



Vision-Build

*BUILT ON INNOVATION*

Vision-Build  
**MORTARLESS**  
Shuttering System

Technical Information  
Guide

November 2008

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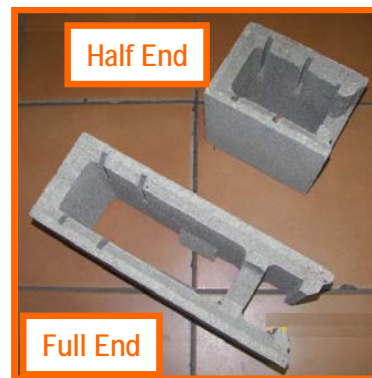
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Vision-Build (VB) MORTARLESS is an exciting new innovation in concrete wall construction. With our specially-engineered mortarless technology, load-bearing walls can be quickly and easily built, even by those without the skills and expertise of professional masons.

## System Components

The system comprises of three shutter units and a unique plastic connector.



This range of shutter units is sufficient to construct straight walls, ends and corners for walls dimensioned in 200mm increments, both lengthwise and in height. The **Stretcher** unit speaks for itself. The **Full End** units are used at all corners and both the **Full End** units and the **Half End** units are used to construct ends of walls.



The plastic **Connector** acts as a joiner, aligner and steel locating chair; holding two shutter units together securely at their perpend. Horizontal and vertical reinforcing bars are held accurately in position so there is no need for tying the bars (*no need for steel fixers*).

## Product Range

VB MORTARLESS shutter units are available in 200mm thicknesses (**VB200 Series**). Other product ranges are currently being planned.

# Planning and Construction



## Foundations

As VB MORTARLESS is a load bearing wall, reduced depth of foundations overall can be achieved. However, your design engineer will specify foundation requirements to suit the structure.

## Dimensioning

Dimension wall lengths in 200mm increments. The positioning of openings and the dimensions of opening widths should ideally suit the 200mm module of the shutter units (*units can be cut to length to suit an opening width and the sides of the openings should also be shuttered prior to grout filling the shutter unit core*).

## Starter Bars

Set out starter bars to coincide with the perpends in the wall (*perpends are the joints between the ends of two adjacent shutters*). The perpends always occur at multiples of 200mm and therefore in any wall the starter bars should be set out at multiples of 200mm starting at the end of the wall. *There is one exception. If the end of the wall is a corner, the first starter bar should be positioned 100mm from the end or it should be omitted.*

As a check, all starter bars, except corner bars, should pass through a plastic **Connector** in either the first course or the second course of work.

Accurate positioning of the starter bars is required to satisfy the engineer's requirements. The vertical bars in many walls will be centrally positioned in the wall thickness and this means that the starter bars should also be centrally positioned. However, in walls designed for flexure, such as cantilever retaining walls, the structural engineer will require the vertical reinforcement to be located towards one face of the wall with a specified cover, and it is important that the starter bars be accurately installed accordingly.

## Reinforcement

Always refer to the engineer's specifications for reinforcement requirements.

All reinforcement bars should be straight. Vertical bars, with the exception of any corner bars, should be aligned with perpend and should therefore pass through the plastic **Connectors**. Vertical bars should also lap with starter bars, therefore it is recommended that the positions of starter bars are marked for future reference when installing vertical bars in subsequent lifts of the wall.

Push horizontal bars into a notch in the **Connector** to secure it in a position; this will support the vertical reinforcement in its specified position.

Install 1000 x 1000L bars in corners and lap minimum 600mm with horizontal bars beyond the corner. Install 1000 x 400L bars at T intersections and lap the 1000mm leg 600 with the horizontal bars in the wall that terminates at the intersection.



After the wall is completed to the required height for grouting, install the vertical bars in the specified position with respect to the outside face of the wall. If the wall has been properly constructed, the vertical bars should be firmly held in their correct position by the horizontal bars and the plastic **Connectors**.

When vertical bars are to be located centrally, they should be held in position by alternating rows of horizontal bars.

When vertical bars are to be located on one side or the other, they should be held in position by a horizontal bar on one side and the **Connector** on the other side.

Note that vertical bars should extend at least 600mm beyond the top of the wall section for lapping with vertical bars in the subsequent wall section. However, vertical reinforcement should not be tied as the vertical bars are used to manually rod the wall during the grout filling process.

## Base Course

It will generally be necessary to set the first course of shutter units in a mortar bed, however if the footing or base slab is precisely finished to an accurate level then this is not essential. *Be aware that if there is any unevenness or variation in level it may be reflected throughout the entire height of the wall.*



When laying the first course in mortar ensure that there is no mortar in the perpend as this would cause the length of the wall to grow and cause a problem in subsequent courses.

Prior to commencing laying the first course, accurately set out all the walls and mark all ends and corners.

Whenever possible mark the line of the face of the wall using a chalk line.

Lay the shutter units from both ends meeting somewhere at about mid length. If the set-out is accurately marked and the shutter units are laid as described above, then the last shutter unit will slip snugly into place.

The **Full End** and **Half End** shutter units contain slots for knock-outs. When constructing a corner, knock out the appropriate side of each end unit so that a plastic **Connector** can be installed to tie it to the end **Stretcher** unit in the intersecting wall. This applies to the first course and all subsequent courses. Ensuring that **Connectors** are installed at all corners minimises the risk of shutter units becoming displaced during grouting. When the first course is fully laid, install the **Connectors** at all perpend.

## Subsequent Courses

Build up the ends and corners of the walls true to a plumb line on all faces, ensuring all shutter units are laid with tight perpend and ensuring all perpend are tied with plastic **Connectors**. Install horizontal reinforcement as required by the engineer. Corner bars and lap bars should be installed when building up ends and corners.



When constructing an end to a straight length of wall, the last shutter unit in each course will alternatively be a **Full End** or a **Half End** unit.

When constructing a corner in a 200mm wall, one **Full End** unit will be required in each course. A **Stretcher** unit will always butt against the side of the **Full End** unit to complete the corner, and the side of the **Full End** unit will need to

be knocked out so that a **Connector** can be installed to connect it to the **Stretcher** unit.

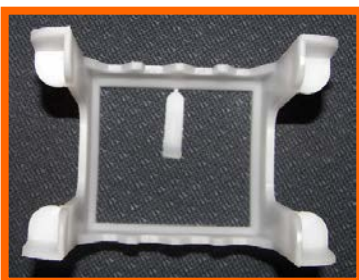


The knock-out is required for the continuity of grout and the installation of L bars that lap with the horizontal reinforcement.

Use a string line stretched between the ends or corners of each length of wall to align the top corner of each shutter unit, and fill in each course of shutter units maintaining tight perpends between all units. After the

course is laid, install a **Connector** at each perpend. Repeat this procedure on subsequent courses ensuring always that the perpends are tight and that the horizontal reinforcing bars are installed at the specified intervals.

## Alignment



If there are any shutter units leaning out of line, adjustments are made by using the break away plastic **Wedge** on the **Connector**. The wedges are used by inserting them under a shutter unit to lean the top of the unit back in line.

## Service Installation

Services are laid within the wall core prior to filling the wall, therefore no chasing in or remedial wall repairs are required.



## Lintels

Lintels can be achieved through a simple support/propping system and are formed in one operation during the core filling.



## Core Filling (Grouting)

Always use specially formulated grout. This should have a maximum 7mm aggregate and approximately 230mm slump. A minimum 20MPa compressive strength ( $f_c$ ) is recommended but always comply with the structural engineer's specification.

The laying of the shutter units and subsequent filling may be carried out up to a height of 3.2m; relevant Occupational Workplace Health and Safety Standards and Requirements should be observed.

It is recommended that workers lay up to seven courses working from ground level, then work from suitable scaffolding for the next and each subsequent lift of 7 courses. Whilst grouting the walls care should be taken to ensure the flow is regulated and individual shutter units and walls are continually checked for alignment.

Prior to filling with concrete, the walls are completely soaked with water to ensure moisture is not absorbed into the block shutter units. This is very important in hot weather conditions. Always rod the grout to ensure proper compaction. Manual rodding is recommended as mechanical vibration may fracture shutter units and result in blow outs during grouting. Wall bleeding indicates that the wall core has been filled adequately.



Upon completion of each grouting operation, clean off the top edges of the shutter units to ensure there will be no issues when the subsequent course of shutter units is laid. Also check that none of the units in the top course have been displaced laterally, that all the **Connectors** are pushed down onto their seating and that the four projecting posts of each **Connector** are free of grout.



## Finishes

Walls can be direct plastered with approximately 4mm skim coat finishes. On non-thermal structures a coat of approximately 4mm render provides good quality finish and cover.

# Structural Features

VB MORTARLESS has been designed by Structural Engineers.

All load bearing walls constructed of VB MORTARLESS rely entirely on the core fill grout for their strength in resisting both axial and transverse loads. Steel reinforcement is used to add strength both during and after construction and as always it is essential to provide adequate concrete cover to reinforcement if long term corrosion is to be avoided in walls that are exposed to the elements.

Not all mortarless walling systems provide adequate cover to the embedded reinforcement; VB MORTARLESS does and is 100% compliant with relevant international standard codes.

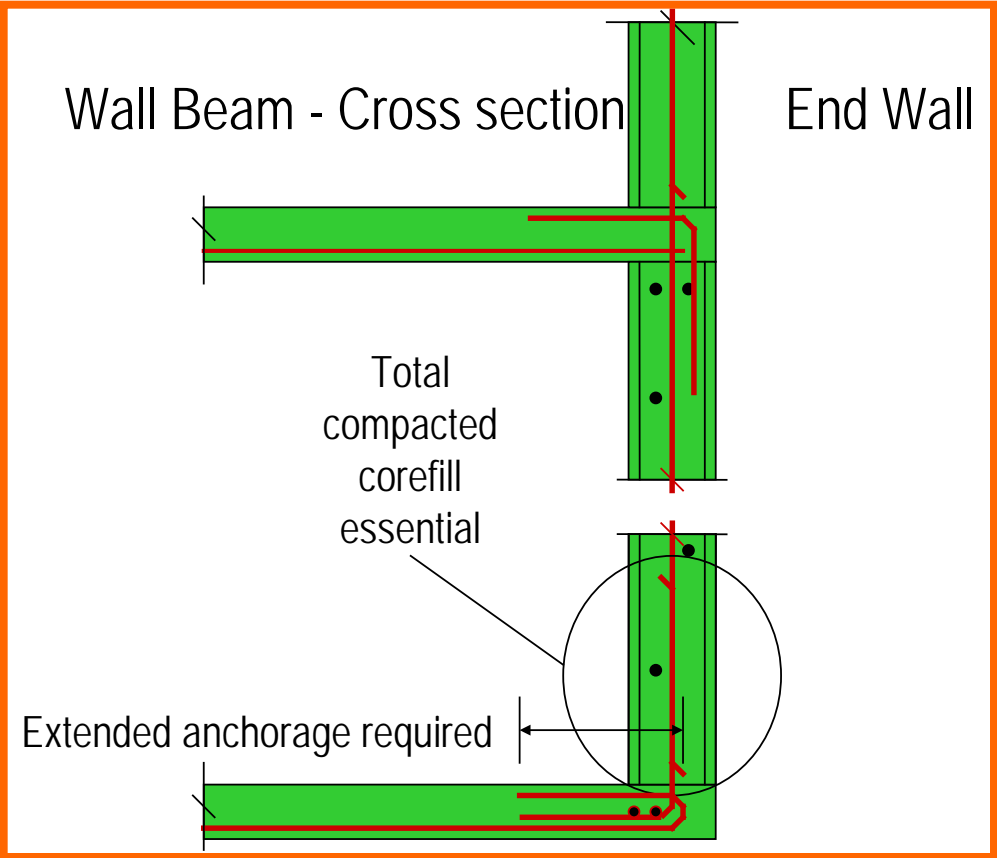
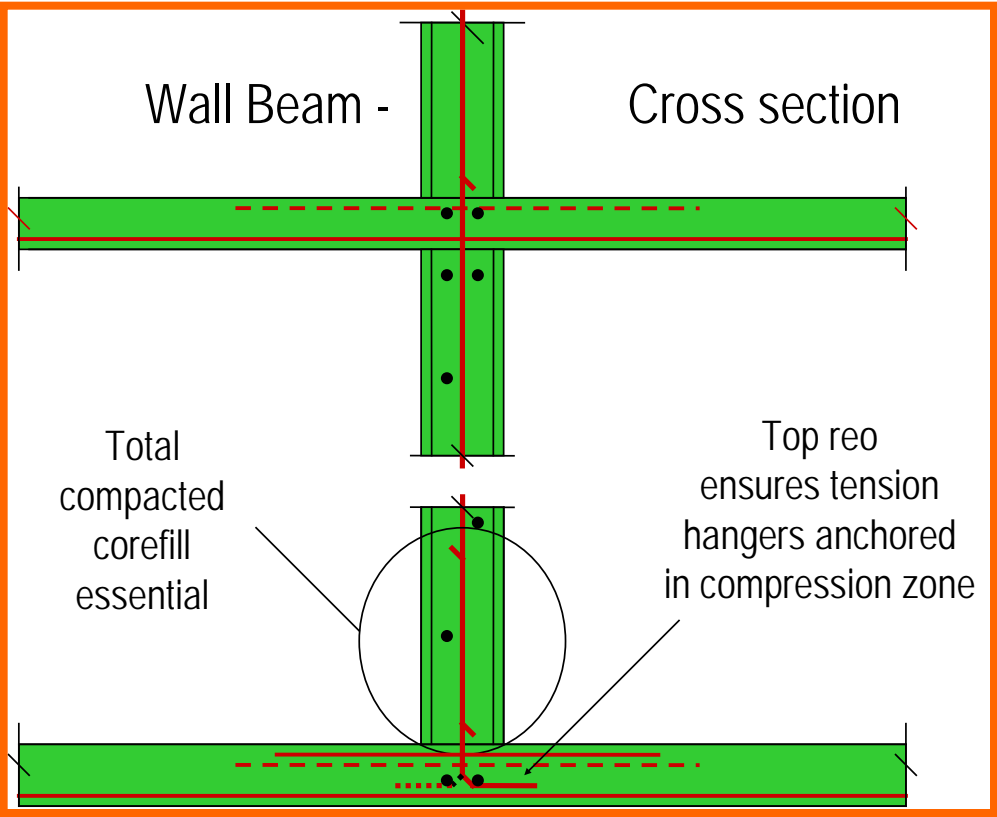
The ends of the shutter units have been especially shaped to ensure adequate grout cover and the plastic *Connectors* have been engineered to ensure that grout can readily and completely fill voids created by the shaped ends of the shutter units. These are the predominant features that differentiate VB MORTARLESS from the rest of the dry-stack walling systems.

Another important feature of VB MORTARLESS is the large chamfer along the inside top edge of both side walls of the shutter units. These chamfers allow grout to fill under the bottom surface of the shutter units in overlying courses and thereby maximise the effective load bearing width or thickness of walls constructed using the shutter units.

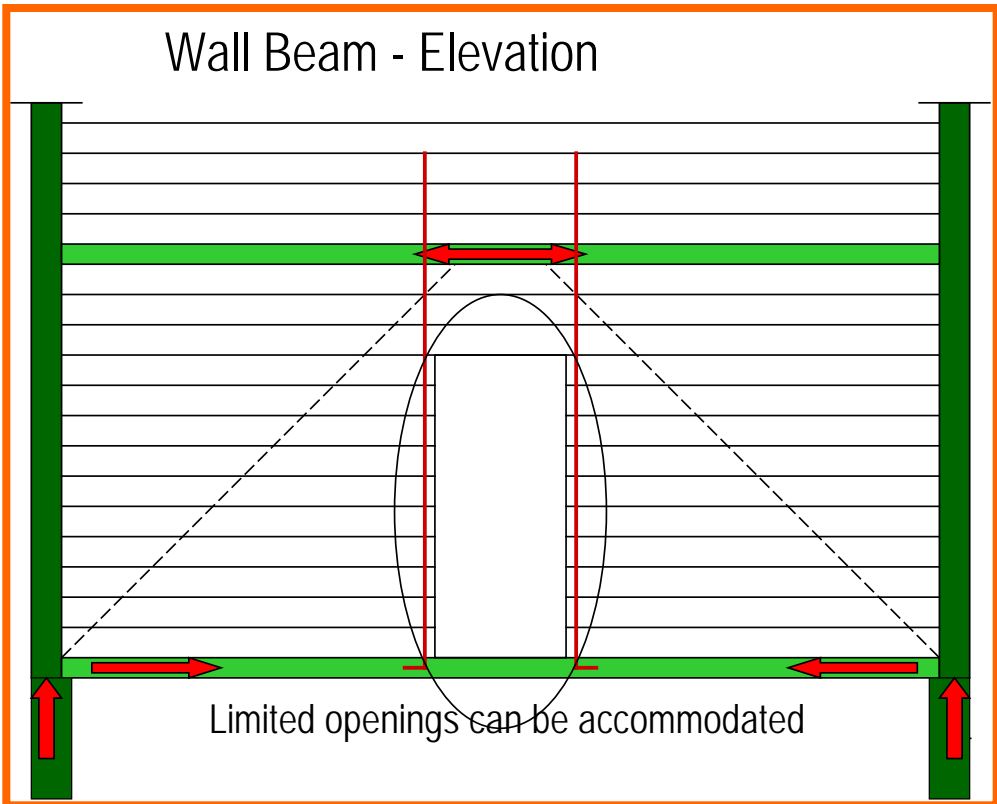
## Structural Applications

- Villas and Condominiums
- Basements
- Load Bearing Walls
- Retaining Walls
- Underground Service Pits and Trenches
- Lift and Stair Wells
- Fire Walls
- Noise Walls
- Fencing
- Shear Walls

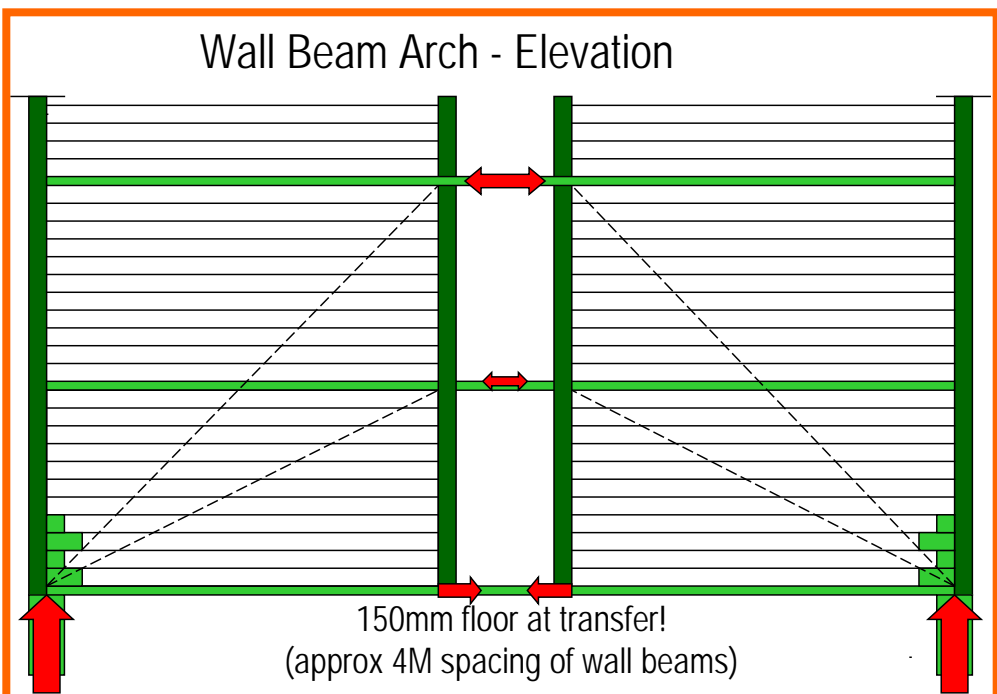
Construction Applications

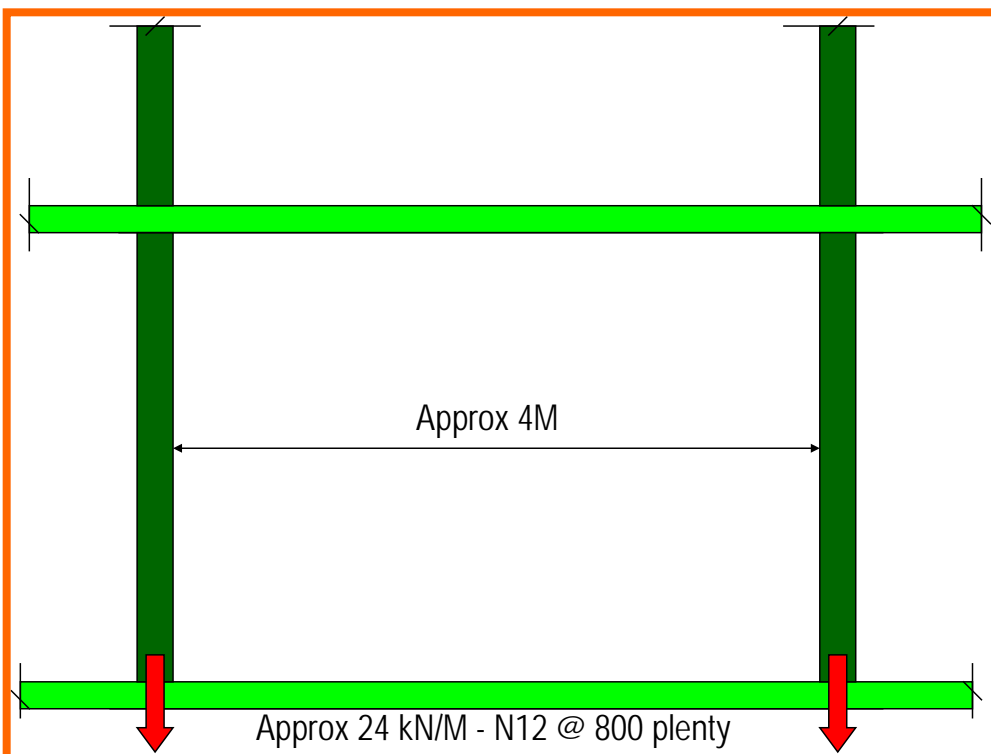
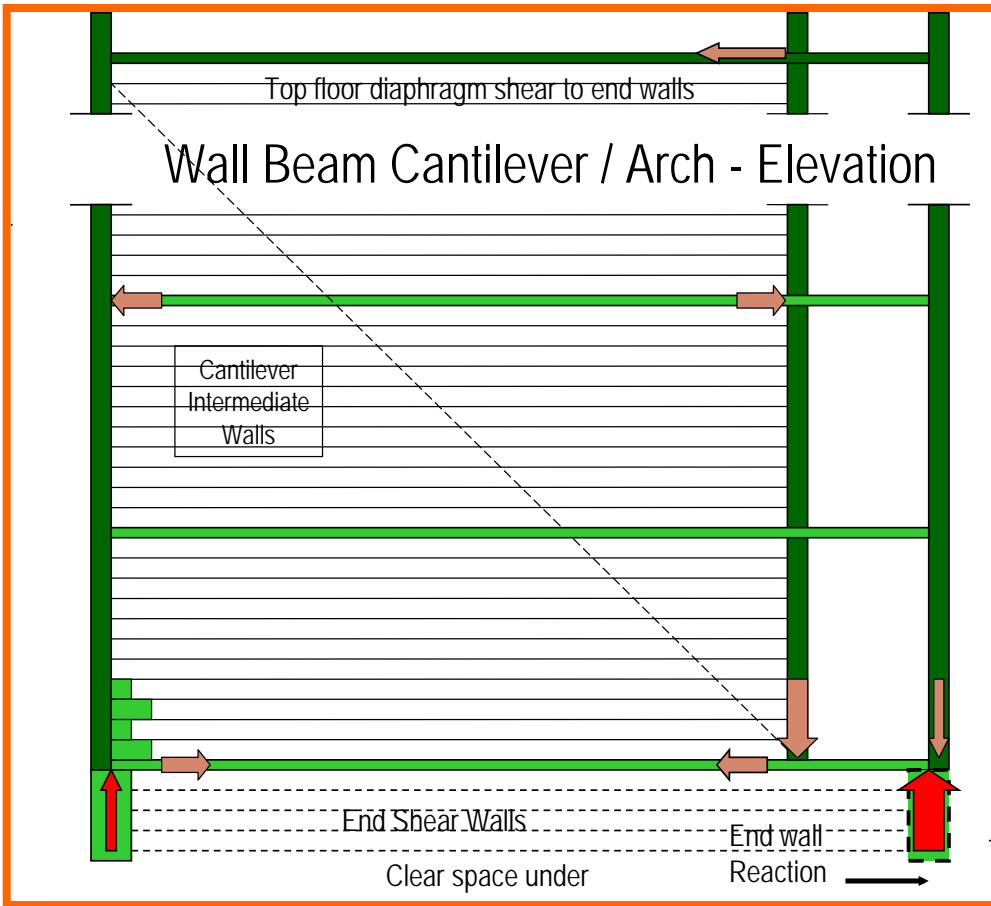


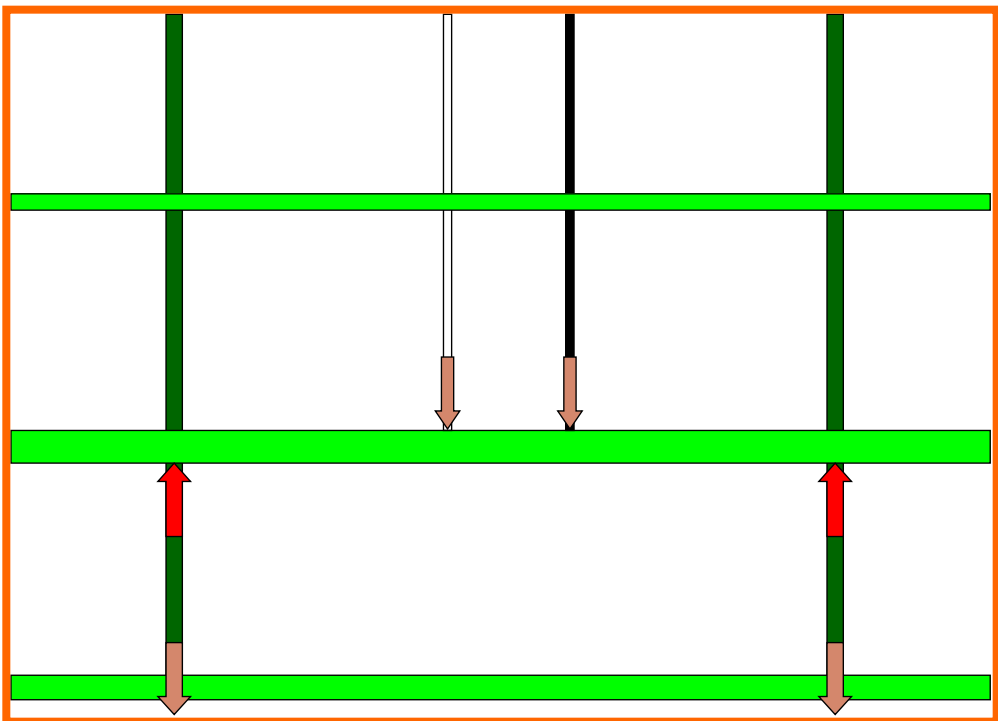
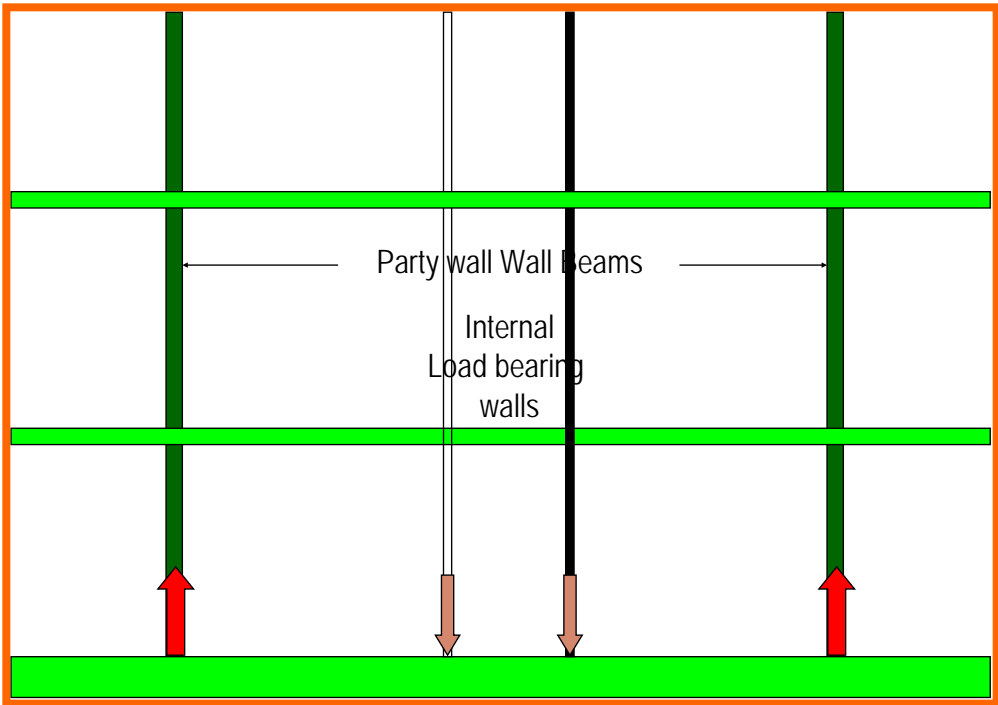
## Wall Beam - Elevation

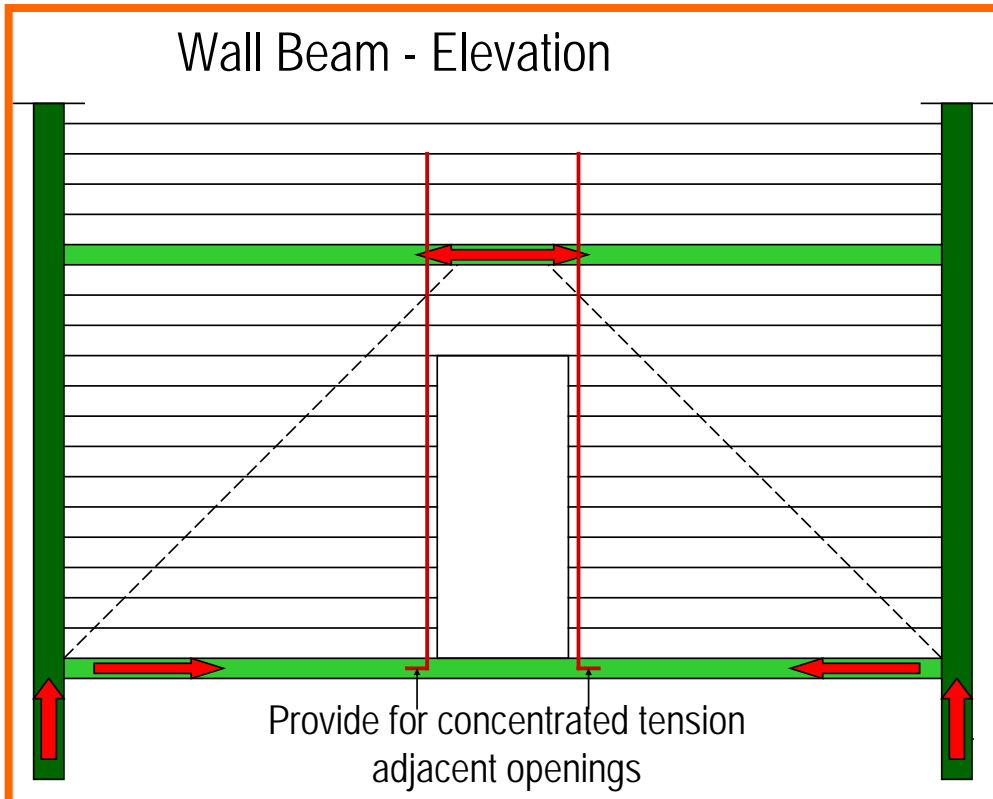
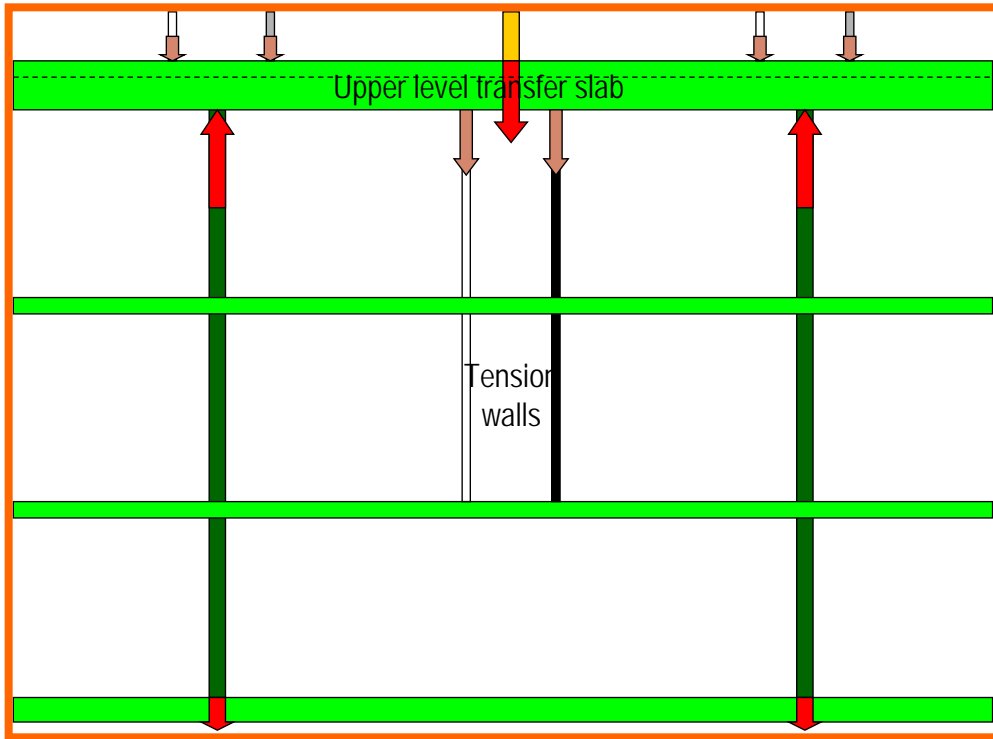


## Wall Beam Arch - Elevation

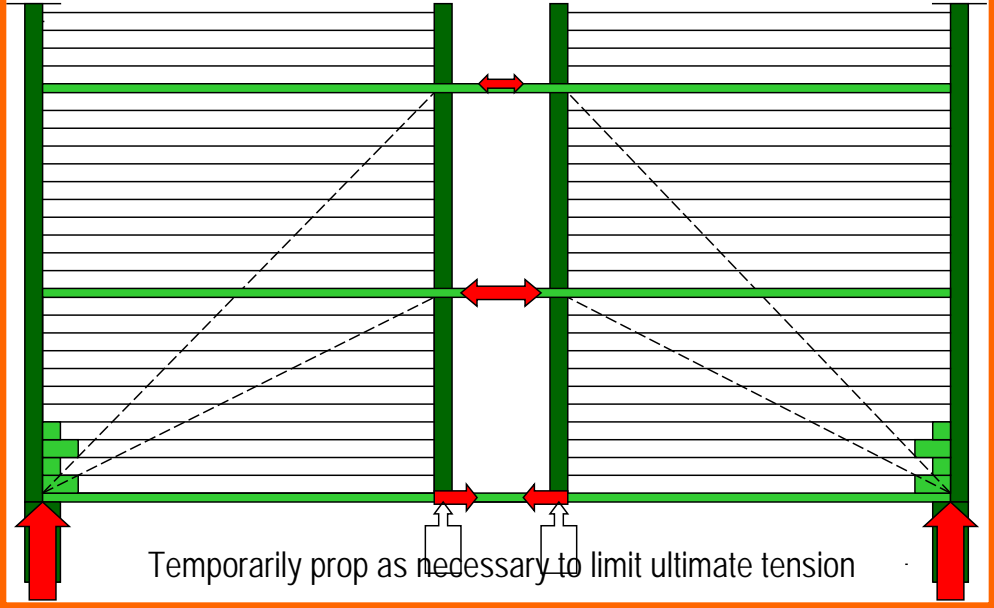




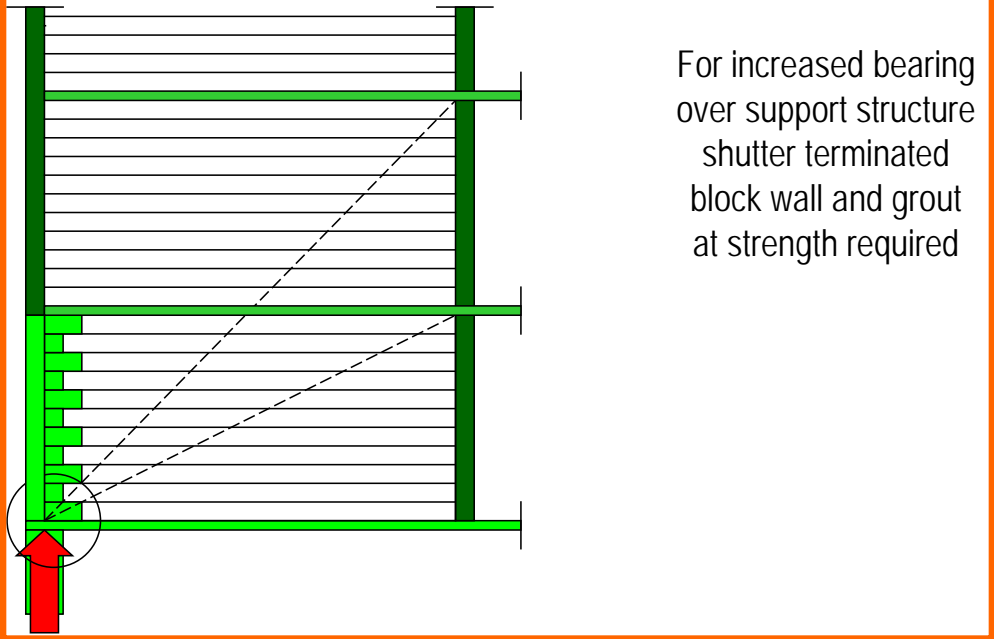


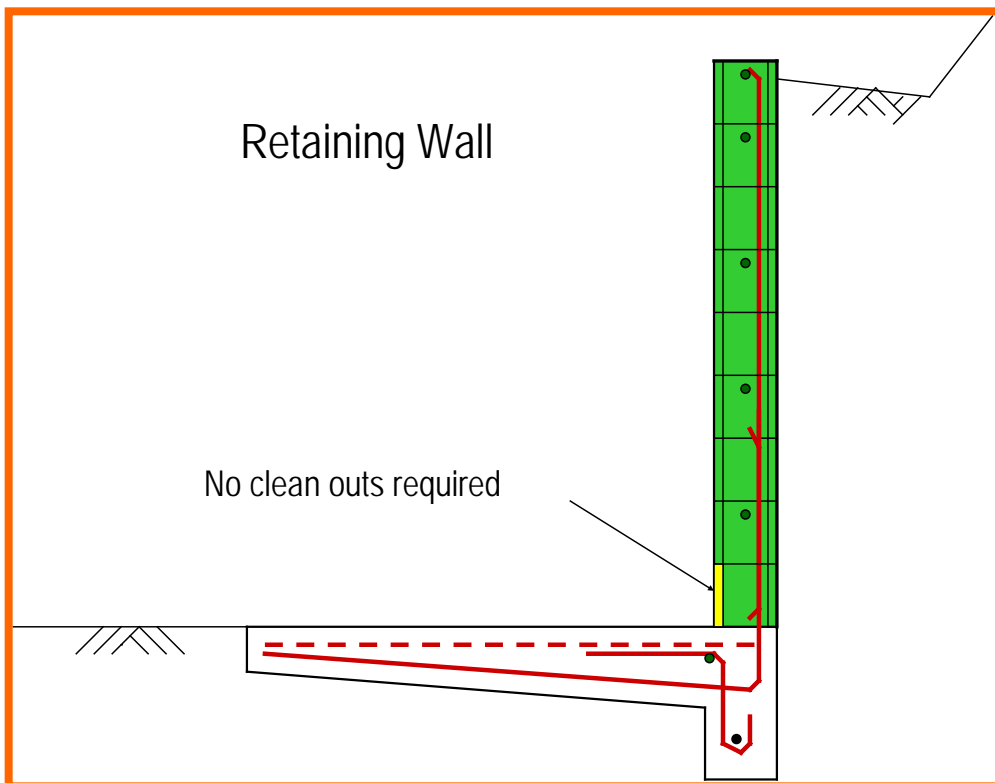
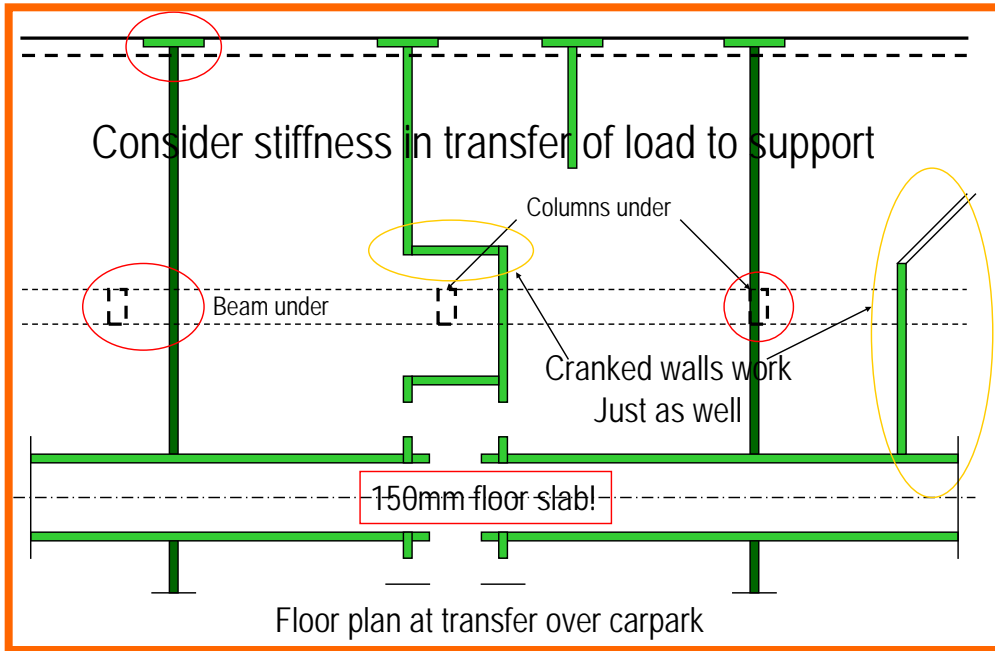


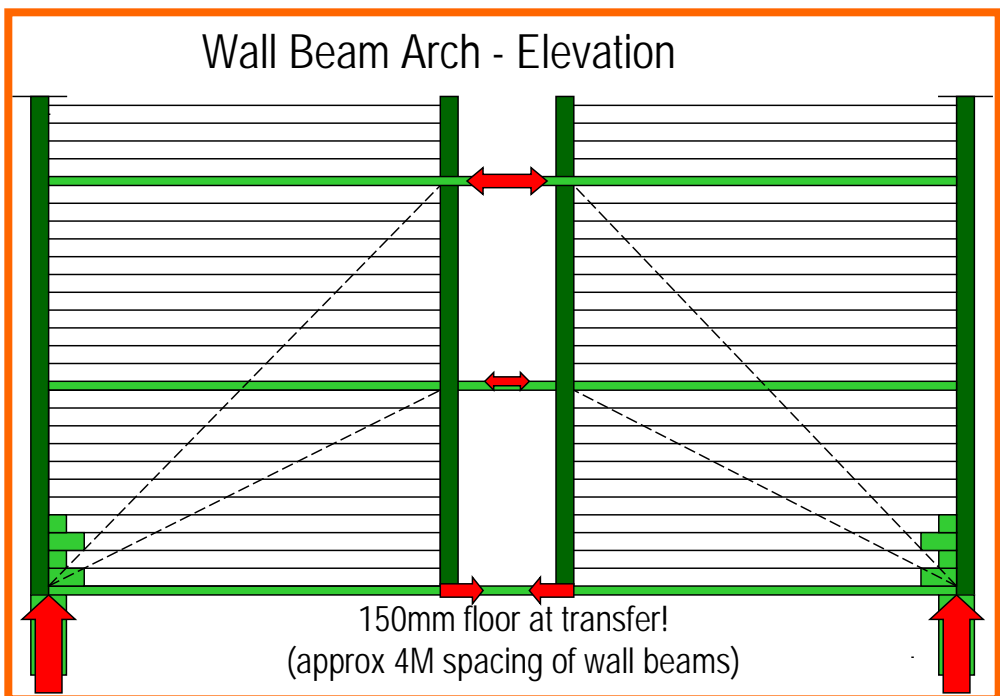
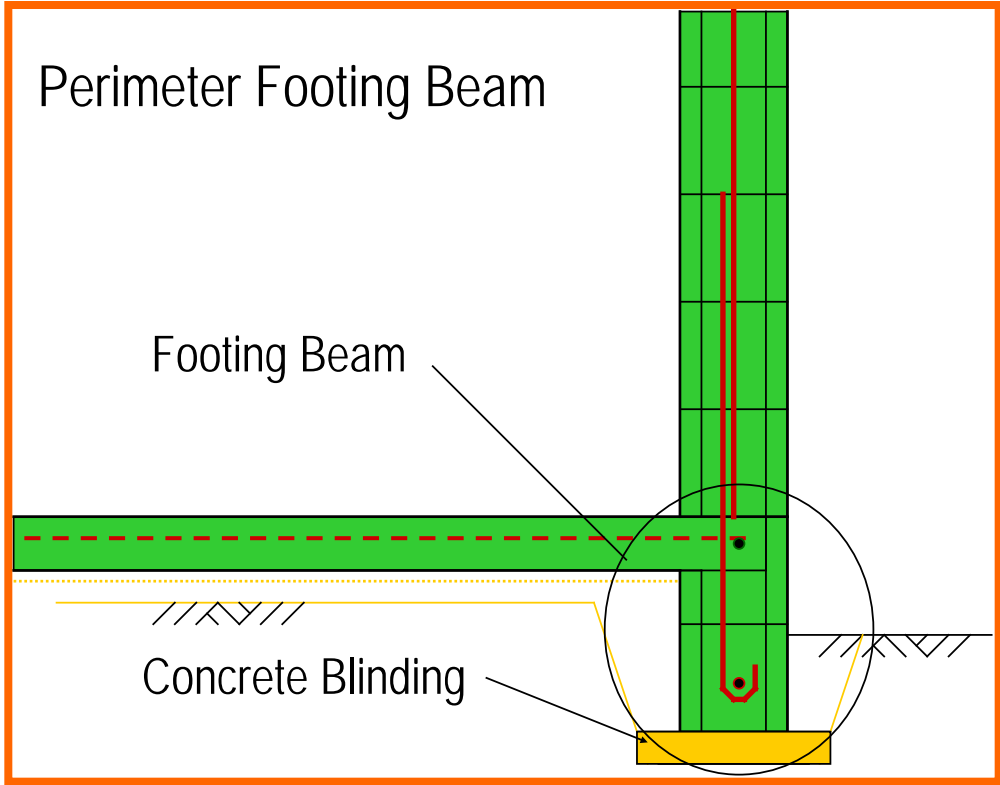
### Wall Beam Arch - Elevation



### High Concrete Bearing Stress







# Vision-Build MORTARLESS Concrete Walling Solution

**fast** up to seven times faster to lay than mortared masonry.

**easy** no mortar means far less skill required.

**clean** no mortar means **no mess** – no sand, no cement bags, no mortar droppings, no site clean up.

**all weather** shutter units can be laid when wet and they can be laid in the rain.

**code compliant** designed by structural engineers.  
Complies with all relevant International Building Codes and features significant **new innovations** to ensure maximum strength and reliability.



Vision-Build  
MORTARLESS Shuttering System

Supplied *exclusively* under license throughout  
the Middle East and North Africa

by



Vision-Build

**BUILT ON INNOVATION**

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