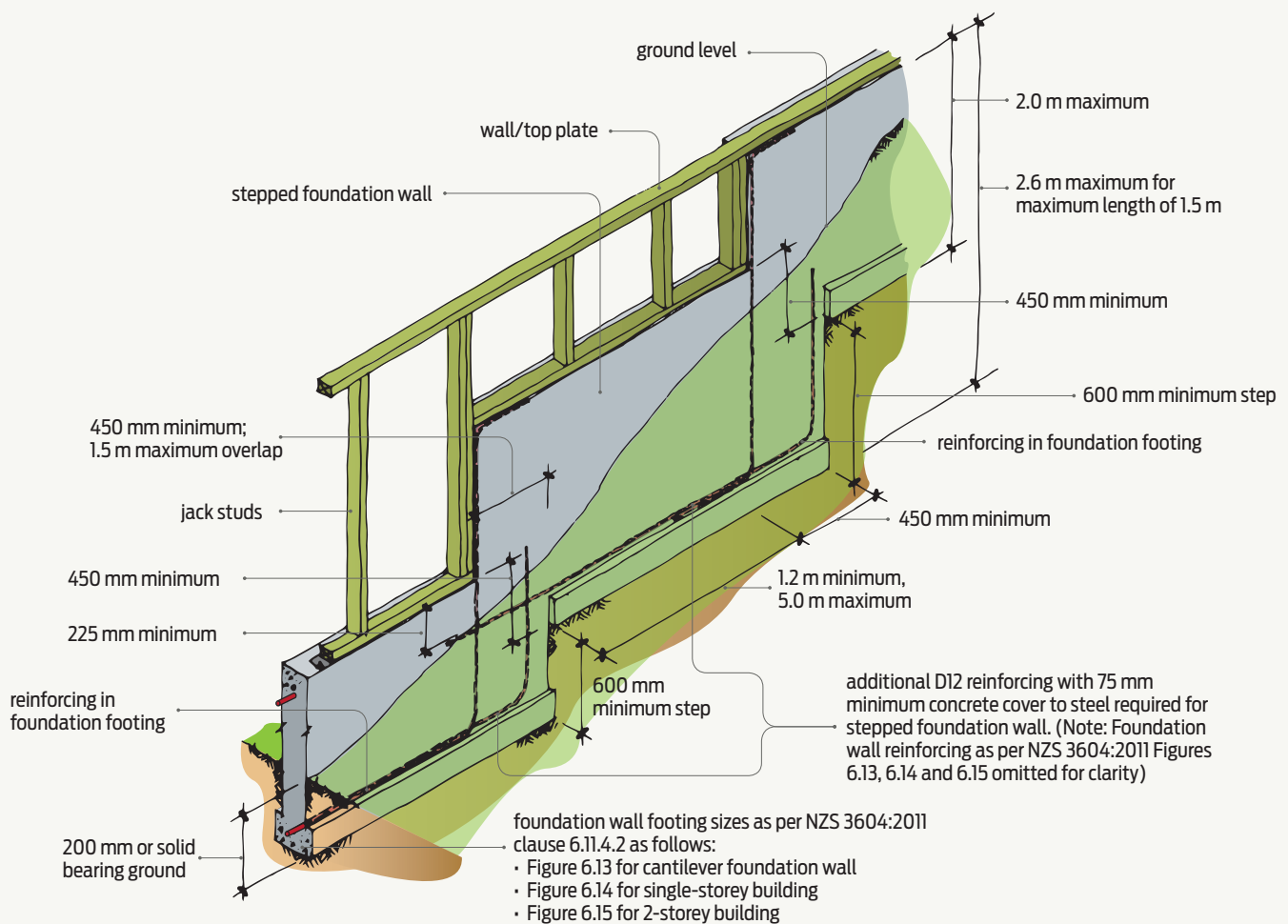




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# Stepped foundation walls

Foundation walls provide support to the external walls of buildings, and on flat sites, their design and construction is quite straightforward. When the site has uneven or sloping ground, however, requirements are more complex.



**Figure 1** Stepped foundation wall footing and step reinforcing only.

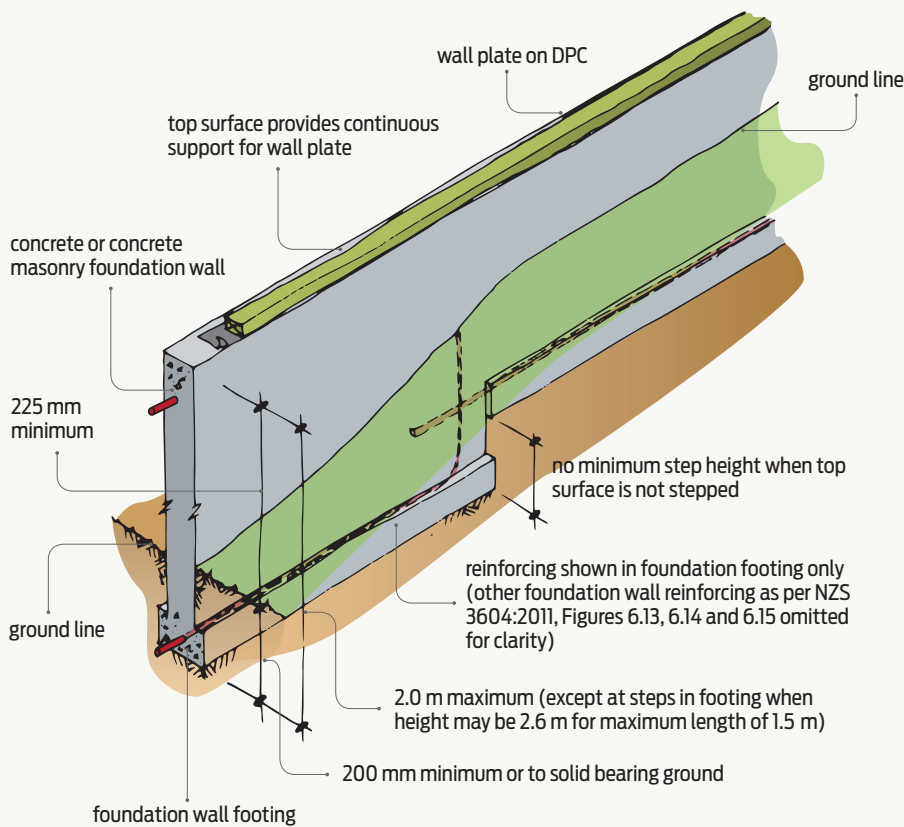
**UNDER NZS 3604:2011** Timber-framed buildings, foundation walls may be constructed from reinforced concrete, reinforced concrete masonry or a combination of the two.

### See NZS 3604:2011 for foundation walls

The footing sizes, width of walls and reinforcement requirements should be as shown in

NZS 3604:2011:

- Figure 6.13 for cantilever foundation walls
- Figure 6.14 for single-storey buildings
- Figure 6.15 for 2-storey buildings.



**Figure 2** Stepped foundation wall – footing bars only.

Other requirements for foundation walls include that:

- the top surface of the foundation wall provides continuous support for the wall plate
- the underside of the footings is horizontal
- the footings are at least 200 mm below cleared ground level and on solid bearing ground
- the minimum height for walls is at least 225 mm above finished ground level
- the maximum height from the underside of the footing to the top of the wall is no more than 2 m except at step in footing when height may be 2.6 m for a maximum length 1.5 m.

### **Different when stepped foundation walls**

Where the ground is sloping or uneven, the foundation wall may need to be stepped to accommodate changes in ground level and remain within the maximum permitted height for foundation walls.

Requirements for stepped foundation walls are described in NZS 3604:2011 clauses 6.11.2, 6.11.4 and 6.11.5 and in Figure 6.12 (see Figure 1). These include that:

- the maximum height of the wall at an overlap may be increased to 2.6 m for a wall length of up to 1.5 m
- steps must have a minimum horizontal overlap of 450 mm
- when both top and bottom surfaces of the wall are stepped, the steps must overlap 450 mm minimum both vertically and horizontally
- additional horizontal and vertical D12 reinforcing bars are required at the steps as shown in Figure 6.12 (in addition to the reinforcing requirements for foundation walls as shown in Figures 6.13, 6.14 and 6.15)
- where they are required, horizontal reinforcing bars must be lapped by at least 500 mm
- when the floor framing is supported on jack studs, the underside of the wall and footing must be stepped at least 600 mm, and the length of wall on the lower side of the step must be no less than 1.2 m and no more than 5 m long.

Note that, if the top surface of the foundation wall is level, the footing may be stepped to accommodate ground slope but there is no minimum step height (see Figure 2). ◀