TYPE OF CONSTRUCTION	RAFTER/TRUSS SPAN IN METRES								MAXIMUM CLEAR SPAN		
	3	4	5	6	7	8	9	10	ARCH BAR *75 x 100 x 10	ARCH BAR *100 x 75 x 10	ARCH BAR *150 x 90 x 10
	LOADING CATEGORIES										
TYPE A Brick veneer construction with non load-bearing brickwork. Roof structure supported on timber frame.	1	1	1	1	1	1	1	1	2000	2700	4100
TYPE B Lightweight metal roof and ceiling supported on single skin brickwork.	1	1	1						2000	2700	4100
				2	2				1800	2500	3700
						3			1700	2300	3300
							4	4	1500	2000	2900
TYPE C Double cavity brick with roof supported uniformly on both skins of brickwork.	1	1	1	1	1				2000	2700	4100
						2			1800	2500	3700
							3	3	1700	2300	3300
TYPE D Tiled roof with truss/rafter construction supported on a single skin of brickwork.	1								2000	2700	4100
		2							1800	2500	3700
			3						1700	2300	3300
				4	4				1500	2000	2900
						5	5	5	REFER DESIGN TO A STRUCTURAL ENGINEER		
TYPE E Lower floor of two storey construction									REFER DESIGN TO A STRUCTURAL ENGINEER		

The above table is provided as a guide for a range of loading applications. Many more loading applications are possible and a comprehensive stock range is manufactured for your selection.

STANDARD STOCK SIZES

INGAL Arch Bar	Length (Metres)																													
Section Size (mm)	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.6	4.0	4.5	5.0	5.5	6.0
*75 x 10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓																				✓
*75 x 100 x 10				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓									✓
*150 x 90 x 10 (*Nominal Sizes)													✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

The required INGAL Arch Bar length is the listed maximum clear INGAL Arch Bar span plus twice the required end bearing which for structural (load bearing) brickwork is typically:

* 75mm x 100mm x 10mm INGAL Arch Bar ~ All spans up to 2000mm = Clear Span + 200mm
* 100mm x 75mm x 10mm INGAL Arch Bar ~ All spans = Clear Span + 300mm
* 150mm x 90mm x 10mm INGAL Arch Bar ~ All spans = Clear Span + 300mm

N.B. Where the brickwork does not comply with the 'Brickwork Code', the bearing capacity of the brickwork should be checked by a Structural Engineer.

Available from

Arch Bar 10/02

INGAL BUILDING SYSTEMS A division of INGAL Civil Products ACN 000 545 415

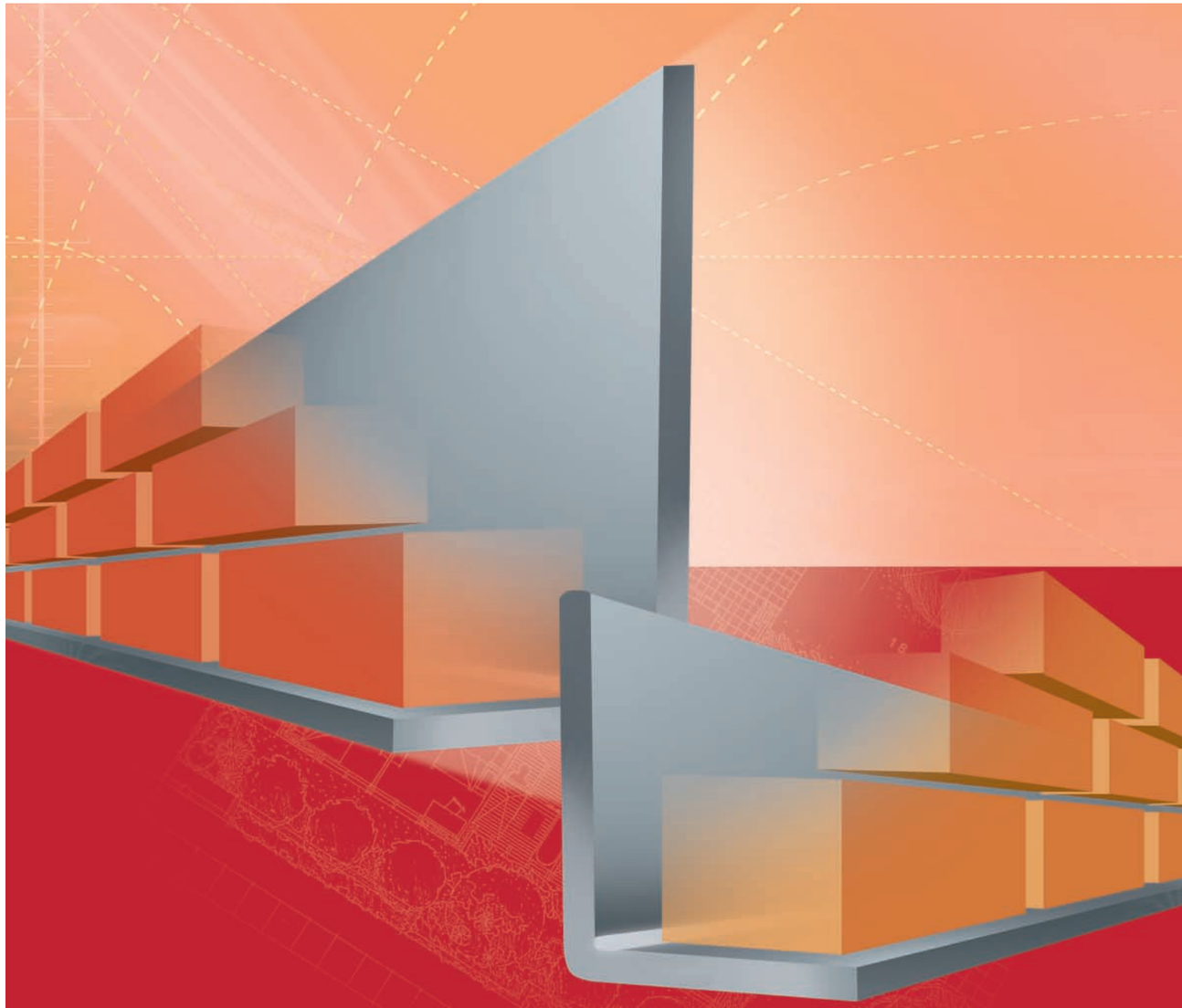
NEW SOUTH WALES 312 Pacific Highway, Hexham NSW, 2322
VICTORIA 28-38 Albert Street, Preston VIC, 3072
QUEENSLAND 90 Mica Street, Carole Park QLD, 4300

Tollfree: **1800 701 555**

Quality Endorsed Company AS3902/ISO9002

INGAL

Arch Bar



The heavy duty bar for greater loads.

- Hot dip galvanized to AS/NZS 4680-1999
- Ease of fitting
- Durability guaranteed

DEVELOPED IN AUSTRALIA FOR SUPPORTING BRICKWORK IN AUSTRALIAN HOMES.

INGAL Arch Bar

FEATURES

1. Hot Dip Galvanized to Australian/New Zealand Standard AS/NZS 4680:1999.
2. Complies with Durability Ratings up to R3 of AS/NZS 2699.3 (Built-in components for masonry construction).
3. Building code approved. INGAL Arch Bars satisfy the appropriate requirements of the following codes:

- AS 3679:1996 (Hot rolled bars – grade 250 or equivalent)
- Hot dip galvanizing code – AS/NZS 4680:1999
- Masonry structures code – AS 3700:2002
- Built-in components for masonry construction code – AS/NZS 2699.3
- Loads – AS 1170.1:1989+A1 and AS 1170.2:1989+A1+A2+A3.
- Steel Structures Code – AS 4100:1998

LOADING CATEGORIES

There are five loading categories normally encountered in domestic and light commercial construction. These categories are listed on the basis of using conventional building practices and framing material. Whenever INGAL Arch Bars are selected, it is necessary to take into account the span of the roof rafter/truss in addition to the clear span of the window or doorway above which the INGAL Arch Bar will be installed.

To help select the appropriate INGAL Arch Bar for the application follow four easy steps **(& refer to table overleaf)**:

1. Identify the type of construction (**from diagrams A-E**)
2. Ascertain rafter or truss span over the opening
3. Determine the loading category (**1-5**) based on rafter or truss span in metres for each type of construction
4. Follow the line across from the loading category column to the maximum clear span recommended for each INGAL Arch Bar

- For **construction type A**, and a rafter/truss span of 6 metres, the loading category is 1, and you could use the *75 x 100 x 10 INGAL Arch Bar up to a maximum clear span of 2000mm, or the *150 x 90 x 10 INGAL Arch Bar up to a maximum clear span of 4100mm.

Hot Rolled and fully hot dip galvanized for maximum performance

THE IMPORTANCE OF PROPPING

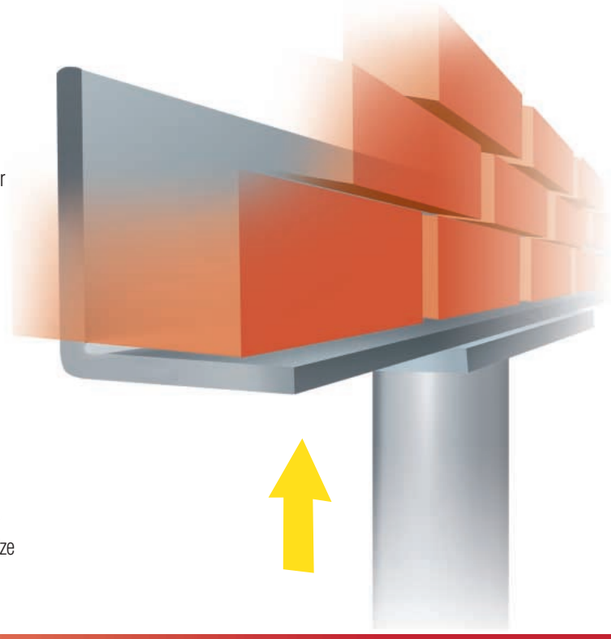
When an INGAL Arch Bar supports masonry over an opening, the load can be shared by three load carrying mechanisms acting either alone or in conjunction with the others, i.e:

- by the INGAL Arch Bar acting as a structural angle alone;
- by composite action between the INGAL Arch Bar and masonry acting together much as reinforced concrete does;
- by the arching action of the masonry acting alone.

It should be noted however, that due to potential variability of the magnitude of composite action (ie from full capability to near zero), the design of INGAL Arch Bar excludes any allowance for loads being carried by this mechanism. Similarly the extent of arching action depends on the depth of brickwork and to a lesser extent the degree of end restraint, and for small numbers of courses the arching effect is minimal. Accordingly, the load charts for INGAL Arch Bars relies solely on the INGAL Arch Bar acting as a structural angle alone without composite or arching action.

Nonetheless, where many courses of brickwork are built over an INGAL Arch Bar, the arching action that occurs limits the load that the masonry itself applies to the INGAL Arch Bar, however as the masonry can only develop arching action after the bonding mortar has hardened to near full strength, it is possible to overload an otherwise adequate INGAL Arch Bar due to the weight of many courses of fresh brickwork. Under these circumstances, there is a likelihood of excess deflection being induced during brickwork construction and the INGAL Arch Bar must be propped to avoid the (temporary) overload and the accompanying unattractive sagging deflections that can result.

Thus the propping of INGAL Arch Bar is recommended where masonry is built up at a rate faster than that at which the masonry becomes self supporting due to arching action (the usual case on most building sites), particularly where the Arch Bar span approaches the maximum for that size INGAL Arch Bar.



LOADING CAPACITIES & RESTRICTIONS

For load bearing walls, it is recommended that there must be at least three courses of brickwork over the opening. In any INGAL Arch Bar application, it is assumed that all loads are uniformly distributed and the opening should not be subjected to any point loading other than the normal structural loads generated by the roof, walls and floors of the structure.

Point loadings generated by hot water systems or roof space storage areas should not be located over the opening.

Category 5 loadings which support load bearing internal and external brickwork in two storey buildings should be referred to a structural engineer to determine if INGAL Arch Bars are appropriate for the application.