



 **RETAINING  
WALLS BRISBANE**

# CONCRETE SLEEPER INSTALLATION GUIDE

Your Complete Guide To Installing  
CSRWB Concrete Sleepers

# Important Information About **CONCRETE SLEEPERS**

## **NOTES**

1. 50-year structural life span.
2. Retained soil is free draining and the water table is below the underside of the cantilever posts.
3. Ground in front of wall to have a maximum slope of 1:4 (14 degrees) for the first metre away from wall.  
Ground above the wall to have a maximum slope of 1:4 (14 degrees).
4. Maximum allowable live load surcharge is 5 kpa.
5. Founding material to be minimum stiff clay, dense sand/gravel or weathered rock, with a minimum allowable load bearing capacity of 75 kpa for non-cohesive (dense sand/gravel or weathered rock) and 150 kpa for cohesive soils (stiff clay) or greater.
6. Assumed retained soil unit weight and soil friction angle are:
  - cohesive (stiff clay)- 18kn/m<sup>3</sup> & 23°
  - non-cohesive (dense sand)- 18.5kn/m<sup>3</sup> & 35°
7. Lightweight fences up to a maximum of 1.8m high may be installed on the walls where wind loads do not exceed a classification of n3. vsit = 50m/s (ult).
8. Concrete cover to reinforcement 30mm.
9. Classes a1, a2, b1 concrete strength 40mpa based on below assumption (inland – greater than 50km from coastline, near - coastal - between 1km to 50km from coastline, industrial and tropical zones).
10. No excavation shall be carried out within 1.5m of base of wall.  
No excavation or additional surcharge (other than surcharges nominated in the design) shall be carried out or placed within the zone of influence of the retaining wall (s). sta does not accept any responsibilities of the wall integrity being compromised as a result of such acts.
11. Drainage & free draining material with geofabric to be installed behind wall.
12. No highly or extremely reactive material is to be used in the back fill zone & no clay or sand can be used in the drainage zone.
13. Regular monitoring of walls to be carried out including :-
  - regular visual inspection
  - inspections after floods & earthquakes
  - basic monitoring of lateral deflection
  - refer to specific retaining wall notes for signs to watch for

## **SURFACE**

- Provide drains at the top of all cut and fill slopes, including those retained. This shall be considered prior to construction commencement.
- Discharge to the street drainage.
- Discharge under controlled conditions, below and clear of the building envelope. Outflows are to be fanned onto slope rather than be concentrated to a single point where scour and/or erosion may be instigated.
- Provide and maintain general falls within drains to prevent blockage by siltation.
- Line spoon drains to minimise the infiltration or surface water and make drains flexible where possible.

## **SUBSURFACE**

- Provide filters around all subsurface drainage.
- Geotextile filter fabric to be installed between drainage gravel backfill and cut face (refer design detail).
- Provide appropriate drainage behind all retaining structures.
- Use flexible pipelines with access for long-term maintenance.
- Prevent the inflow of surface water.

## **CONSTRUCTION**

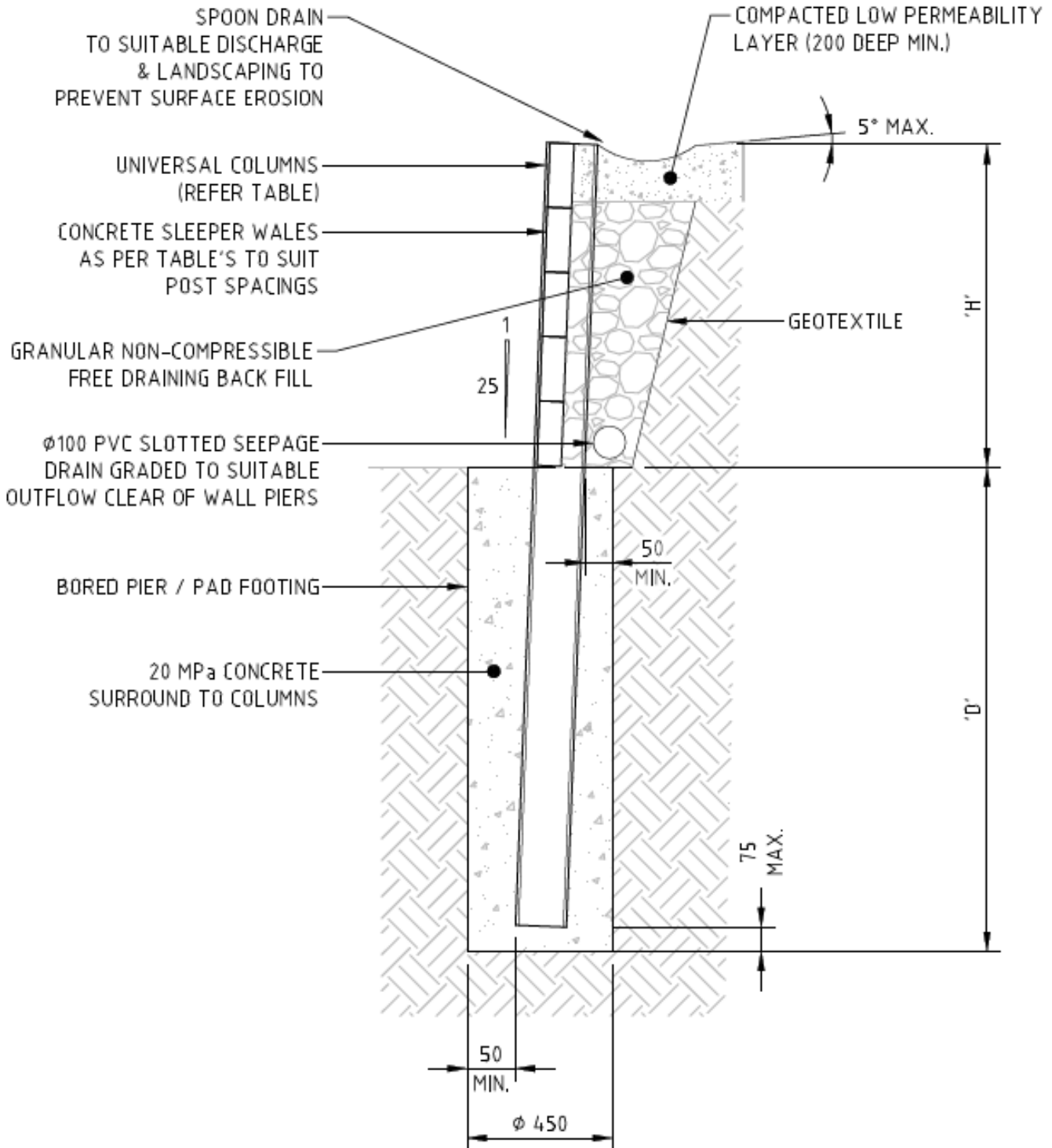
- Prior to site works & construction, checks are to be made that any existing structures are not within the Zone of influence of the proposed retaining wall.
- Where a cut is to be made works should proceed in a timely & safe manner to minimise the chances of slip before construction is complete. Site works should not be undertaken if periods of wet weather are forecast.
- If retaining a cut up to 1m high the ground is to be excavated a minimum of 300mm behind the wall then battered at an angle of 1:1. If this cannot be achieved, STA consulting engineers should be contacted to provide a stability assessment of the temporary batter slopes.
- It is the principal contractors responsibility to ensure that all workplace health & safety measures are adhered to during construction of the retaining wall.
- It is the builders responsibility to ensure relevant engineers design and approvals are in place prior to construction and that all required inspections are requested at each stage of construction.

**IMPORTANT: The information within this guide is intended as a guide only.**

If in doubt, please seek an expert opinion - CSRWB can provide you with guidance and more information.

# Typical Concrete Sleeper Wall

## Single Tier - Retaining Residential



# Concrete Sleeper Retaining Wall Detail

## with Universal Columns

POST SPECIFICATION-UC POST SIZE AND SPACING								
Wall Height 'H'	Cohesive (Stiff Clay)				Non-Cohesive (Dense Sand)			
	Sleeper Span / Post Spacing (m)				Sleeper Span / Post Spacing (m)			
	1.2	1.6	2.0	2.4	1.2	1.6	2.0	2.4
400	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8
600	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8
800	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8
1000	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8
1200	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8
1400	100UC 14.8	100UC 14.8	100UC 14.8	150UC 23.4	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8
1600	100UC 14.8	150UC 23.4	150UC 23.4	150UC 23.4	100UC 14.8	100UC 14.8	100UC 14.8	150UC 23.4
1800	150UC 23.4	150UC 23.4	150UC 23.4	150UC 23.4	100UC 14.8	150UC 23.4	150UC 23.4	150UC 23.4
2000	150UC 23.4	150UC 23.4	150UC 23.4	150UC 30.0	150UC 23.4	150UC 23.4	150UC 23.4	150UC 23.4
2200	150UC 23.4	150UC 23.4	150UC 30.0	150UC 30.0	150UC 23.4	150UC 23.4	150UC 23.4	150UC 23.4
2400	150UC 30.0	150UC 30.0	200UC 46.2	200UC 46.2	150UC 23.4	150UC 23.4	150UC 30.0	150UC 30.0
2600	150UC 30.0	200UC 46.2	200UC 46.2	200UC 46.2	150UC 23.4	150UC 30.0	150UC 30.0	N/A
2800	200UC 46.2	200UC 46.2	200UC 46.2	N/A	150UC 30.0	150UC 37.2	N/A	N/A
3000	200UC 46.2	200UC 46.2	N/A	N/A	150UC 37.2	N/A	N/A	N/A

BORED PIER / PAD FOOTING 450mm DIA. PIER DEPTH (m) 'D'								
Wall Height 'H'	Cohesive (Stiff Clay)				Non-Cohesive (Dense Sand)			
	Sleeper Span / Post Spacing (m)				Sleeper Span / Post Spacing (m)			
	1.2	1.6	2.0	2.4	1.2	1.6	2.0	2.4
400	0.5	0.6	0.6	0.7	0.5	0.6	0.7	0.7
600	0.6	0.7	0.8	0.9	0.7	0.8	0.9	1.0
800	0.8	0.9	1.0	1.1	0.9	1.0	1.1	1.3
1000	0.9	1.1	1.3	1.3	1.0	1.2	1.3	1.3
1200	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4
1400	1.3	1.3	1.3	1.5	1.3	1.3	1.5	1.7
1600	1.3	1.4	1.6	1.9	1.3	1.6	1.8	2.1
1800	1.3	1.6	1.9	2.2	1.5	1.9	2.2	2.5
2000	1.6	1.9	2.3	2.6	1.8	2.2	2.6	3.0
2200	1.8	2.2	2.6	3.1	2.0	2.5	3.0	3.5
2400	2.1	2.6	3.0	3.5	2.3	2.9	3.5	4.1
2600	2.3	2.9	3.5	4.0	2.7	3.3	4.0	N/A
2800	2.6	3.3	3.9	N/A	3.0	3.8	N/A	N/A
3000	2.9	3.7	N/A	N/A	3.4	N/A	N/A	N/A



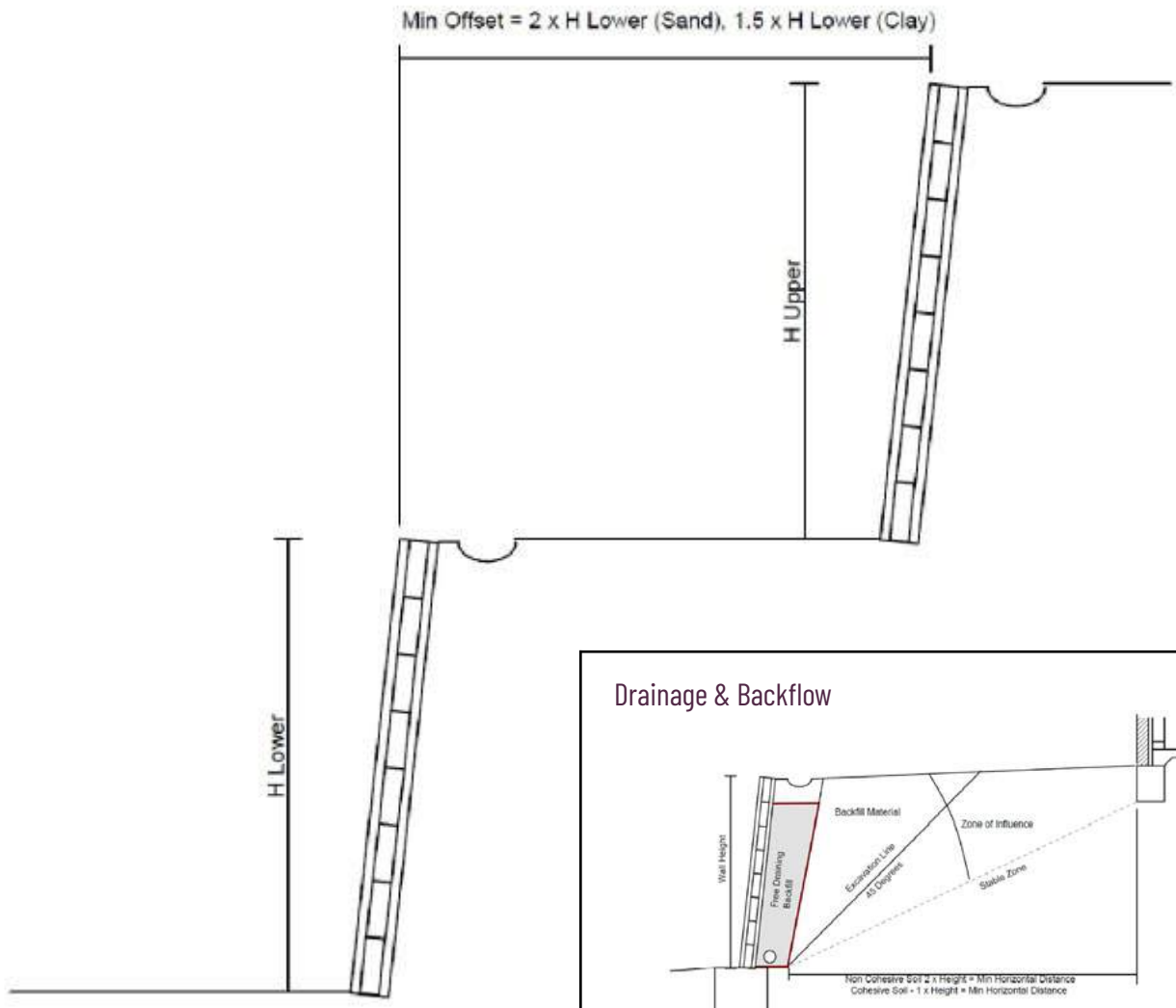
# Concrete Sleeper Retaining Wall Detail

with Fence Detail - N3 Max. Wind Rating (with Universal Columns)

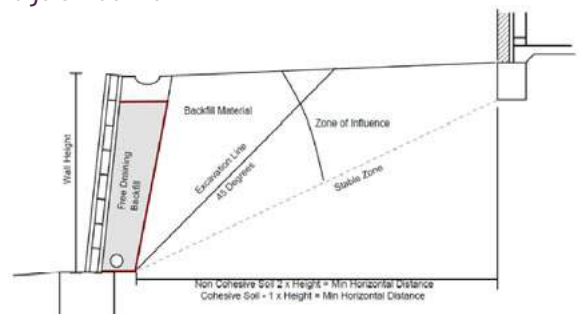
POST SPECIFICATION-UC POST SIZE AND SPACING								
Wall Height 'H'	Cohesive (Stiff Clay)				Non-Cohesive (Dense Sand)			
	Sleeper Span / Post Spacing (m)				Sleeper Span / Post Spacing (m)			
	1.2	1.6	2.0	2.4	1.2	1.6	2.0	2.4
400	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8
600	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8
800	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8
1000	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8
1200	100UC 14.8	100UC 14.8	100UC 14.8	150UC 23.4	100UC 14.8	100UC 14.8	100UC 14.8	100UC 14.8
1400	150UC 23.4	150UC 23.4	150UC 23.4	150UC 23.4	100UC 14.8	100UC 14.8	150UC 23.4	150UC 23.4
1600	150UC 23.4	150UC 23.4	150UC 23.4	150UC 23.4	100UC 14.8	150UC 23.4	150UC 23.4	150UC 23.4
1800	150UC 23.4	150UC 23.4	150UC 23.4	150UC 23.4	150UC 23.4	150UC 23.4	150UC 23.4	150UC 23.4
2000	150UC 23.4	150UC 23.4	150UC 30.0	150UC 30.0	150UC 23.4	150UC 23.4	150UC 23.4	150UC 23.4
2200	150UC 23.4	150UC 30.0	150UC 30.0	150UC 37.2	150UC 23.4	150UC 23.4	150UC 23.4	150UC 30.0
2400	150UC 30.0	150UC 37.2	200UC 46.2	200UC 46.2	150UC 23.4	150UC 23.4	150UC 30.0	N/A
2600	150UC 30.0	200UC 46.2	200UC 46.2	200UC 46.2	150UC 23.4	150UC 30.0	N/A	N/A
2800	200UC 46.2	200UC 46.2	200UC 46.2	N/A	150UC 30.0	150UC 37.2	N/A	N/A
3000	200UC 46.2	200UC 46.2	N/A	N/A	150UC 37.2	N/A	N/A	N/A

BORED PIER / PAD FOOTING 450mm DIA. PIER DEPTH (m) 'D'								
Wall Height 'H'	Cohesive (Stiff Clay)				Non-Cohesive (Dense Sand)			
	Sleeper Span / Post Spacing (m)				Sleeper Span / Post Spacing (m)			
	1.2	1.6	2.0	2.4	1.2	1.6	2.0	2.4
400	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.2
600	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.3
800	1.1	1.2	1.3	1.3	1.3	1.3	1.3	1.3
1000	1.2	1.3	1.3	1.3	1.3	1.3	1.4	1.5
1200	1.3	1.3	1.3	1.4	1.3	1.5	1.6	1.8
1400	1.3	1.3	1.5	1.7	1.5	1.7	1.9	2.1
1600	1.3	1.6	1.8	2.0	1.7	1.9	2.2	2.4
1800	1.5	1.8	2.1	2.4	1.9	2.2	2.5	2.9
2000	1.7	2.1	2.4	2.7	2.2	2.5	2.9	3.3
2200	2.0	2.4	2.8	3.2	2.4	2.9	3.3	3.8
2400	2.2	2.7	3.2	3.6	2.7	3.2	3.8	N/A
2600	2.5	3.0	3.6	4.1	3.0	3.6	N/A	N/A
2800	2.8	3.4	4.0	N/A	3.3	4.0	N/A	N/A
3000	3.1	3.8	N/A	N/A	3.7	N/A	N/A	N/A

# Terraced Wall Minimum Offset

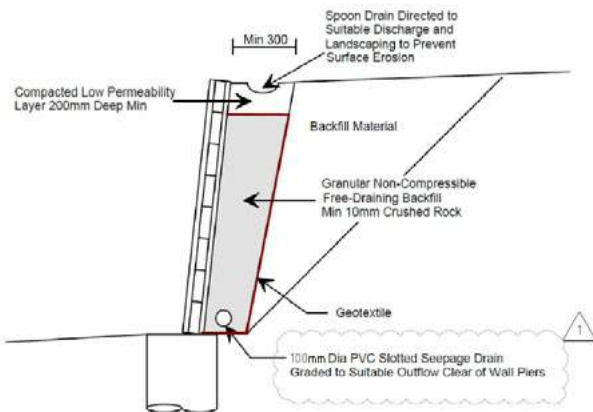


## Drainage & Backflow

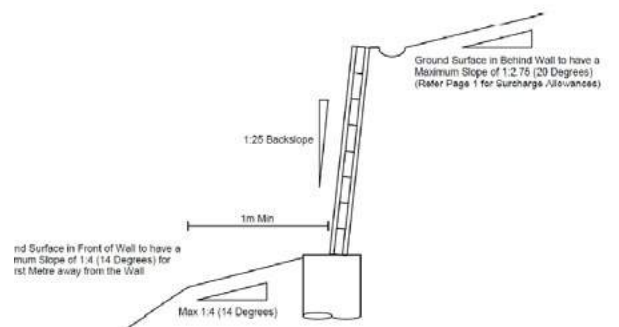


Terraced Wall Minimum Offsets

## Excavation Zones



## Maximum Slopes



# CONCRETE SLEEPERS

## Typical Installation Information

### **CONSTRUCTION NOTES**

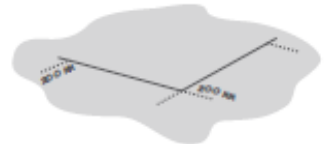
- Check with your local council whether building approval is required.
- All pier holes, posts & fences must be wholly contained within the retaining wall owners lot.
- If cutting back existing bank, care is to be taken to ensure no footings/structures are destabilised.
- It is the contractors responsibility to ensure all excavations, trenches and piers are fenced off with safety barriers.
- Ensure 50mm cover to all post reinforcement.
- All pier holes shall be firm, dry and free from loose material prior to placement of concrete.
- Ensure site adequate drainage with sub-soil drain outlets installed to the retaining wall at 30m centres.
- Sub-soil drains should be regularly flushed/inspected by all a qualified person to ensure proper function of the drainage system.
- Sleepers are heavy. Sleepers should only be lifted by 2 persons or with the assistance of plant equipment.
- All sleepers cut on site to be treated with high build epoxy or inorganic zinc silicate to AS2312.1:2014
- Treated surface is to be dry, clean and free from debris or cutting slurry.
- Efflorescence is a white powdery deposit that can naturally form on concrete subject to repeated wet/dry cycles. To mitigate efflorescence ensure environment is dry and free draining.



# COLORBOND PLINTH

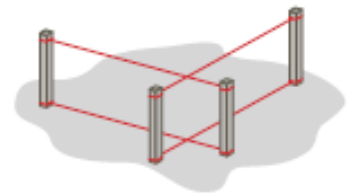
## 1. PREPARE THE AREA

Clear and level your site where you plan to build the retaining wall. Ensure you leave 300mm behind the retaining wall area for backfill.



## 2. ALIGNMENT & HOLE POSITION

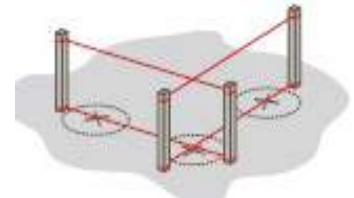
Place a star piquet or peg at both ends of the proposed wall. Attach two string lines at each end of the wall, top and bottom, to keep your wall aligned.



## 3. MARK OUT HOLE POSITIONS

Starting from one end of the wall, mark a cross on the ground at intervals with their centre being approximately 20mm more than the length of the sleeper.

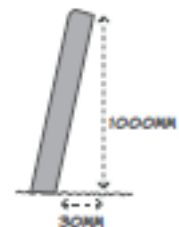
For example: If you are using 1990mm sleepers the hole centres should be 2020mm apart for walls with fence brackets 2030mm.



## 4. AUGER HOLES AND POUR CONCRETE

Auger holes as per your engineer's specifications.

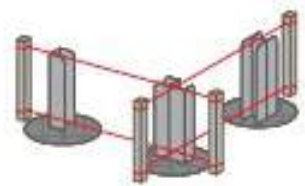
- Pour concrete into holes, one at a time.
- Make the concrete stiff. If using readymix concrete, order 20/20, 60 slump.
- Set your post by lowering into ground until level with the top string lines.
- Ensure there is a minimum lean back of 1.25 (40mm for every 1.0m in height).



## 5. CHECKING POSTS

Use a spirit level to make sure all your posts are aligned with the string line and are perpendicular on the sides.

- It is also important to measure the remaining distance to the top of your steel posts, to ensure the sleepers finish flush with the top of the posts.
- If required, lay a concrete pad on both sides of the steel post.



## 6. AG PIPE AND BACKFILL

Allow the concrete to cure for two to three days before you place your sleepers in. Place ag pipe at the base, then backfill with gravel to 200mm from the top.



## 7. FINISHED WALL

Enjoy your new CSRWB retaining wall.

Machine equipment & heavy vehicles should not be used on the high side of the wall, minimum distance of 2x H Lower (sand) and 1.5x H Lower (clay).





Easy Installation Using

# OUR CONCRETE SLEEPER LIFTERS

To help you more easily install your concrete sleepers for your retaining walls, we have concrete sleeper lifters available for hire.

These lifters allow you to grab and easily manoeuvre concrete sleepers safely.

For more information about hiring our concrete sleeper lifting equipment, please contact our friendly team. We're always happy to help.



Need a little

## MORE GUIDANCE?

Our staff at Concrete Sleepers Retaining Walls Brisbane are knowledgeable and happy to help.

If you need any guidance during the installation of your retaining walls, our friendly staff are on hand to offer assistance.

Feel free to call, email or visit us and we'd be happy to guide you through the process.

### CONTACT US

Call Us  
07 3393 9647

Email Us  
sales@csrwb.com.au

Visit Us  
7/237 Fleming Road  
Hemmant QLD



Call us on 07 3393 9647  
[www.csrwb.com.au](http://www.csrwb.com.au) | [sales@csrwb.com.au](mailto:sales@csrwb.com.au)