

### Introduction

Timber sleepers or round poles and logs can be used to create effective and relatively inexpensive garden edges, steps and walls to terrace sloping sites.

This data sheet contains Timber Queensland's recommendations for the construction of timber garden walls up to 1 metre high. For retaining walls greater than 1 metre high refer to Technical Data Sheet 9.

### Building Approval and Certification

Local authorities generally do not require building approval or engineer certification for retaining walls up to 1 metre high. Walls (irrespective of height) closer than 1.5 metres to a building, and retaining walls greater than 1 metre high will generally require building approval and certification by an engineer.

### Ground Conditions

The sizes and other recommendations in this data sheet assume that posts are embedded into firm natural ground (e.g. stiff clay, shale or dense sand), with a maximum ground slope of 1 in 6. Special design may be required for steeper slopes and poor subgrade soil conditions such as uncompacted fill.

### Materials

There is no Australian Standard or other grading requirement for landscaping timber. The quality of sawn "sleepers" and round logs can vary greatly between different suppliers.

Timber sold for landscaping is likely to contain natural characteristics such as knots, gum veins, heart, insect damage, want, wane etc., and there could be some bow, cupping, twisting etc. Where a higher than normal appearance or performance is required, timber should be selected with limitations on the size and number of these characteristics.

Note: Structurally graded timber (e.g. F14 hardwood and F7 treated pine) will have prescribed limits for natural characteristics and will generally be higher quality than 'landscaping' timbers.

Softwood logs and sleepers shall be preservative treated to hazard level H4 or better.

Hardwood shall be durability Class 1 or 2. Hardwood containing sapwood shall be preservative treated to H4 or better.

### Retaining Walls (up to 1 m high)

Timber retaining walls up to one metre high can be constructed as shown in Figure 1.

Member sizes and post embedment depths shall be as outlined in Tables 1 and 2 for preservative treated softwood and hardwood, respectively.

Walls exceeding 400 mm high should have a 1 : 10 batter as shown.

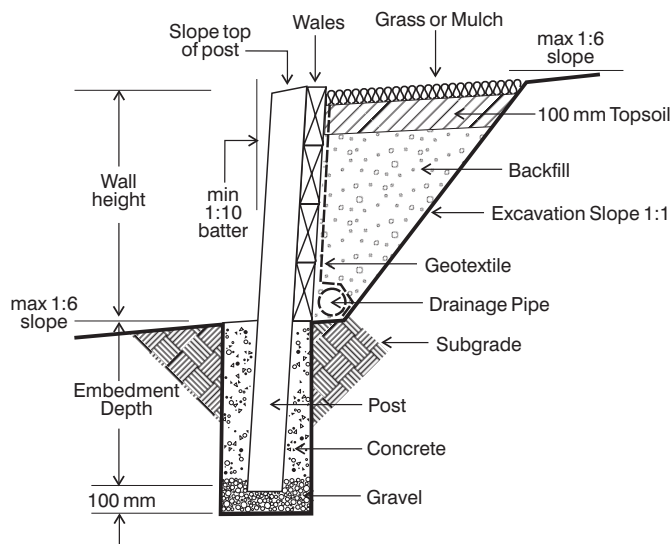


Figure 1 - Typical Retaining Wall Construction

Note: The batter allows for the wall to have some lateral movement and still appear stable.

Post holes shall have a 100 mm layer of coarse gravel installed prior to placing posts and backfilling with concrete.

Note: 'No-fines' concrete is recommended for hardwood posts.

Walls up to 400 mm high may have concealed posts, with wales fixed to the outside of posts with hot dipped galvanised batten screws, coach screws or bolts. Walls above 400 mm shall have wales behind posts. Typical methods of positioning posts at ends and corners are shown on Figure 2.

Note: Wales may require temporary fixing to posts with wire ties, skew nails or batten screws.

The top of posts shall be cut with a slight slope to shed water and shall be sealed with a preservative emulsion.

Drainage shall be provided behind walls exceeding 400 mm high to prevent additional loads due to the build up of ground water. A slotted polyethylene drainage pipe shall be provided at the base of the wall, discharging to a suitable outlet. To prevent backfill material from flowing through gaps in the wall and to assist in drainage, geotextile should be placed to the inside face of wales and between the drainage pipe and the backfill.

Backfill shall be a free flowing material such as ashes, sand or gravel – not clay. Backfill shall be installed no sooner than three days after concreting posts.

## Garden Edges

Single sleepers and rounds can be used to form garden edges.

Garden edges can be self supporting or may require restraining at corners and ends.

Typical corner and end restraints are shown in Figure 3. Alternatively, posts can be positioned as shown on Figure 2.

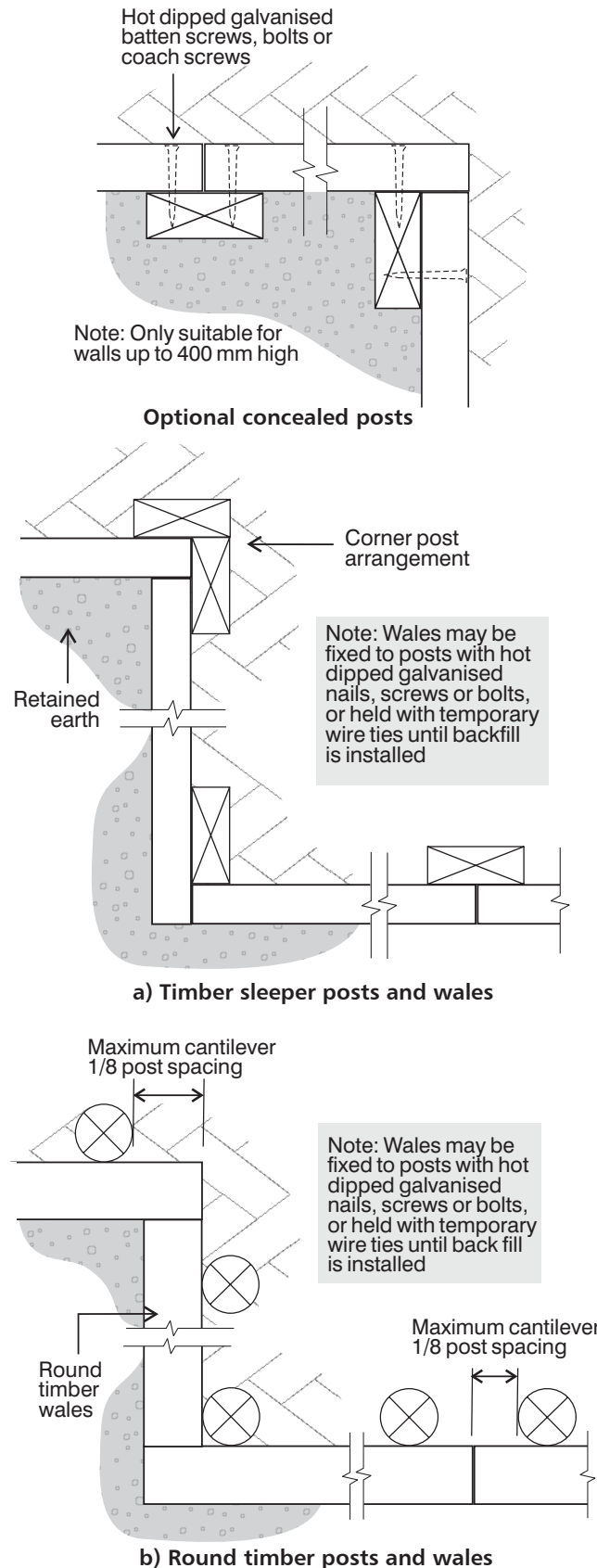


Figure 2 - Positioning Posts at Ends and Corners

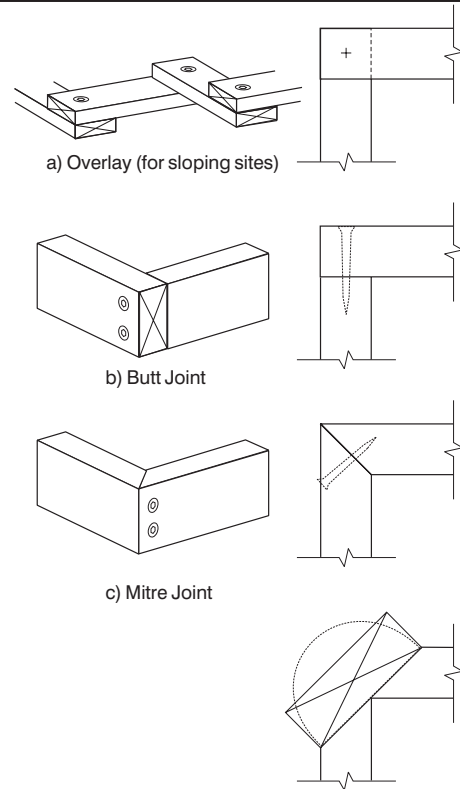


Figure 3 - Typical Methods of Restraining Garden Edges

## Steps

Single sleepers can be used to form steps or to terrace gently sloping ground.

Ends can be restrained by one of the methods shown in Figures 2 or 3. Alternatively, end restraint can be achieved by fixing to retaining walls as shown on Figure 4.

Tread options include bricks, pavers, gravel, compacted earth, or timber sleepers 'on flat'.

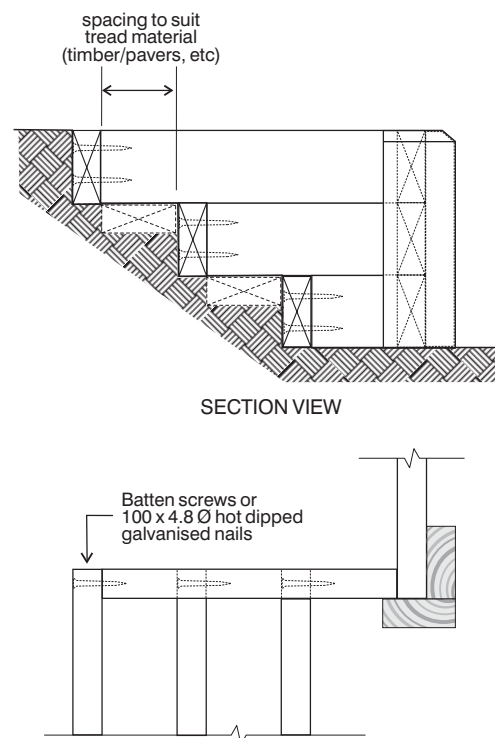
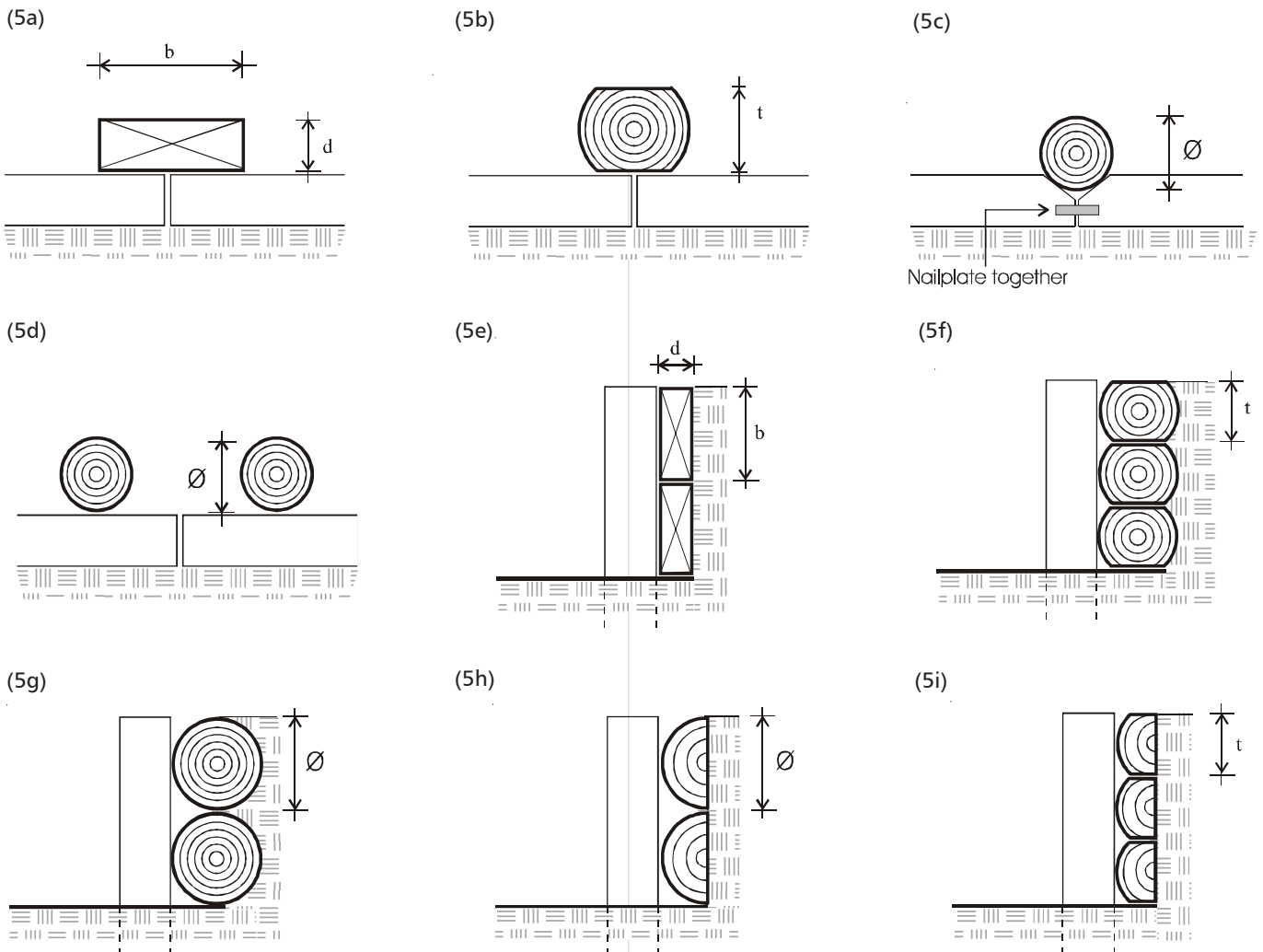


Figure 4 - Typical Sleeper Steps

**Table 1 Preservative Treated Softwood**

Member	Refer Figure	Post Spacing Wall Height	1200				1500				2400			
			400	600	800	1000	400	600	800	1000	400	600	800	1000
Sleeper Posts	5a	Size (b x d)	150 x 150	150 x 75	200 x 75	N/A	150 x 50	150 x 75	200 x 75	N/A	200 x 100	200 x 100	N/A	N/A
		Hole Dia.	300	300	450	N/A	300	330	450	N/A	300	450	N/A	N/A
		Depth	400	600	600	N/A	400	600	650	N/A	400	600	N/A	N/A
Slab Post	5b	Thickness (t)	90	90	90	125	90	90	90	125	100	100	125	2 X 125
		Hole Dia.	300	300	300	300	300	300	300	300	300	300	300	450
		Depth	400	600	600	750	400	600	650	750	400	600	900	950
Single Round Posts	5c	Post Dia. (Ø)	100	125	150	180	100	125	175	200	100	150	200	225
		Hole Dia.	300	300	300	300	300	300	300	450	300	300	450	450
		Depth	400	600	800	1000	400	600	800	1000	600	800	1000	1400
Double Round Posts	5d	Post Dia. (Ø)	100	100	125	150	100	100	150	175	100	125	175	200
		Hole Dia.	300	300	300	300	300	300	300	450	300	300	450	450
		Depth	400	600	800	1000	400	600	800	1200	600	800	100	1400
Sleeper Wales	5e	Size (b x d)	150 x 50	150 x 50	200 x 50	200 x 50	150 x 50	150 x 50	200 x 50	200 x 75	200x100	200x100	200x100	200x100
Slab Wales	5f	Thickness (t)	90	90	90	90	90	90	90	90	90	100	100	125
Round Wales	5g	Dia. (Ø)	75	75	75	75	75	75	75	75	100	100	100	100
Split Wales (½ round)	5h	Dia. (Ø)	75	75	100	125	75	100	125	N/A	N/A	N/A	N/A	N/A
Winged Split Wales	5i	Thickness (t)	100	100	100	100	100	100	100	100	N/A	N/A	N/A	N/A

**Figure 5 - Post/Wale Arrangements**



**Table 2 Hardwood** (refer Figures 5a & 5e)

Member	Wall Height	400	600	800	1000
		Post Spacing 1200			
Posts	Size (b x d)	200 x 50	200 x 75	200 x 75	200 x 100
	Hole Dia.	300	300	300	300
	Depth	400	600	800	1000
Wales	Size (b x d)	200 x 50	200 x 50	200 x 50	200 x 50
Member	Wall Height	Post Spacing 1500			
		400	600	800	1000
Posts	Size (b x d)	200 x 50	200 x 75	200 x 75	200 x 100
	Hole Dia.	300	300	300	300
	Depth	400	600	800	1200
Wales	Size (b x d)	200 x 50	200 x 50	200 x 50	200 x 50
Member	Wall Height	Post Spacing 2400			
		400	600	800	1000
Posts	Size (b x d)	200 x 50	200 x 75	200 x 75	200 x 100
	Hole Dia.	300	300	300	300
	Depth	600	800	1000	1400
Wales	Size (b x d)	200 x 50	200 x 50	200 x 50	200 x 50

### Safe Working

Working with timber produces dust particles. Protection of the eyes, nose and mouth when sanding, sawing and planing is highly recommended. Refer to tool manufacturers for safe working recommendations for particular items of equipment.

### Disposal of Offcuts and Waste

As with all treated timber, do not burn offcuts or sawdust. Preservative treated offcuts and sawdust should be disposed of by approved local authority methods.



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