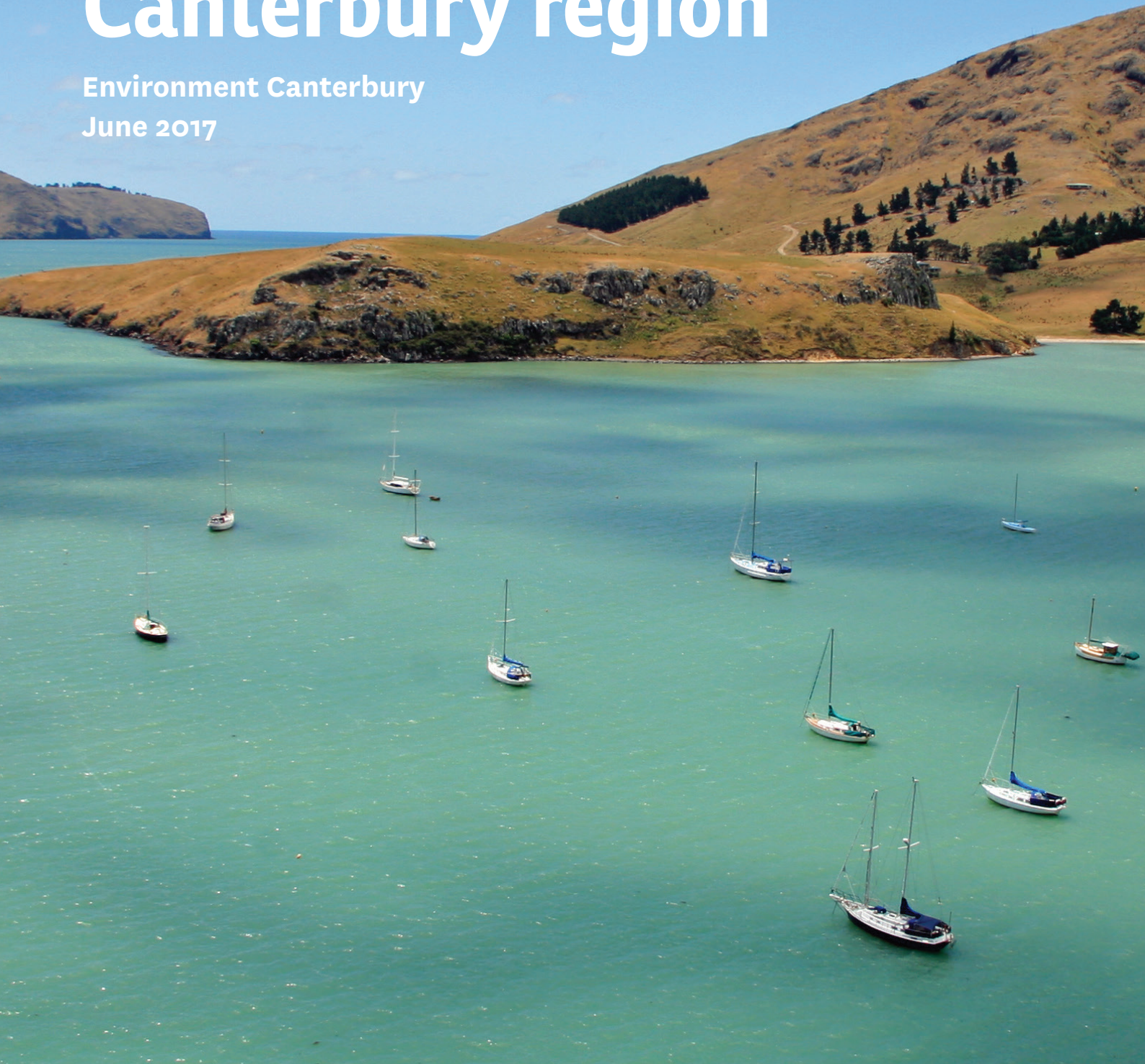


Swing mooring specification for the Canterbury region

Environment Canterbury

June 2017



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Swing Moorings

This booklet provides guidance on swing moorings within the Canterbury region. The booklet contains information on specifications for mooring construction. These specifications have been compiled by the Harbourmaster in conjunction with mooring contractors, mooring owners, boat clubs and a naval architect.

Introduction

There are many different methods of constructing a secure mooring for a vessel.

The specifications provided in this booklet are:

- moorings suitable for vessels up to a maximum of 12m length overall and a maximum displacement of 20 tonnes, and
- Include provisions allowing moorings for larger vessels, and
- Allow alternate mooring types to be used following an assessment and approval.

Where a vessel owner wishes to make use of a different mooring type, to moor a vessel in excess of 12m length overall or 20 tonnes displacement, or have a non-standard area of swing room, they must gain the approval of the Harbourmaster. An application for approval of mooring system and/or swing room will need to demonstrate a standard of safety equivalent to, or greater than, the Environment Canterbury specifications.

Many of the moorings currently in use will have been constructed to an older specification. These moorings may continue to be used, however, where any component of the mooring is replaced, that component must be replaced to meet the new specifications. This will allow a period of time for all moorings to be brought up to the requirements of this specification but will not require owners to replace components of an older system that remain usable.

Components of a Mooring System

The quality of individual mooring components can vary considerably. A mooring owner must ensure only suitably high quality components are used. Where any doubt exists it is recommended that professional advice is sought from a suitably competent mooring contractor, mooring association and/or naval architect.

Mooring Blocks

A mooring may be secured to the seabed by a variety of methods. This specification makes use of concrete blocks but allows a mooring owner to apply to the Harbourmaster to make use of a different mooring block/securing system. An application for approval of mooring block/securing system will need to demonstrate a standard of safety equivalent to, or greater than, the Environment Canterbury specifications.

Mooring Maintenance and Inspection

The safety of a mooring is the responsibility of the mooring owner. The mooring system must be inspected at least annually to assess its condition. A mooring must be maintained in good condition with the wear of any component not exceeding the maximum wear tolerances set out in this booklet. Some components may require replacement even if they have not reached the maximum wear tolerance. Pitting, bending, stretching or signs of localised wear may indicate a component requires replacement. A mooring block, or any other securing device, must be thoroughly inspected at intervals not exceeding 10 years. The condition of the mooring block ring, or securing device attachment point, and the condition of the mooring block/securing device construction must be established. The wear of any component must not exceed the maximum wear tolerances set out in this booklet.

Swing Room and Vessel Length

In assessing the location of a swing mooring the Harbourmaster's Office undertakes an assessment that allows moorings to be spaced at a suitable distance apart to minimise any possible conflicts between moored vessels. Vessel length is used to ensure sufficient swing room is available and thus mitigate possible damage to vessels. Vessel length should include bowsprits, davits, boomkins, bathing platforms and other such items to ensure suitable swing room is provided. Vessel length for determining the mooring specification is the length of the vessel without the spars or overhanging items. If you are in any doubt please contact the Moorings Officer to discuss the matter. We all want vessels to be securely moored and remain un-damaged.

Mooring Installation

When mooring is installed, the mooring owner and or mooring contractor must ensure the mooring is located in the position provided by the Harbourmaster's Office and that they are satisfied there is a suitable depth of water for their vessel to moor safely. Where any concern exists please contact the Moorings Officer at the Harbourmaster's office. Only authorised persons may install moorings.

Mooring Specification

This specification, for moorings within the Canterbury region, requires that a mooring must be:

- 1 Constructed in accordance with table 1 of this booklet, or
- 2 Constructed to a specification providing an equivalent level of security and safety and that is approved by the Harbourmaster, and
- 3 Make use of a mooring block meeting the specifications of block type 1 or 2 (as noted in this booklet), or
- 4 Be secured to the seafloor in a manner providing an equivalent level of security and safety and that is approved by the Harbourmaster.

Mooring Buoy

The mooring buoy must be a specific bright colour and, if hollow, must be filled with foam or other material to prevent the buoy sinking if it becomes damaged. The swing mooring number must be engraved on top in lettering not less than 300 high and painted in a contrasting colour. A mooring may be marked by a larger buoy, supporting the weight of the top chain, or a smaller 'pick-up buoy' at the owners discretion.

Colour Code for mooring buoys

Yellow for vessels up to 6m length

Orange for vessels up to 12m length

Blue for vessels over 12m length

TABLE 1 - Minimum Swing Mooring Specification - Banks Peninsula

(please also refer to the notes below)

		Vessel Category		
		Length M Displacement		
Item		A	B	C
		< 6 m, and < 3 t	< 10 m, and < 12 t	< 12 m, and < 20 t
Pickup Buoy & Rope (Note 1)	Buoy Rope mm	Foam filled 12	Foam filled 12	Foam filled 12
Top Chain, or Top Rope	Chain Size mm, or Rope (Note 2) Length m	12 Rope (Note 2) 2.5 - 5.0	12 Rope (Note 2) 2.5 - 5.0	14 (Note 12) Not permitted 2.5 - 5.0
Joining (Note 3)	Shackle mm Roving ring mm	16 16	16 16	19 20
Swivel (Note 4)	Size mm	20	25	25
Intermediate Chain	Size mm Length m (Note 5)	12 1.5 x Depth at MHWS	16 1.5 x Depth at MHWS	19 1.5 x Depth at MHWS
		(But not less than 4.0M or more than 6.0M)		
Joining (Note 3)	Shackle mm Roving ring mm	16 16	19 16	25 20
Ground Chain	Size mm Length m (Note 6)	20 4.0 - 6.0	32 4.0 - 6.0	32 6.0 - 8.0
Joining (Note 3)	Shackle mm Roving ring mm	25 20	32 32	32 32
Block (Note 7)	Ring Size mm Weight in air t	32 1	32 2	32 2

Notes for - TABLE 1

1	The length of the buoy rope is not to be greater than the depth of water at MHWS.
2	Rope, where permitted, is to be equivalent strength to the chain as proven by certificate or test result. The type of rope and the maximum replacement period is to be as approved by the Harbourmaster. It is recommended that chain should be used, due to problems that have been experienced with ropes been caught on blocks and other objects, and chafing.
3	Annealed roving rings maybe used as an alternative to shackles at the sizes stated. Where roving rings are used, they must be roved around another item, and not connected directly with shackles. The weld overlap is to be at least 5 times the bar diameter, and construction of rings is only to be carried out by suitably competent and skilled persons.
4	The swivel maybe located between the intermediate chain and the top chain/rope. It may also be located at a point along the top chain, and connected by matching shackles.
5	The length of the intermediate chain is to be 1.5 times the depth at MHWS, but not less than 4.0m length or more than 6.0m length without approval from the Harbourmaster. The Harbourmaster may require an increased length at locations where MHWS is greater than 4.0m.
6	The length of the ground chain is to be within the length range stated, and where practicable should be equal to the depth at MHWS. When possible but must not be longer or shorter than lengths shown on table 1.
7	Blocks are to be constructed as per Environment Canterbury specifications. Weight may vary by 10% from stated value. A block must be marked with the mooring number.

General Notes

8	A mooring for a vessel of over 12 m length, or over 20 t displacement, is to be designed by a naval architect or suitably competent person, and must be approved by the Harbourmaster.
9	A chain must be a continuous length and not made up of daisy chained short lengths, as every additional join is a potential weakness. Ground chains larger than 16 mm are to be stud-link type.
10	Shackles must be moused, pinned or welded to ensure they are not liable to come loose.
11	Dimensions provided are metric however imperial measurement equivalents are acceptable.
12	It is recommended that 16mm chain be used on vessels at the upper end of the maximum length and displacement.

Maximum allowed wear tolerances:

Item	Specified diameter	Minimum diameter allowable
Chain or shackle	42 mm, 38 mm or 36mm	25 mm
Chain or shackle	32 mm	22 mm
Chain	25 mm	20mm
Chain or shackle	20 or 19 mm	16 mm
Chain or shackle	16 mm	14 mm
Chain or shackle	14 mm, 13 mm or 12 mm	10 mm (NOTE: for vessels 12t to 20t max wear tolerance 12mm)
Block Ring	39 mm or 36 mm	24 mm
Block Ring	33 mm or 32 mm	20 mm
Swivel pin	28 mm Pin (25mm Swivel)	23 mm
Swivel pin	22 mm Pin (20mm Swivel)	17 mm

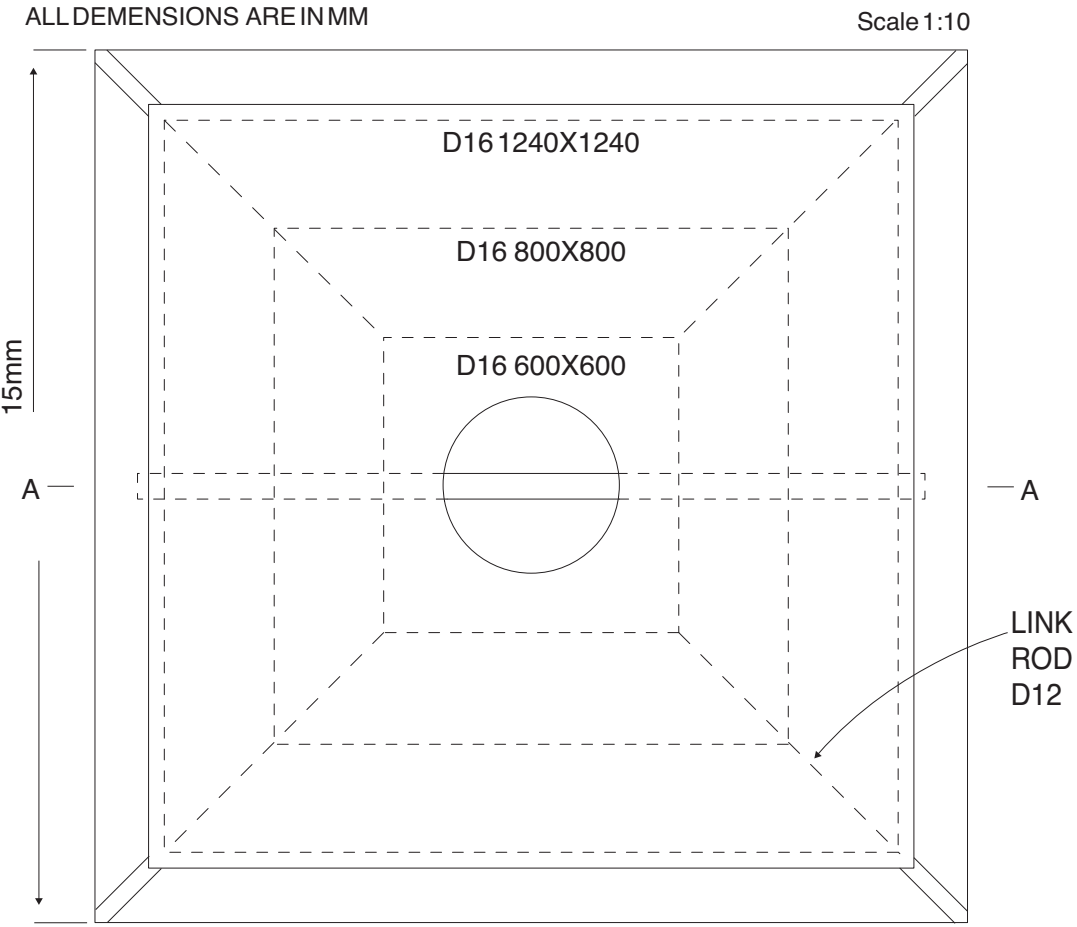
Note: Pitting, electrolysis, wear with the moving parts of a swivel, corrosion within a shackle pin housing all weaken a mooring component. Any component should be replaced when there is any doubt!

Block Type 1

Block Size	Base size	Height	Top size	Volume	Weight
2 tonnes	1.5m x 1.5 m	0.45 m	1.3 x 1.3 m	0.883m ³	2.2 tonnes
1 tonne	1.2 m x 1.2 m	0.35 m	1.0 m x 1.0m	0.425 m ³	1.0 tonnes

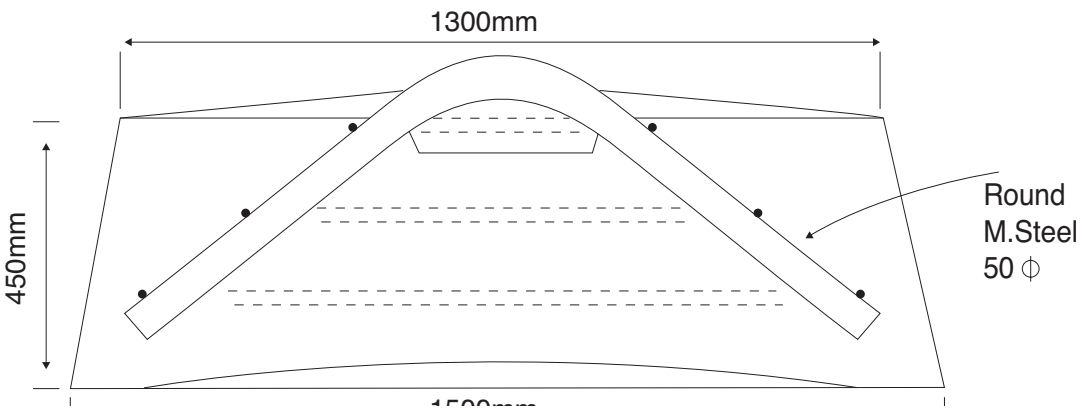
Diagram of nominal 2 tonne block (Note 1 tonne block not shown)

Normal 2 Tonne Mooring Block



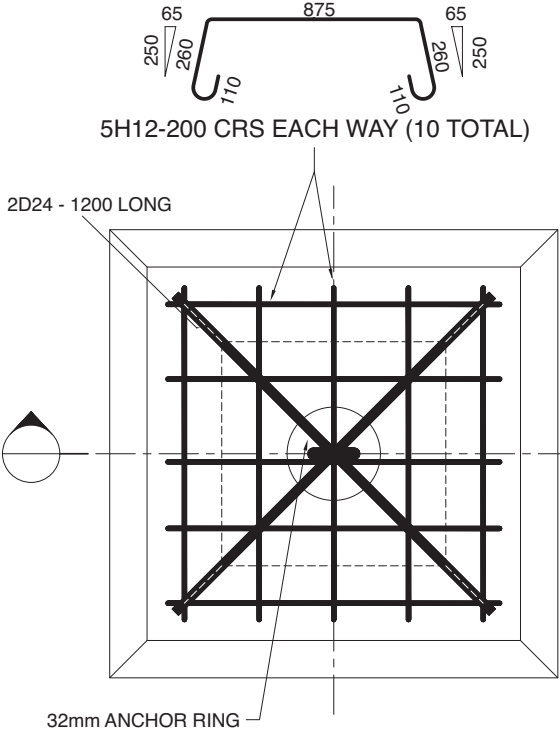
PLAN

CONCRETE > 20MPa

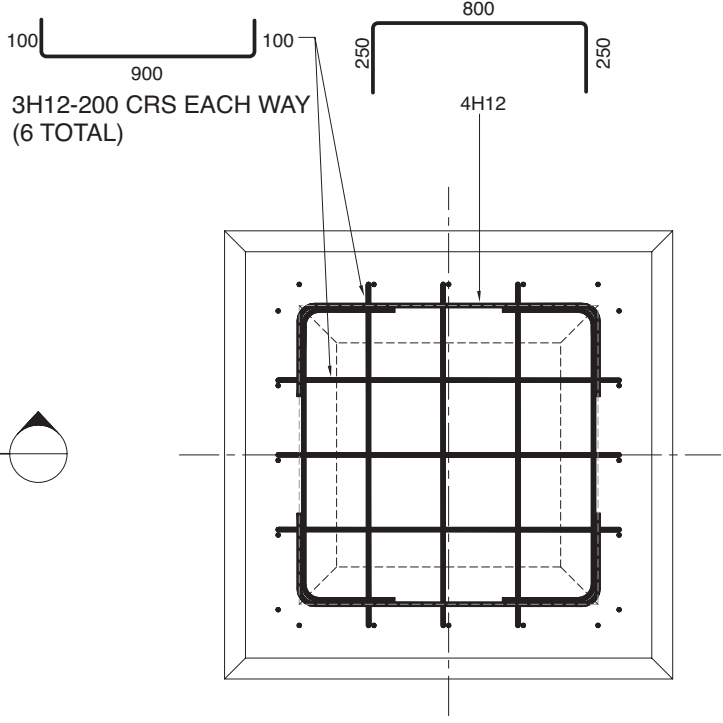


Block Type 2

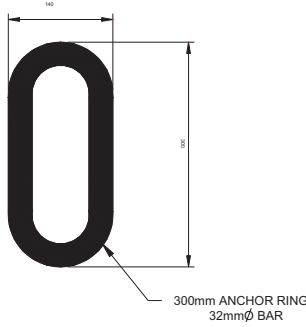
1 Tonne Mooring Block



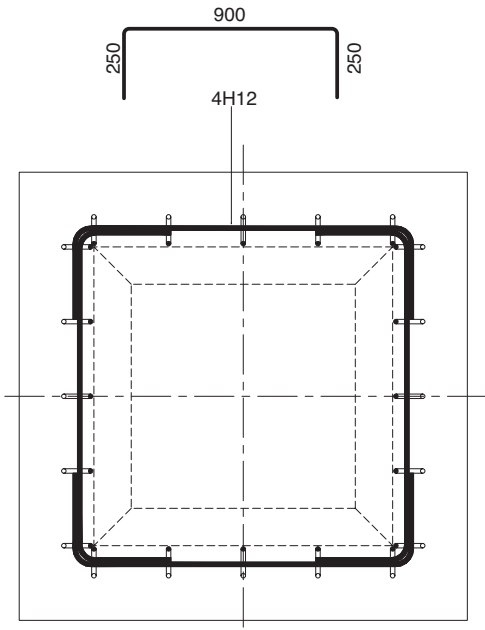
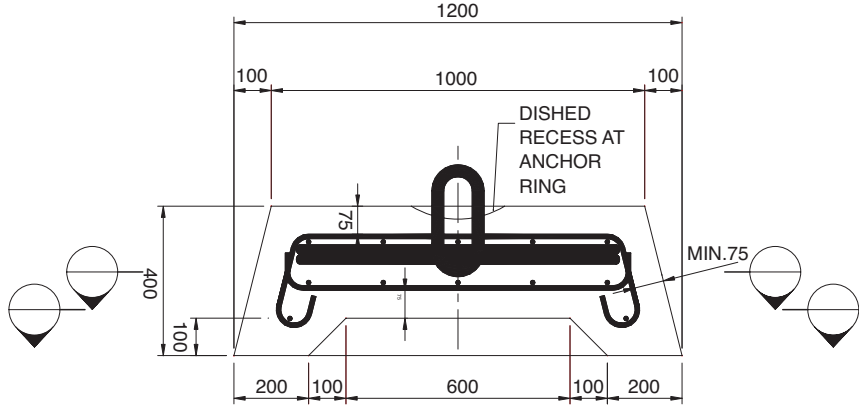
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SECTION B
CONCRETE > 20 MPa

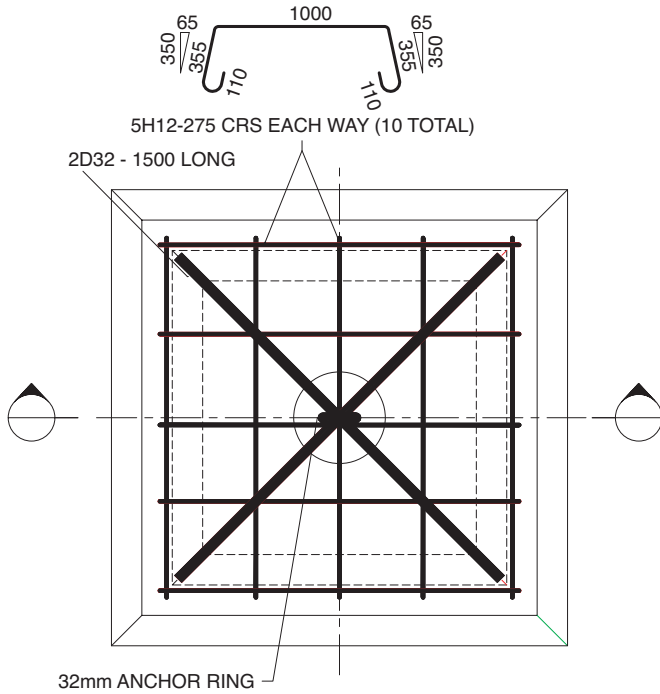


ANCHOR RING DETAIL

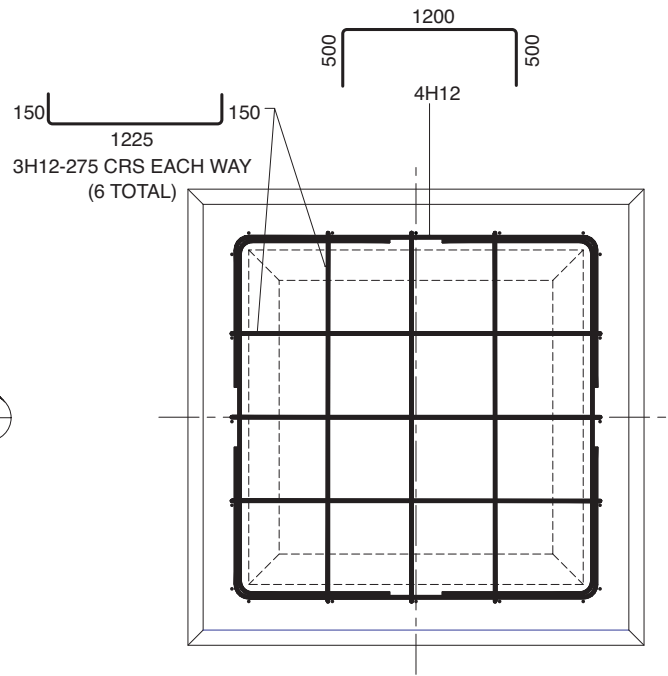


SECTION C

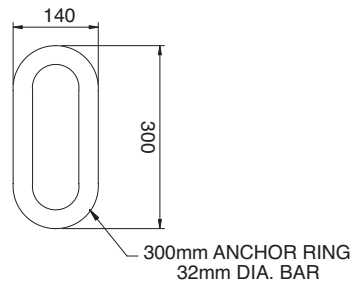
2 Tonne Mooring Block



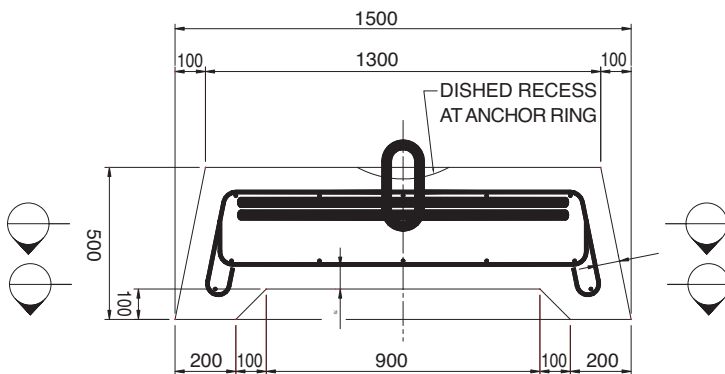
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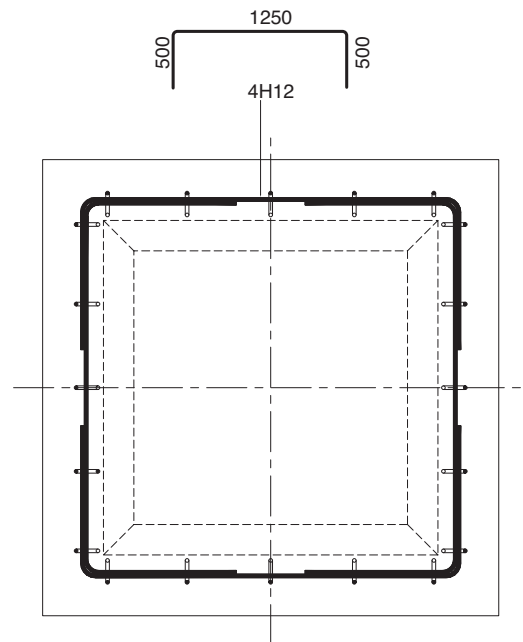
SECTION B
CONCRETE > 20 MPa



ANCHOR RING DETAIL



SECTION A



SECTION C

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