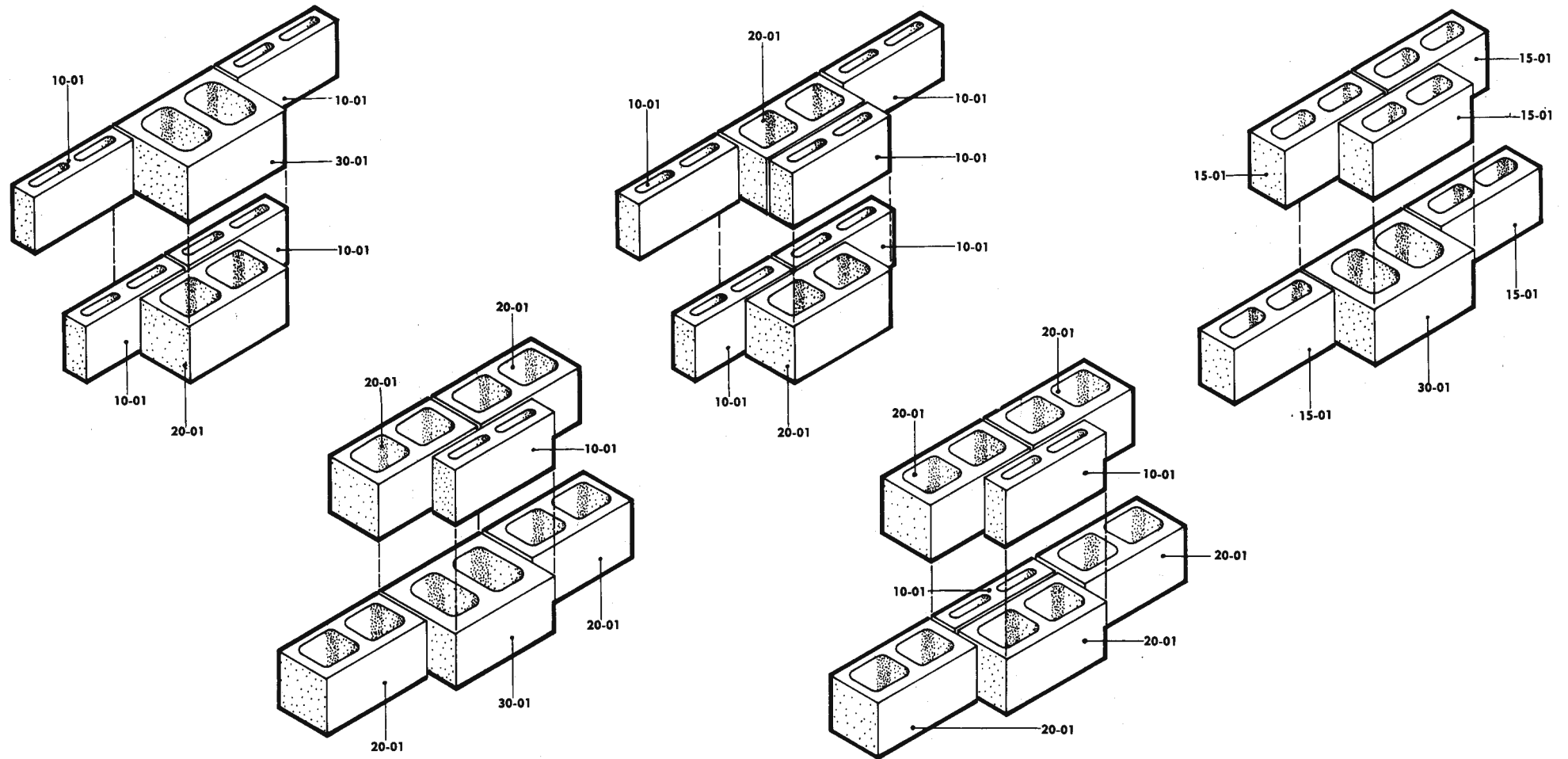
NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L35.eps](#)



390 mm x 240 mm ENGAGED PIERS

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L36.eps](#)

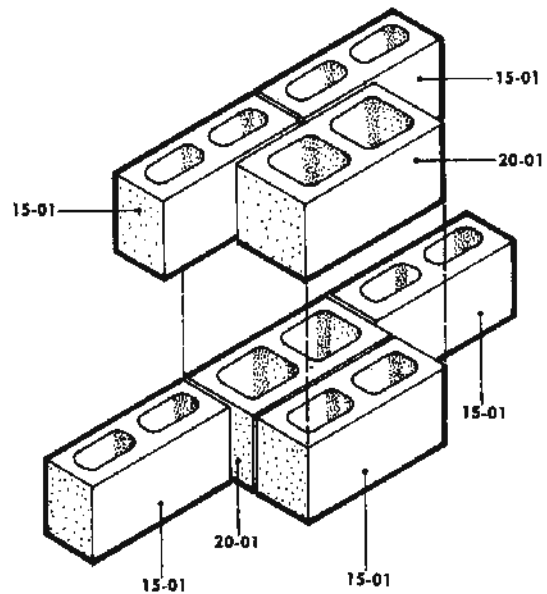




390 mm x 290 mm ENGAGED PIERS

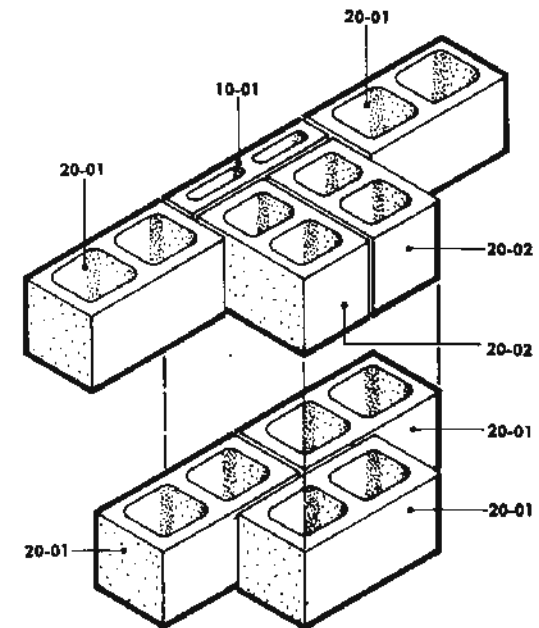
NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L37.eps](#)





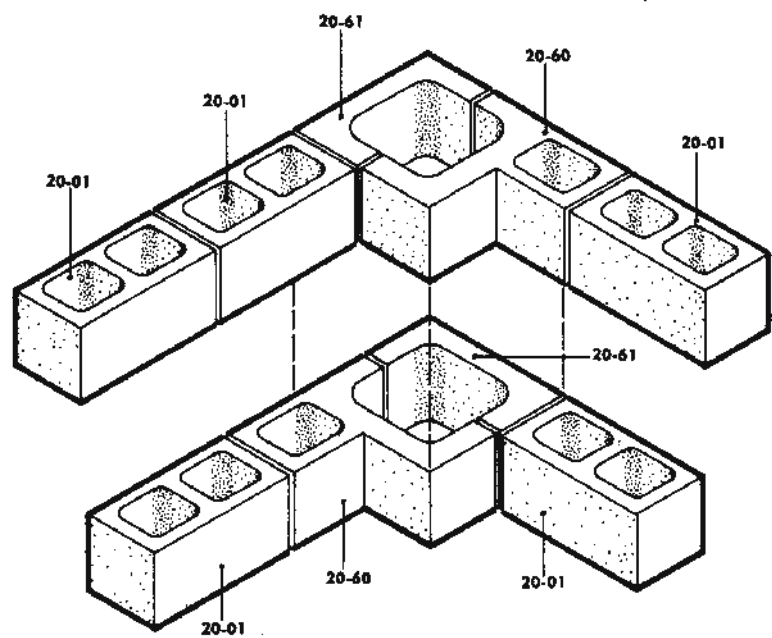
390 mm x 340 mm ENGAGED PIER

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L38.eps](#)



390 mm x 390 mm ENGAGED PIER

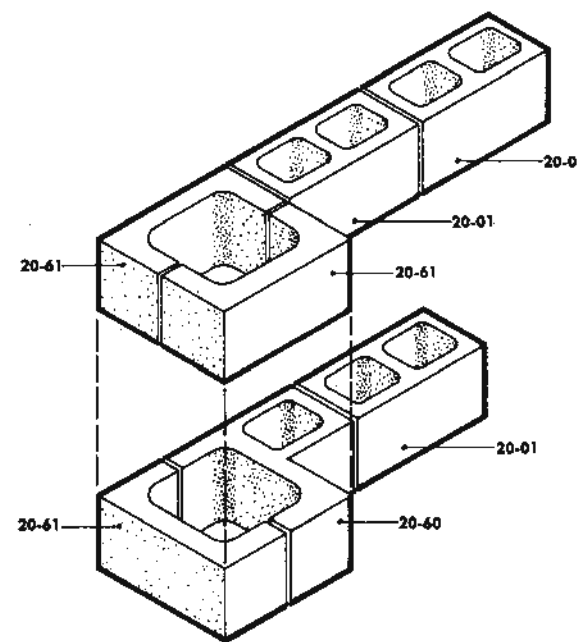
NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L39.eps](#)



COLUMN – CORNER

NOTES:

The design of columns, which may include the use of steel reinforcement and grout, should be undertaken by a qualified and experienced person.

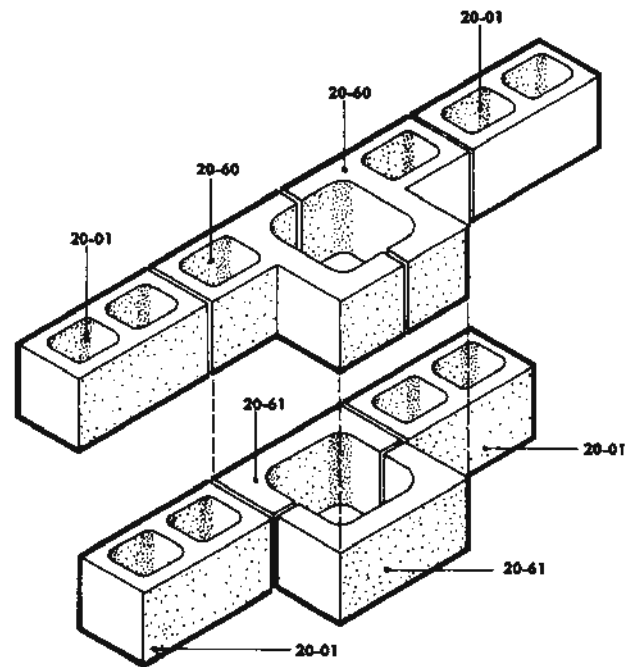


COLUMN – END OF WALL

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L40.eps](#)

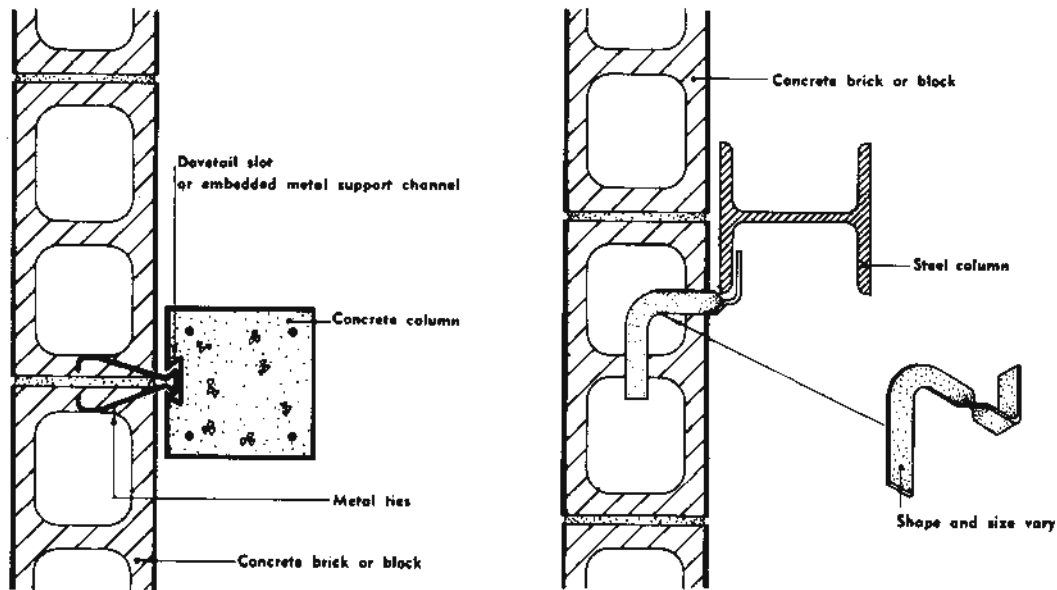
NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L41.eps](#)



**COLUMN – WITHIN WALL****NOTES:**

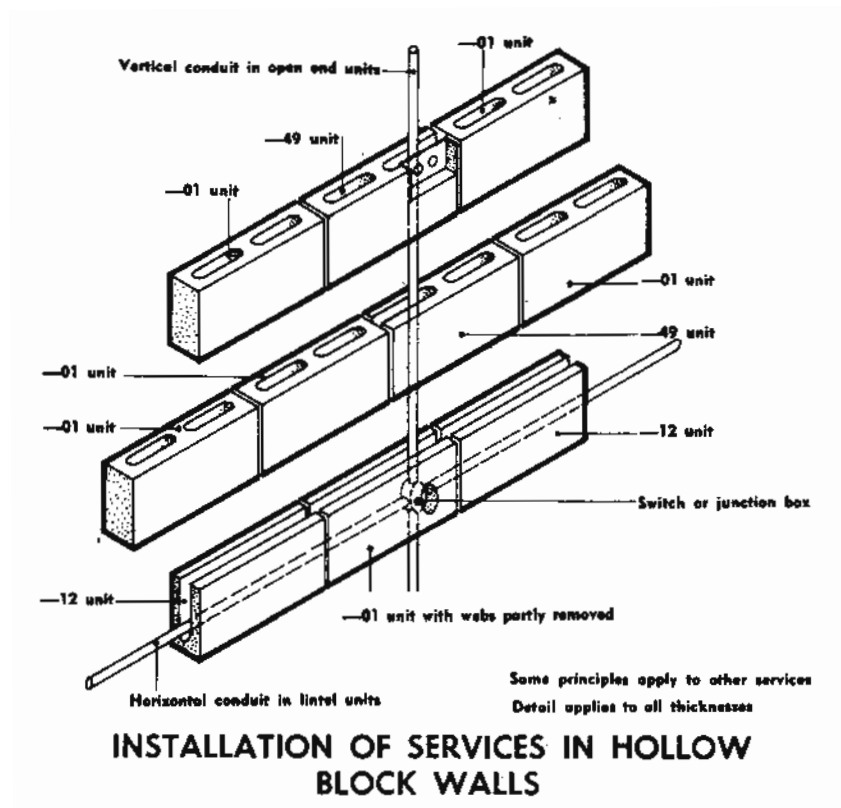
The design of columns, which may include the use of steel reinforcement and grout, should be undertaken by a qualified and experienced person.

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L42.eps](#)



FLEXIBLE WALL TO COLUMN CONNECTIONS

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L43.eps](#)

**Notes:**

The cutting of chases in hollow concrete block walls should be avoided. Cut chases weaken walls and do not permit the use of fair-face finishes.

Wherever possible, services should be located in the cores of hollow block walls as suggested in **Detail L44**.

Although electrical services only have been illustrated, similar principles may be applied to other services capable of fitting within the cores.

To make this technique work, careful planning and co-ordination is needed during the design and construction stages.

NOTE: This detail is available, in EPS format, in the location: [Data/CAD/L-Ancillary/L44.eps](#)