



# INFORMATION SHEET

BUILDING SERVICES

Ref: BCA 17-04

## OVERVIEW OF THE REQUIREMENTS FOR RAFT SLABS

Below is a general overview of the Building Code of Australia (BCA) requirements for raft slabs for houses and associated buildings.

### BCA Requirements

BCA Volume Two covers the design and construction requirements for houses (Class 1 buildings) and garages, carports and sheds (Class 10 buildings). The BCA Deemed-to-Satisfy Provisions for residential slabs and footings are covered in Part 3.2.

Under the Deemed-to-Satisfy Provisions there are 2 compliance paths for the design and construction of raft slabs:

- complying with the prescriptive provisions written into the BCA; or
- complying with the Australian Standard – AS 2870 referenced by the BCA.

Commonly, raft slabs are designed and constructed in accordance with AS 2870.

Accordingly this information sheet focusses on the requirements in AS 2870. However, it should be noted a detailed description of all of the requirements prescribed in AS 2870 is not provided, rather a general overview of some of the key components.

### AS 2870

AS 2870 covers the design and construction of residential slabs and footings. The current edition referenced in the BCA is the 2011 version.

The standard also includes substantial commentary at the back of the standard to assist in its application. As with most 'commentary' or 'explanatory information' in codes and standards, it is included for information and advice only, and does not form part of the mandatory body of the standard.

Here are some of the key aspects of applying the standard and working out the requirements for a raft slab.

### Site Classification

Site Classification is based on expected ground surface movement and the depth of which this movement extends. Classifications range from A= little or no movement, S= slightly reactive clay sites, M= Moderately reactive clay and silt sites, H1=Highly reactive clay sites, H2= Highly reactive clay sites, E=Extremely reactive sites, P= Sites with unstable or soft foundations, fill etc.

The requirements for depth of footings and reinforcement for the slab differs based on the soil classification. A geotechnical engineer can provide you with a soil classification for the site and the local council may also have detail on the soil characteristics for the site.

### Fill under slab

Filling used for the support of a slab shall be controlled fill or rolled fill as follows;

- Sand fill up to 0.8m deep that is required to be well compacted by a vibrating plate or roller in layers not exceeding 0.3m is deemed to be controlled fill.
- Non sand fill up to 0.4m deep that is well compacted by a mechanical roller in layers not

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more than 150mm is deemed controlled fill.

- Rolled fill consists of materials compacted in layers by repeated rolling with an excavator or similar.  
The depth of rolled fill shall not exceed 0.6m compacted in layers not more than 0.3m thick for sand materials and not more than 0.15m thick for other materials.

## Slab design

A raft slab can be designed in accordance with either:

- Clauses 3.2.2 – 3.2.4 and Clause 5.3 of AS 2870; or
- Section 4 of AS 2870 – Design by engineering principles.

The approach of using the provisions of AS 2870 written into standard is more of a prescriptive approach of following standard design and prescriptive tables. This approach does contain certain limitations on its use depending on building geometry and being limited to only certain site classifications.

In terms of the prescriptive provisions under this approach - Clause 3.2.2 prescribes the internal and external beam layout requirements for the slab design. Clause 3.2.3 prescribes the reinforcement requirements and 3.2.4 the construction requirements. Clause 5.3 contains further detailing requirement which may apply depending on the slab design itself.

Section 4 uses more of a 'first principles' approach to the design of the slab, and this is generally done by a structural engineer, or someone with the relevant skills and experience.

## Concrete

The grade of concrete used shall be N20 with a slump of 100mm with 20mm maximum nominal aggregate size, or as specified by the designer. Thickness of the slab may also vary depending on engineering requirements, such as filled land, underfloor heating, polished concrete finish.

## Reinforcement

Reinforcement in rafts and slabs shall be in accordance with the following:

- (a) Minimum concrete cover for the reinforcement shall be 40 mm to unprotected ground, 40 mm to external exposure, 30 mm to a membrane in contact with the ground and 20 mm to an internal surface.
- (b) The slab mesh shall be of a type prescribed in AS 2870 and placed towards the top of the raft or slab. Overlap of at least 2 cross wires are generally recommended where there are a number of sheets of mesh, and tied unless specified otherwise.

Where slab mesh is specified such as **SL82** the full description is:

**S** = square mesh, **L** = Low ductility, **8** = 8mm bars, **2** = 200mm square size.

- (c) Reinforcing bars shall have a lap length at splices not less than 500 mm up to a bar diameter of 12 mm, and not less than 700 mm up to a bar diameter of 16 mm.

At T- and L-intersections, the bars shall be continued across the full width of the intersection. At L-intersections, one outer bar shall be bent and continued 500 mm, or a bent lap bar 500 mm long shall be provided on each leg.

- (d) Bar chairs and/or spacers support the reinforcement bar or mesh to provide the required concrete coverage. They are available in a variety of shapes and sizes and may be made from wire to plastic to concrete.

## Edge Rebates

Edge Rebates for slab on ground, stiffened raft or waffle raft with masonry cavity or veneer construction shall comply with the following:

- (a) The rebate depth shall be not less than 20 mm. The edge rebate may be stepped along it's length.
- (b) Where the edge rebate exceeds 150 mm in depth, the minimum horizontal width of the edge beam at the base of the rebate shall be not less than 200 mm, except that if R10 or N10 ties at 900 mm spacings are provided to resist vertical forces, this minimum width may be reduced to 150 mm.  
This requirement does not apply to waffle rafts.
- (c) The depth of concrete below the edge rebate shall be not less than 150 mm.
- (d) Edge rebates are not required for construction with single-leaf masonry.
- (e) Where the edge beams are retaining more than 450 mm of fill, the standard prescribes additional requirements or that the design shall be in accordance with engineering principles.
- (f) Where the edge rebate depth is greater than 400 mm, the minimum stem width shall be 200mm. The effect of the rebate shall be assessed in accordance with engineering principles.

## Service penetrations

Service penetrations are permitted through the middle third of the depth of edge and stiffening beams. The effect of other service penetrations shall be taken into account by the provision of extra concrete depth or reinforcement.

Termite management treatment particularly of service penetrations should be considered at this stage. Vapour barriers or damp proofing membranes may also be required for the slab and there may be specific requirements for these in your state or territory.

Note: As listed above, the information provided in this information sheet is not a detailed description of all of the requirements prescribed in AS 2870, rather just a general overview.

**For further information on the requirements for raft slabs HIA members can contact HIA's Building Services team on [hia\\_technical@hia.com.au](mailto:hia_technical@hia.com.au).**