FIXINGS

Aggregate concrete blocks provide an ideal substrate for many types of fixings. This ranges from light, medium and heavy-duty fixings. Although it is generally easier to fix into solid blockwork, it is possible to fix into the solid portion of hollow blockwork with certain light and medium duty fixings. Alternatively, for a stronger connection, it is possible to fill the hollow portion of the blockwork with concrete for the units that require the fixing. This technique would allow a substantial fixing to be applied to the hollow unit once filled with concrete and allowed to set.

For light duty use, plastic plug and screw type fixings are ideal and can achieve adequate pull out strengths for general applications. Pull out strengths will vary between different strengths and density of blockwork. It is therefore advisable to consult Forticrete's Technical Department for guidance and typical pull out strengths.

Medium duty applications will generally require a heavier gauge fixing than the light duty option. This will obviously depend on the fixing requirement.

Heavy duty fixings should be considered carefully. The most common form of fixing is the chemical anchor or resin bonded rod. It is generally not advisable to use expanded anchor bolts on aggregate concrete blocks due to the action of the fixing, which tends to put excessive strain onto the blockwork when trying to expand. It may be possible to use expanding anchor type fixing for light or medium duty applications, bearing in mind the above caution. This should be discussed with Forticrete's Technical Department, to ensure suitability of the product in question.

It is possible to substitute hollow blockwork with solid blockwork in areas where fixings are necessary. An example is blockwork next to a roller shutter door. Fixing strength is critical because vibration from the motion of the door may put extra stress onto the fixings. The solid blocks would obviously enhance the pull out strengths giving full restraint to the shutter door. However, it may also be necessary to reinforce the bed joints with Bed Joint Reinforcement to cope with the stresses imposed on the surrounding blockwork. Alternatively, the hollow blockwork could be filled with concrete at the position where the fixing is needed to ensure total stability. It may be necessary to consult with a Structural Engineer for this type of detailing, as there may be a need for specialist types of fixings in certain installations.

When fixings have to be considered after the completion of the building, there are numerous additional factors to consider.

These include:

- the range of blockwork strengths
- the possibility of voids if unknown
- the variable quality of mortar
- the difficulty of avoiding mortar joints when the surface is rendered or plastered
- the correct choice of fixing system to suit loading and whether hollow, Hi-Light or solid blocks are the supporting background

Figure 13 is a useful indicator of where to locate fixings within a blockwork wall. It may be used at the design stage, during construction, as well as after the building has been occupied.

FIG 13 POSITION OF FIXINGS

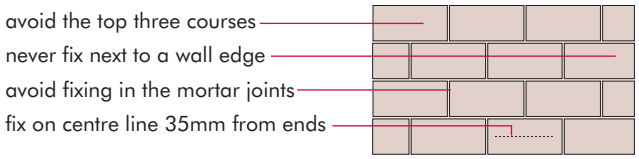


TABLE 14 PULL OUT LOADS

Rawplug Fixing	Block Designation	Average Ultimate Load (kN)	SWL (kg)
8mm Rawl-in-one	Solid 7N	1.22	30
	Hollow 7N	1.38	35
	Hi-Light 7N	1.42	35
10mm Rawl-in-one	Solid 7N	2.14	50
	Hollow 7N	1.26	30
	Hi-Light 7N	1.61	40
8mm Rawlbloc	Solid 7N	1.92	45
	Hollow 7N	2.24	55
	Hi-Light 7N	1.83	45
10mm Rawlbloc	Solid 7N	1.81	45
	Hollow 7N	2.73	65
	Hi-Light 7N	2.68	65
8500 Rawlnut	Solid 7N	4.25	105
	Hollow 7N	2.41	60
	Hi-Light 7N	2.6	65
1055 Rawlnut	Solid 7N	5.53	135
	Hollow 7N	6.36	155
	Hi-Light 7N	5.44	135
M10 R-kem Resin (inc. dia. 15 x 95 mesh sleeve)	Solid 7N	11.1	270
	Hollow 7N	6.3	155
	Hi-Light 7N	7.6	190
Fischer Fixing	**Block Designation**	**Average Ultimate Load (kN)**	**SWL (kg)**
SX Plug	Dense 7N	3.58	52
	Lightweight 7N	3.7	54
UX Plug	Dense 7N	2.17	32
	Lightweight 7N	1.8	25
M Unit	Dense 7N	5.83	85
	Lightweight 7N	4.9	71
FIP 380C	Dense 7N	11.1	283
	Lightweight 7N	5.5	140
FIS V360S	Hi-Light	10.53	265
KD8	Hi-Light	8.75	214
FHY	Hi-Light	7.2	184
SXS	Hi-Light	2.04	31
FU	Hi-Light	3.33	51

PROVISION FOR SERVICES AND FITTINGS

When making provision for services and services fittings, designers should ensure that none of the functions of the wall are impaired by fixings, chases or holes.

The designer should consider the effects of chasing on stability, bearing in mind the recommendations of BS 5628 : Part 3, particularly where walls or leaves are constructed of hollow units. In walls or leaves constructed of solid units, the depth of horizontal chases should not normally exceed one-sixth of the thickness of the single leaf at any point, whilst the depth of vertical chases should not normally exceed one-third of the thickness of the single leaf at any point.

The cutting of holes up to approximately 300mm square in the wall to accommodate items of equipment may be permitted.
See Sitework Guide for further clarification.

FIG 14

JUNCTION BETWEEN LOADBEARING CAVITY WALL AND INTERNAL WALL

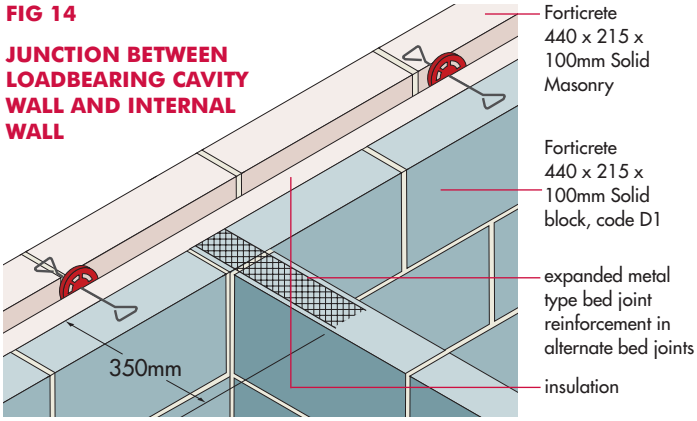


FIG 15

INTERSECTION OF TWO LOADBEARING WALLS

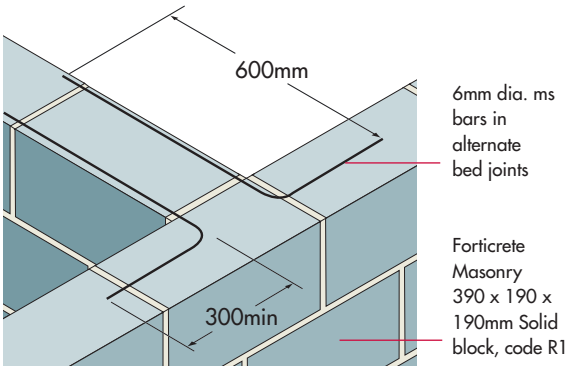


FIG 16

SLIDING ANCHOR AND MOVEMENT DETAIL AT FLOOR SLAB

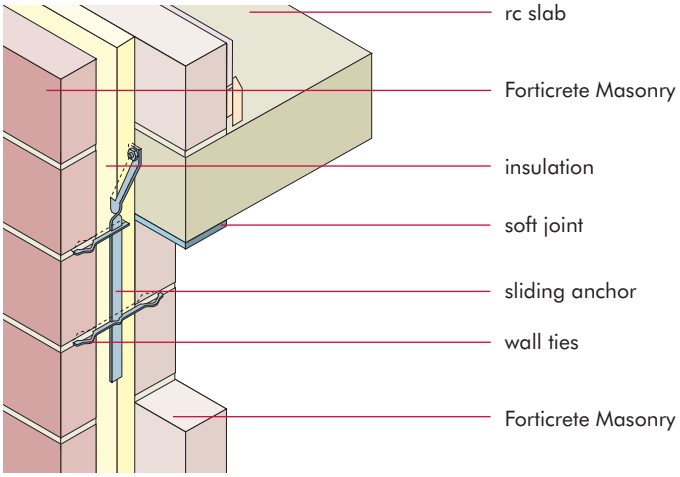


FIG 17

JUNCTION OF STEEL COLUMN WITH CAVITY WALL

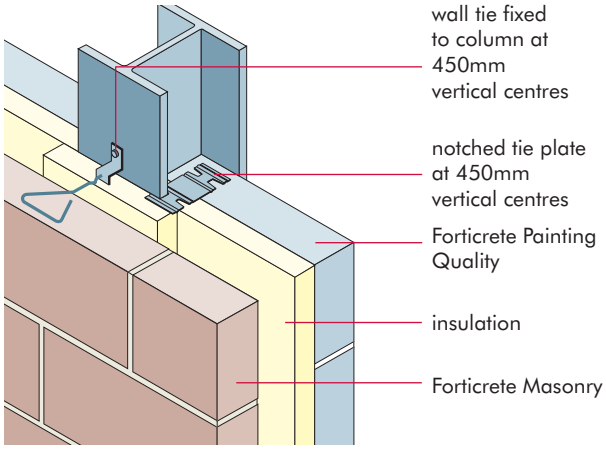


FIG 18

JUNCTION OF CONCRETE COLUMN WITH BLOCKWORK

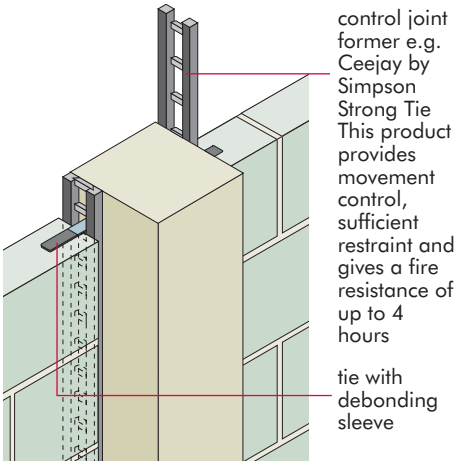


FIG 19

JUNCTION OF NON LOADBEARING WALL WITH CONCRETE SLAB - WITH HEAD RESTRAINT

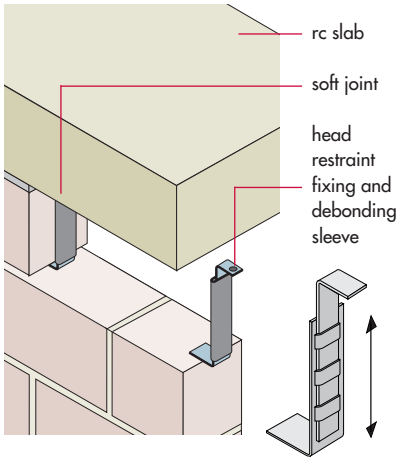


FIG 20

JUNCTION OF NON LOADBEARING WALL WITH CONCRETE SLAB - WITHOUT HEAD RESTRAINT

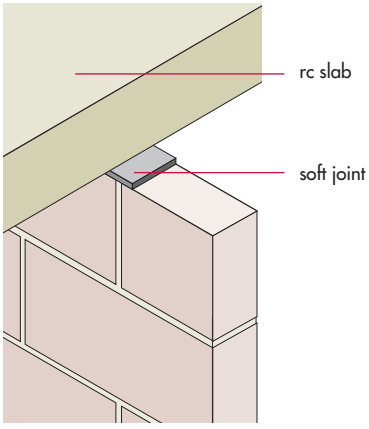


FIG 21

MASONRY WALL AND STRIP FOUNDATION DETAIL

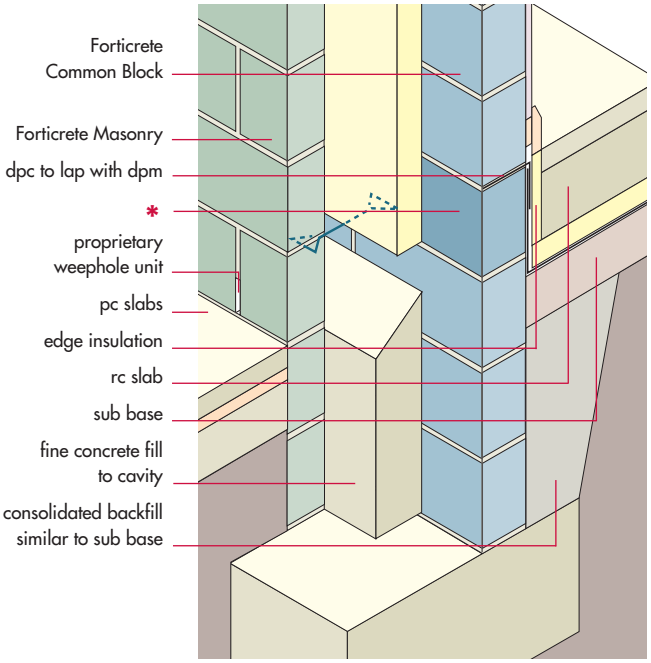
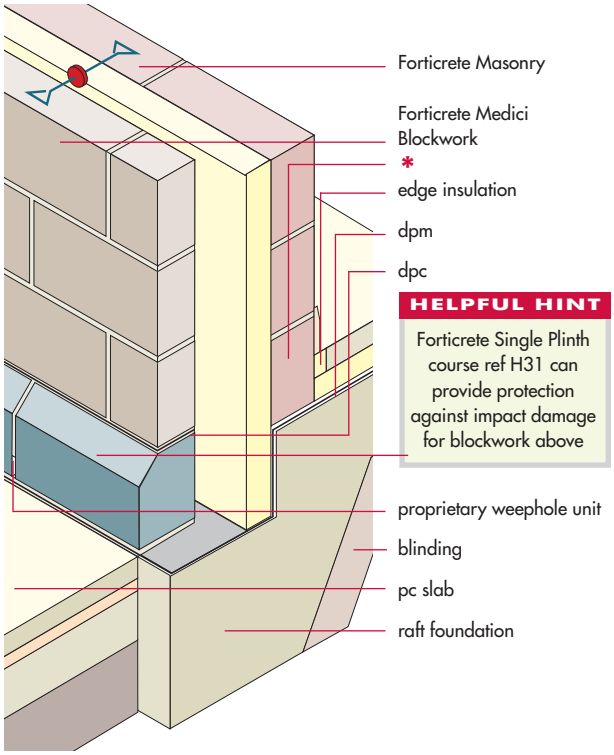


FIG 22

MASONRY WALL AND RAFT FOUNDATION DETAIL



HELPFUL HINT

Forticrete Single Plinth course ref H31 can provide protection against impact damage for blockwork above

FIG 23

DETAIL AT PARAPET

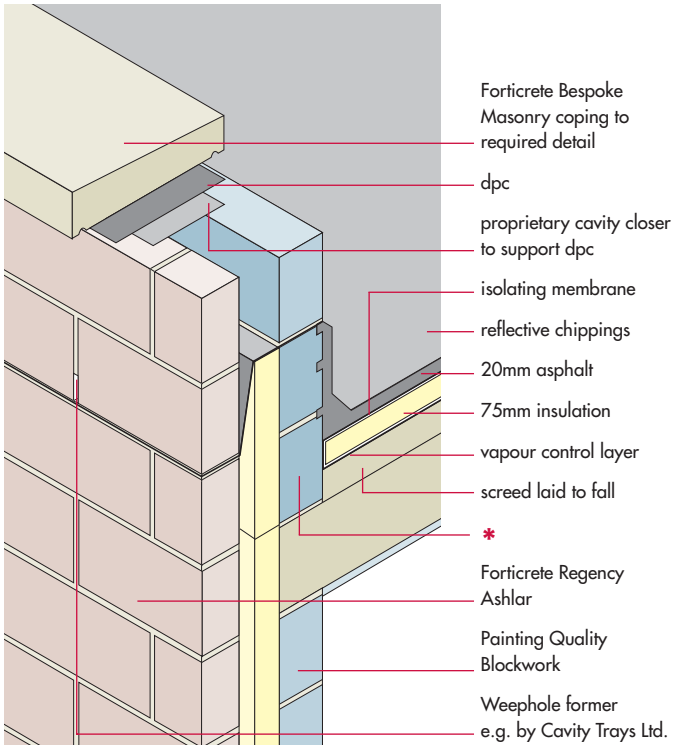
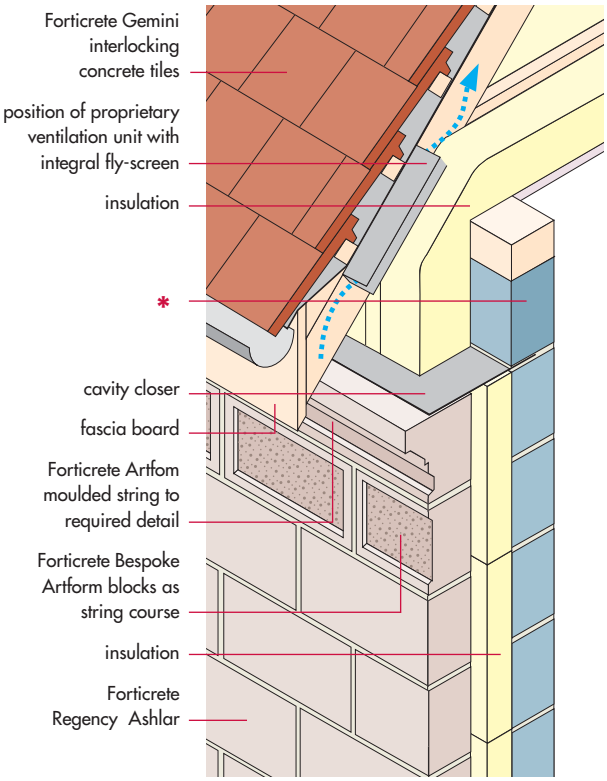


FIG 24

DETAIL AT EAVES



HELPFUL HINTS

Fig 21: Overall insulation thickness will be determined by buildings location and type of insulation material.

Fig 21/22: *Course of insulating blockwork, if structurally acceptable, to maintain thermal continuity.

Fig 23: Direction of cavity tray fall depends on degree of exposure. If high exposure, the tray should discharge to outer leaf as shown.

Fig 23/24: *Courses of insulating blockwork to maintain thermal continuity

FIG 25

LINTEL AND CILL DETAIL ALTERNATIVE 1

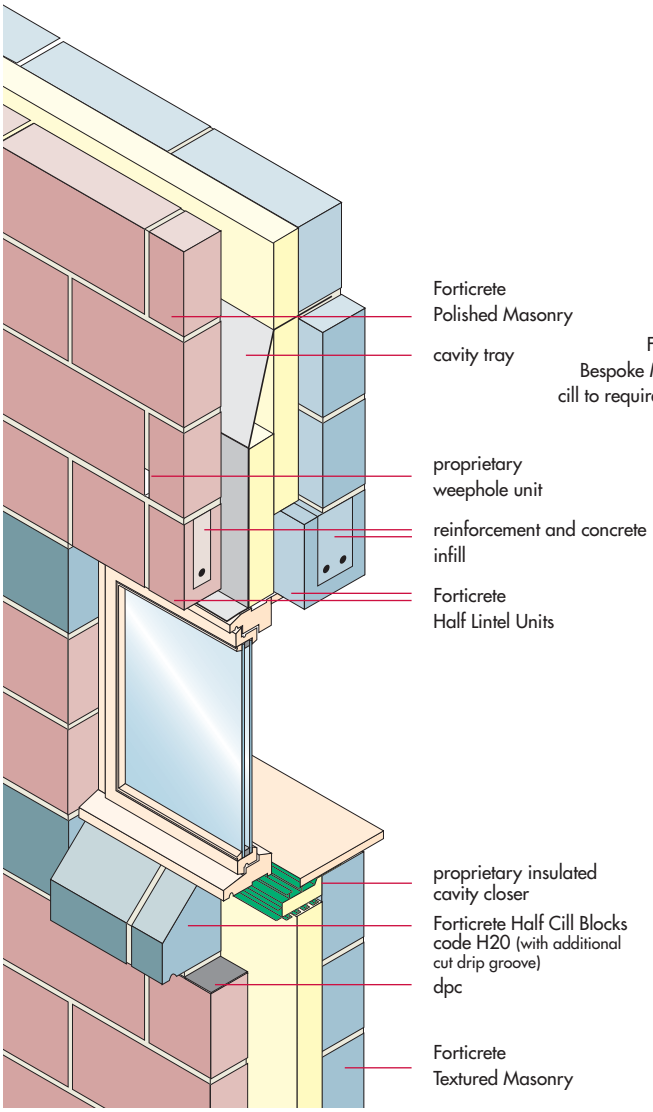


FIG 26

LINTEL AND CILL DETAIL ALTERNATIVE 2

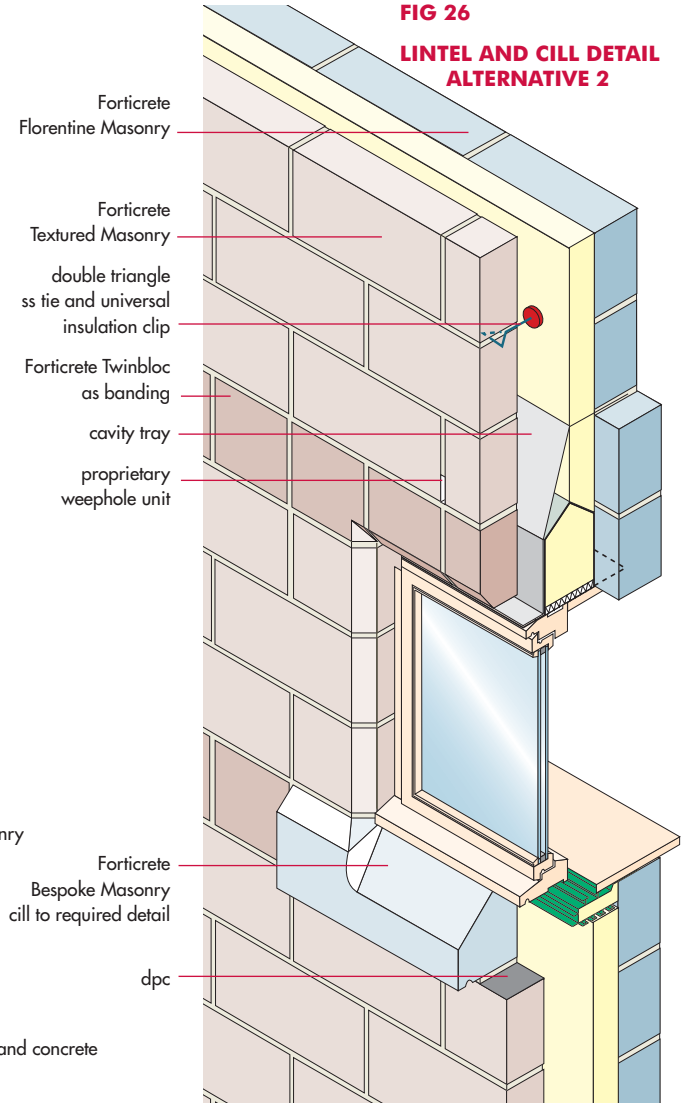
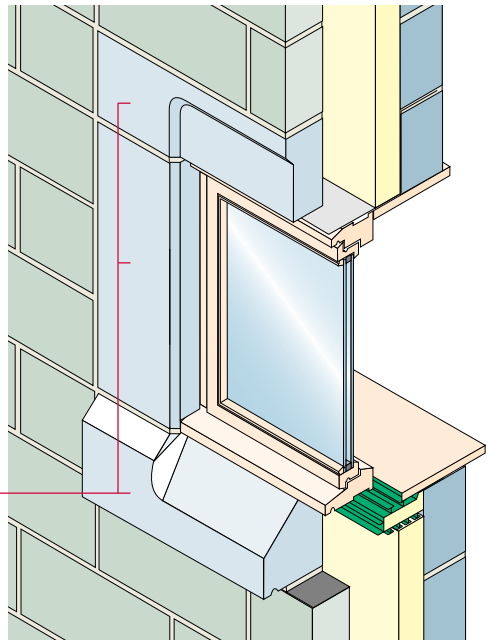


FIG 27

LINTEL AND CILL DETAIL ALTERNATIVE 3



HELPFUL HINT

If Textured or Polished Masonry is used, ensure that return ends, reveal blocks etc have been similarly specified to ensure a uniform finish.

HELPFUL HINTS

To eliminate stress and differential movement, bed joint reinforcement should be provided for two courses above and below all openings and should extend no less than 600mm either side of the opening.

*Fig 29 Bed joint to allow for a maximum deflection of 5mm for steel support lintel

FIG 28

CAST STONE DECORATIVE HEAD WITH SUPPORTING LINTEL DETAIL

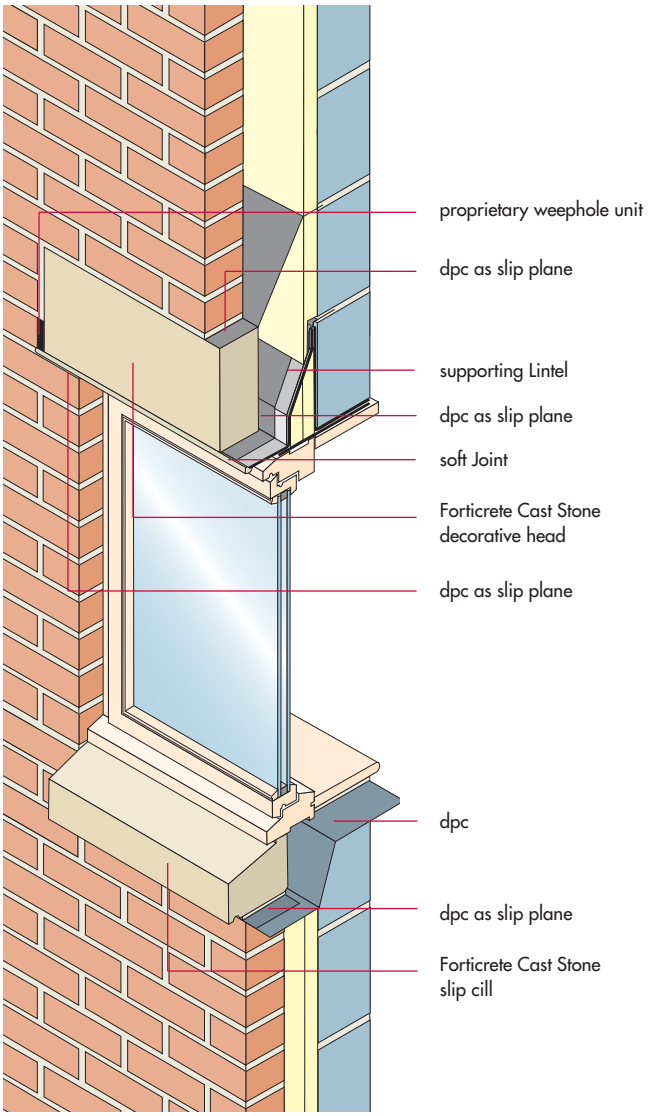
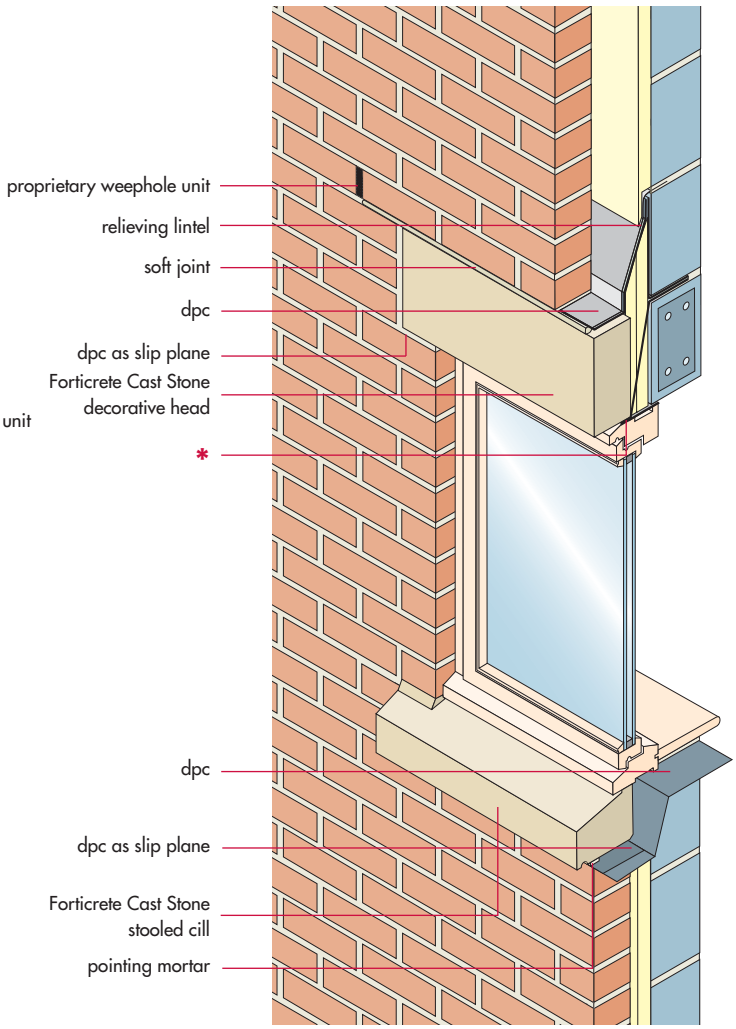


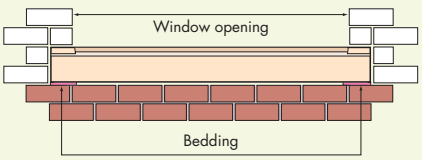
FIG 29

CAST STONE DECORATIVE HEAD WITH RELIEVING LINTEL DETAIL



HELPFUL HINT

Fig 30: Stooled Cills should be bedded according to BS 8000 part 3 i.e. the ends only should be mortar bedded during construction, followed by the pointing of the remaining joint when the construction is completed.



(dpc removed for clarity)

FIG 30

CAST STONE STOOLED CILL DETAIL