



**BAINES  
MASONRY**  
Quality First

# Wallaroo<sup>®</sup> Concrete Sleepers

## Retaining Wall Evaluation and Installation Guide



Woodgrain Snow Gum (L), Rock Face Basalt (R).

Australian Owned, Designed and Manufactured

member of



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**Wallaroo® Concrete Sleeper retaining walls are a proven load bearing retaining wall system designed and manufactured in Australia.**

**The Wallaroo® Sleeper retaining wall system has undergone extensive testing by the most up-to-date test facility in Australia and the results achieved are equal or better than most products designed in Australia or foreign countries.**

**The aesthetic design and colour selection available ensures you not only get a retaining wall system designed for Australian conditions but a system that has the beauty to blend in any landscape environment.**

**Professional engineers and designers prefer the qualities the system has, including but not limited to:**

- **A range of modern textures and colours to suit many different designs.**
- **Main wall assembly including sleepers and steel pipes required.**
- **Snug fitting connections, very little movement once sleepers are placed in the frame and on each other.**
- **A professionally designed wall system that complies to Australian Standards.**

**Quality is our priority when producing our retaining wall systems, the Wallaroo® Concrete Sleeper system is no exception. Other products on the market do not compare well because they cannot duplicate the finishes and production process of the Wallaroo® Concrete Sleeper.**

**When you choose the Wallaroo® Concrete retaining wall system you can be confident you will receive the best Australian designed concrete sleeper retaining wall system that is superior in quality, design and aesthetics of any local or overseas product.**

# Wallaroo® Concrete Sleepers Retaining Wall Evaluation and Installation Guide



Woodgrain Snow Gum (Above)

This installation guide demonstrates the basics on how to construct sleeper retaining walls using the Wallaroo® Concrete Sleepers Retaining Wall System.

This guide outlines the retaining wall selection and identification procedure along with the retaining wall construction process.

This is a guide only, and not a design manual.

The information provided in no way replaces the services of professional consultants on a particular project.

No liability can therefore be accepted by Baines Masonry.

Rock Face Basalt (below).



# Wallaroo® Concrete Sleepers Retaining Wall



Smooth Natural Grey (Above).

The Wallaroo® Concrete Sleepers range from 70-80mm wide and require at a minimum 100mm galvanised steel posts. Refer to design schedule for details.

## Details of the Wallaroo® Concrete Sleepers System

Sleeper height	200 mm
Sleeper length	1800 mm
Sleeper depth	70-80 mm
Sleeper weight	65 kg approx.
Sleepers per pallet	30 units
Weight per pallet	1800 kg approx.
Wall slope	17 Degrees (55 in 180)
Infill behind & within the facing blocks	Compacted 10 to 20 mm crushed rock aggregate
Drainage pipe	100 mm diameter PVC agricultural pipe with sock

\*A variation in width is possible across the range of textures.

Available up to 2400mm in length, the steel posts come in H posts and C channels, along with 45° and 90° Corner posts.

***Wallaroo® Concrete Sleepers - a retaining wall system that has the beauty to blend in any landscape environment!***

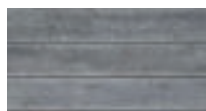
## Wallaroo® Concrete Sleeper Finish & Colour Range

Available in various textures and colours to suit any design project.

### Smooth Face



Natural Grey



Santorini Black



Grey Stone



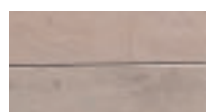
Basalt



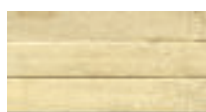
Snow Gum



Black Wattle



Havana Brown



Tuscan Sun



River Rock



Sand



Ironbark



Highland Pine

### Rock Face

### Woodgrain

Colours displayed in this brochure are to be used as a guide only. Colours are as close as printing process will allow. Displays in store may vary to actual colour due to batch variations. Obtain samples from Baines Masonry for current batch colour. Care should be taken to order sufficient product to complete job at the one time to avoid batch variation. Surplus blocks are not returnable. No Claim after 7 days or once products have been incorporated in construction. Not all colours available in every region, please check with your supplier.

# Retaining Wall Selection Procedure

## Step 1 Legislation & Regulative Requirements

Seek and adhere to information and advice on local legislative and regulative requirements pertaining to the proposed retaining wall project before commencing.

## Step 2 Retaining Wall Design

Using the retaining wall design tables provided on page 7, identify the appropriate design including supporting other structures such as a fence.

## Step 3 Wall Height

Find the maximum required retaining wall height ( $H_s$ ) via site survey or measurement.

If a wall is taller than the maximum height allowed for in the design guide, seek the advice of a suitably qualified structural engineer before proceeding.

## Step 4 Pile depth ( $H_p$ ), Column embedment ( $E_d$ ) & Column size ( $SC1$ )

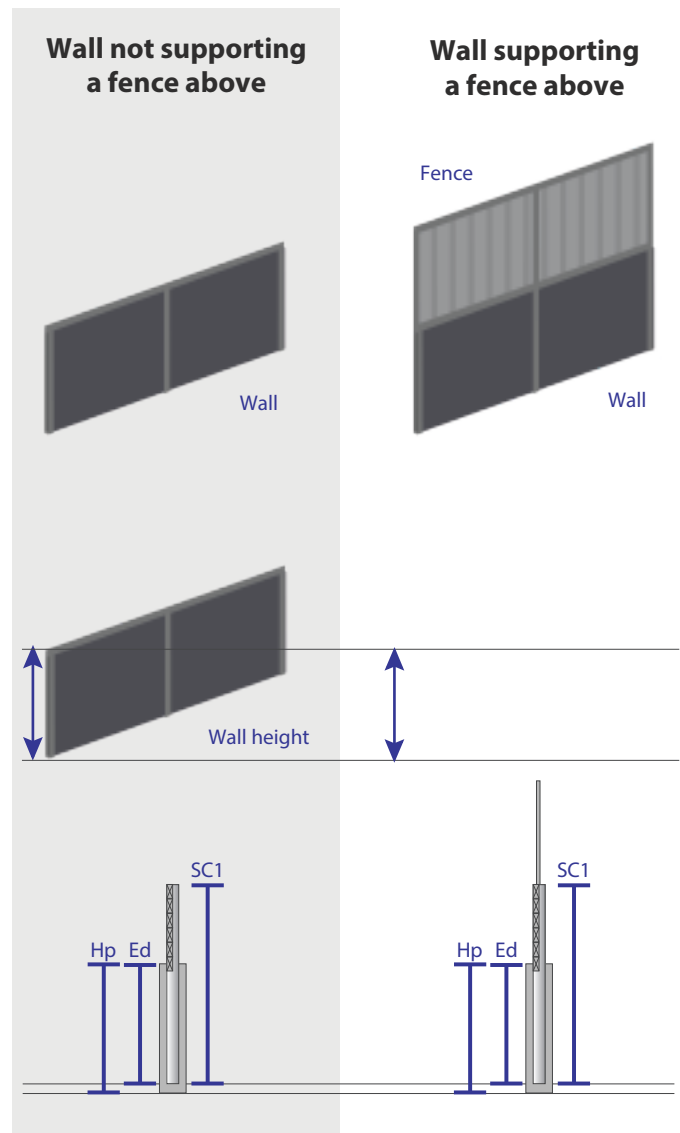
From the design tables on page 7, determine the required pile depth ( $H_p$ ), column embedment ( $E_d$ ) and column size ( $SC1$ ) required to achieve the desired wall height.

## Step 5 Ground and Soil Conditions

Verify that the in-situ ground properties reflect the assumptions outlined in the general notes of the design guide – refer Note RW8 on Engineers Drawing (available upon request).

## Step 6 Geotechnical Engineer

Engage a geotechnical engineer to confirm the in-situ ground conditions conform with the wall design assumptions – refer Note RW8 on Engineers Drawing (available upon request). Seek the advice of a qualified geotechnical/structural engineer if any deviations from these assumptions are identified.



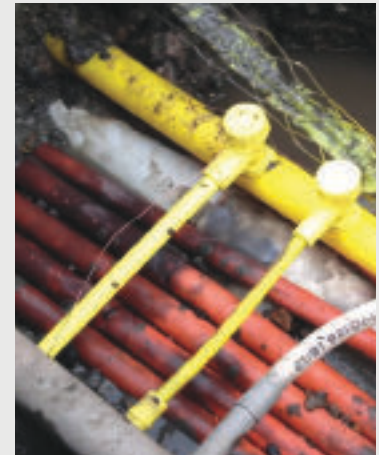
### As an example:

A client wants to install a 1700mm high retaining wall supporting a fence above. This scenario would require a 450mm diameter pile at a depth of 1850mm, with a 150UC23 column embedded 1650mm deep into the pile.

# Retaining Wall Construction Procedure

## Step 1 Dial Before You Dig

Identify wall location, contact local authority if required, and determine the location of all in-ground services and existing footings prior to commencing excavation.



## Step 2 Prepare For Access

Prepare the site for access.

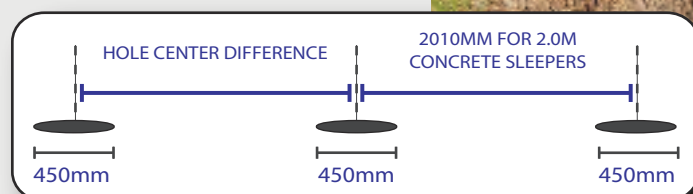
This means clearing space for labour and equipment, and ensuring the site is safe to for all.



## Step 3 Mark Pile Holes

Mark out the location of all piles to be excavated. Set pegs at each of the retaining wall site and connect with a stringline to give required alignment.

Allow for a 10mm gap for ease of installation i.e. holes should be dug at 2010mm for 2.0 m sleepers. The pile hole diameter must be at least 450mm for a one (1) meter high retaining wall.

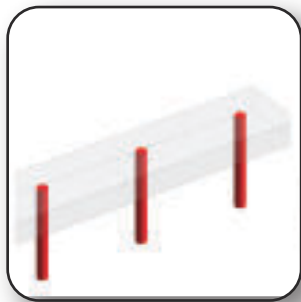
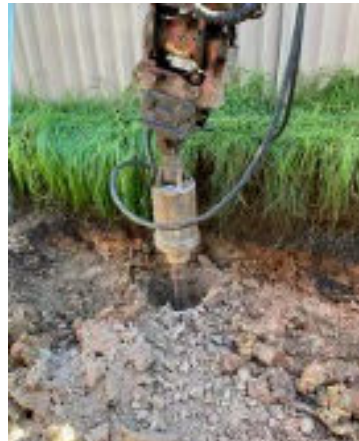


# Retaining Wall Construction Procedure

## Step 4 Excavate Pile Holes

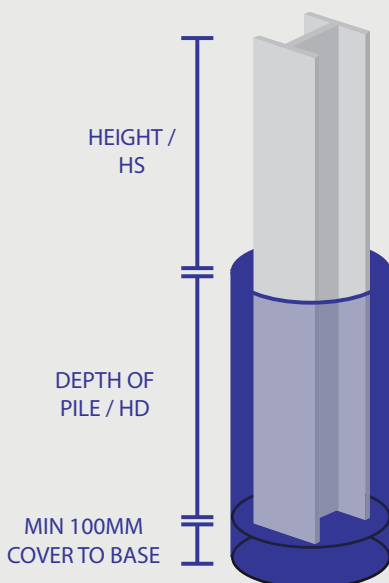
Excavate pile holes to required depth and diameter. Ensure no loose material falls into the bored holes.

Refer to tables below, for recommended pile specifications based on wall height.



## PILE SPECIFICATIONS TABLES

Recommended Pile Specifications based on With or Without Fence Over. Engineer specifications and drawings available upon request.



WITHOUT FENCE OVER				
SLEEPER LENGTH (L) = 2000MM				
HEIGHT 'Hs' (MM)	DEPTH OF PILE 'Hp' (MM)	PILE DIA 'Hd' (MM)	EMBEDMENT 'Ed' (MM)	COLUMN SIZE 'SC1'
0-900	1400	450	1300	100UC14
901-1200	1600		1500	100UC14
1201-1400	1800		1700	100UC14
1401-1600	2000		1900	150UC24
1601-1800	2300		2200	150UC30

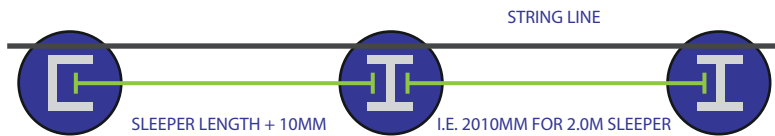
WITH FENCE OVER				
SLEEPER LENGTH (L) = 2000MM				
HEIGHT 'Hs' (MM)	DEPTH OF PILE 'Hp' (MM)	PILE DIA 'Hd' (MM)	EMBEDMENT 'Ed' (MM)	COLUMN SIZE 'SC1'
0-900	1600	450	1500	100UC14
901-1200	1700		1600	150UC24
1201-1400	1900		1800	150UC24
1401-1600	2000		1900	150UC30
1601-1800	2200		2100	150UC37

# Retaining Wall Construction Procedure

## Step 5 Install Steel & Check

Install the SC1 columns into the bored hole. Ensure the columns are adequately braced to ensure no movement during the concrete pour. Provide aspro spacers fixed to SC1 as required to achieve cover.

Use a string line to ensure correct alignment and distances between posts. This can be done with a tapemeasure or a piece of cord cut at 2010mm, and a spirit level.

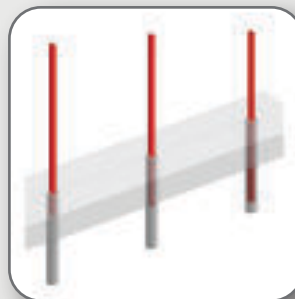


## Step 6 Pour Concrete

Pour concrete in accordance with the concrete schedule.

Do not overfill holes.

Allow concrete to cure for a minimum of 24 hours prior to installing the concrete sleepers.



## Step 7 Install Two (2) Sleepers

Install first two (2) layers of concrete sleepers.





# Retaining Wall Construction Procedure

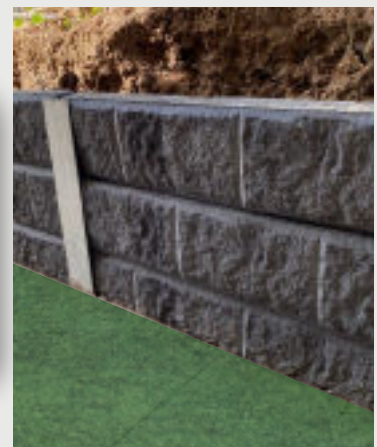
## Step 8 Install Drainage Pipe

Install slotted 100mm aggregate pipe drain along base of wall connected to legal point of discharge.



## Step 9 Install Remaining Sleepers

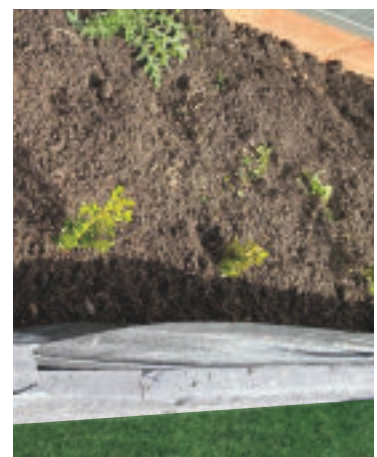
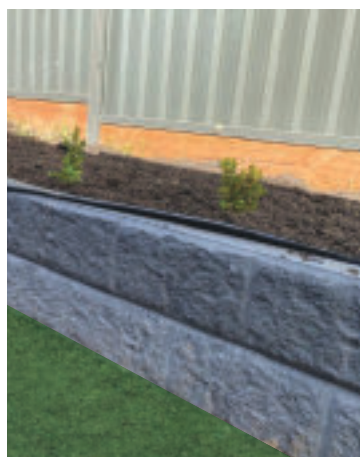
Install remaining concrete sleepers to the required high.



## Step 10 Backfill Wall

Wait a minimum of seven (7) days after the concrete pour to backfill the wall.

Ensure the aggregate pipe is covered with 20mm clean screening gravel to allow for adequate drainage.



## Glossary

### **Infill / Backfill Material**

The soil material, placed behind the retaining wall facing and strengthened by the geogrids.

### **Bearing Pad / Slab**

The pad made from concrete the retaining wall is built on.

### **Drainage Fill**

The crushed rock, gravel or similar material placed behind a retaining wall to convey ground water away from the wall foundations. It is commonly used in conjunction with other drainage media, such as agricultural pipes.

### **Structural Engineer**

Structural engineers analyse, design, plan, and research structural components and structural systems to achieve design goals and ensure the safety and comfort of users or occupants. Their work takes account mainly of safety, technical, economic, and environmental concerns, but they may also consider aesthetic and social factors.

### **Pile**

A pile is a long structure, usually in the shape of a cylinder, that is placed deep into the soil to provide support for the structures above, such as a retaining wall.

### **Pile Depth (Hp)**

The pile depth is the measurement of how far down the pile must be placed within the soil in order to provide the most support for the structure.

### **Column Embedment (Ed)**

The measurement of the column embedment within concrete.

### **Column Size (SC1)**

The size of the column to be used given the project requirements and specifications.

## Reference Documents

This sleeper retaining wall design guide has been designed in accordance with the following standards:

- AS/NZS1170.0-2002 Structural design actions - Part 0: General principles
- AS/NZS1170.1-2002 Structural design actions - Part 1: Permanent, Imposed and Other Actions
- AS/NZS1170.2-2011 Structural design actions - Part 2: Wind actions
- AS/NZS2312-2002 Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings
- AS3600-2018 Concrete structures
- AS4100-1998 Steel Structures
- AS4678-2002 Earth-retaining structures

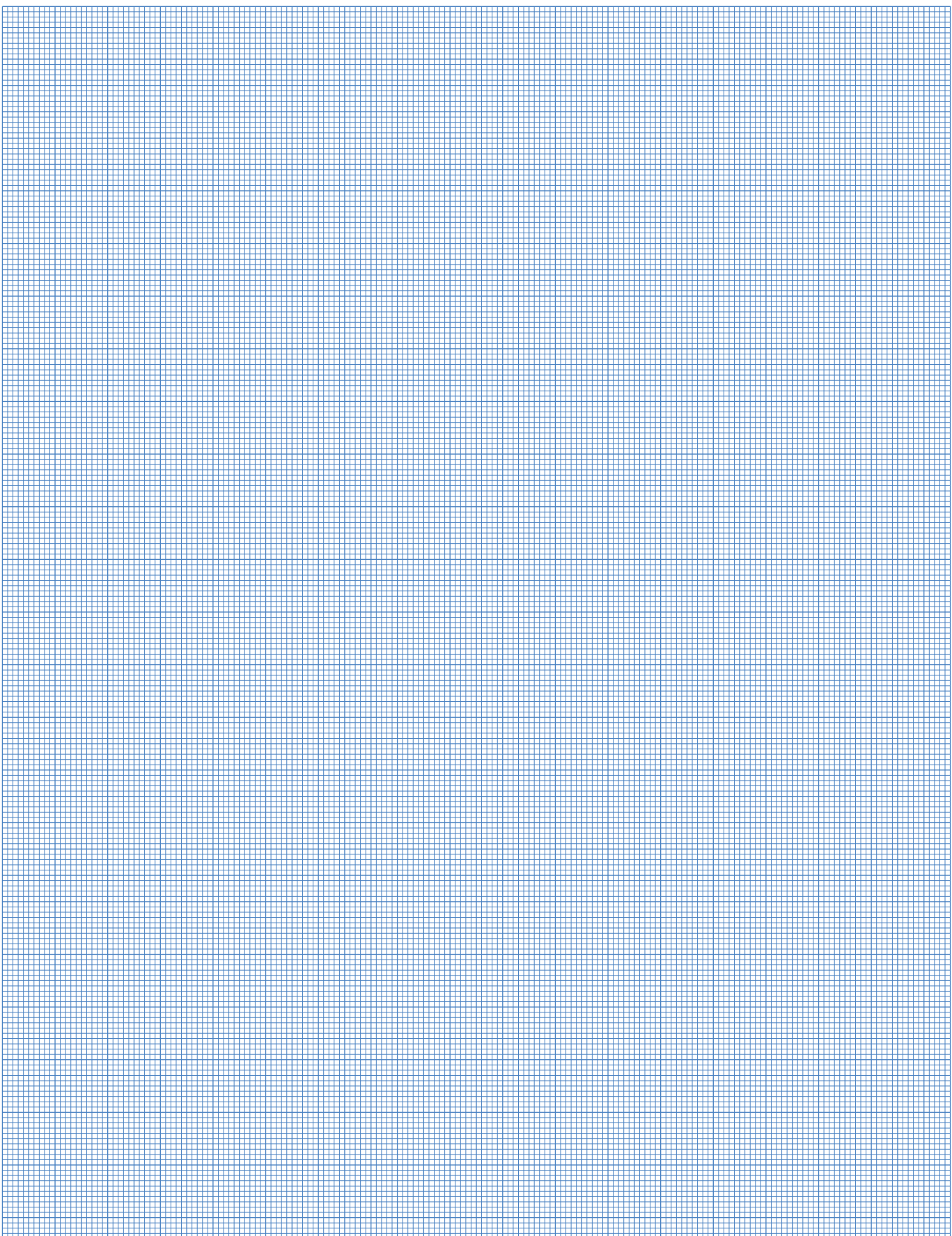
### **Disclaimer**

1. These design tables were compiled by FMF Engineering. The design tables are only valid for the limits and assumptions outlined in the structural drawings – the advice of a suitably qualified engineer should be sought for any proposed deviations to these parameters.
2. Drainage is critical to avoid water retention behind the wall. Adequate drainage should be installed in accordance with AS/NSS3500 Plumbing & Drainage and other relevant codes/guidelines.

Client	
Site	
Ph	Fax



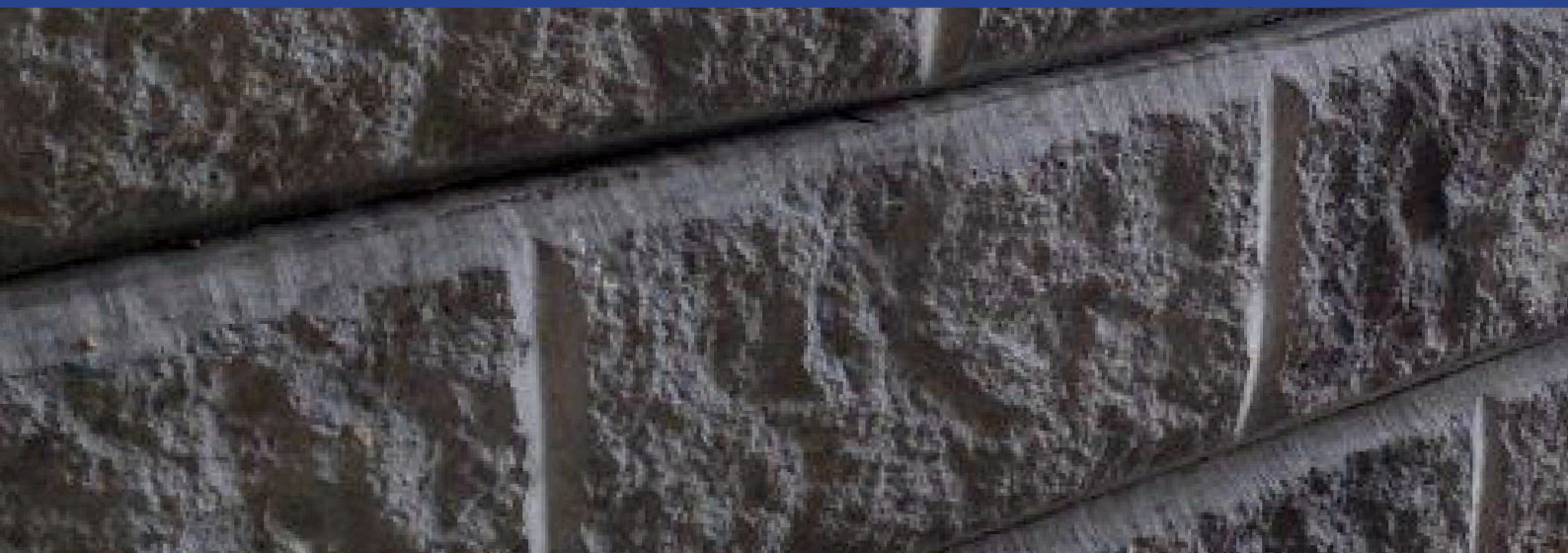
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this drawing is indicative only and is not to scale unless otherwise stated



## Supplier:



This installation guide demonstrates the basics on how to construct earth retaining walls using the Wallaroo® Concrete Sleepers Retaining Wall System. The guide outlines a retaining wall selection procedure and a retaining wall construction procedure.

Rock Face Sand (Top), Rock Face Basalt (Below).

This is a guide only, and not a design manual.

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