



SENSE 600[®] CodeMark Certificate of Conformity Guide Residential Footings





DISCLAIMER:

THIS DOCUMENT PROVIDES GENERAL GUIDANCE ONLY – SEEK PROFESSIONAL ADVICE

The information provided in this document is general guidance only. You should seek professional advice before relying on any of the information in this document. To the extent permitted by law, InfraBuild, the authors, publishers and editors expressly disclaim any liability for personal injury, death, or loss or damage directly or indirectly resulting from relying on this document. InfraBuild reserves the right to change specifications and availability of the products at any time.

Copyright © 2023, InfraBuild Australia Pty Ltd ABN 91 631 112 457. All rights reserved. This document (in full or part) must not be reproduced, copied, modified, adapted, translated, republished, uploaded or posted to any website or other online platform, publicly displayed, distributed for commercial purposes, or electronically transmitted or communicated in any way, without the express prior written permission of the copyright owner.

Document: T10 V0.1

SENSE 600[®] TrenchMesh[™]

InfraBuild has made SENSE 600[®] bars and SENSE 600[®] TrenchMesh[™] easy to use by having it assessed for a CodeMark Certificate of Conformity (CodeMark) in residential footings. This makes it easier for building professionals to use the more sustainable SENSE 600[®] bars and SENSE 600[®] TrenchMesh[™] in place of the standard 500 MPa bars and trench mesh.

CodeMark allows the deemed-to-comply designs in AS 2879 Section 3 with 500 MPa trench and bars to be substituted with the equivalent load capacity SENSE 600[®] TrenchMesh[™] or bar as appropriate. The SENSE 600[®] TrenchMesh[™] and bar sizes are shown in Tables 1a and 1b.

Table 1a: SENSE 600[®] TrenchMesh[™] Sizes and Properties

500L ($f_{sy} = 500 \text{ MPa}$)					SENSE 600 [®] ($f_{sy} = 600 \text{ MPa}$)				
Trenchmesh/ Bar	d_b (mm)	Area (mm ²)	Total Area (mm ²)	Load Capacity (kN)	TrenchMesh [™]	d_b (mm)	Area (mm ²)	Total Area (mm ²)	Load Capacity (kN)
3-L11TM	10.7	89.9	270	135	3-S10TM	9.8	74.9	225	135
4-L11TM			360	180	4-S10TM			300	180
5-L11TM			450	225	5-S10TM			375	225
6-L11TM			540	270	6-S10TM			450	270
3-L12TM	11.9	111	330	167	3-S11TM	11.0	94.2	283	170
4-L12TM			440	222	4-S11TM			377	226
5-L12TM			550	278	5-S11TM			471	283
6-L12TM			660	334	6-S11TM			670	339
3-L16TM	16	201	600	302	3-S15TM	14.6	168	503	302
4-L16TM			800	402	4-S15TM			670	402

Table 1b: SENSE 600[®] Bar Sizes and Properties

500N ($f_{sy} = 500 \text{ MPa}$)					SENSE 600 [®] ($f_{sy} = 600 \text{ MPa}$)				
Bars	d_b (mm)	Area (mm ² /bar)	Total Area (mm ²)	Load Capacity (kN)	TrenchMesh [™] /Bar	d_b (mm)	Area (mm ² / bar)	Total Area (mm ²)	Load Capacity (kN)
1N12	12	110	110		S11	11.0	94.2	75.4	
3N16	16	200	600	300	3S15	14.6	168	500	300
4N16			800	400	4S15			660	396

How does CodeMark make it easy?

CodeMark makes it easy for Engineers to substitute SENSE 600® bars or SENSE 600® TrenchMesh™ for their equivalent load capacity 500 MPa bar or trench mesh by knowing it is certified to conform with the National Construction Code (NCC), specifically the Building Code of Australia (BCA) Volume 2.

The sometimes-difficult process of producing a Performance Solution requiring either calculations, research or testing or a combination of these has already been completed and assessed. The resulting CodeMark Certificate of Conformity means that designers that follow the requirements for the SENSE 600® reinforcing bar applications detailed on the Certificate will have a design which is deemed-to-satisfy the NCC.

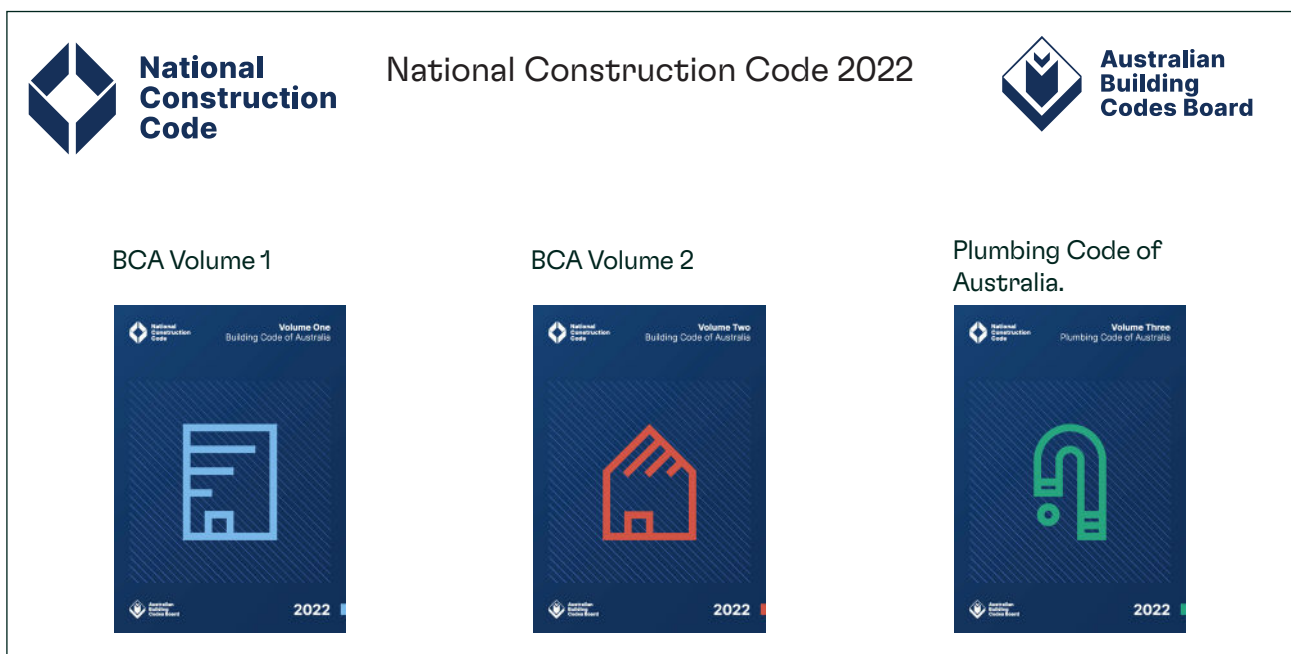


Figure 1 – National Construction Code (NCC)

Volumes 2 of the BCA 2022 Clause A5G3 states the following:

A5G3 Evidence of suitability – Volumes One and Two (BCA)

- (1) *Subject to A5G5, A5G6, A5G7 and A5G9, evidence to support that the use of a material, product, form of construction or design meets a Performance Requirement or a Deemed-to-Satisfy Provision may be in the form of any one, or any combination of the following:*
 - (a) *A current CodeMark Australia or **CodeMark Certificate of Conformity.***
 - (b) *A current Certificate of Accreditation.*

It is clear from this BCA extract that compliance with the SENSE 600® CodeMark Certificates of Conformity provides compliance to the BCA and hence the NCC.

What is the CodeMark Certificate Conformity?

The SENSE 600[®] TrenchMesh[™] and SENSE 600[®] Reinforcing Bar CodeMark Certificate of Conformity enables Engineers to produce BCA compliant designs using InfraBuild’s SENSE 600[®] – Design Guide for Residential Footings.

This SENSE 600[®] Design Guide provides deemed-to-comply designs with a range of combinations from the design parameters shown in Table 1 aligning with those in AS 2870: 2011 Section 3.

Table 1: Residential Footing Design Parameters

Footing Systems	Site Classes	Types of Construction
Stiffened Rafts	Class A	Clad frame
Waffle Rafts	Class S	Articulated masonry veneer
Stiffened Slabs with Deep Edge Beams	Class M	Masonry veneer
Strip Footings	Class M-D	Articulated full masonry
	Class H1	Full Masonry
	Class H1-D	
	Class H2	
	Class H2-D	

Engineers using the InfraBuild’s SENSE 600[®] – Design Guide for Residential Footings will notice that the deemed-to-comply footings using SENSE 600[®] TrenchMesh[™] or bar is a direct substitution for the equivalent capacity 500 MPa trench mesh or bar in the AS 2870 deemed-to-comply designs in Section 3.

Example – Using CodeMark Certificates of Conformity

The following design example demonstrates how the CodeMark Certificates of Conformity can be used in the redesign of a residential footing.

Consider a single storey residential building with the following design criteria:

Footing Type: **Waffle Raft**

Site Class: **Class M - D**

Type of Construction: **Articulated Masonry Veneer**

Design:

Refer to the InfraBuild SENSE 600® – Design Guide for Residential Footings

The appropriate design table in the Guide is –

Table 5.3 Waffle Raft Designs with SENSE 600® TrenchMesh™

Table 5.3: Waffle Raft Designs with SENSE 600® TrenchMesh™: refer to Figure 5.3								
Site class	Type of Construction	Depth [D] (mm)	Bottom Reinforcement				Slab Mesh	
			Edge Beam Alternatives Bottom		Internal Beam Alternatives Top and Bottom		Slab Length (m)	
			500 MPa	SENSE 600®	500 MPa	SENSE 600®	<20	≥20 - <30
Class M	Clad frame	310	3-L11TM	3-S10TM	1N12	1S11	SL72	SL82
	Articulated masonry veneer	310	3-L11TM	3-S10TM	1N12	1S11	SL72	SL82
	Masonry veneer	310	3-L11TM	3-S10TM	1N12	1S11	SL72	SL82
	Articulated full masonry	610	2x3-L11TM	2x3-S10TM	1N12	1S11	SL72	SL82
	Full masonry	-	-	-	-	-	-	-
Class M-D	Clad frame	310	3-L11TM	3-S10TM	1N12	1S11	SL72	SL92
	Articulated masonry veneer	310	3-L11TM	3-S10TM	1N12	1S11	SL72	SL92
	Masonry veneer	385	2x3-L11TM	2x3-S10TM	1N16	1S15	SL72	SL92
	Articulated full masonry	610	2x3-L11TM	2x3-S10TM	1N16	1S15	SL72	SL92
	Full masonry	-	-	-	-	-	-	-

Figure 3.1.1 – Extract from Table 5.3 for Design Example 1

Using Table 5.1 select Class M – D and then Articulated Masonry Veneer, then reading across gives the CodeMark Certified design.

Depth of Waffle Raft: 310 m

Reinforcement for External Beam: 3-S10TM

Reinforcement for Internal Ribs: Either 1N12 top and bottom or 1S11 top and bottom.

All other aspects of the design and installation of the residential footing are to be in accordance with AS 2870.

Engineer's Structural Design Certificates

When an Engineer is required to provide a Structural Design Certificate for a Building Surveyor and/or a Regulatory Body, it should include a statement that the footings were designed using the CodeMark Certificate of Conformity, Certificate No CM30155. This is similar to the statement that is typically included where Australian Standard AS 2870 Residential slabs and footings is reference when it is used to determine the 500 MPa deemed-to-comply designs.

The aforementioned Certificate of Conformity can be found on the [Sense Solutions website](#).

It just makes **SENSE**