

# HOW-TO-BUILD GUIDE

## LOW LEVEL DECK WITH HANDRAIL

### WHAT YOU CAN BUILD USING THIS GUIDE

This guide shows you how to build a timber deck and handrail with a maximum finished deck height above ground of not more than 990 mm.

The construction of this deck is separate from the adjacent building. No sub-deck bracing is required provided piles are embedded in concrete to a depth below ground of not less than 450 mm.

The deck is not designed to accommodate loads from planters, spa pools, pergolas or conservatories.

### BEFORE YOU BEGIN

Check with your local territorial authority that the proposed height, type and location of your deck comply with local planning (ground coverage) and building rules, and whether a building or resource consent is required. Decks that are less than 1 m above the ground do not normally require a building consent, although some local territorial authorities require consent for any decks attached to a house.

Decks where the fall distance to the ground is less than 1 m do not require a handrail, but we have included instructions for building a 1 m high handrail as part of the deck.

### MATERIALS

The materials will need to be calculated based on the actual size and type of deck you intend to build.

#### Deck

Piles	125 x 125 mm H5 treated radiata pine timber
Bearers	150 x 50 mm H3.2 treated radiata pine timber
Joists	150 x 50 mm H3.2 treated radiata pine timber
Decking	100 x 25 mm H3.2 treated radiata pine griptread decking
Nails	100 mm hot-dip galvanised jolt-head
	60 mm hot-dip galvanised jolt-head
Plates	stainless steel
Profiles/pegs	scrap timber
Concrete	pre-mixed bagged dry material, or builders mix and cement for on-site mixing

#### Handrail

Top rail	150 x 50 mm H3.2 treated radiata pine timber
Balusters	90 x 90 mm H3.2 treated radiata pine timber
	50 x 50 mm (or 100 x 25 mm) H3.2 treated radiata pine timber
Bolts	M10 hot-dip galvanised bolts with 50 x 50 mm square washers (or 55 mm diameter round washers)

### CONSTRUCTION

#### Set-out

1. An accurate set-out of the deck is essential to ensure it is level and square and at the correct height.
2. Mark the edges and required finished height of the deck on the house wall cladding with a felt pen. For timber-slat decks the decking surface can be at the same level as the floor inside the building. Measure down from that point (by adding the thickness of the decking, the bearers and the joists) to give the finished height of the piles to be installed.
3. Measure the width of the deck out from the building and mark the ground with spray paint to indicate the outer corners of the deck.
4. Install four timber profiles (as shown in Figure 1) about 1 m away from the finished edges of the deck. Set the horizontal profile members to the finished height of the deck less 20 mm. Butt the profile closest to the building tight to the cladding. (An alternative is to set the profile height to match the top of the piles and construct the deck once the piles tops are cut to level.)
5. Run string lines parallel to the building from A to B and C to D as indicated in Figure 1 to give the finished width of the deck. Keep string line A to B 12 mm out from the face of the cladding to allow a drainage gap between the deck and the cladding.
6. Bring string lines from the lower points marked on the cladding at E and G and run them out at right angles to the wall of the house to the profiles at F and H to a distance of 1 m past the deck width. For houses with timber cladding a nail may be fixed into the cladding and the string line fixed in place. For other cladding types you will need a helper to hold the string line against the cladding. Use a plumb bob where the string lines cross corners to locate the position of the external corner of the deck and mark this position with a vertical steel rod.
7. To ensure that the deck is square, check the diagonal dimensions between each external corner. Adjust the position of the deck corners to get both diagonal dimensions equal. This will confirm that the deck set-out is square (see Figure 1).

#### Piles

8. Piles are to be spaced at maximum centres of 1.3 m along the lines of the bearers and at maximum centres of 1.9 m along the lines of the joists.
9. Locate the piles adjacent to the building at least 450 mm out from the face of the foundation wall. Mark out the pile hole positions on the ground with spray paint.
10. Locate the outermost row of piles 300 mm in from the edge of the deck. Mark out the pile hole positions on the ground with spray paint.
11. Locate the positions of the piles within the deck area. Mark out the pile hole positions on the ground with spray paint.
12. Dig 300 x 300 mm square by 550 mm deep (below natural ground level) holes for each pile.
13. Place a 100 mm thick bed of dry concrete mix into the hole (for installations using wet concrete the piles must be temporarily supported to give a 100 mm gap between the bottom of the hole and the bottom of the pile – see Figure 2). Insert the 125 x 125 mm timber piles. Place a further 200 mm of concrete into each hole, tamp it down with a length of timber or steel rod, then drive pegs into the ground at each pile and firmly brace each pile in a vertical position along the string line. Allow a minimum of four days for the concrete to cure.
14. Level string lines across the piles to give the finished pile height, then mark and cut to suit. (It may be possible to install the top of the piles to a string line to avoid later cutting.)

### Bearers

15. The bearer (see Figure 3) consists of two 150 x 50 mm lengths of timber nailed together. They are cut to the length of the deck (parallel to the building) and nailed together with skewed 100 mm jolt-head galvanised nails at 300 mm centres on opposite faces. Sit the bearer on top of the piles, ensuring it is aligned at each end pile and parallel to the building, and skew nail it to the pile with two 100 mm galvanised nails on each side of the bearer. Nail a 200 x 50 mm nail plate from the face of each pile to the face of the joist on both sides. Remove the temporary braces from the piles.

### Joists

16. The joists (see Figure 3) run at right angles to the building span across the bearers with the ends cantilevered so that they finish 12 mm clear of the wall cladding. This prevents moisture accumulation. They run approximately 250 mm past the edge of the bearer along the outside edge. The length of the joists can be adjusted to suit the decking width and gap between boards to avoid the need to rip the last board to fit. The end of the joists will have a boundary joist the length of the outside edge of the deck to provide a neat finish and allow the handrail to be fixed.
17. Cut the 150 x 50 mm end joists to the width of the deck less the thickness of the 150 x 50 mm boundary joist.
18. Install the two end joists first, then evenly space the rest of the joists across the bearers with a maximum spacing of 400 mm centre to centre. Nail each joist to the bearer and the stringer with skew nails to each side.
19. Nail a continuous 150 x 50 mm boundary joist to the end face of each of the deck joists, ensuring it is level with the top of each joist and aligned at each end (see Figure 3).

### Decking

20. Locate the first length of decking 12 mm out from the house cladding to prevent moisture accumulation. Ensure that it aligns at each end with the face decking and then nail the decking with two nails to each joist. For 25 mm decking use 60 mm galvanised jolt-head nails and for 40 mm decking 75 mm galvanised jolt-head nails. If you are using hardwood decking you will need to drill each nail hole in the decking to avoid splitting it (see Figure 3).
21. End joints in decking where required must be staggered and made over a joist by cutting across each board at 45° to give a scarfed joint.
22. Use a 2.8 mm diameter nail to space the next length of decking evenly from the first length and nail decking to joists. When laying, check every five boards that the decking is parallel to the wall and the boundary joist and nail these to the face of the relevant joists. Continue in this way until all the decking is laid. At the front of the deck it may be necessary to cut a narrower length of decking to ensure that it aligns with the face decking fixed to the front boundary joist.

### Handrail

23. While it is not a requirement to provide a barrier to falling on a deck less than 1 m off the ground, you may want to install one because you like the look of it or to prevent people walking or falling off the edge. Any handrail installed must be 1 m in height above the deck level and be designed to be non-climbable and with gaps between any vertical balusters that are no wider than 100 mm.
24. Mark a location for the corner support balusters 100 mm in from the corners of the deck at each end and 100 mm out from the house cladding where the deck joins the house. Bolt 90 x 90 mm timber balusters with two 10 mm hot-dip galvanised bolts through the face decking and edge joists. The bottom of the baluster must be aligned to the bottom edge of the face decking and be 950 mm in height above the finished decking level.
25. On the face decking mark out locations for intermediate support balusters, evenly separated and no more than 1.2 m apart. Bolt the 90 x 90 mm intermediate support balusters at each location. Mark and install 50 x 50 mm or 100 x 25 mm intermediate balusters of the same length as the support balusters at even spacings of a maximum of 100 mm vertically between each support baluster. Nail with two 100 mm hot-dip galvanised jolt-head nails through the face decking into the edge joists (see Figure 5).

26. Cut the horizontal 150 x 50 mm timber handrail to the lengths required for each side and across the front of the deck. Bolt it on edge with 10 mm galvanised bolts to each support baluster, ensuring that the baluster is plumb. Locate the top edge of the handrail 50 mm above the top of the support balusters and mitre the joints at each corner (see Figure 4).

Nail each intermediate baluster to the handrail with two 65 mm galvanised jolt-head nails, ensuring that the maximum spacing does not exceed 100 mm and that the balusters are plumb.

### MORE INFORMATION

Refer to the New Zealand Standard for light timber frame construction, NZS 3604:1999 *Timber Framed Buildings*, for more detailed information if your deck is higher, wider or more complicated than the one in this guide.

Figure 1

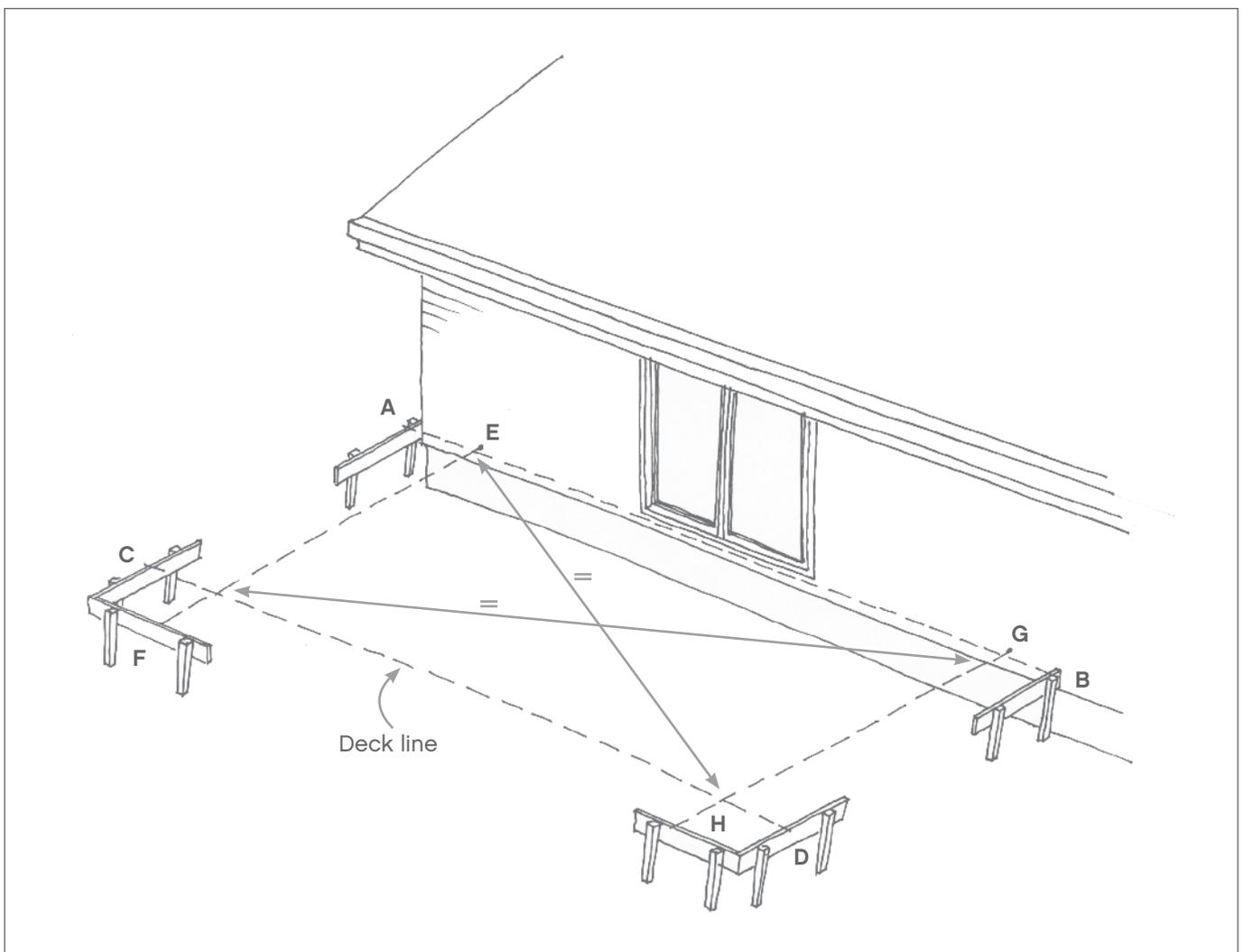


Figure 2

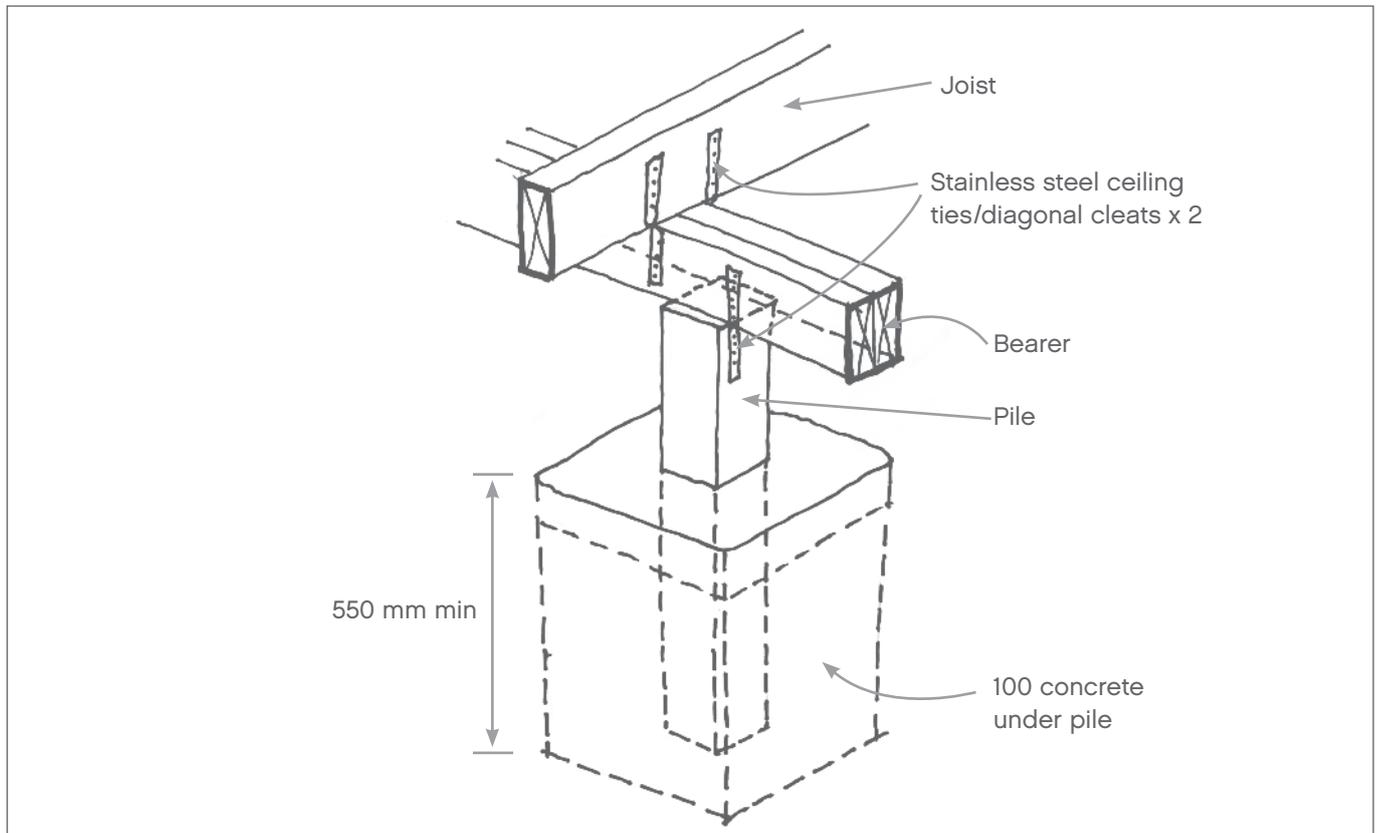


Figure 3

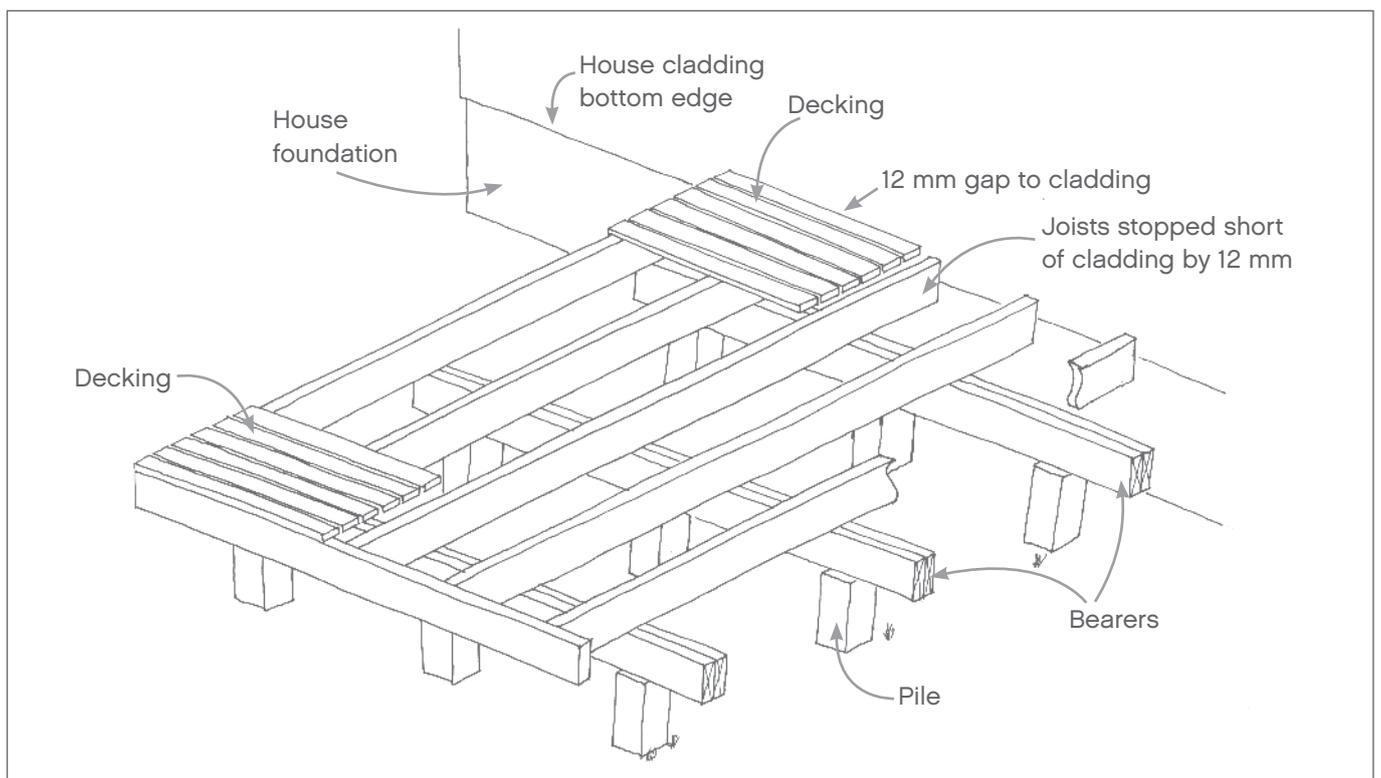
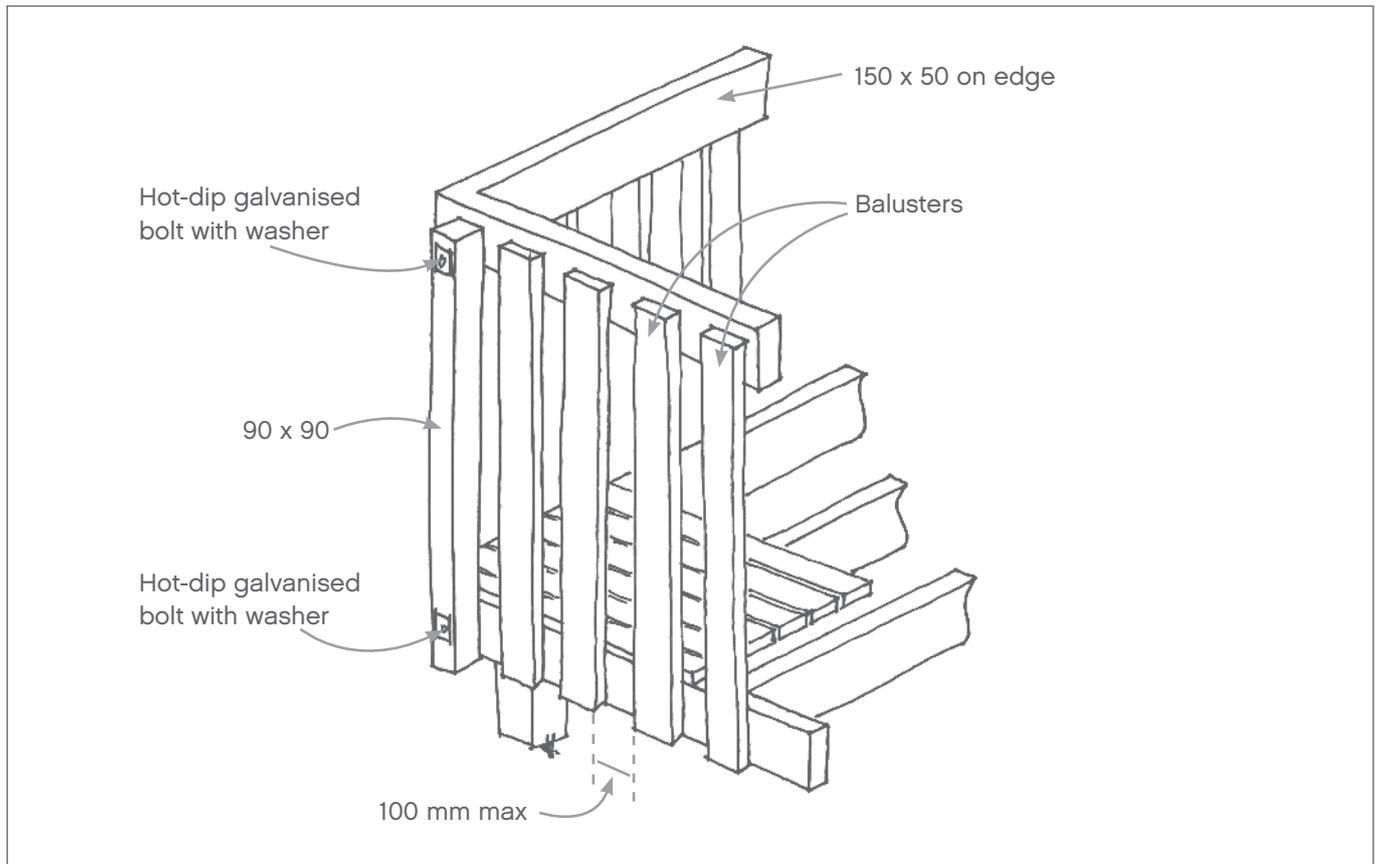


Figure 4



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