Masonry Reinforcement and Windposts

Bed Joint Reinforcement

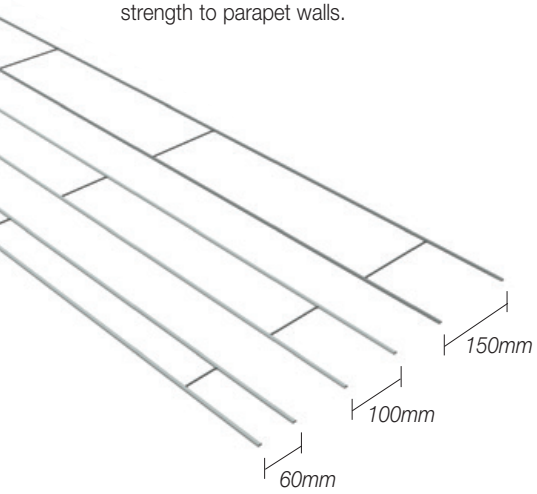
Bed joint reinforcement is used to improve the structural performance of masonry walls by providing additional resistance to lateral loads e.g. wind. It can also be used to reduce the risk of cracking either at stress concentrations around openings or as a result of movement, including the control of shrinkage. A structural engineer should be consulted to assess the spacing of control joints and bed joint reinforcement.

Bed joint reinforcement may be used in both main and secondary reinforcement applications for a variety of purposes and locations, as set out in the table below.

Purpose / Location	Ladder Type Reinforcement
Increase panel sizes	✔
Increase movement joint spacing	✔
Feature courses, corbels, plinths	✔
Corner and T junctions	✔
Stack-bonded panels	✔
Differential movement control	✔
Above and below openings	✔

In walls which have door and window openings, bed joint reinforcement can reduce the frequency of control joints. Reinforcement should be provided in the first and second courses above and below all openings and should extend no less than 600mm either side of the opening.

Bed joint reinforcement can also be used near the top of the structural walls abutting concrete roofs and to provide additional strength to parapet walls.



Available in a range of widths and wire diameters

Ancon AMR 'Ladder Type' Masonry Reinforcement

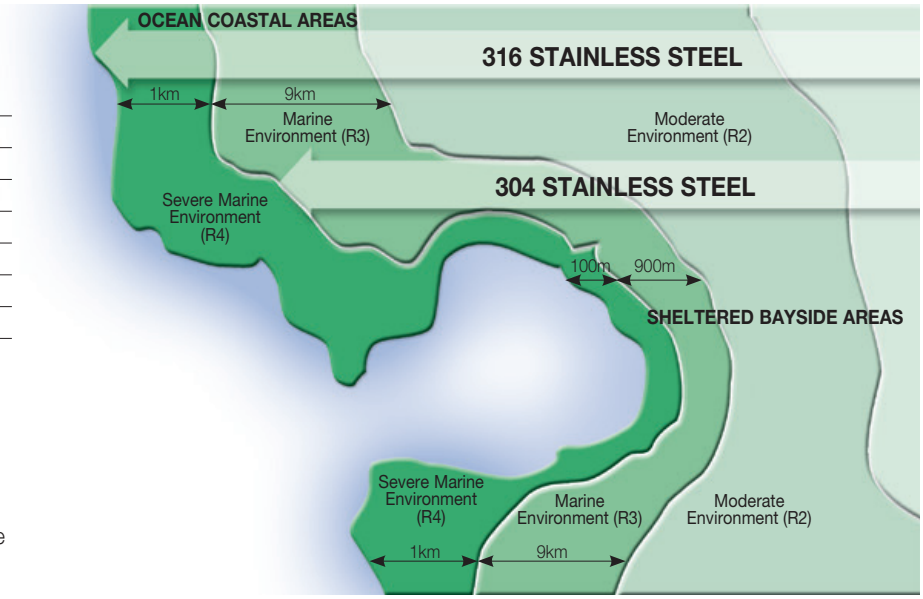
Available in various standard configurations, Ancon AMR and AMR-X suit a wide range of structural load conditions and wall widths. The longitudinal wires have a minimum characteristic yield strength of 500 MPa.

The range of Ancon masonry reinforcement is tested and manufactured to EN 845-3 to ensure the highest quality and complies with AS 3700. Wires are flattened to 3mm ensuring the longitudinal bars have space in the joint to be surrounded by mortar.

Durability

Material selection will be determined by the location of the building. Grade 304 can be used in all but the most aggressive applications and Grade 316 should be used in severe marine, industrial and below DPC with aggressive soil.

Durability Exposure Map



Materials

Available in both grade 304 and 316 stainless steel, Ancon masonry reinforcement provides the greatest corrosion resistance and life-cycle costing benefits.

Wire Diameters

Manufactured from three wire sizes which, after flattening, have an equivalent wire diameter of 3.0, 4.0 and 5.0mm, the range suits the majority of load conditions. AMR-X is available from stock in 4mm wire diameter with the other sizes available to order.

AMR Size	Cross Section Area mm²	
	Per Wire	Total
3mm AMR	7.07	14.14
4mm AMR	12.57	25.14
5mm AMR	19.63	39.26

Depth

The main longitudinal wires are flattened to less than 3mm. These wires are joined by cross wires welded in the same plane at 450mm centres. This profile ensures good mortar cover is maintained, even when the product is lapped or used with wall ties.

Length

Manufactured in standard lengths of 2700mm.

Widths

Standard AMR is available in three widths (60, 100 and 150mm), and can be used in wall widths from 90mm to 190mm. Care must be taken in selecting the correct width of reinforcement which should be 30mm - 50mm less than the width of the masonry unit.

AMR-X is stocked in a standard 60mm width for use in 90mm and 110mm masonry units. Other widths are available to order.

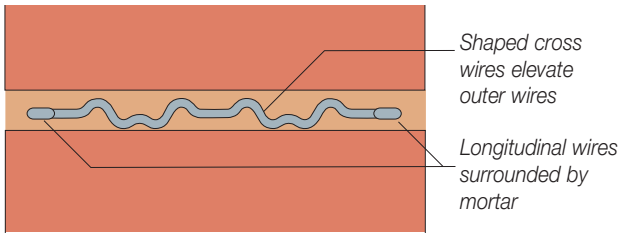
Ancon AMR-X, Enhanced Masonry Reinforcement

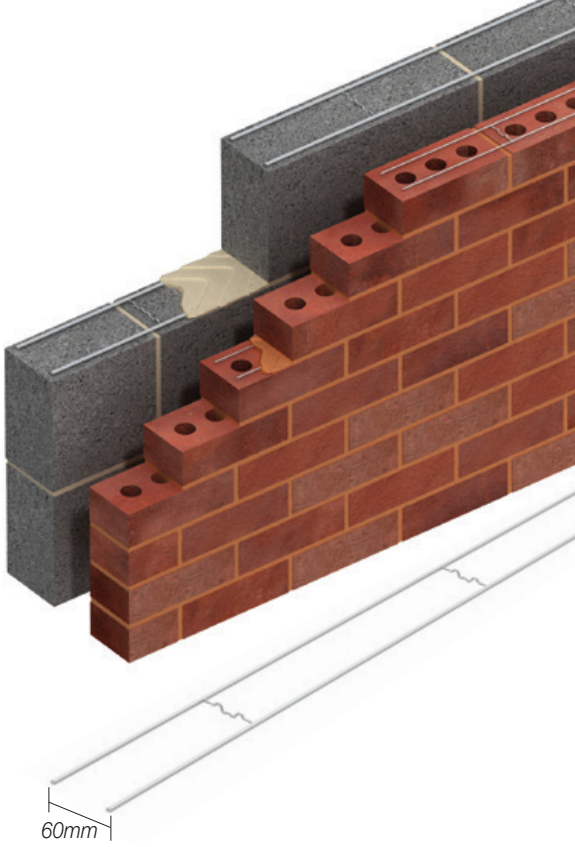
When compared to other ladder-type reinforcement, Ancon AMR-X can accelerate the speed of construction, improve build quality and reduce the requirement for site supervision.

To provide additional resistance to lateral loads and improve the structural performance of a masonry wall, it is important that the reinforcement is surrounded by mortar.

The designed performance of a wall panel may not be achieved if the bed joint reinforcement is simply laid directly onto dry masonry with a mortar layer applied above. Unfortunately, research has shown that this is common site practice, which led us to develop the new AMR-X reinforcement.

The product is based on standard Ancon AMR masonry reinforcement, but with shaped rather than straight cross wires. This innovative design is a simple, cost-effective way to correct poor site practice.





If applied to dry bricks or blocks, only the cross wires are in contact with the masonry; the longitudinal wires are elevated. When the next masonry unit is lowered, the mortar layer disperses around the steel, leaving the reinforcement fully surrounded.

The cross wires have been designed so the AMR-X can be installed either way up.

AMR-X is available in various configurations, suitable for brickwork or blockwork, internal or external walls and the majority of load applications.

BIM Objects

BIM objects for AMR-X masonry reinforcement are available to download from www.ancon.com.au/downloads/bim-object-library

'Using Ancon AMR-X will ensure bed joint reinforcement is accurately installed without compromising on build time'.

Structural Engineer

'I have recommended that we use this product as it can eliminate the risk of inadequate mortar bond around bed joint reinforcement'.

Site Manager

Specification / Identification

AMR is specified using the simple reference structure shown below. Each length of AMR is marked with a product reference to aid identification on site.

Material Reference — *Width (mm)*

e.g. **AMR/S304/D3/W60**

Product Code — *Wire (mm)*

Equivalent wire diameter after flattening

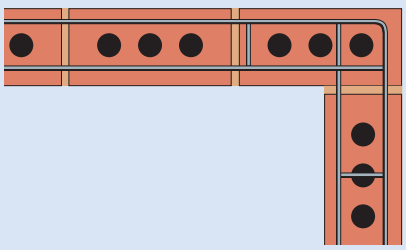
AMR and AMR-X Typical Applications

Masonry Width	Wire Dia.	Material Grade	Cross Wire	Product Reference
90/110	3	304	AMR	AMR/S304/D3/W60
	3	316	AMR	AMR/S316/D3/W60
	4	304	AMR	AMR/S304/D4/W60
	4	304	AMR-X	AMR-X/S304/D4/W60
	4	316	AMR	AMR/S316/D4/W60
140/150	4	304	AMR	AMR/S304/D4/W100
190/200	4	304	AMR	AMR/S304/D4/W150
	5	304	AMR	AMR/S304/D5/W150

Note: Other sizes available to order

Corners

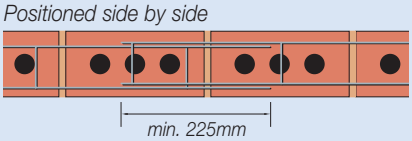
Corners are formed on site by cutting the inner wire and bending the outer wire.



Laps and Positioning

Laps should be a minimum of 225mm in length and must include at least one cross wire. The lap can be achieved by either stacking the product or positioning lengths side by side. The position of laps should be staggered throughout the masonry panel.

Positioned side by side



Stacked

Overall thickness when lapped is max. 6mm

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Reinforcing Stack-Bonded Masonry

Stack bonding has a distinctive uniform bond pattern and is often detailed for its aesthetic appearance without consideration for its design limitations.

Where masonry units are stacked one above the other, the lack of bonding between them will greatly reduce the overall flexural strength of the panel and the ability of the wall to spread vertical loads. In stack bonded masonry, concentrated loads will be carried down to the support by the particular vertical 'column' of masonry under load, with little distribution to adjacent masonry. Ancon AMR Masonry Reinforcement, located in the bed joints, will increase the panel's flexural strength and improve the capacity to resist lateral loads and spread vertical loads.

AS 3700:2018 defines stack bonded masonry as masonry in which the overlap of masonry units in successive courses is less than ¼ of the unit length or 50mm, whichever is greater. Clause 4.12 sets out the minimum requirements for bed joint reinforcement in a stack bonded wall:

Extract from AS 3700:2018 Clause 4.12
Bed joint reinforcement shall be spaced vertically at centres not exceeding six times the thickness of the stack bonded leaf and shall have an area not less than 0.00035 the gross vertical cross sectional area of the wall.

Bed joint reinforcement shall also be placed in the first joint above and below unrestrained edges and within 300mm of a horizontal line of lateral support. See adjacent illustration.

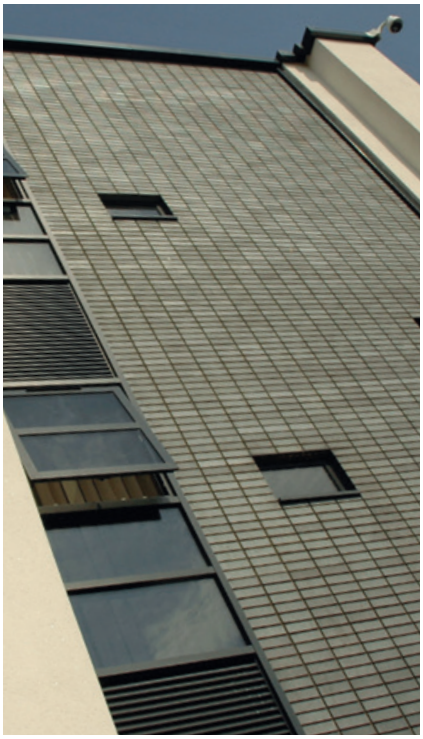
Examples

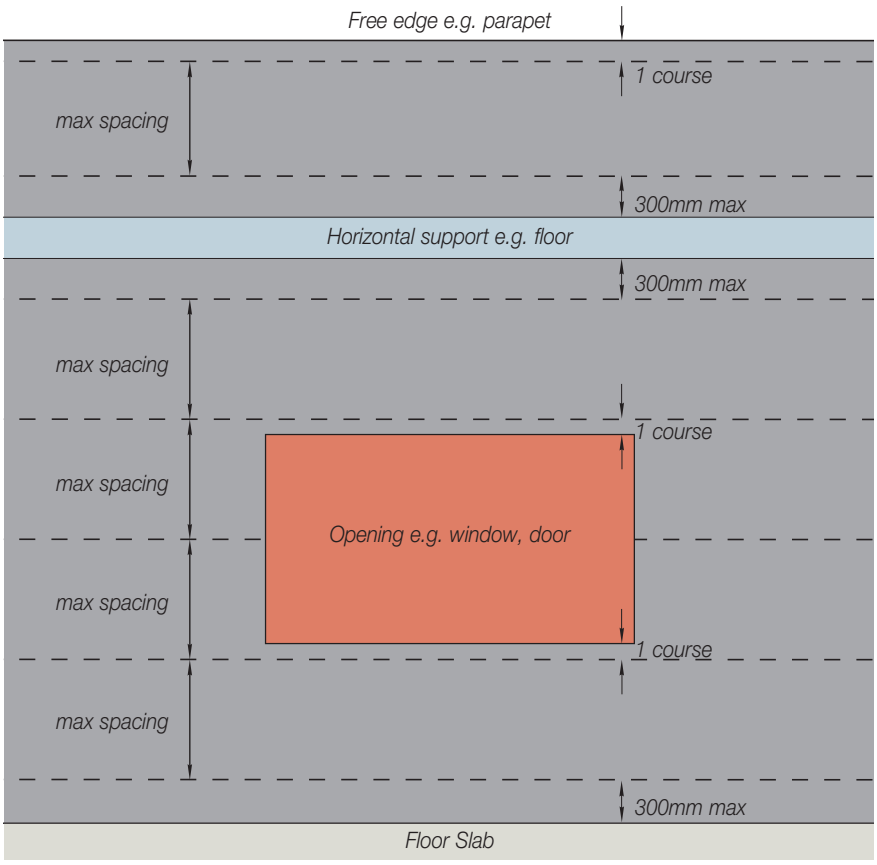
For 110x76 brick unit walls over 1.5m high 4mm diameter bed joint reinforcement should be placed in the third bed joint from the top and bottom of the wall panel and then in every fifth joint.

For 150x200 block unit walls over 1.5m high 4mm diameter bed joint reinforcement should be placed in the first bed joint from the top and bottom of the wall panel and then in every second joint.

Our technical team can advise on spacing for other masonry unit and wall heights. Contact us on 1300 304 320 or email info.ancon.au@leviat.com

Please note that these are minimum requirements to stabilise the stack bonded masonry. The project structural engineer may specify more than this to add additional strength to the wall panel.





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