



# Halfen WI Beam System

Achieve 10m spans without the need for windposts, movement joints or lintels



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# WI Beam System

The WI Beam System is an innovative approach to strengthening masonry by increasing lateral load capacity. Its simple design uses bespoke components to create a reinforcement system that allows wall spans of up to 10m, without the need to include windposts or movement joints. It can also be used to span openings up to 2.5m, thereby dispensing with lintels.

WI Beam System is CDM compliant with a maximum component weight of 14kg. It provides improved wall integrity and maximises the walls' airtightness, acoustic and fire performance. Its carbon footprint is minimal and it improves the aesthetic appearance of an in-fill wall by reducing the number of vertical joints.

## Features and benefits

- BS 5628 tested design, developed by CERAM, Jenkins & Potter and Buro Happold
- Improved aesthetics, acoustic and thermal performance
- Increased wall spans
- 4 hour masonry fire protection for non-loadbearing blockwork walls
- 100, 140, 190 and 215mm block range
- Flexible location of service penetrations above and below beams
- CDM compliant – maximum component weight of 14kg for the 140mm 'U' Block

## Standards and authority

- AIS approved for use under Building Regulations, Part A
- CERAM tested and approved to BS5628



Step One The vertical transfer rods are fitted at perpend between slotted blocks at 900mm centres and mortared in place. The end cleats are fixed at either end of panel to concrete or steel columns.



Step Two U-blocks installed as next course with transfer rods penetrating at midway point through slot at base of U-block. The slotted blocks below provide for an enhanced mortar bond, and rebated ends allow a standard vertical joint thickness to be maintained.

## Typical applications

The system can be used for a wide range of applications including: commercial, hospital, warehousing, sporting, leisure, residential, utility and school buildings and in car parks.

This system is predominantly designed for internal single-skin or partition walls.

The paint grade blocks used in the WI Beam System can be used externally or internally above ground.

## Description

The system comprises the following components to create the in-fill panels/walls:

- Paint quality 7.3N/mm<sup>2</sup> blockwork
- Steel end cleats
- Steel transfer rods
- PVC de-bonding sleeves

Additionally, 2 standard 16 mm dia. Y16 steel reinforcing bars and pre-mixed C40 in-fill concrete are used (supplied by others).

The vertical transfer rods extend through the U-block at 900mm centres. This creates a 3 course deep, composite masonry beam between the blockwork courses immediately above and below the centreline. The transfer rods also locate and connect the 2 reinforcing bars thus increasing the load distribution and enabling the surrounding subpanels to be reduced. The end cleats connect to the primary structural frame thereby focusing the lateral wall load there.

By removing the handling and fixing of heavy windposts and lintel and reducing the number of blocks needing to be cut, the overall health and safety of construction workers is improved. The simplified design process of the WI Beam system can significantly reduce build time and costs over traditional windpost construction.

## Environmental

Use of this system produces masonry wall panels with increased wall spans that will reduce the amount of non-recyclable movement joint filler and mastic materials required.

All masonry and steel components used in the system can be recycled.

## Accommodation of services

Service penetrations or internal ducts can be installed in the vertical spanning panels between WI Beams.

## Decoration

Internal surfaces can be decorated directly; external surfaces can be rendered or finished with a waterproof cladding.





Step Three Reinforcing bar is passed through locating slots in the vertical transfer rod that ensures correct cover and bar centres. The bars should be lapped for 800mm between transfer rods when required.

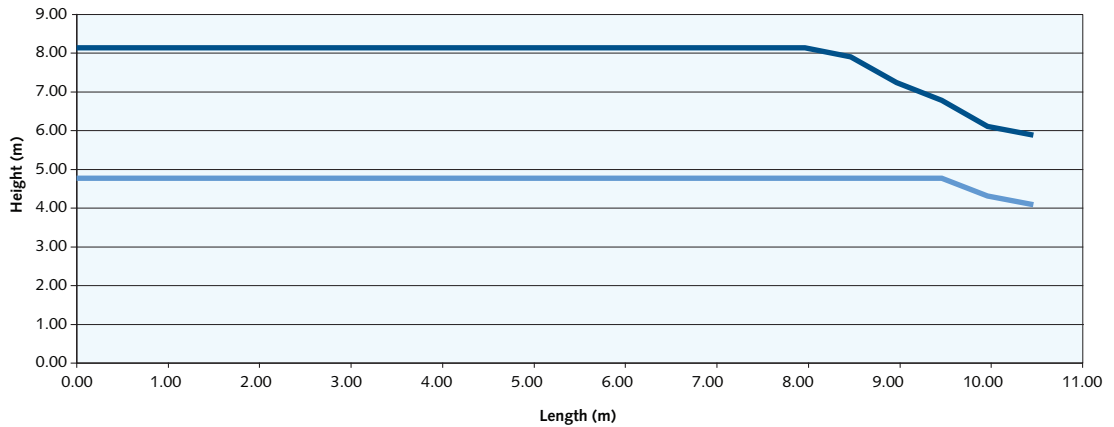


Step Four The reinforcement bars are inserted through the PVC sleeves, which allow for thermal movement, into the end cleat. Concrete is infilled along the length of the panel and tamped to level, with top blocks being layed within three hours.



# Loadings

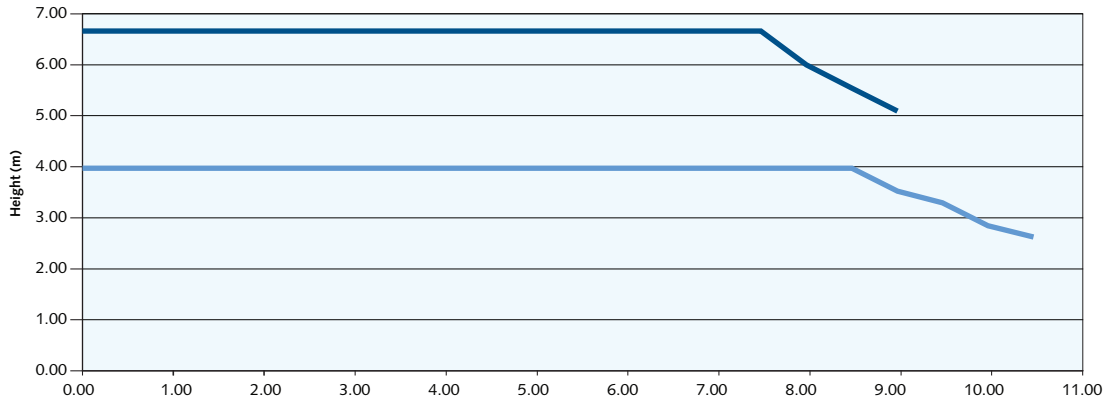
**Bond beams spacing for wind loads of 0.50kN/m<sup>2</sup>**

 Maximum height for wall with 2 bond beams  
 Maximum height for wall with 1 bond beam



**140m, 7.3/Nmm<sup>2</sup> block  
Bond beams spacing for wind loads of 0.75kN/m<sup>2</sup>**

 Maximum height for wall with 2 bond beams  
 Maximum height for wall with 1 bond beam



### Note to loadings tables

Blockwork between WI Beams is vertically spanning. Therefore wall panels are separated by the horizontal spanning WI Beam, which is connected to the primary structural column.

Maximum allowable bending moment resistance is 60 kNm, safe working bending moment is 20 kNm.

The final deflections should not exceed span/250 for general wall finishes or span/500 for decorated finishes.

Design guide is available for 100, 140, 190 and 215mm blocks.

The Halfen WI Beam has been developed to offer architects a uniform and modular means of construction, it extends the current limit of masonry panel design providing the engineer with greater flexibility in column positioning, in addition to which it allows the contractor continuity of works.



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