

RETAINING BLOCKS

Terraforce & Terravert Technical Guide



Retaining wall systems
for medium & heavy
gravity mass retentions

Version 1 - 12|02|2025

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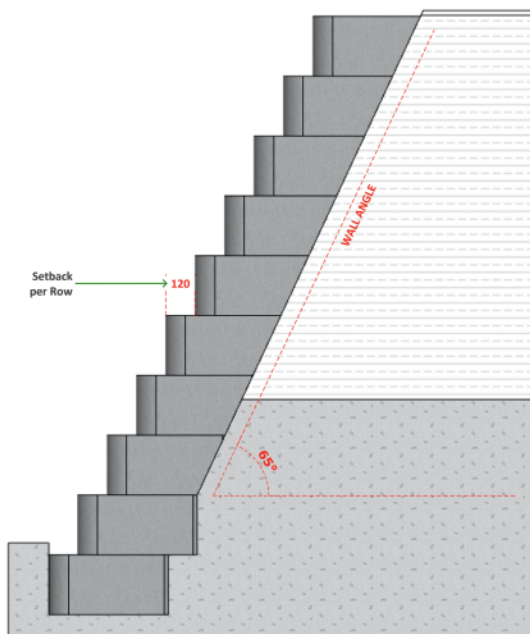
RETAINING WALL BLOCK SELECTION CHART

Type:	V10	V8 (320)	L11	V8 (400)	S10	S10 Double Row
Wall Width (mm)	250	320	350	400	500	1000
Blocks per m ²	10	8	11	8	10	20
Block Mass (kg) +/-	25	37	35	50	48	96
Infill Volume (litres) +/-	11	22	15	23	24	48
Infill Mass per Unit (kg)	16.5	33.5	22.5	35	37	74
Wall Mass per m ² incl. Soil (kg) +/-	390	580	545	616	850	1580
Recommended Max Wall Height (meters)	2	3.5	5		7	9

WALL ANGLE | SETBACK CHART

ROWS ARE 250MM HIGH

Setback Per Row (mm)	Approx. Wall Angle (Degree)
300	40
250	45
210	50
175	55
145	60
120	65
90	70
65	75
45	80
20	85



TYPICAL WALL ELEVATION PROFILE

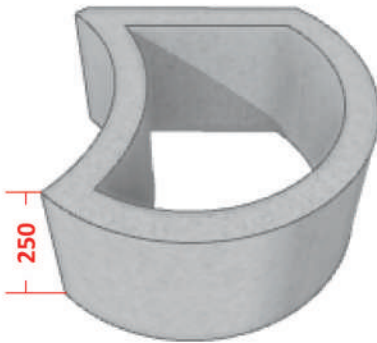
ADVANTAGES OF OUR RETAINING SYSTEMS

- Terraforce and Terravert blocks are packed close fitting to maximize the wall mass.
- These systems provide a closed vertical face to the backfill preventing washout and destabilisation of the backfill and ultimately the wall.
- There are no air voids created in these walls.
- Both the bottom course and the top course present a completely flat stable surface finish at both the top and base of the wall.
- These systems provide for construction of variable setback angles within a wall to adapt to prevailing site conditions.
- Retentions with wall angles from vertical to 40 degrees are possible with the ideal at about 65 degrees. (See setback wall angle chart above)
- When necessary, wall angles may be set back (angle reduced) to overcome anticipated challenges of overturning and sliding forces from subsurface storm water and instability of the material being retained.
- Soil infill within the blocks allows for uninhibited root growth and penetration throughout the wall, thereby also binding the wall together.
- Additional wall security can be provided in columns in the blocks by infill with rods and concrete both vertically and horizontally, with rods secured into foundations. Integral concrete 'Richter' tie backs into the backfill, or walkways cast behind at the top of the wall provides additional stability when required. (Cut out part of back of blocks to facilitate this).

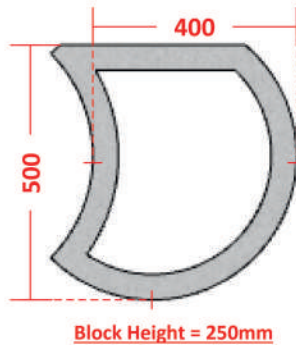
S10 (500) HEAVY DUTY APPLICATIONS

SPECIFICATIONS

3D Image



Top View



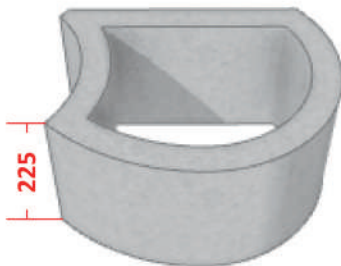
- Wall width 500mm
- 10 blocks per square meter
- Unit mass 45kg
- Wall mass 850kg per square meter
- Block infill volume 24 liters
- Cast in 35MPa concrete mix design
- Variable setback and wall angles permitted

Ideal for large-scale and challenging retaining walls, for walls up to 9 meters high and built 500mm wide. Used for heavy-duty landscaping and erosion control suiting both straight and curved structures.

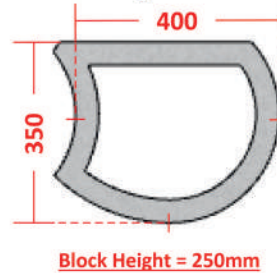
L11 (350) MEDIUM DUTY APPLICATIONS

SPECIFICATIONS

3D Image



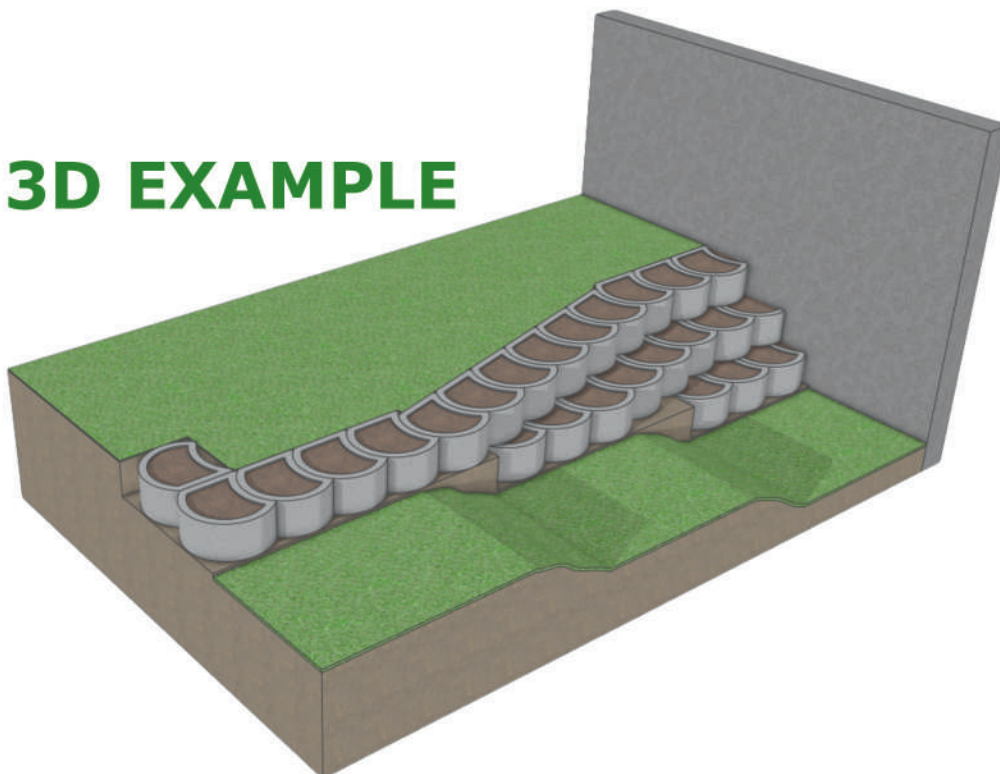
Top View



- Wall width 350mm
- 11 blocks per square meter
- Unit mass 31kg
- Wall mass 566kg per square meter
- Block infill volume 15 liters

Ideal for large-scale and challenging retaining walls, for walls up to 9 meters high and built 500mm wide. Used for heavy-duty landscaping and erosion control suiting both straight and curved structures.

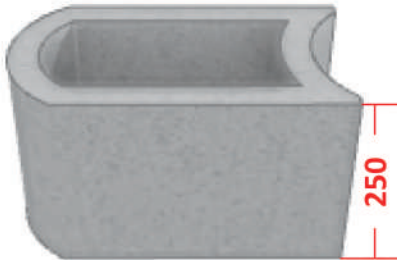
3D EXAMPLE



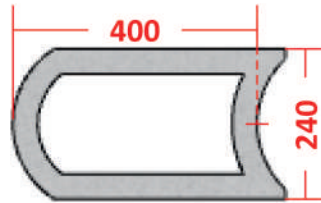
V10 (250)

SPECIFICATIONS

3D Image



Top View



Block Height = 250mm

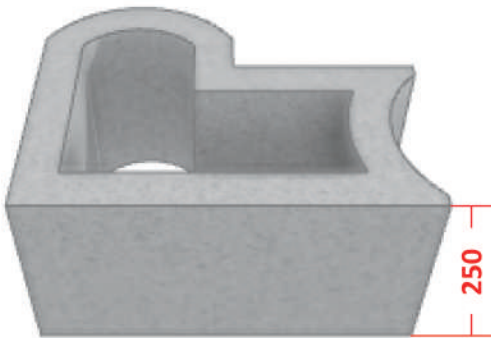
- Wall width 250mm
- 10 blocks per square meter
- Unit mass 25kg
- Wall mass 390kg per square meter
- Block infill volume 11 liters
- Available in a rockface finish

A versatile and cost-effective choice for lighter retaining walls, perfect for D.I.Y. projects and tight spaces. With a narrow 250mm width, they create seamless 90-degree angles and wall terminations while offering long-lasting, corrosion-free durability.

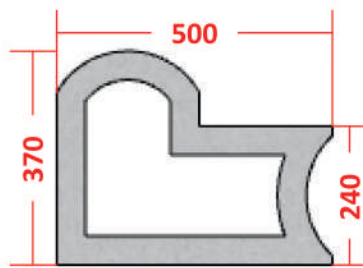
VC10

SPECIFICATIONS

3D Image



Top View



Block Height = 250mm

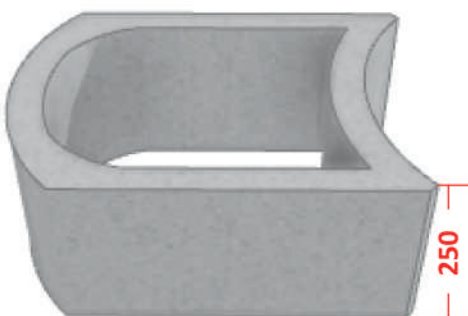
- Wall width 300mm
- 10 blocks per square meter
- Unit mass 25kg
- Wall mass 390kg per square meter
- Block infill volume 11 liters
- Available in a rockface finish

These blocks are complementary to the V10 blocks for using at and around corners.

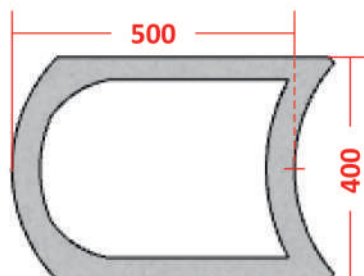
V8 (400)

SPECIFICATIONS

3D Image



Top View



Block Height = 250mm

- Wall width 400mm
- 8 blocks per square meter
- Unit mass 50kg
- Wall mass 616kg per square meter
- Block infill volume 23 liters
- Available in a rockface finish

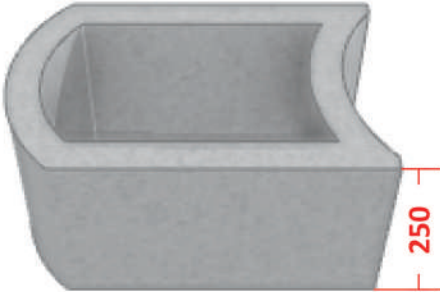
A powerful and cost-effective solution for vertical or near-vertical heavy-duty retaining walls, the V8 Blocks offer strength, durability, and a natural aesthetic. Available in 400mm and 320mm widths, they provide a cost-effective option with smooth or rockface finishes for a polished look.

Please note: All retaining walls built over 1800mm in height need to be engineered

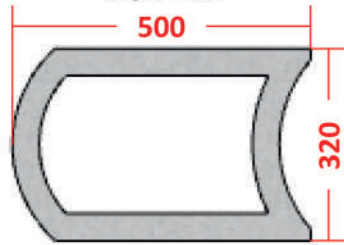
V8 (320)

SPECIFICATIONS

3D Image



Top View

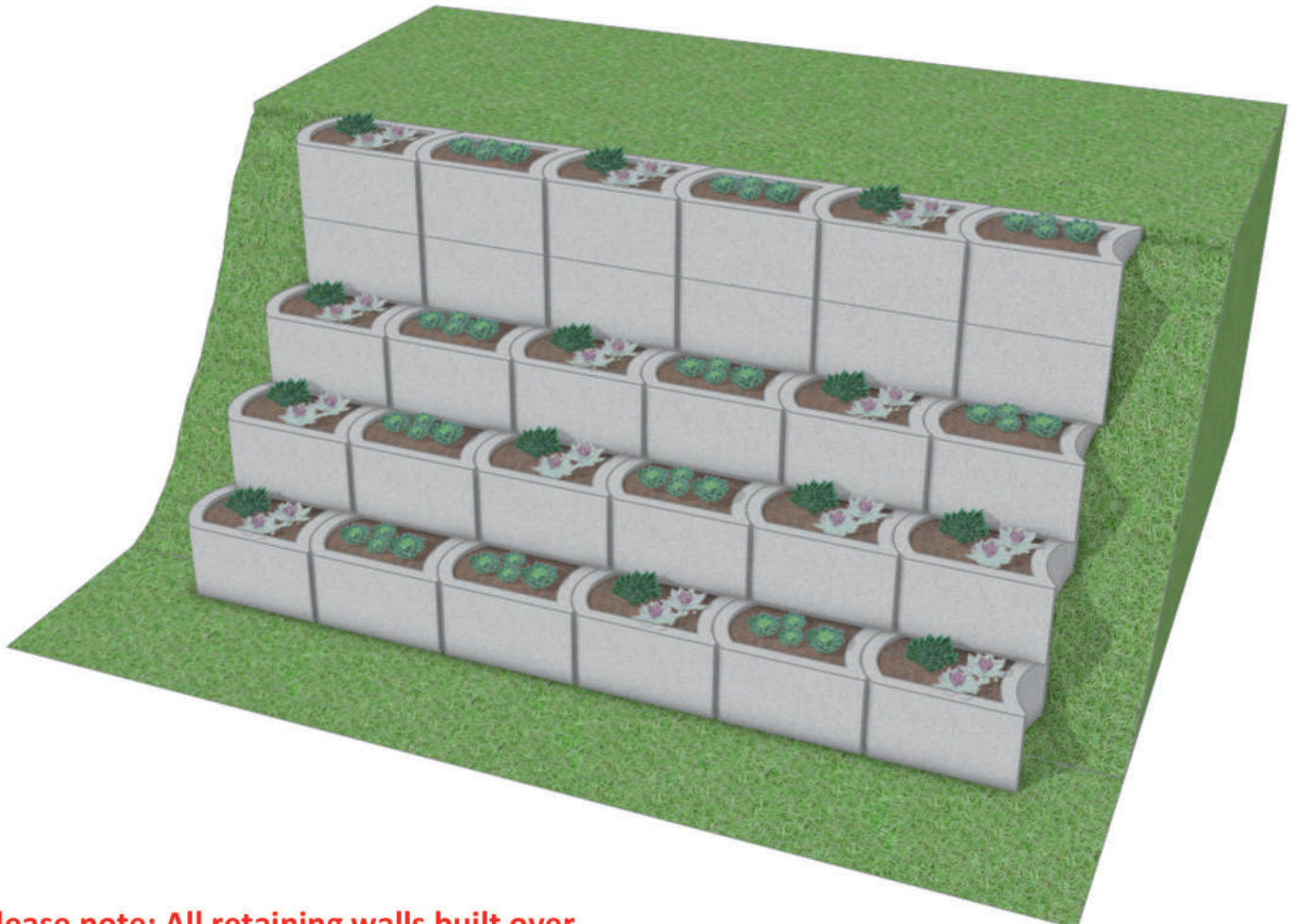


Block Height = 250mm

- Wall width 320mm
- 8 blocks per square meter
- Unit Mass 37kg
- Wall mass 564kg per square meter
- Block infill volume 22 liters
- Available in a rockface finish

A powerful and cost-effective solution for vertical or near-vertical heavy-duty retaining walls, the V8 Blocks offer strength, durability, and a natural aesthetic. Available in 400mm and 320mm widths, they provide a cost-effective option with smooth or rockface finishes for a polished look.

3D EXAMPLE



Please note: All retaining walls built over 1800mm in height need to be engineered

INTRODUCTION

Terraforce & Terravert are a cost effective, segmented and mortarless retaining system which is fully interlocking and truly plant supportive. The unit by itself or in combination with other products in the Terraforce range offers the designer unlimited creativity, structural integrity and continuing aesthetic appeal. The systems comprise of versatile, reversible units that can effectively be used in the planning of virtually all erosion control, landscaping and even heavy earth retaining projects.

FEATURES

Sharp or wide convex or concave curves are formed by simply turning the units without eliminating the interlocking feature. By reversing the elements, flat faced structures such as steps or vertical flush faced retaining walls and free-standing walls may be built. The units that have been filled with topsoil can be planted with creepers, ground covers, shrubs or flowers.

DESIGN AND SPECIFICATION

The success of any construction project depends on:

- Professional design
- Quality materials
- Good construction techniques

PROFESSIONAL DESIGN

This guide is intended to provide on-site installation guidelines and ideas only. For Engineering details on the following vital design considerations, please consult a registered qualified engineer.

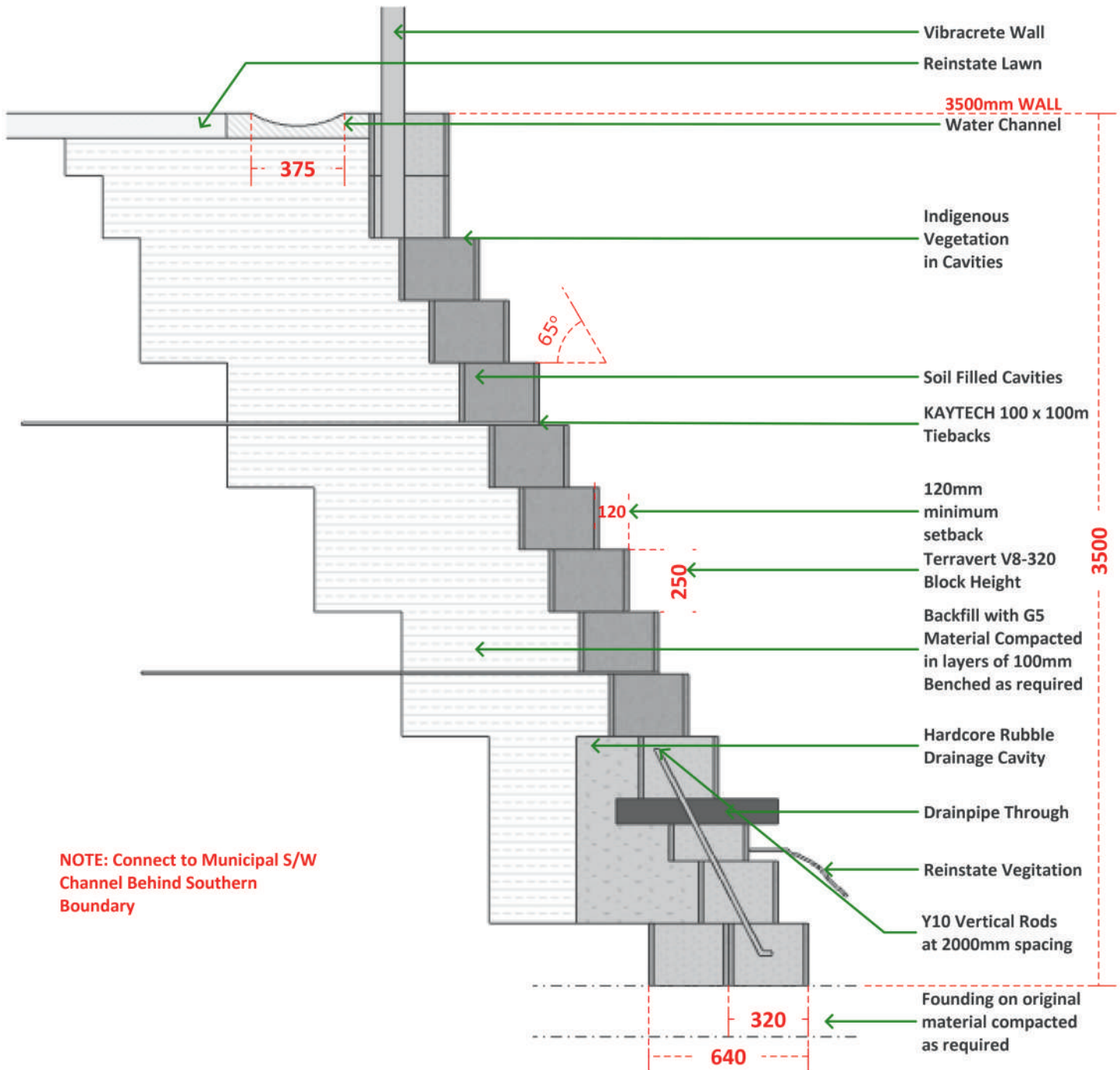
- Safe wall inclinations for final height and fill slope
- Inspection of ground conditions
- Calculation of wall loading conditions
- Foundation specification
- Engineered backfilling materials and technique
- Drainage surface and subsurface collection and direction

A separate calculation and specification will be necessary for site conditions not covered within the scope of the design manual.

QUALITY MATERIAL

Terraforce elements are machine made to exacting standards by leading manufacturers of concrete products on three continents. They have been thoroughly tested and researched under field and laboratory conditions, backed up by substantially engineered design manuals. This aspect, combined with unmatched versatility, cost effectiveness and aesthetic appeal, make Terraforce the best retaining walls system available. blocks are manufactured generally in compliance with SANS 508:2008.

TYPICAL TERRAVERT WALL PROFILE 3500mm HIGH TERRAVERT V8-320 BLOCKS AT 65°



NOTE: Connect to Municipal S/W Channel Behind Southern Boundary

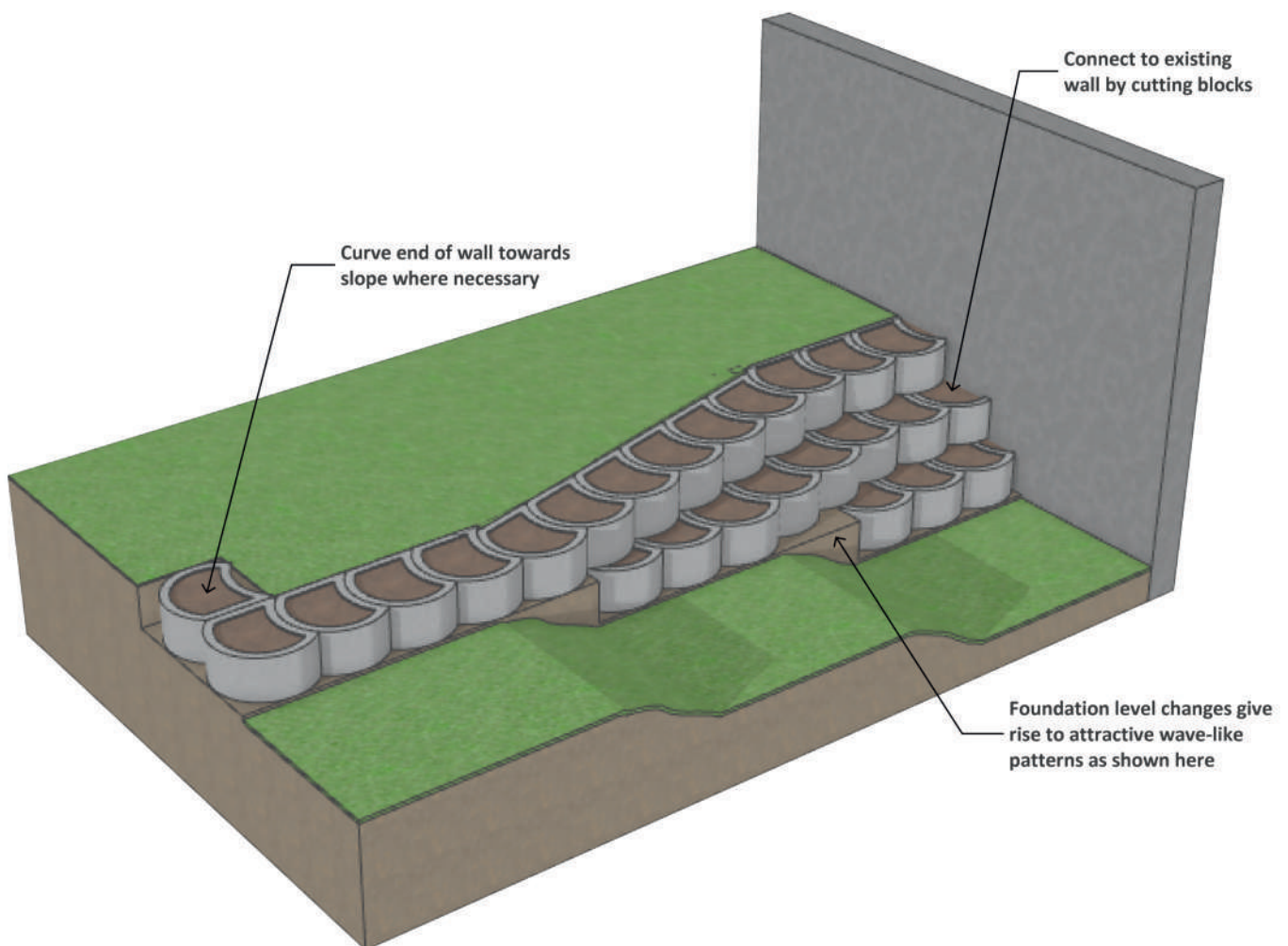
FOUNDATIONS

Prepare a level foundation, compacted earth, subbase of concrete as directed to suit site conditions. The top of finished foundation level should be at least 150mm below natural ground level. Compacted earth foundations are usually sufficient for structures not higher than 1,5 meters. When poor ground conditions occur or higher walls are to be built, please consult your local supplier with regards to foundation details. On sloping sites, the foundation may be stepped in intervals to suit the height of units.

(See Illustration on PAGE 6)

NOTE: No services and trenches are to be permitted immediately in front of the foundation.

3D ELEVATION SLOPING FOUNDATION LEVEL

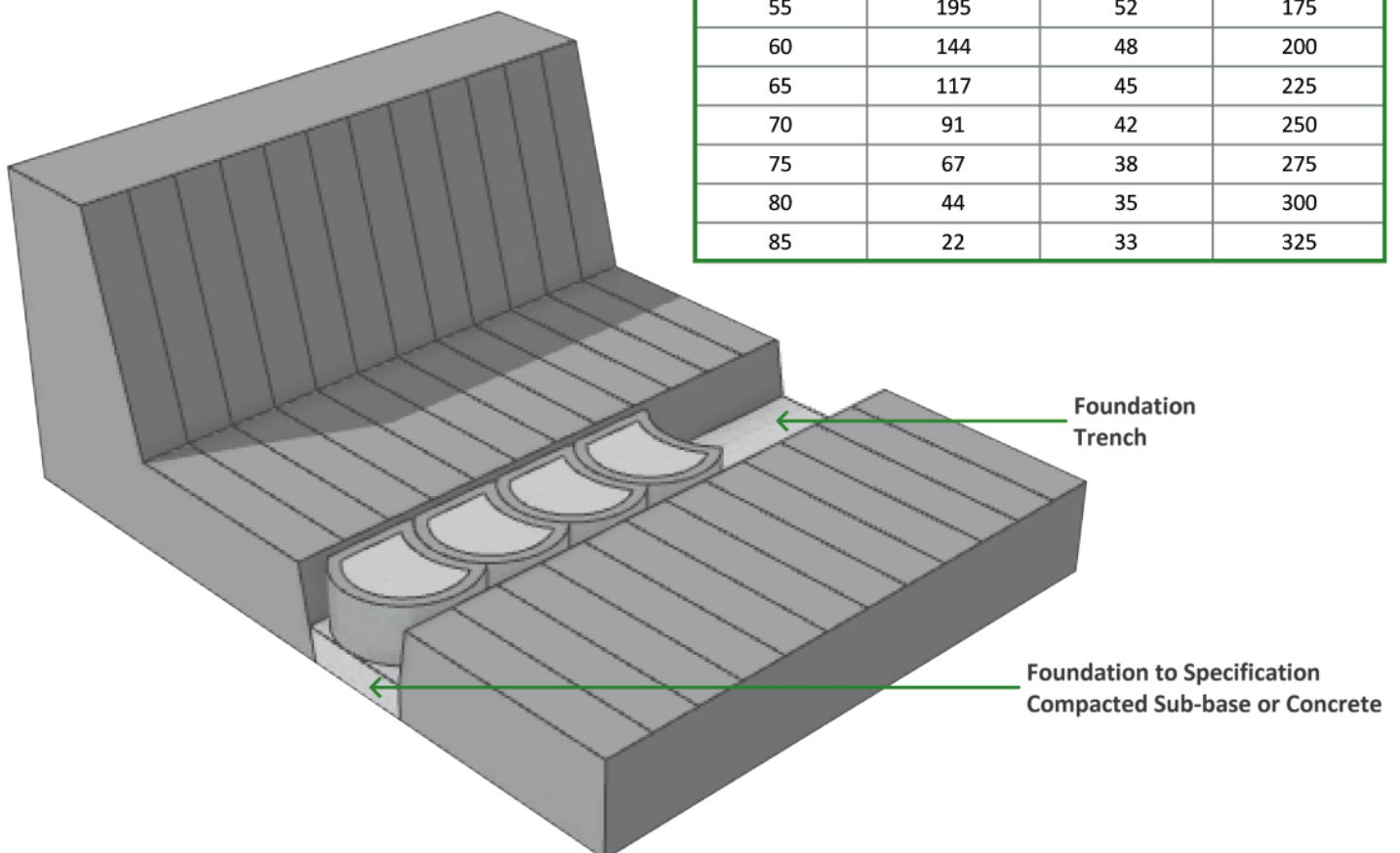


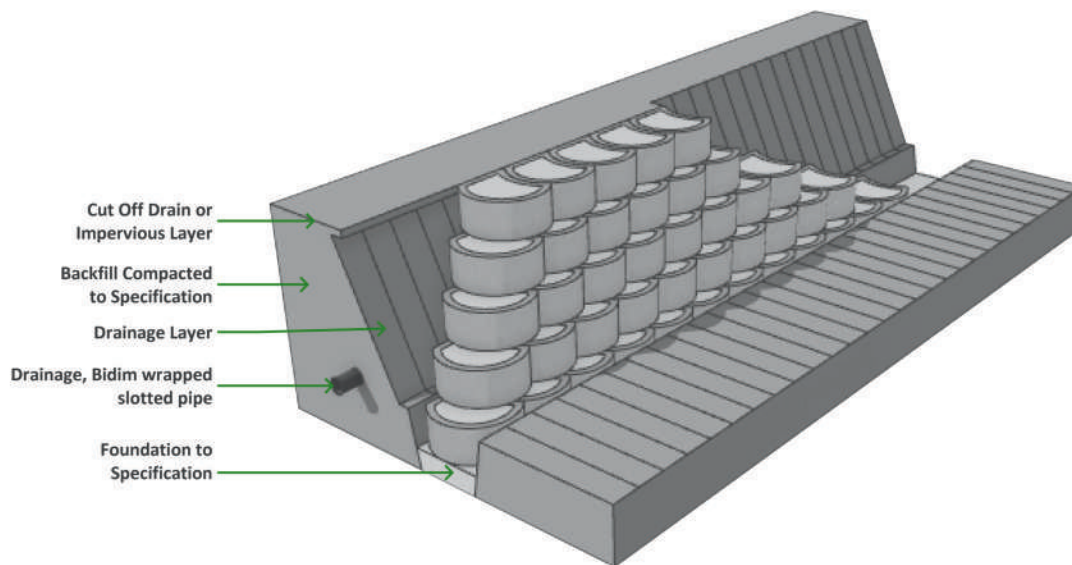
INSTALLATION

Always start laying units at the lowest point, where a stepped foundation occurs. Ensure that the first row of units is accurately aligned, and each block is absolutely level. (Use builders line and level). When placed on a set concrete foundation, a small amount of mortar under each unit of the bottom row facilitates accurate levelling. Proceed to dry stack further layers of the retaining blocks, stepping back as designed while constantly checking on levels and alignment, prepare compacted bed with hoe-head and use a 4LB hammer tamping with the wooden handle to humour blocks to bond and level.

It is common practice to lay units in an offset stretcher bond fashion, however in some instances stack bond may be more suitable or will occur within curved structures. An angle grinder is most suitable for cutting elements, should this become necessary.

SETBACK CHART			
S10 V8(320) V8(400)		M15	
Approx. Wall Angle (Degree)	Setback Per Row (mm)	Approx. Wall Angle (Degree)	Setback Per Row (mm)
25	536	84	25
30	433	75	50
35	357	71	75
40	298	66	100
45	250	60	125
50	210	56	150
55	195	52	175
60	144	48	200
65	117	45	225
70	91	42	250
75	67	38	275
80	44	35	300
85	22	33	325





BACKFILL AND DRAINAGE

Units must be filled with lightly tamped topsoil as each row is completed. Backfill, incorporating a 300mm wide layer of well-draining material immediately behind the wall, must be introduced as construction progresses.

COMPACT SPECIFICATION

The coarse backfill should be compacted in layers of preferably not more than 100mm at a time behind rows of blocks that have already been filled with topsoil. Where water-logged or poorly draining soil conditions occur, a properly designed subsoil drainage system will have to be installed behind a wall. Such a drain must be suitably positioned to allow for outlets through the wall or at either end.

CONCRETE INFILL WITHIN BLOCKS

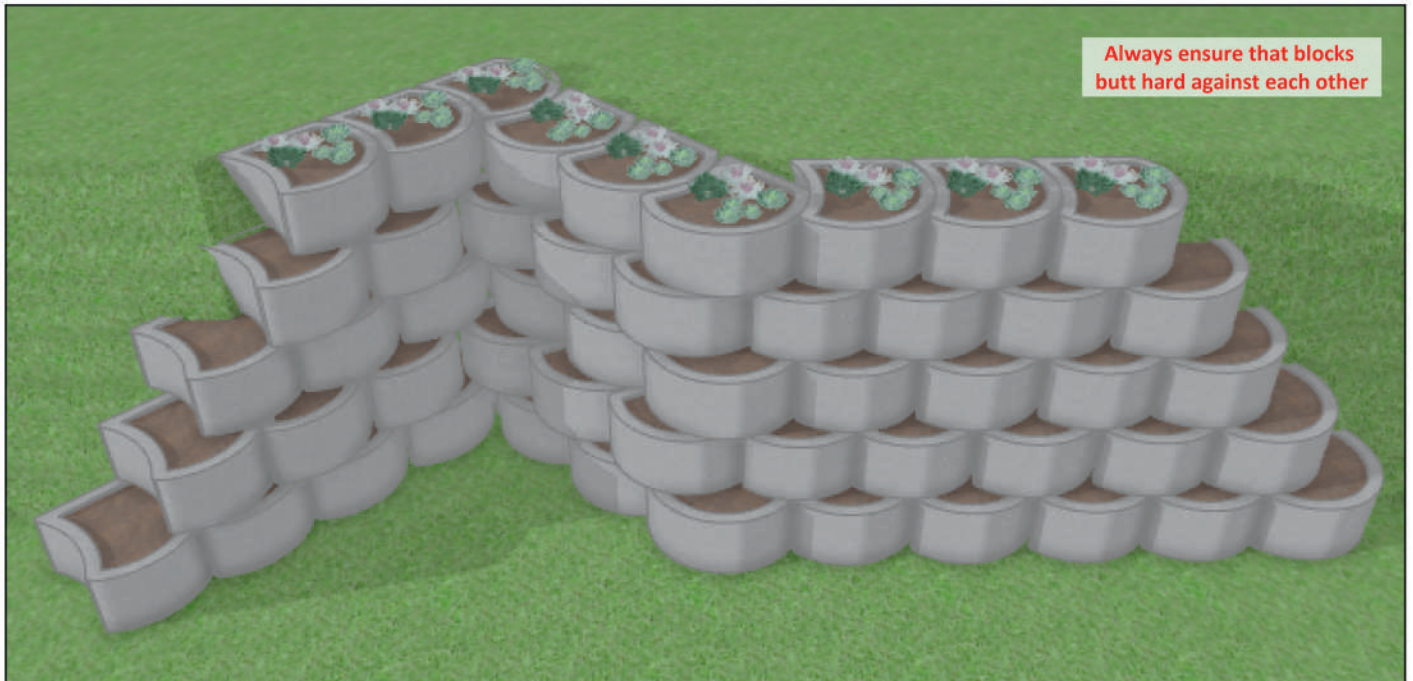
Terravert and Terraforce provide for construction of reinforced vertical columns within the wall with rebar drilled and set into the foundation.

These columns also act as internal buttresses and stiffeners when cast in at 2-meter centers, whilst still allowing for minor movement (settlement) of the wall. They provide excellent additional support, particularly to the lower sections of the wall.

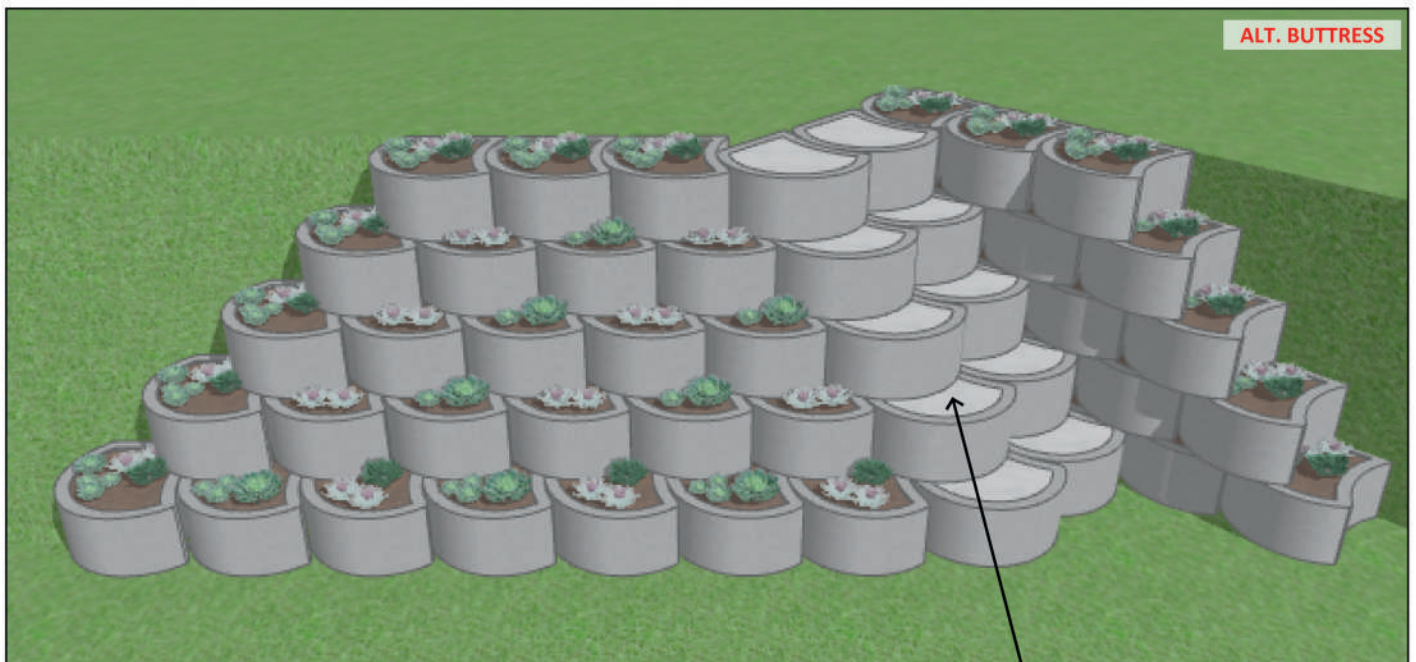
In more vertical applications, stitch or full concrete tie backs can be cast into the backfill with reinforced concrete slabs connected to the vertical columns by cutting out a section at the back of the retaining blocks.

Kaytech Rockgrid 100 x 100mm restraining mesh set between rows of blocks and into the backfill will also integrate into the concrete infill.

The blocks in stretcher bond and vertical, also permit creation of horizontal reinforced concrete beams within the wall, by placing Y10 rebar in the 'V' notches between rows and casting concrete 100mm deep into the lower block and 100mm deep into the upper block. These beams can also be placed at 1-meter centres with soil infill in intervening rows.



**S10 BLOCK SHARP OR WIDE CONCAVE
OR CONVEX CORNERS & CURVES**



M15 BLOCK STEP DETAIL



V8 (400) FORMAL APPEARANCE



V10 BLOCK WITH 4X4 MULTI STEP BLOCK