

# BUILDING A TIMBER RETAINING WALL

## BEFORE YOU BEGIN

Retaining walls perform heavy and important work. Therefore high or complicated walls, perhaps supporting several metres of bank above a road or driveway, must be designed and constructed by experienced contractors.

Retaining walls can also be used to terrace a slopping section, provide a levelled garden, flat lawn or paving.

The retaining wall described here is less than 1.5M in height with post spacing set at 1.2M, and does not support any surcharge or load additional to that of the ground.

## Ideas & Inspiration



## Notes About Building Consents

- In New Zealand retaining walls over 1.5M high require a building consent from the local body council.
- Walls lower than 1.5M but carrying extra loading on top, for instance a driveway, a building or a steeply sloping bank, also require a building consent.
- If you are in any doubt, consult your council for advice. Some insurance may be void if retaining walls are not constructed and signed off correctly.
- Locations which require a building consent may also need an engineer's design certificate.

## Retaining Wall Fundamentals

### Good Footings or Foundations

While the whole wall has to be strong enough to support the load pressing against it, it's the part below the ground that anchors it. No matter how sturdy the upper part of a wall is, if the footings or foundations are weak, there is nothing stopping it from falling over. Check with your council to determine if a geotechnical and structural engineering report is required.

### Good Drainage Behind and/or Through the Wall

When soil or clay on a slope is waterlogged, it is practically unstoppable. Like jelly while it's still liquid, you need a bowl to contain it, but after it's set, it supports itself.

So one of the main tasks required of a retaining wall is to drain water out of the bank behind. If a wall doesn't drain well, even previously dry earth in the bank will gradually become waterlogged until it finally pushes the wall over. Check regulations regarding water run off from drainage.

## TOOLS

- Spade or post hole borer
- Spirit level
- Shovel
- Sledgehammer
- Circular saw
- Old paintbrush
- Hammer
- Safety equipment
- Tape, square and pencil
- Wheelbarrow
- Stringline
- Sawhorse

## MATERIALS

- H5 treated 200mm diameter posts – one every 1.2M of wall length.
- 150 x 50mm or 200 x 50mm H4 treated rough sawn or tongue & groove rails. Alternatively use 150mm half round trimmed rails.
- Free draining metal backfill (approximately 1/3M<sup>3</sup> will be used for every metre of the retaining wall length).
- Concrete to set the posts. (Rapid set concrete will speed up the process).
- Nails – 100mm and 125mm or 150mm Hot-dipped galvanised.
- Timber preservative (eg Metalex).
- Plastic drain coil and filter sock – the length of the wall.
- Old sheets of hardboard, cardboard or plasterboard.
- Bracing timber, pegs and nails.
- Geotextile fabric.

## GETTING STARTED

1. Draw a plan and take measurements to calculate materials required for this project.
2. You need at least a 250mm gap between the back of the wall and the face of the bank. Decide where you want the wall and cut back the face of the bank if necessary.
3. Make sure that the ground behind the wall line is level, or slopes toward the end where you want it to drain.
4. Dig 500mm diameter holes every 1.2M along the line of the wall. The depth of the holes should be equivalent to 70% of the height of the wall. Examples: wall height 1M – hole depth 700mm, wall height 1.5M – hole depth 1.05M. If you have an engineer's design, the hole depth will be specified.
5. Put 100mm of concrete into the two end holes. Set posts on top of the concrete. Make sure only uncut post ends go into the holes. If that isn't possible, point cut ends with liberal amounts of timber preservative. Check that the top of the posts sit high enough.
6. Lean posts slightly back into the hill (for a dead vertical wall, set the posts even deeper into the ground).
7. Brace posts. Check that you have exactly the same lean back on both posts and they are plumb (vertical) when viewed from the front (see Fig.1).

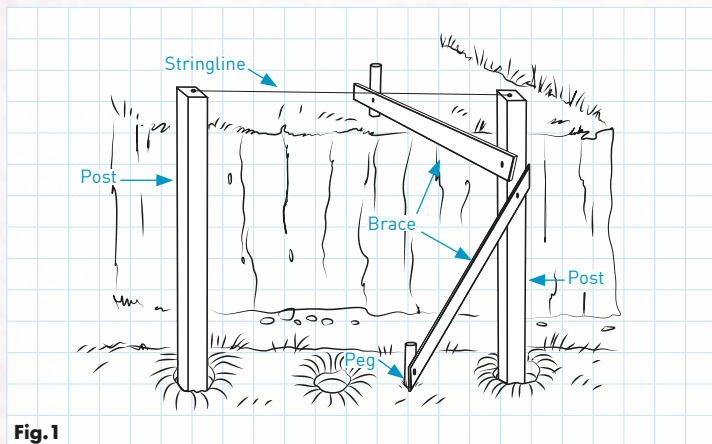


Fig.1

8. Fill the holes with concrete to within 100mm of ground level. Then tamp the concrete down with a piece of 100 x 50 timber, brace and leave to set.
9. Run string lines top and bottom between the two set end posts. Use these as guides to line up intermediate posts. Set them in their holes the same way as the end posts.
10. When all posts are in place, leave a couple of days for the concrete to set properly. The use of Dricon Rapid Set can speed this process up.
11. Nail horizontal rails (logs) to the back of the posts, starting at the bottom and working to the top of the wall. Join rails only on the posts. The gaps that occur between them will allow water to percolate through.
12. When the wall is complete, lay about 50mm of clean drainage metal along the bottom at the back of the wall. Cover drain coil (punctured) with a filter sock then lay on top of the metal and cover with about 250mm more drainage metal. If possible, protrude the drain coil at both ends so you can flush it with a garden hose from time to time.
13. Position old sheets of hardboard, cardboard, or plasterboard down the back, about 250mm behind the wall. Keeping the level the same on both sides of the sheets, fill between them and the wall with more drainage metal; and behind with any dug out soil or clay. Take the metal to within 300mm of the ground surface at the top of the wall, place geotextile fabric over free draining gravel, and then fill with topsoil. The drainage metal is needed as far as possible up the back of

the wall for optimum drainage. The sheets contain it, so you don't use any more than necessary. They will eventually disintegrate (see Fig.2).

14. If your wall is to support new fill, leave at least two more weeks for the concrete to set completely before vigorously compacting the backfill.

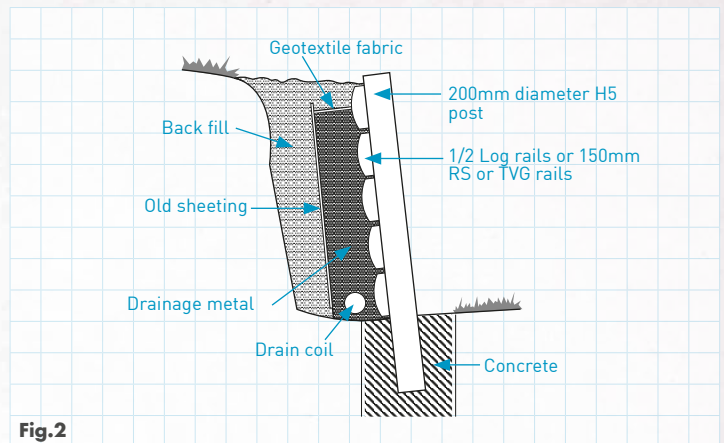


Fig.2

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## TIMBER SELECTION GUIDE

TREATMENT LEVEL	APPLICATION	TYPICAL USES
H4	For timber exposed to the weather and in-ground contact	<ul style="list-style-type: none"> <li>– Fence posts</li> <li>– Pergola post</li> <li>– Retaining wall TGV and lumber</li> </ul>
H5	For timber exposed to the weather, ground and fresh water contact; and in high risk, loadbearing applications	<ul style="list-style-type: none"> <li>– Piles (house foundations, retaining walls, and in decking piles)</li> <li>– Vineyard supports</li> <li>– Veranda posts</li> <li>– Poles</li> </ul>

**NOTE:** Consumer Information and Handling Guide for Treated Timber is available at your local PlaceMakers store.

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