Windposts

Halfen windposts have been specifically designed to strengthen masonry panels. They are set out between structural columns, as shown, and are used at storey height or as spandrel or parapet posts. Both cavity windposts and blockwork windposts are available.

Cavity windposts

Cavity windposts can be used without cutting blockwork and are therefore the preferred option, where possible. Cavity windposts are available in 2 profiles:

CW2

CW2 is formed from 4 or 5 mm thick folded C profile. Ties are normally the hook-on type WPT 1, but posts can also be slotted for ties.

CW3

CW3 is formed from 2 CW2 channels welded back-to-back, providing a stiffer profile.

Blockwork windposts

Blockwork windposts (BW1) are formed from angle and built into the blockwork inner skin, as shown. Blockwork windposts are available in a range of angle sizes.

BW1

Normally the angle is folded from 4, 5 or 6 mm thick plate. Angle dimensions can be selected from the Halfen standard schedule (page 33), or to suit the project detail. Ties for the outer skin (if required) are the hook-on type WPT 1. The inner skin ties may be either WPT 3 or WPT 3PS to suit the slot in the spine.

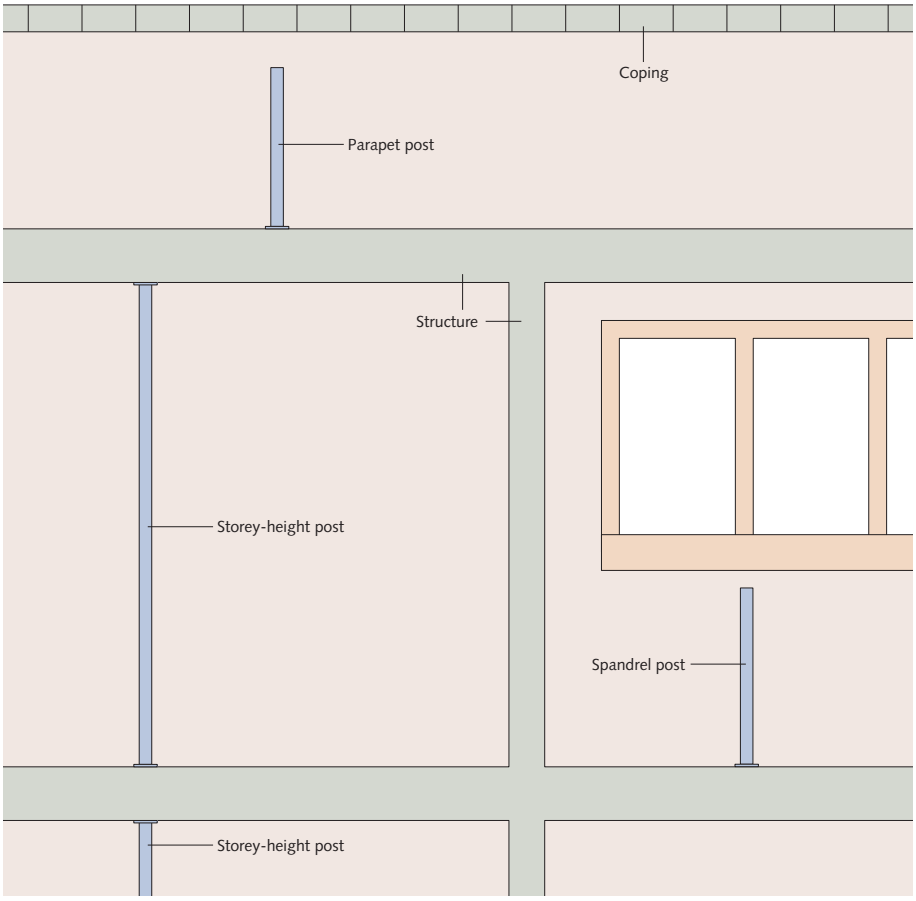
Materials

Windposts and brick ties are normally manufactured from Grade 304 stainless steel. (Grade 316 is also available, if required.)

For dry internal applications hot dip galvanised windposts can be manufactured, but it is recommended that the ties in the outer skin are stainless, even if the windpost is hot dip galvanised.

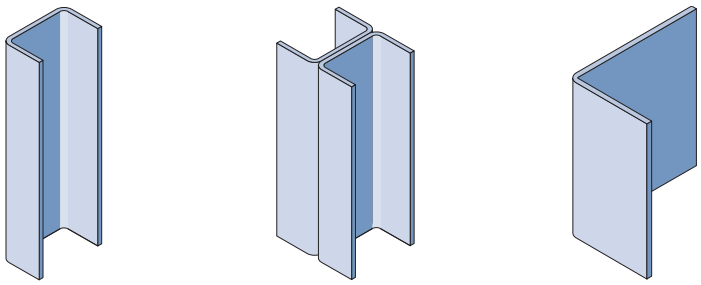
Dimensions

Typical profile dimensions are given on page 33, however profiles are manufactured on a project basis, so any dimensions are possible. The lengths of windposts are specified to suit the project requirements.



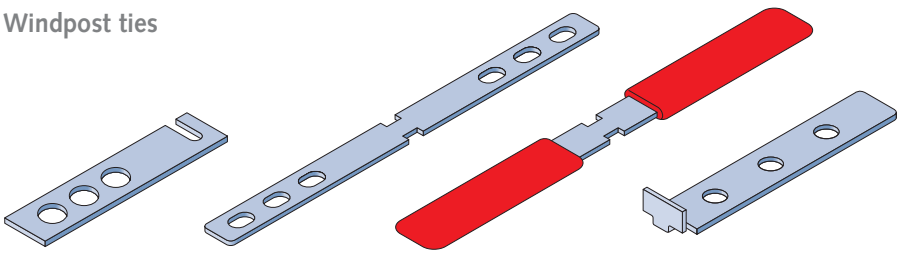
Elevation

Windpost profiles

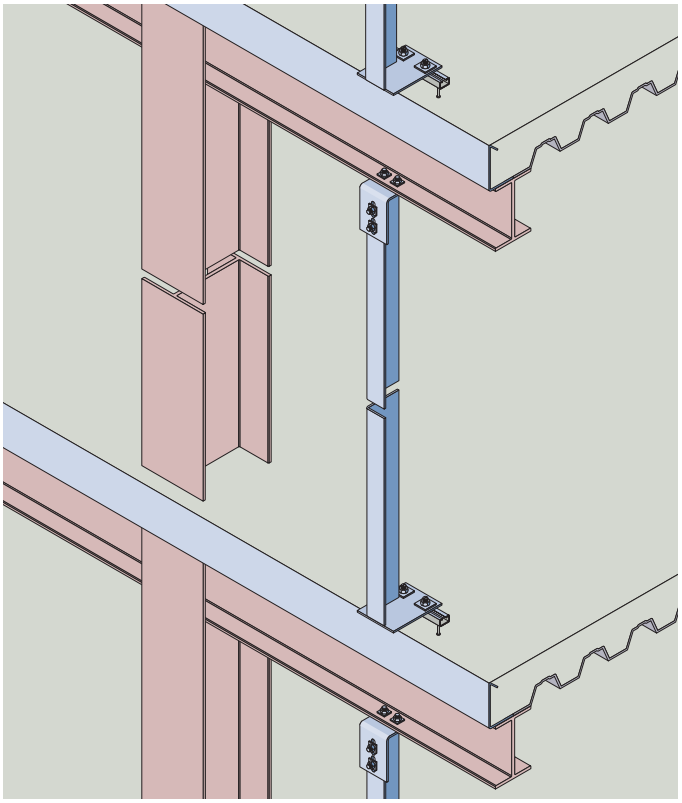


CW2 CW3 BW1

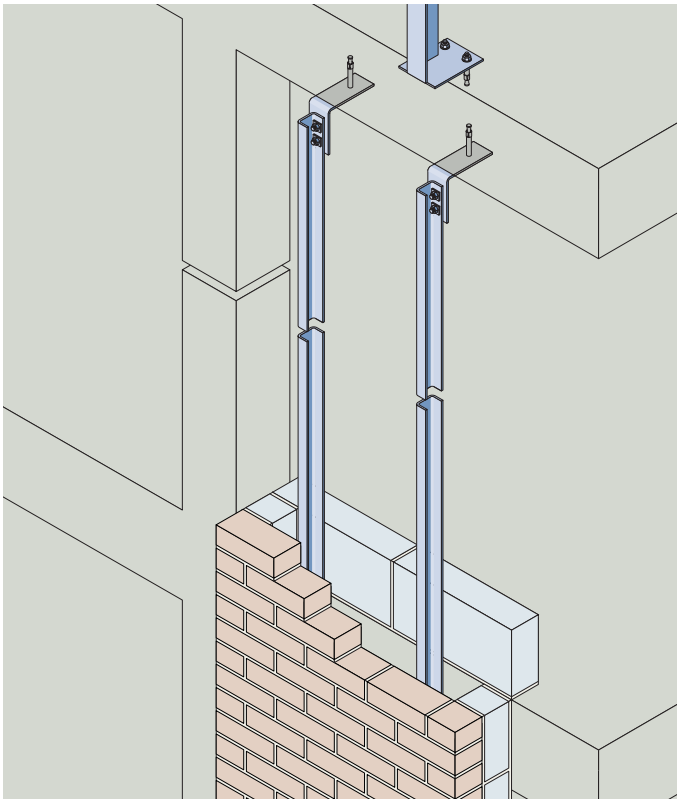
Windpost ties



Flange tie WPT 1 | Web tie WPT 3 | Web tie with plastic sleeves WPT 3 PS | One way web tie WPT 4



Storey-height windposts (BW1)



Storey-height windposts (CW2) with brick pier

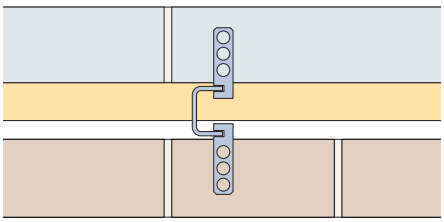
Setting-out

Relationship to the structure

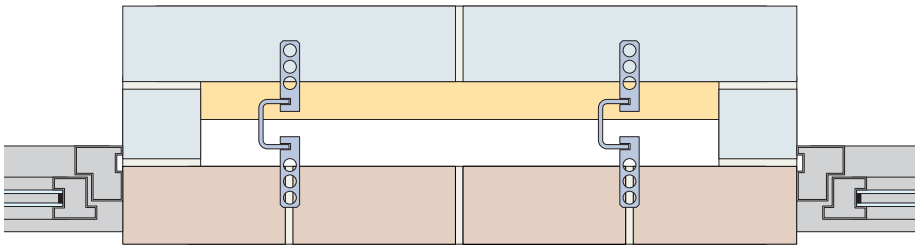
Windposts are set out between the structural columns at centres to suit the wind load. In piers it may be necessary to have 2 posts, as shown below right.

Posts are positioned in the cavity where possible, but, if an angle section is needed to take the load, the block is cut to allow the angle to be built into the inner skin. Posts can be fixed to any structure, as shown: concrete slabs, steel beams or metal deck.

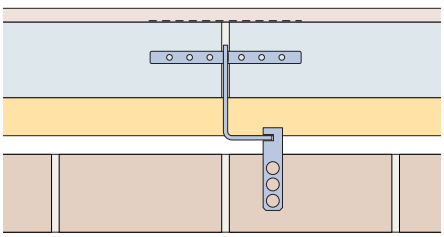
The top fixing on storey-height posts is normally a sliding fixing to allow for deflection, i.e. to prevent the post being pinched by the frame.



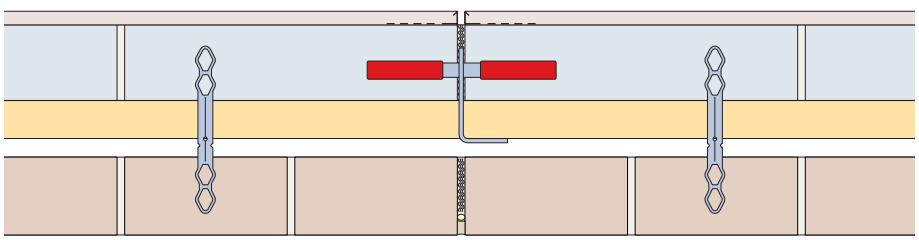
CW2 windpost with WPT 1 ties



CW2 windposts with WPT 1 ties



BW1 windpost inner skin bond
WPT 3 tie in inner skin
WPT 1 tie in outer skin



BW1 windpost inner skin de-bond
WPT 3 PS tie with plastic sleeve in inner skin
HTS-C 12 wall ties across cavity

Windposts – fixing details

Windposts are designed and manufactured by Halfen complete with top or bottom angles or shoes for fixing to the structure. The detail varies on a project basis. Typical examples are shown on this page.

Windposts should be fixed at top and bottom before brickwork commences.

Loadings

The data tables opposite show a range of typical windposts with their sectional properties and maximum allowable loads for various heights of post. Other windposts can be designed on a project basis.

The maximum loads are restricted either by the maximum allowable deflection or by a maximum allowable stress of 175 kN/mm^2.

Loading criteria

Storey-height windposts

The windposts are assumed to be simply supported top and bottom with a uniformly distributed load acting over the full height of the windpost. The loads given opposite are total loads, i.e. udl x post height. The mid-span deflection is limited to SPAN/360.

Spandrel and parapet windposts

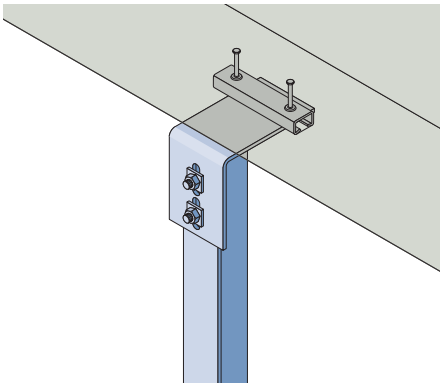
The windposts are assumed to be a cantilever with a horizontal point load acting at the unsupported end of the post. The deflection at the unsupported end of the post is limited to SPAN/180.

The sectional properties of a range of windposts are given opposite to allow engineers to calculate allowable loadings for conditions other than those quoted.

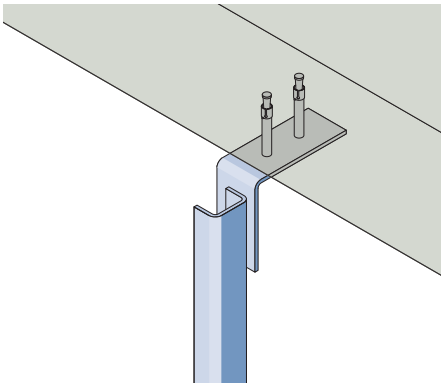
Brick tie loadings

Halfen brick ties used with windposts provide a safe working load of 1.5 kN per tie in tension and compression. The spacing of the ties can be determined from the loading data table, but should not exceed 450 mm centres.

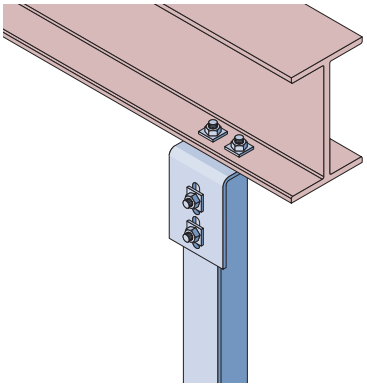
For applications requiring higher loads than those quoted, solutions are available using larger profiles and spines, and with increased sectional properties. Please consult Halfen.



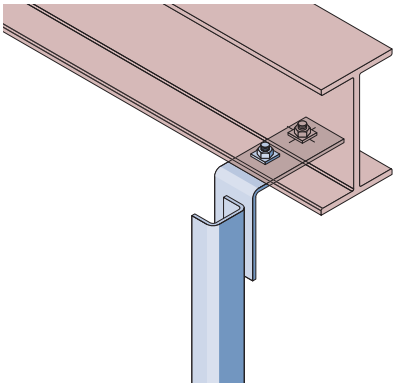
Type BW1 – top fixing to concrete



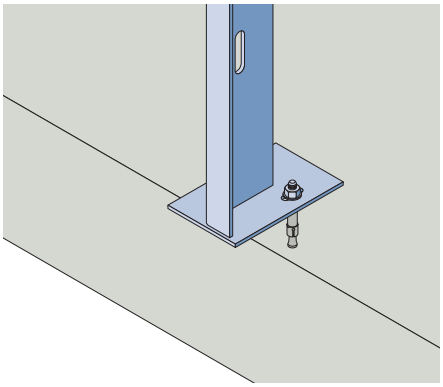
Type CW2 – top fixing to concrete



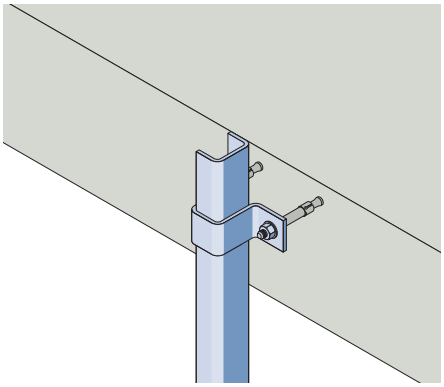
Type BW1 – top fixing to steel



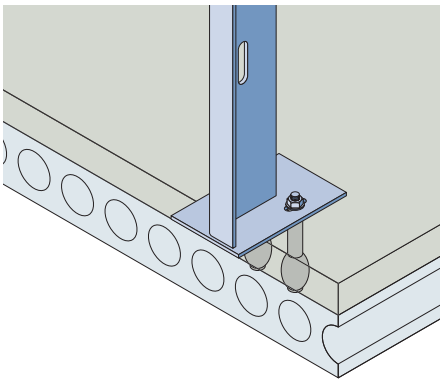
Type CW2 – top fixing to steel



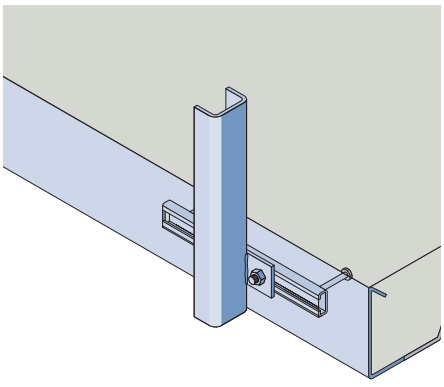
Type BW1 – bottom fixing to slab top



Type CW2 – top fixing to slab edge



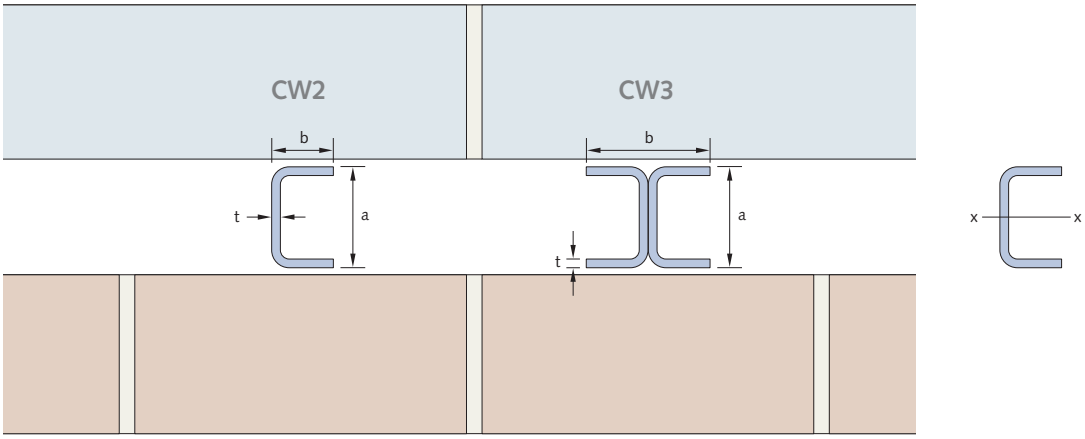
Type BW1 – bottom fixing to hollow core slab: example shows resin sock



Type CW2 – bottom fixing to metal deck

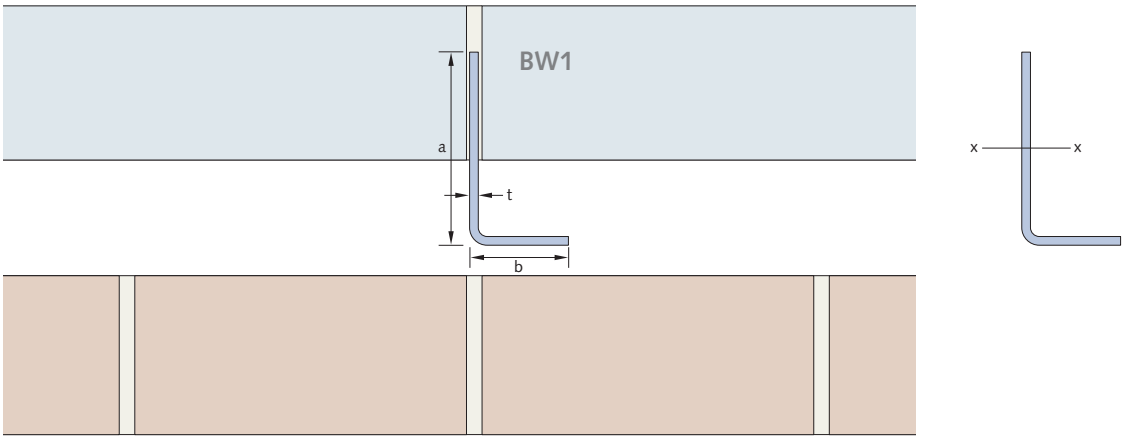
Sectional properties and load data tables for windposts

Cavity windpost type CW2/CW3



Code	a x b x t (mm)	Area (cm^2)	Mass (kg/m)	Ixx (cm^4)	Zxx (cm^3)	Maximum load on windpost (kN)							
						Storey height posts (m)				Spandrel/parapet posts (m)			
						2.5	3.0	3.5	4.0	0.75	0.90	1.05	1.20
CW2 6544	65 x 40 x 4	5.13	4.05	32.38	9.96	2.21	1.54	1.13	0.86	1.92	1.33	0.98	0.75
CW2 6545	65 x 40 x 5	6.21	4.90	37.43	11.52	2.56	1.77	1.30	1.00	2.22	1.54	1.13	0.87
CW2 8045	80 x 40 x 5	6.96	5.50	62.19	15.55	4.25	2.95	2.17	1.66	3.63	2.56	1.88	1.44
CW3 6584	65 x 80 x 4	10.26	8.11	64.76	19.93	4.42	3.07	2.26	1.73	3.84	2.67	1.96	1.50
CW3 6585	65 x 80 x 5	12.41	9.81	74.87	23.04	5.11	3.55	2.61	2.00	4.44	3.08	2.26	1.73
CW3 8085	80 x 80 x 5	13.93	11.00	124.39	31.10	8.49	5.90	4.33	3.32	7.26	5.12	3.76	2.88

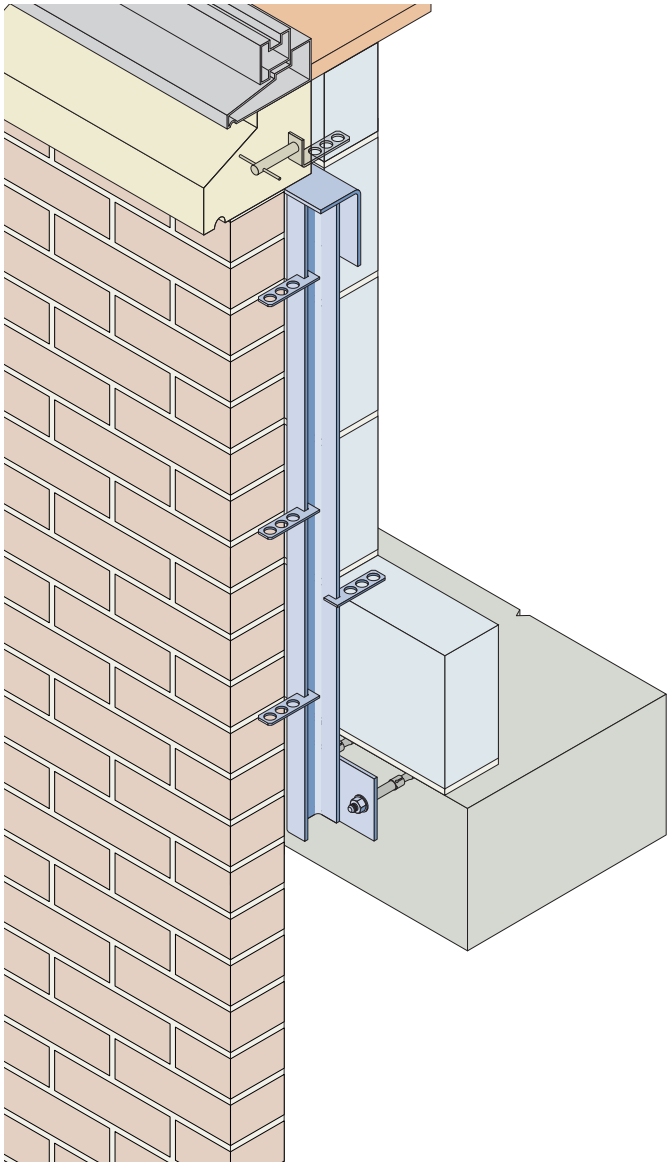
Blockwork windpost type BW1



Code	a x b x t (mm)	Area (cm^2)	Mass (kg/m)	Ixx (cm^4)	Zxx (cm^3)	Maximum load on windpost (kN)							
						Storey height posts (m)				Spandrel/parapet posts (m)			
						3.0	3.5	4.0	4.5	0.75	0.90	1.05	1.35
BW1 1254	125 x 70 x 4	7.47	5.90	125.38	15.21	5.94	4.37	3.34	2.64	3.55	2.96	2.53	1.97
BW1 1255	125 x 70 x 5	9.23	7.29	153.60	18.78	7.28	5.35	4.10	3.24	4.38	3.65	3.13	2.43
BW1 1403	140 x 70 x 3	6.11	4.83	130.18	14.24	6.17	4.53	3.47	2.74	3.32	2.77	2.37	1.85
BW1 1406	140 x 70 x 6	11.85	9.36	246.20	27.53	11.67	8.58	6.57	5.19	6.42	5.35	4.59	3.57
BW1 1605	160 x 70 x 5	10.98	8.68	300.53	29.76	13.89	10.47	8.01	6.33	6.94	5.79	4.96	3.86
BW1 1606	160 x 70 x 6	13.05	10.31	354.15	35.32	16.48	12.34	9.44	7.46	8.24	6.87	5.89	4.58
BW1 2006*	200 x 70 x 6	15.45	12.21	650.90	53.52	24.98	21.41	17.36	13.71	12.49	10.41	8.92	6.94

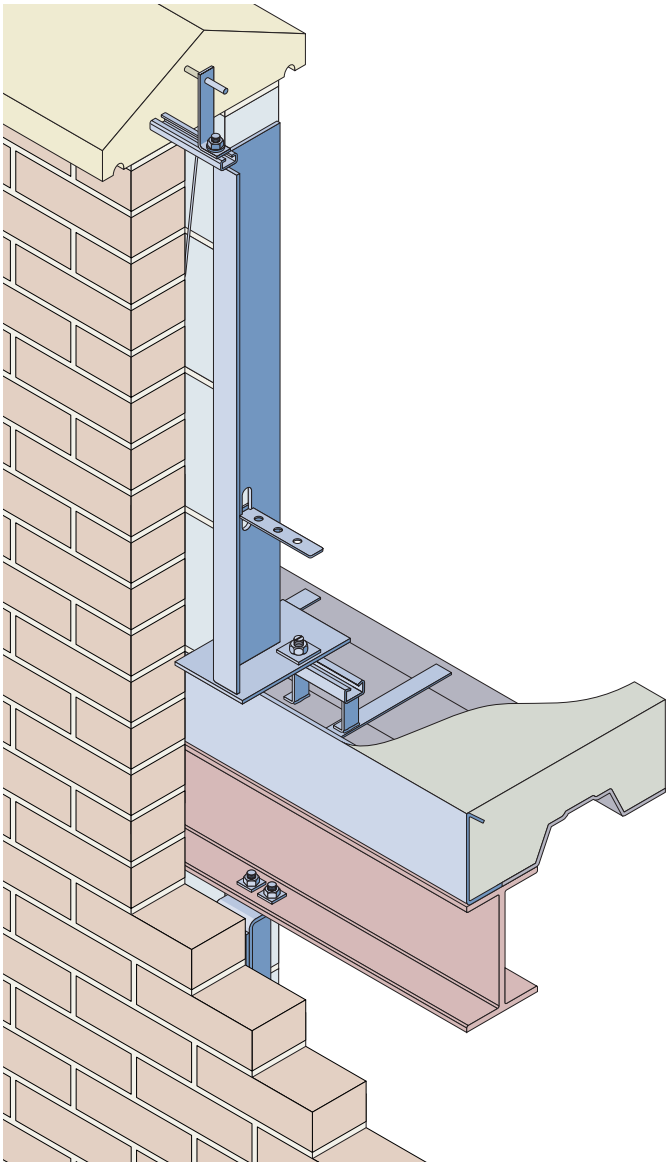
*Example for extreme condition in 140 mm blockwork.
Note: any size can be made to order, i.e. all windposts are made on a project basis.

Windposts – applications



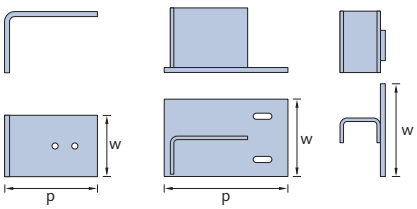
Spandrel Windpost (CW2)

Windpost below window sill, showing possible horizontal rail bolted to windpost, and restraint for reconstructed stone sill



Parapet Windpost (BW1)

Windpost below stone coping, showing fixing to cast-in channel ski assembly in floor slab. Also showing Halfen channel 28/15 built into cavity wall to provide total adjustability for coping ties
Note: cast-in channel ski assembly is effective at minimal edge distance in slab



Dimensioning examples

Normally fixing plates are designed by Halfen on a project basis.

How to specify windposts

The following codes are examples only; any profile requested can be manufactured to suit the design detail. Posts may be stainless steel Grade 304 or hot dip galvanised after manufacture. Ties are always stainless steel Grade 304. All posts are supplied complete with welded base fittings; the design will vary according to fixing type, position and structure.

For storey-height posts the length will be made to suit the structure. A suitable sliding top shoe will be designed by Halfen to accommodate differential movement; this will normally be an angle (code AC).

Fixing bolts can be supplied for fixing to either cast-in channel or structural steel, or for site-drilling into concrete.

For spandrels or parapets the post can be made any length to order, to avoid clashes with sills or copings.

Windpost complete with welded base and sliding top shoe **Storey height**				
BW1 1254 Code a x t	**hdg** Material	**3300** Length (mm)	**SF** Structure	**AC** Type of sliding top fitting

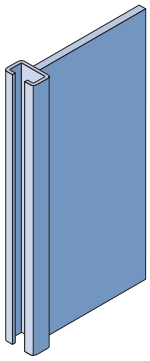
Windpost complete with welded base **Parapet**				
CW3 6584 Code a x b x t	**ss** Material	**1050** Length (mm)	**RC** Structure	–

Windpost ties			
WPT 1 **WPT 3** Code	**ss** **ss** Material	**70** **200** Projection	**inner &/or outer skin** **inner skin** Brick skins tied

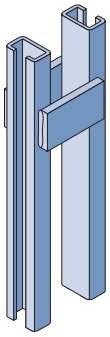
Abbreviations

Dimensions	a x b x t	windpost dimensions (see page 33)
Top fitting	AC	angle cleat
Structure	RC	concrete
	SF	steel
	PS	Pourstop
Material/finish	hdg	hot dip galvanised
	ss	stainless steel

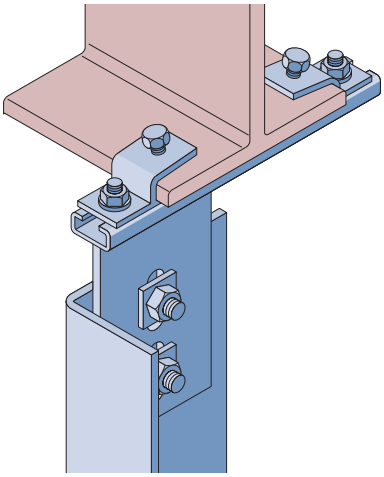
Windpost variations



28/15 channel windpost with fin for building into blockwork, Code BW2

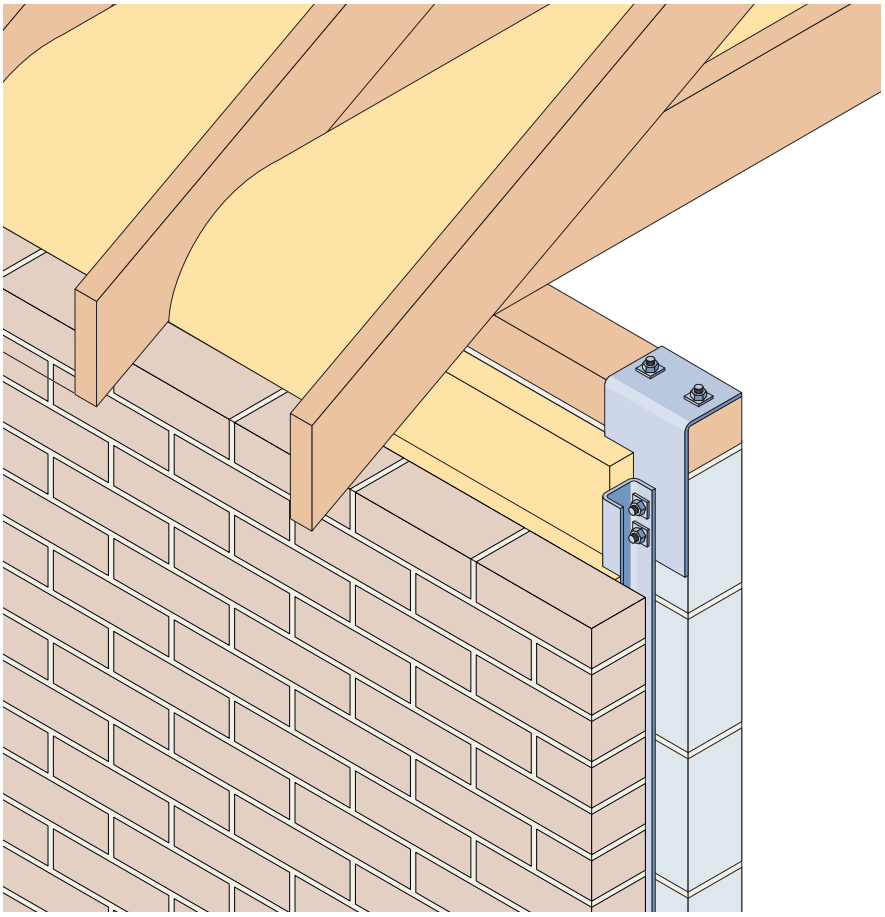


28/15 channels welded back-to-back for building into cavity, Code CW1



To avoid drilling of steel beams the top fixing of the windpost can be made to suit beam clamps to order, Code ND AC

Fixing variation



CW2 windpost fixed to wall plate in timber roof construction