



Anchor Bayfield® *Installation Guide*



BAYFIELD® PRODUCT DETAILS

Anchor Bayfield® Block



Approx. Dimensions:	150 x 435 x 250mm
Approx. Unit Weight:	23.5 kg
Units Per Pack:	54 No.
Approx. Weight of Pack:	1.3 tonnes
Approx. Coverage:	16 blocks per m ²
Approx. Coverage per Pack:	3.6 m ² per pack
Approx. Batter Angle:	11°

No mortar, No pins, No misalignments.



Patented rear lip technology ensures perfect alignment and consistent batter is achieved.

Suitable for walls up to 900mm without reinforcement when no slope above or below the wall exists and the wall is being built in good ground conditions.

For walls above 900mm and up to 1800mm the walls require reinforcement. *The wall must be designed by a suitably qualified engineer. Acheson & Glover can supply names and contact details of engineers in your area.*

Anchor Bayfield® Capping Block



Approx. Dimensions:	75 x 450 x 250mm
Approx. Unit Weight:	16.5 kg
Units Per Pack:	60 No.
Approx. Weight of Pack:	1.0 tonne
Approx. Coverage:	2.5 Caps per linear metre
Approx. Coverage per Pack:	24 linear metres per pack
Approx. Batter Angle:	n/a



Anchor Bayfield® Stone is manufactured with a random stone cut appearance to replicate the appearance of natural stone walling. Some blocks may have distressed edges and corners which will enhance the natural look of the finished wall. This is normal. At all times, blocks must be randomly chosen and mixed from a minimum of three packs to help achieve a balanced colour blend throughout the completed wall.

TERMS & DEFINITIONS

BASE COURSE A full course of blocks which are buried so that the top is level with the surrounding ground height.

BATTER The facing angle measured from a vertical line drawn from the bottom of the wall, expressed in degrees.

COMPACTABLE BACKFILL MATERIAL Used to fill the excavated area behind the wall. Usually a granular material, specified by the engineer at design stage, that forms the reinforced zone behind a reinforced wall.

COMPACTION Compressing or densifying the material used for the base and backfill. Use a manual or self-propelled compactor.

DRAINAGE AGGREGATE Drainage fill placed within and immediately behind the Segmental Retaining Wall (SRW) units, and in other areas, for free drainage of water.

FINES The smaller particles of aggregate.

FOOTING - known as the 'LEVELLING PAD'. Constructed from a compactable, free draining aggregate (not concrete), the footing forms the base on which the first course of blocks are laid.

GEOGRID A synthetic material formed into a grid-like structure for use in soil reinforcement. Usually comprised of polypropylene, polyester or polyethylene.

GEOSYNTHETIC A generic term used to describe synthetic or plastic materials used in soil, such as fabrics, geogrids, drainage composites or erosion-control mats.

GEOTEXTILE A textile-like material used in soil drainage and reinforcement applications. Usually comprised of polypropylene or polyester, it can be woven or non-woven.

GRAVITY WALL A retaining wall that does not use soil reinforcement. A gravity wall relies on the weight and batter of the block to resist the soil forces that are being exerted on the wall.

GROUND CONDITIONS *Good ground conditions* are free draining soil predominantly made up of sand or gravel.

Poor ground conditions are heavy soil or clay which is not free draining.

LEVELLING PAD - Constructed from a compactable, free draining aggregate (not concrete), the levelling pad (base) on which the first course of blocks are laid. See 'FOOTING'

Anchor Bayfield® Corner/Step Block



Approx. Dimensions:	150 x 435 x 218mm
Approx. Unit Weight:	29.5 kg
Units Per Pack:	Supplied as required.
Approx. Weight of Pack:	n/a
Approx. Coverage:	n/a
Approx. Coverage per Pack:	n/a
Approx. Batter Angle:	n/a



Anchor Bayfield® Stone Corner/Step units are available in the same colours and finish as the Anchor Bayfield® Stone. Steps and 90° corners are easily constructed and incorporated within walls, giving the opportunity to give walls an individual character and style without becoming too complex to build and install. The use of these units also removes the need for complicated splitting and cutting on site, giving a professional quality finish to corner and step features.

LOAD - The forces being applied to a wall. These come from the retained ground, or from other sources (cars, buildings, water, footing etc. around the wall location. *See surcharge*

REINFORCED ZONE The area of a soil-reinforced SRW which contains the soil reinforcement.

REINFORCED WALL A retaining wall that uses soil reinforcement to increase the loads the wall can retain.

RETAINED ZONE The area of a SRW which is immediately behind the reinforced zone.

RUNNING BOND A staggered vertical alignment used to create a consistent pattern. It may be necessary to use split or partial units to maintain a running bond.

SEGMENTAL RETAINING WALL (SRW) A wall system built with modular blocks to retain soil.

STEPPING UP THE WALL BASE Used to maintain a level wall on a slope. See page 9 for more information.

SURCHARGE An external load, usually applied at the top of a SRW. A roadway or building foundation can be a surcharge.

TERRACED WALLS There are independent and dependent terraces. See page 18 for more information.

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HOW TO USE THIS GUIDE

Advance planning, careful preparation and layout at the job site help ensure a successful retaining wall project. Read and understand the information provided in this guide. This guide is designed to provide you with an understanding of what type of wall needs to be constructed, ideas and information on product use, estimating and installation procedures.

While this manual provides general guidelines, installation contractors must always refer to construction drawings provided by a suitably qualified engineer for final design, layout and construction specifications for any Anchor Bayfield® Walls that are higher than 900mm or for walls being built in sloping or unusual ground conditions and locations. If you have any doubts about whether engineering design and support is required, please contact Acheson & Glover (contact numbers are on the back of this guide) and obtain our advice and guidance on whether an engineer must be involved in designing the wall.

Use this guide and this checklist to ensure that you have covered all the important issues involved in successfully building an Anchor Bayfield® Wall:-

Understand and propose a wall solution that meets the clients requirements

- Understand and note the wall location and layout
- Wall length (in metres) _____
- Wall height (in metres) _____
- Maximum wall height at any point along the wall _____
- What additional features or details are required?
 - Curves (see INSIDE CURVES, page 14, OUTSIDE CURVES, page 15) YES___ NO ___
 - Corners (see INSIDE CORNERS, page 11, OUTSIDE CORNERS, page 13) YES___ NO ___
 - Caps (see CAPPING WALLS, page 10) YES___ NO ___
 - Steps (see STEPS, page 17) YES___ NO ___
 - Terraced Walls (see TERRACES, page 18) YES___ NO ___
 - Fencing (see FENCES, page 18) YES___ NO ___
- What drainage details will the wall require?
 - Is the wall longer than 15 metres? (see DRAINAGE, page 10) YES___ NO ___
- Do the ground levels slope by more than 150mm along the wall length? (see STEPPING UP THE BASE, page 9) YES___ NO ___

What type of wall is required (Gravity Wall or Reinforced Wall)? - Use RETAINING WALL BASICS, opposite, with the maximum wall height measurement, from above, to determine what type of wall is required.

Note: If a Reinforced Wall is needed, design advice and guidance will be required from a suitably qualified engineer. Contact Acheson & Glover (contact numbers are on the back of this guide) for names and contact details of engineers in your area.

How much walling material and aggregates are required? - Use ESTIMATING FORMULAS, Page 5 Note: If a Reinforced Wall is needed, also use - GRID REINFORCEMENT ESTIMATING TABLES, Page 6

Make sure all the relevant Installation Guidance required for the wall has been read and understood

- All Walls - Use BASIC INSTALLATION, Page 7
- Reinforced Walls - Also use INSTALLING WITH REINFORCEMENT, Page 5
- Additional features and details - Use appropriate CONSTRUCTION DETAILS (as identified above)
- Drainage requirements

Before installation begins

- Review the site plan to confirm boundary lines, wall location, length and elevations. Prepare a drawing of the site with the wall location, length and elevations.
- Confirm the location of underground utilities and seek all necessary building permissions or authorisation.
- Check the block (and cap) deliveries to ensure they are the correct colour and quantity.
- Check the geogrid to confirm that it is the strength and weight specified in the engineering plans.
- Check the delivered aggregates conform to the required specification.
- Ensure all site activity and operations conform to or exceed relevant health and safety guidance and legislation. Appropriate personal safety equipment (hands, eyes, ears and feet) must be worn at all times. Plant and machinery must be operated and handled in accordance with the supplied operating instructions.

RETAINING WALL BASICS

Bayfield® Segmental Retaining Walls fall into one of two categories depending upon the maximum wall height involved.

For walls which are 900mm high or less, with no slopes above and below the wall, and are being built in good ground conditions, a simple gravity retaining wall will perform satisfactorily. Provided it is constructed in accordance with this guidance, the wall will give a long lasting retaining wall solution.

For any walls which are more than 900mm high at any point along their length, or are being built in poor ground conditions, a reinforced retaining wall will be required. ***If a reinforced wall is needed, design advice and guidance will be required from a suitably qualified engineer. Contact Acheson & Glover (contact numbers are on the back of this guide) for names and contact details of engineers in your area.***

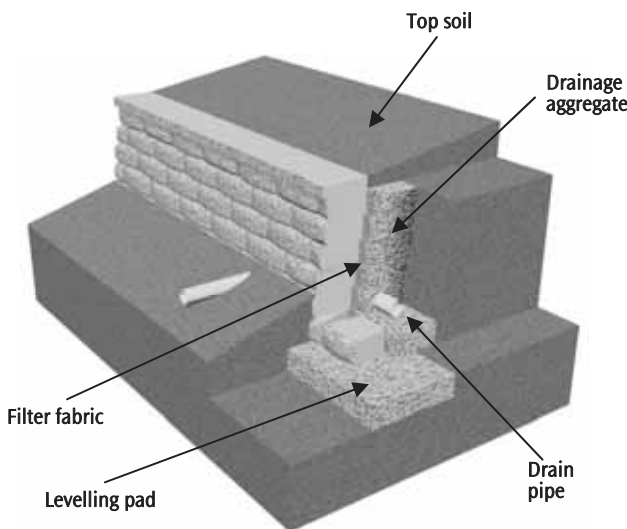
Under no circumstances must any Anchor Bayfield® Wall of more than 900mm be designed and built without the design advice and guidance of a suitably qualified engineer. The safety and satisfactory performance of any wall higher than 900mm can only be guaranteed when an engineer has taken all the variables (soil and ground types, loads and surcharges, water and drainage etc.) into consideration and undertaken a design methodology based on proven engineering techniques. Failure to follow this advice could have serious consequences in respect of the performance of the wall and its ability to remain structurally sound and safe.

Consideration can be given to using several separate terraced walls, each being less than 900mm high (gravity wall) to achieve greater overall heights, providing the guidance shown in TERRACES, page 18 is strictly adhered to in full.

See Terms & Definitions for guidance on what are considered to be good or poor ground conditions.

GRAVITY WALLS

FOR WALLS UP TO 900mm HIGH WITH NO SLOPES ABOVE & BELOW THE WALL, BUILT IN GOOD GROUND CONDITIONS

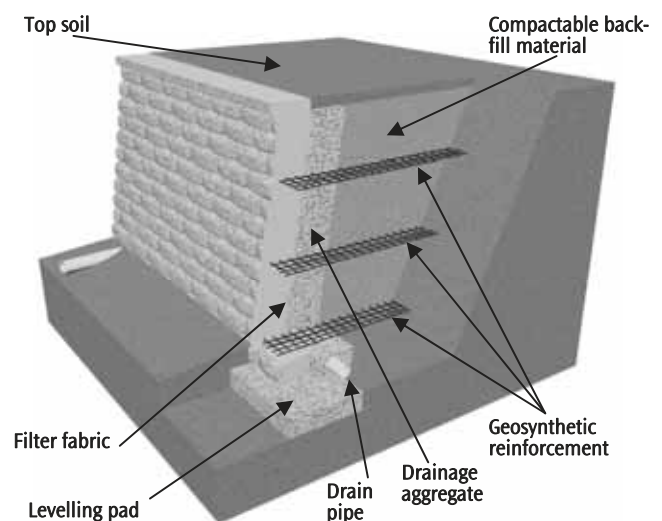


The first category – a gravity wall – is a retaining wall that does not use soil reinforcement. For Bayfield®, a gravity wall has a height limitation of 900mm. Advantages of this type of retaining wall are the simple construction involved, along with a smaller work area behind the wall. A gravity wall relies on the weight and batter of the block to resist the soil forces being exerted on the wall. The completed wall must include drainage fill immediately behind the wall blocks to ensure free drainage of water will take place.

REINFORCED WALLS

FOR ANY WALLS HIGHER THAN 900mm, UP TO 1800mm HIGH, OR ANY WALLS WITH SLOPES ABOVE & BELOW THE WALL, OR FOR ANY WALLS BEING BUILT IN POOR GROUND CONDITIONS

The second category is a geosynthetic-reinforced wall, which needs to be designed by a suitably qualified engineer. A reinforced retaining wall is capable of withstanding much higher loads than a gravity wall. They require more work area behind the structure. The block of soil is stabilized by introducing reinforcement layers into the ground behind the facing blocks. The larger the stabilized mass, the stronger the wall. The geosynthetic reinforcement extends past the theoretical failure plane and serves to create a large, rectangular mass of block and reinforced material, restraining the retained soil.



ESTIMATING FORMULAS

For your project material estimating, use the following calculations. Measure the length and height of the wall in metres.

BLOCK ESTIMATE.

No of blocks = Length (m) x Height (m) x 16

CAP ESTIMATE

No of caps = Length (m) x 2.5

LEVELLING PAD AGGREGATE ESTIMATE

Tonnes of
Compactable material = Length (m) x 0.2

DRAINAGE AGGREGATE ESTIMATE

Tonnes of free
draining material = Length (m) x Height (m) x 0.57

GRID REINFORCEMENT ESTIMATE

See the opposite page

REINFORCED ZONE MATERIAL ESTIMATE

See the opposite page

PROJECT ESTIMATING EXAMPLE

A 1.65 metre high wall is being built 9.5 metres long.

BLOCK ESTIMATE.

No of blocks = Length (m) x Height (m) x 16
= 9.5 x 1.65 x 16
= 251 blocks

CAP ESTIMATE

No of caps = Length (m) x 2.5
= 9.5 x 2.5
= 24 caps

LEVELLING PAD AGGREGATE ESTIMATE

Aggregate = Length (m) x 0.2
= 9.5 x 0.2
= 1.9 tonnes

DRAINAGE AGGREGATE ESTIMATE

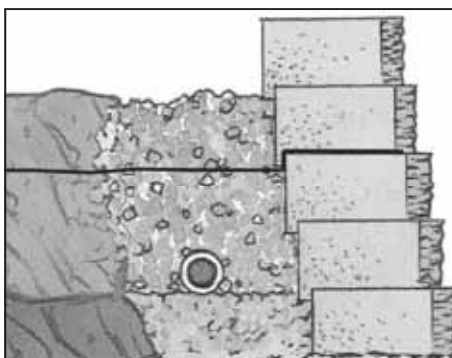
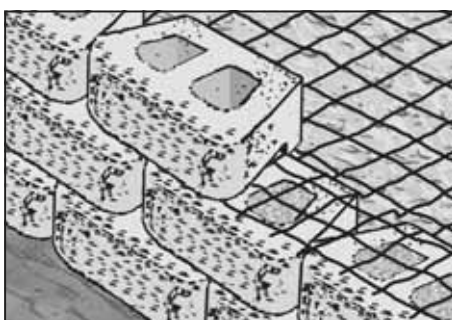
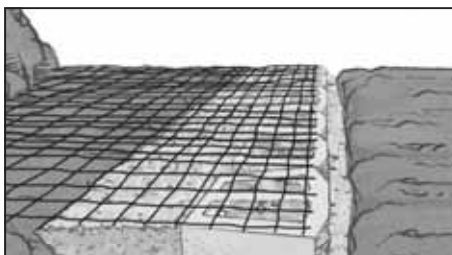
Aggregate = Length (m) x Height (m) x 0.6
= 9.5 x 1.65 x 0.57
= 8.95 tonnes

GRID REINFORCEMENT ESTIMATE

See opposite page

REINFORCED ZONE MATERIAL ESTIMATE

See opposite page



INSTALLING WITH REINFORCEMENT.

Geosynthetic reinforcement is recommended for walls taller than 900mm and they require a suitably qualified engineer for design assistance. To estimate reinforcement requirements, refer to the Grid Reinforcement Estimating Tables opposite. These tables are for estimating purposes only and must not be used for construction. **A suitably qualified engineer must always be consulted for the final wall design against which construction will take place**

- Check the wall construction plan (produced by a suitably qualified engineer) for which courses will need reinforcement grid.
- Clean any debris off the top layer of blocks.
- Add an extra 200mm to the design length shown in the plan and cut the reinforcement to this measurement. The extra 200mm allows for the additional grid that is held between the blocks when the wall is built.
- Know how the reinforcement works. The reinforcement has a design strength direction, which must be laid perpendicular to the wall.
- Place the front edge of the reinforcement on the block below, 50mm back from the face of the block. Correct placement ensures that maximum connection strength between the wall and the grid is achieved.
- Install the next course of block to secure the reinforcement in place, pushing the block forward to ensure the rear lip is tight against the block below.
- To keep it from wrinkling, pull the reinforcement taut and pin the back edge in place with stakes or staples.
- Add the drainage aggregate behind the blocks, then add the compactable backfill material (to the engineer's specification) and fully compact.
- Fully compact as close to the rear of the blocks as possible whilst avoiding any damage to any blocks from contact with the compaction machinery.
- A minimum of 150mm of backfill (above the installed grid) is required prior to operating any vehicles on the reinforced zone. Avoid sudden turning or braking whilst operating vehicles on the reinforced zone.

GRID REINFORCEMENT ESTIMATING TABLES

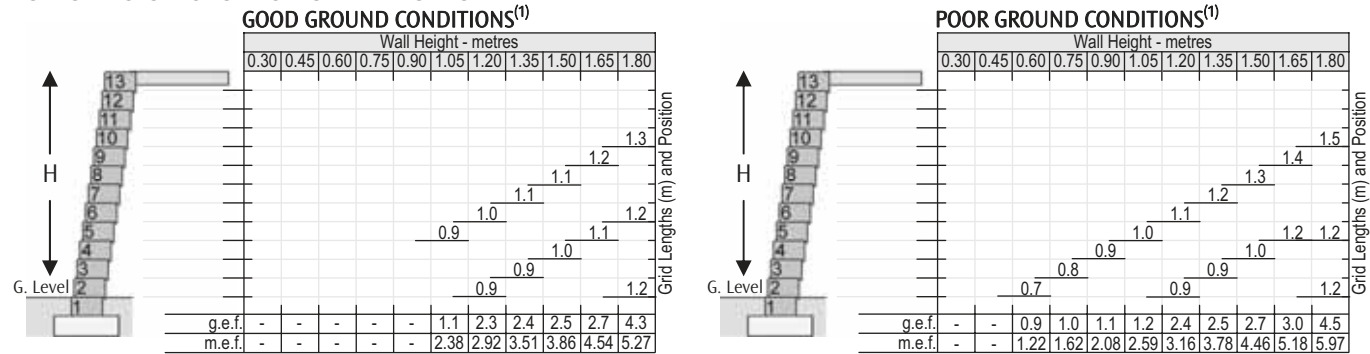
Grid requirements shown are for estimating only and must not be used for construction purposes.

Find the table which best describes the wall in terms of the slopes, loads and ground conditions under which it will be performing. Within the selected table, find the wall height (above ground level) from across the top of the table. The figures found in the column below the wall height show the length (metres) of any grid requirements and the position of the grids relative to the blocks in the wall. Some walls may require more than one grid layer. The Grid Estimation Factor (g.e.f.) and the Material Estimation Factor (m.e.f.) are used for cost estimates of the grid and backfill material requirements for the wall.

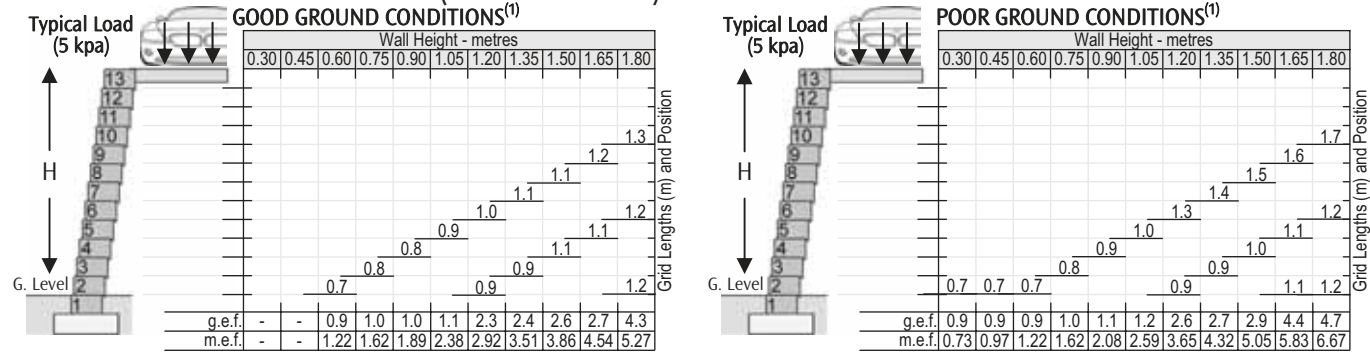
Example: A wall has no slope to the top, will be subject to loading and is in good ground conditions and the wall height above ground level is 1.65m. The figures show that 2 grids will be required, one above block 4 with a length of 1.1m and one above block 8 with a length of 1.2m. The g.e.f. value is 2.7, and the m.e.f. value is 4.54

NOTE: If site or location restrictions limit the room available behind the wall to less than the length of grid shown in the tables below, other, shorter reinforcement options may be available. Please contact Acheson & Glover to discuss these alternative reinforcement solutions.

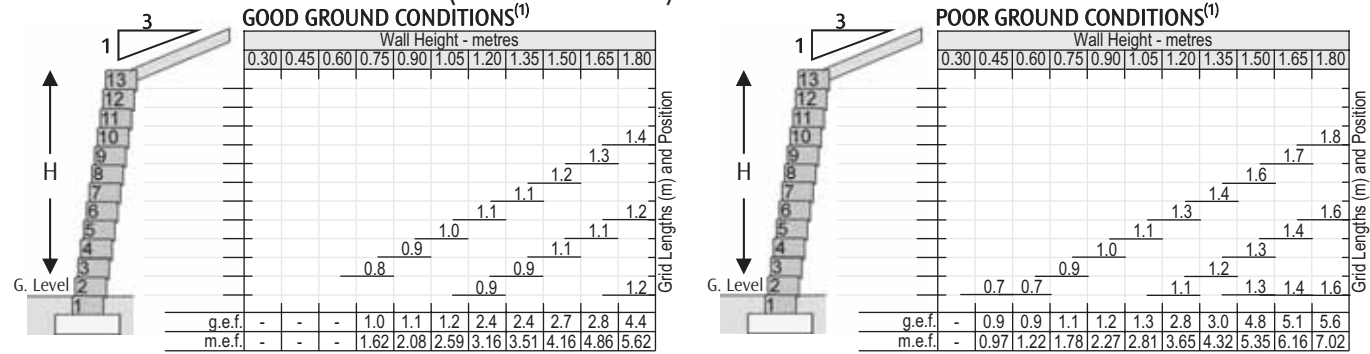
NO LOADS OR SLOPES TO THE TOP OF THE WALL



LOADS TO THE TOP OF THE WALL (WITH NO SLOPE)



SLOPES TO THE TOP OF THE WALL (WITH NO LOADS)



NOTES: Charts based on Mirafi 3XT grid. ⁽¹⁾γ=19kN/m³, for Good ground φ=35° and for Poor ground φ=26°, see Terms & Definitions, page 1 for further descriptions

ESTIMATING FORMULAS

For project estimating, use the following calculations to estimate grid and reinforced zone material requirements.

GRID REINFORCEMENT ESTIMATE

From the tables, find the Grid Estimating Factor (g.e.f.)
 Sq. metres of grid = Wall Length x g.e.f.

REINFORCED ZONE MATERIAL ESTIMATE

From the tables, find the Material Estimating Factor (m.e.f.)
 Tonnes of material = Wall Length x m.e.f.

PROJECT ESTIMATING EXAMPLE

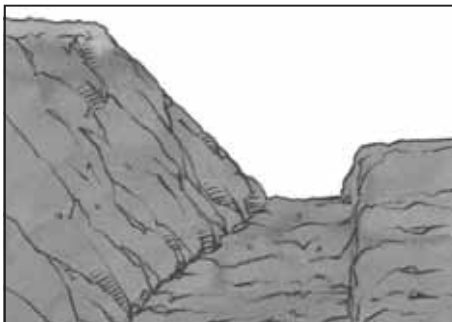
A 1.65m high, 9.5m long wall, subject to loads, with no slope and being built in good soil.

GRID REINFORCEMENT ESTIMATE

Grid requirements = Wall length x g.e.f.
 = 9.5 x 2.7
 = 25.7 sq. metres of grid

REINFORCED ZONE MATERIAL ESTIMATE

Material requirements = Wall length x m.e.f.
 = 9.5 x 4.54
 = 43.1 tonnes of material



EXCAVATION TRENCH

Diagram 1

LEVELLING PAD (FOOTING)
COMPACTION

Diagram 2



BASE COURSE

Diagram 3

CONSTRUCTION OF THE
NEXT COURSE

Diagram 4

BASIC INSTALLATION

SETTING OUT THE WALL & EXCAVATION - *see diagram 1*

- Mark out the wall placement. Verify the locations with the client and engineer if required/appropriate.
- Mark out the location of the excavation trench so that, when dug, the wall blocks will run centrally down the middle of the trench with equal spacing between the front and back of the blocks to the front and back of the trench.
- For Bayfield® walls make the excavation 600mm from front to back, and 350mm deep, unless design assistance has specified this differently.
- Firmly compact the soil in the base of the trench, using either a hand tamper or a vibrating plate compactor before installing the levelling pad.

LEVELLING PAD (Footing) - *see diagram 2*

- An aggregate levelling pad is made of a good compactable base material - **MOT Type 1, 20mm Aggregate with fines, Crusher Run or similar.**
- The pad must be 150mm deep (after compaction) and must extend the full width of the excavation trench.
- Fully compact the aggregate, using either a hand tamper or vibrating plate compactor, making sure it is level front-to-back and side-to-side.
- If the ground levels along the wall length slope by more than 150mm, the levelling pad must be stepped up to match the slope of the ground. *See page 9 for further details on STEPPING UP THE BASE.*

BASE COURSE - *see diagram 3*

- The most important step in the construction process.
- Always randomly select and mix blocks from a minimum of three packs to help achieve a balanced colour blend.
- Begin laying blocks at the lowest elevation of the wall.
- The base course blocks must be fully bedded and lie completely flat on the levelling pad. Either remove the rear lips from all the blocks that form the base course, or alternatively form a groove in the levelling pad in which the rear lips can sit.
- Lay the first block, levelling it front to back and side to side.
- Place the blocks side by side, flush against each other, making sure the blocks are in full contact with the levelling pad. Ensure blocks are level in both directions with a spirit level.
- Use a string line along the back of the blocks to align the wall units, or evenly align the back of the units (not the front) to form smooth and consistent curves. .
- If the wall site is on an incline, do not slope the blocks; step them up so they remain consistently level. *See page 9 for further details on STEPPING UP THE BASE.*

CONSTRUCTION OF THE NEXT COURSE - *see diagrams 4, 5 and 6*

- Clean any debris off the top of the blocks.
- Always randomly choose and mix blocks from a minimum of three packs to help achieve a balanced colour blend.
- Place the second course of blocks on top of the base course. Maintain running bond by placing units in a staggered relationship to the course beneath, pulling each unit forward until the rear lip is securely in contact with the units below.
- Backfill with drainage aggregate directly behind the block. As each course is completed, add 150mm at a time followed by full compaction. Ensure the aggregate is fully compacted before installing the next course
- The drainage aggregate should be **15-20mm clean or No Fines aggregate** and should extend at least 300mm back from the rear of the wall.

- Fill all voids between each wall unit with drainage aggregate. The block cores must also be fully filled.
- Fully compact as close to the rear of the blocks as possible whilst avoiding any damage to any blocks from contact with the compaction machinery.
- For best results, consider using a filter fabric, either placed directly behind the wall units, or to the rear of the drainage fill, extending from the bottom of the main course to the middle of the top course. This will minimise fine soil or fill material coming through the joints between the wall units.

DRAINAGE DESIGN - see diagrams 7 and 8

- Each project is unique. The ground levels on the site will determine at what level to install the perforated drainage pipe, but generally the drainage pipe is positioned as low as possible behind the wall so water drains down, out and away from the wall into a storm drain, or to an area lower than the wall.
- The perforated drainage pipe should be placed in the middle point of the 300mm drainage zone.
- You may need to place and backfill several courses to achieve the proper drainage level. For best results, consider covering the perforated drainage pipe with a geotextile sock to act as a filter. See page 10 for further details on DRAINAGE

COMPACTION - see diagram 9

- Shovel suitable compactable backfill material behind the drainage aggregate and compact with a hand-operated compactor.
- Make sure the aggregate is level with or slightly below the top of the base course.
- Place soil in front of the base course and compact. The base course must be buried.
- Continue to fill and compact as each course is constructed

REINFORCEMENT - FOR WALLS ABOVE 900mm HIGH

- Geosynthetic reinforcement is required for walls taller than 900mm.
- **For walls taller than 900mm a suitably qualified engineer must be consulted for design assistance.** Contact Acheson & Glover (contact numbers are on the back of this guide) for names and contact details of engineers in your area.
- See page 5 for further details on INSTALLING WITH REINFORCEMENT

CAPPING WALLS

- See page 10 for further details on CAPPING WALLS

FINISH LEVELS AND SURFACE DRAINAGE

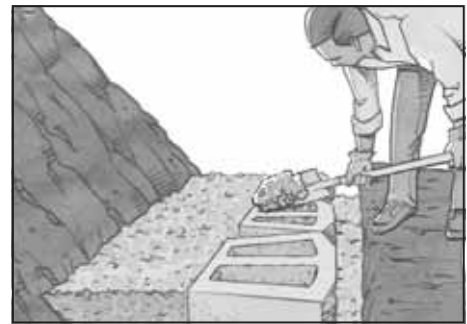
- Protect the wall with a finished ground level at the top and bottom.
- To ensure proper water drainage away from the wall, use 150mm of soil with low permeability. This will minimize water seeping into the soil and drainage aggregate behind the wall.

SITE CLEANING AND RESTORATION

- Brush off the wall and clean up any debris from the construction process
- Following these best practices for construction will ensure the successful construction of an Anchor Bayfield® Wall.

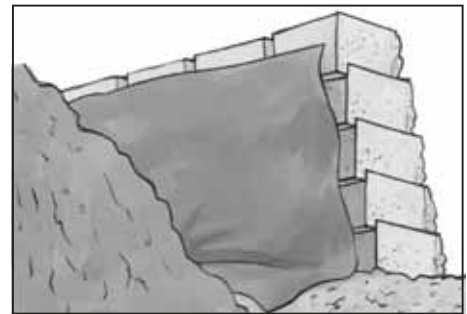
IMPORTANT SAFETY NOTE

Ensure all site activity and operations conform to or exceed relevant health and safety guidance and legislation. Appropriate personal safety equipment (hands, eyes, ears and feet) must be worn at all times. Plant and machinery must be operated and handled in accordance with the supplied operating instructions.



CORE FILL

Diagram 5



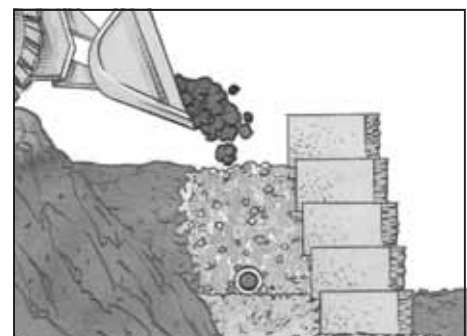
FILTER FABRIC

Diagram 6



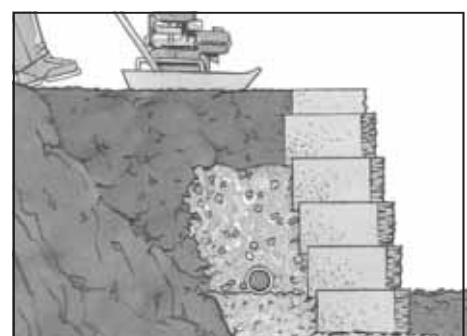
DRAINAGE PIPE

Diagram 7



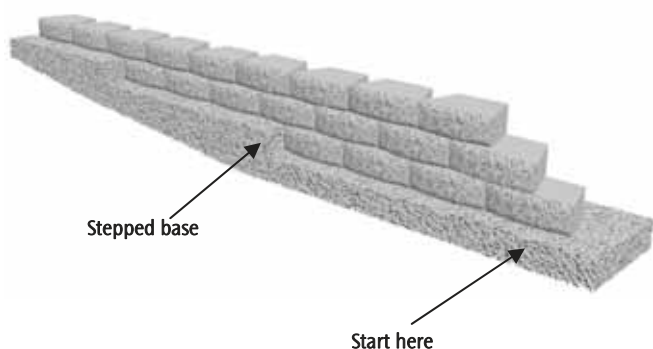
DRAINAGE AGGREGATE

Diagram 8



COMPACTION

Diagram 9



STEPPING UP THE BASE

Anchor Bayfield® Walls must always be constructed with levelled, horizontal courses. Courses should not be sloped to match the slope of the surrounding ground levels. Walls built on a sloping ground levels require a stepped base (footing or levelling pad) which steps up in 150mm increments up the slope, as often as required.

LOWEST POINT.

Begin excavation at the lowest point and dig a level trench into the slope until it is 300mm below the surrounding ground level. This is deep enough to accommodate the base material and one entire block. Form the base and lay the first course of blocks, starting at the bottom of the slope, working upwards. See *BASIC INSTALLATION, steps 2,3 and 4, page 7 for further information*

STEP UP

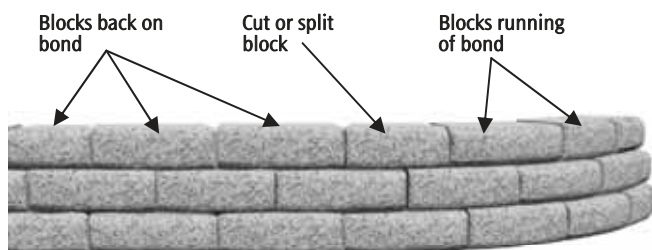
At this point, step up the next section of the trench 150mm and begin a new section of base trench, maintaining the level from this point. Once compacted, the base (footing or levelling pad) must be exactly level with the top of the course of blocks previously installed.

Continue to step up as needed to top of slope. Always bury at least one full unit at each step.

RUNNING BOND

STRAIGHT WALL

Proper installation of an Anchor Bayfield® retaining wall requires that running bond be maintained. Running bond occurs when the blocks are centred over the vertical joints of the previous course. This significantly adds to wall stability and makes the wall more pleasing to look at.



CURVED WALL

Any wall that is curved will eventually run off bond, due to the batter of the wall. When this happens, skip a block position and place the next block into the next place where it is back on bond. Measure the remaining gap and cut or split* a block to fit. Once the partial unit is in place, bond with a concrete adhesive (See page 10 for bonding agent details). Partial units must not be less than 215mm and should not be placed directly on top of each other. If the gap is larger than the length of one block, divide the measurement by two and put two partial units in place.

*Cutting or splitting blocks - Use a hydraulic or mechanical splitter, or split manually by using a hammer and chisel to score the block on all sides. A circular masonry saw may also be used. **Safety Note:** See Page 8



See *INSIDE CURVES, page 14, and OUTSIDE CURVES, page 15 for further information, including the minimum radiuses achievable with Bayfield® blocks.*

DRAINAGE

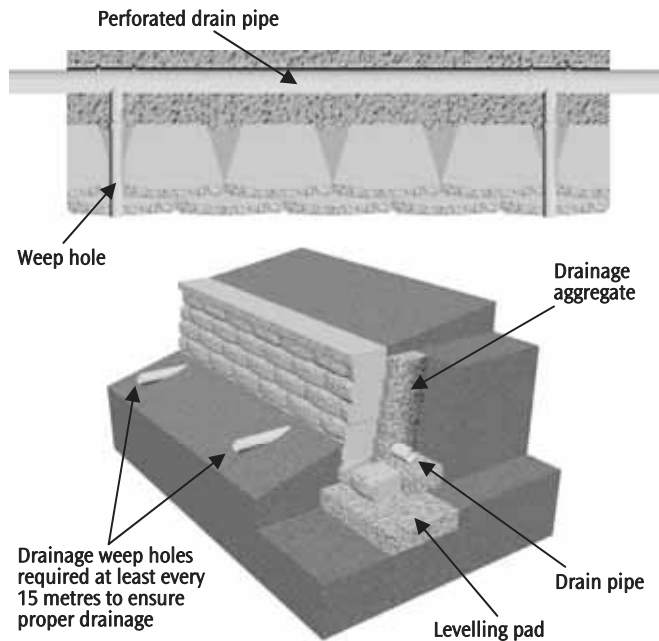
Good drainage is critical to ensuring the long term performance of an Anchor Bayfield® Wall. Water collected from the drainage fill behind the wall must be able to drain down and away from the wall into storm drains or an area lower than the wall, either at the end of the wall, or through drainage weep holes.

FIRST COURSE

If the wall is longer than 15 metres, drainage weep holes must be installed through the wall face, no more than 15 metres apart. Remove 50mm off the front of two adjacent blocks to provide sufficient space for the drain pipe to exit through the face to form the weep hole.

NEXT COURSE

Build this and remaining courses using standard construction techniques.



CAPPING WALLS

STRAIGHT WALL

Always start capping from the lowest elevation. Caps are trapezoidal and must be laid alternatively short and long cap faces for a straight line.

OUTSIDE CURVES

Lay out the cap units side by side and cut at least every other cap to produce a uniform look. Start with the long side of the cap facing out and adjust to the radius.

INSIDE CURVES

Lay cap units side by side with the short side facing out. In most circumstances, making two cuts on one cap and then not cutting the cap on either side produces the most pleasing look.

CORNERS

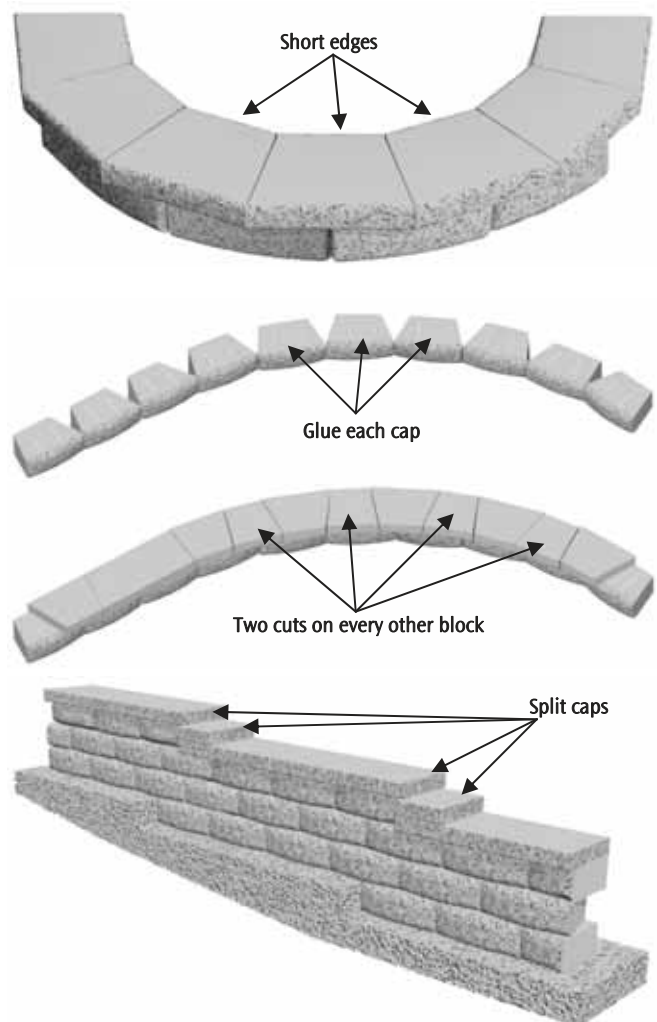
On a 90° corner wall, the corner caps need to be saw-cut to achieve a 45° mitred corner.

STEPPING UP CAPS

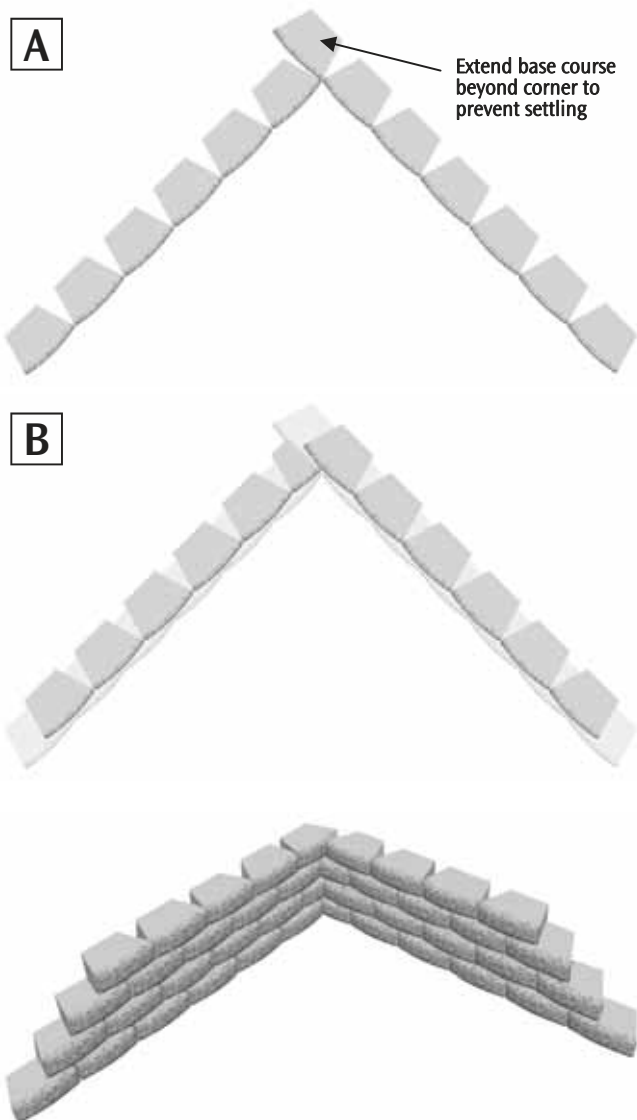
If a wall elevation changes, caps can be stacked where the wall steps up. Begin laying caps at the lowest elevation level and work your way towards the next step up. Split a cap unit to create a rough face on the exposed side. Place the half unit directly on top of the capped portion of the wall with all three split faces exposed.

FINISHING

After layout is complete and caps are saw-cut or split to size, carefully bond the caps in place using a concrete adhesive.



Acheson & Glover can provide a gun grade product for bonding Anchor Bayfield® Wall components. This cost effective product is moisture cured and is particularly suitable as it can be used in damp site conditions. When used to the manufacturers instructions, it will ensure bonding is permanent. *Supplied in boxes of 12 tubes.*



INSIDE CORNERS

A BASE COURSE

To create an inside 90° corner, begin by placing a block at the corner. Then lay a second block perpendicular to the first and continue laying out the rest of the base course working from the corner out. *Ensure the base course is constructed according to the BASIC INSTALLATION details shown on Page 7.*

B NEXT COURSE

On the second course, place all blocks in a running bond along one side of the corner. Once the second course of one wall is established, begin the second course of the adjacent wall. Several blocks away from the corner, position full blocks in a running bond. Continue the running bond back towards the corner, until the gap becomes less than a full unit. A split unit* will then be required to maintain running bond away from the corner. Measure the length of the unit required and split to fit.

Block placement in the corner must alternate in direction with each succeeding course. The rear lip of the blocks that run over each other in the corner must be removed, and these units should be bonded in place using a concrete adhesive. *See Page 10 for bonding agent details.*

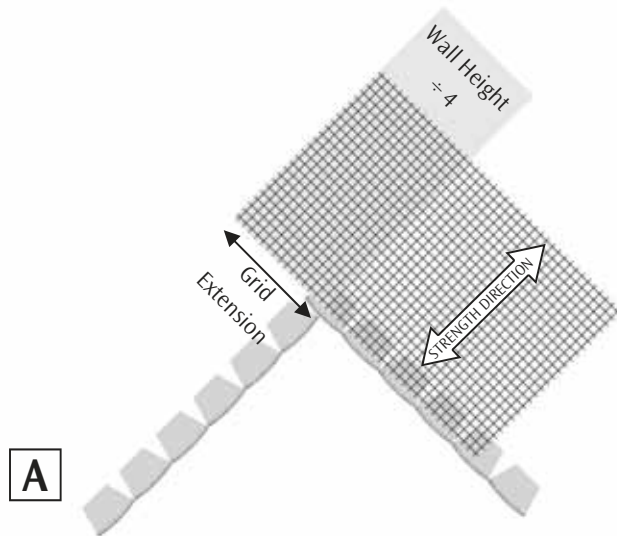
*Cutting or splitting blocks - Use a hydraulic or mechanical splitter, or split manually by using a hammer and chisel to score the block on all sides. A circular masonry saw may also be used. **Safety Note:** *See Page 8*



INSIDE CORNERS - REINFORCEMENT

A FIRST COURSE WITH REINFORCEMENT

To install reinforcement on an inside 90° corner, begin by checking the wall plan to determine reinforcement lengths and elevations. Cut reinforcement to the lengths shown in the wall plan, paying attention to the reinforcement strength direction.



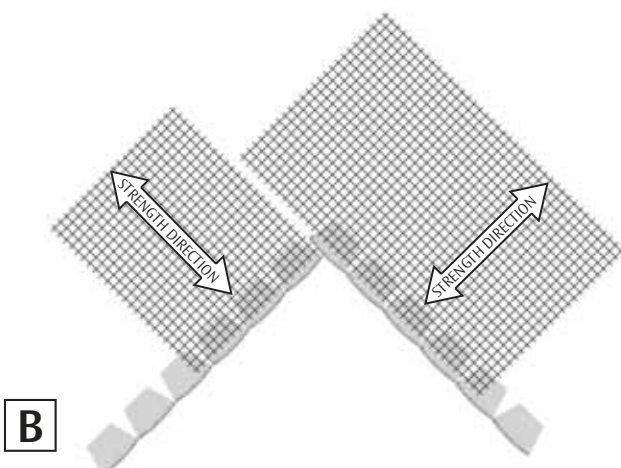
A

Next, determine the proper placement of the reinforcement by dividing the proposed height of the wall by four. This represents the distance that reinforcement must extend beyond the front of the adjoining wall. Measure this distance from the front of the adjoining wall and begin the grid placement here.

Example: If overall wall height is 1.2 metres, the reinforcement extension would be 300mm.

Make sure the grid is placed 50mm back from the face of the block below and runs along the back of the adjoining wall.

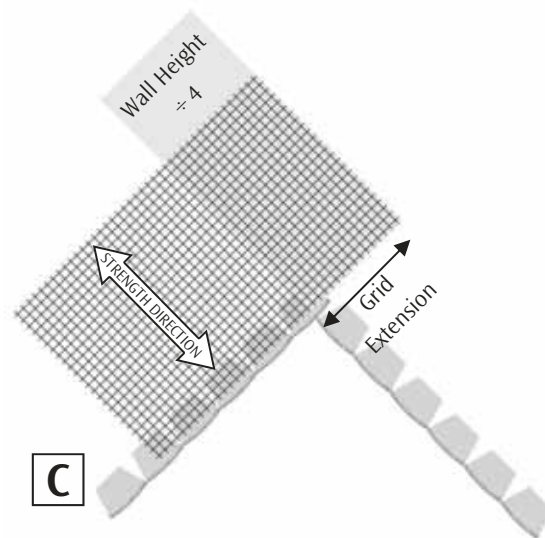
B Place the next section of reinforcement on the adjoining wall. The reinforcement must not overlap and should lie flush with previously placed sections. Once reinforcement is in place, the next course of blocks can be installed.



B

C SECOND COURSE WITH GEOGRID

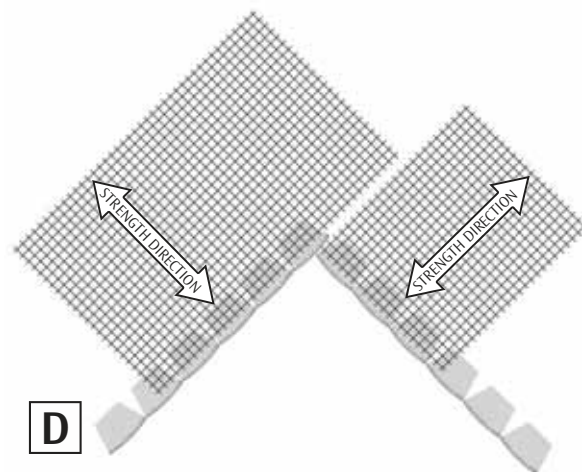
C The first section of grid on this course is placed using the same formula that determines placement in front of the adjoining wall. Alternate the reinforcement extension to the previous reinforced course on each course where reinforcement is required.



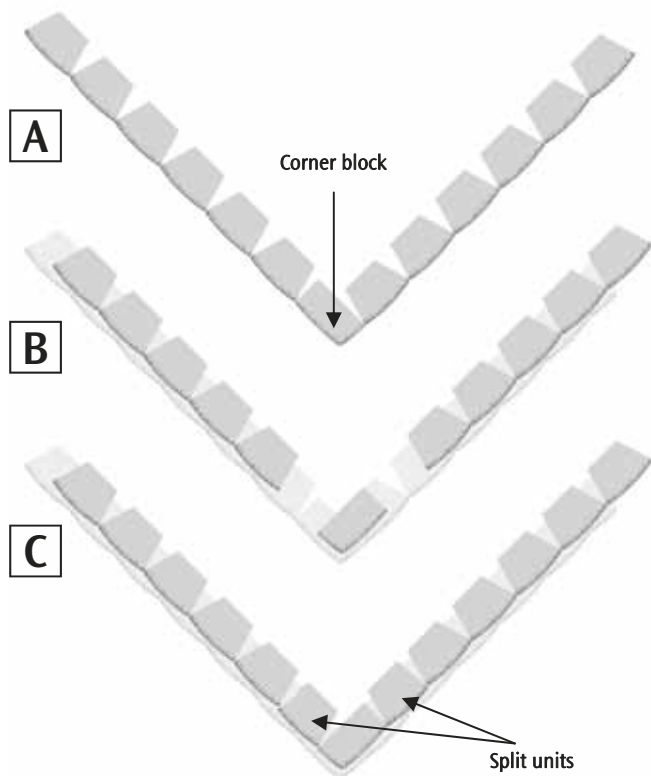
C

D Place the next section of reinforcement on the adjoining wall. The reinforcement must not overlap and should lie flush with previously placed sections. Once reinforcement is in place, the next course of block can be installed.

Ensure the reinforcement grid is installed in accordance with the *INSTALLING WITH REINFORCEMENT* details shown on Page 5.



D



OUTSIDE CORNERS

BASE COURSE

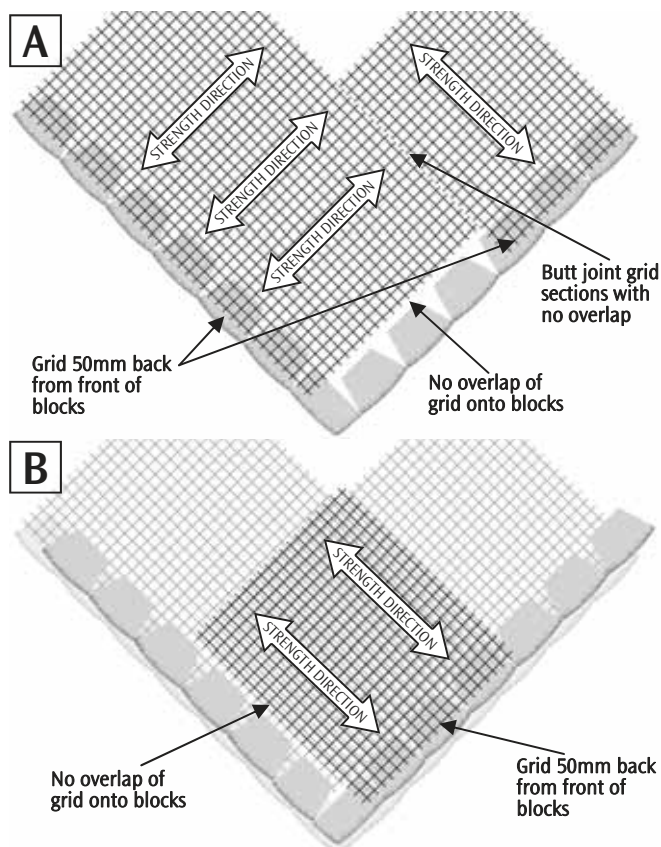
- A** To build an outside 90° corner, begin by placing a corner unit, split faces outwards, at the corner. Lay the rest of the base course working from the corner block outwards.

SECOND COURSE

- B** Lay a corner block perpendicular to the one below and fix the block in place with concrete adhesive. Two or three blocks away from the corner lay full blocks, maintaining running bond with the course below. Lay blocks back towards the corner block, leaving space for the final split units required to complete the course.

- C** Use split units immediately adjacent to the corner block to complete the course. Continue to alternate the corner unit orientation with each course and always use a concrete adhesive on all corner blocks and split units. Use split units* as necessary to maintain running bond. *See Page 10 for bonding agent details.*

*Cutting or splitting blocks - Use a hydraulic or mechanical splitter, or split manually by using a hammer and chisel to score the block on all sides. A circular masonry saw may also be used. **Safety Note:** *See Page 8*



OUTSIDE CORNERS - REINFORCEMENT

FIRST COURSE WITH REINFORCEMENT

- A** Begin by checking the wall plans from the engineer to determine reinforcement lengths and elevations. At each reinforced course, lay a section of reinforcement near the corner wall, ensuring that it is placed 50mm back from the wall face in one direction, whilst running along the back, but not overlapping the adjacent wall. Ensuring no grid overlap occurs, continue the grid reinforcement along both legs of the wall, to the reinforcement lengths specified. At this stage, there will still be several blocks which are not in contact with any reinforcement. Grid must not be directly overlaid, so this reinforcement must be incorporated at the next block level up. Lay the next course of blocks and before backfilling, mark the portion of the wall without reinforcement. This is important, because once the backfill is in place this cannot be seen.

- B** Back fill and compact behind the course of blocks. Cut an additional length of grid to correspond to the marked section of blocks. This grid should be cut to the length shown in the drawings and laid so that it is placed 50mm back from the wall face, whilst running along the back, but not overlapping the adjacent wall.

Repeat this procedure at each reinforced layer within the wall, alternating the alignment of the additional layer of reinforcement at each elevation.

Ensure the reinforcement grid is installed in accordance with the INSTALLING WITH REINFORCEMENT details shown on Page 5.



INSIDE CURVES

MINIMUM RADIUS

When building an inside curve, the minimum radius allowed (when measured to the front face of the block) for an Anchor Bayfield® wall is 2.4 metres. Check the wall plan to ensure the radius of the base courses of any inside curves are greater than 2.4 metres.

BASE COURSE

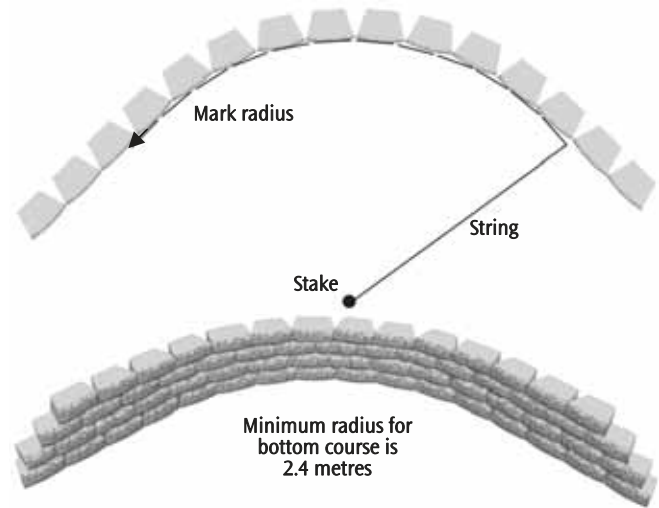
Begin by driving a stake into the ground at the desired centre of the curve. Attach a string and rotate it in a circle around the stake to mark the radius in the levelling pad (footing or base). Align each block face with the radius curve and ensure level placement from side to side and front to back.

ADDITIONAL COURSES

On each course, the lip of each block must be in contact with the back of the units below to ensure structural stability. The setback of the block will cause the radius of each course to gradually increase and eventually affect the running bond of the wall. To maintain proper running

bond, use split units* as needed. Once a split unit is cut to size, bond in place with a concrete adhesive. *See Page 10 for bonding agent details.*

*Cutting or splitting blocks - Use a hydraulic or mechanical splitter, or split manually by using a hammer and chisel to score the block on all sides. A circular masonry saw may also be used. **Safety Note:** *See Page 8*

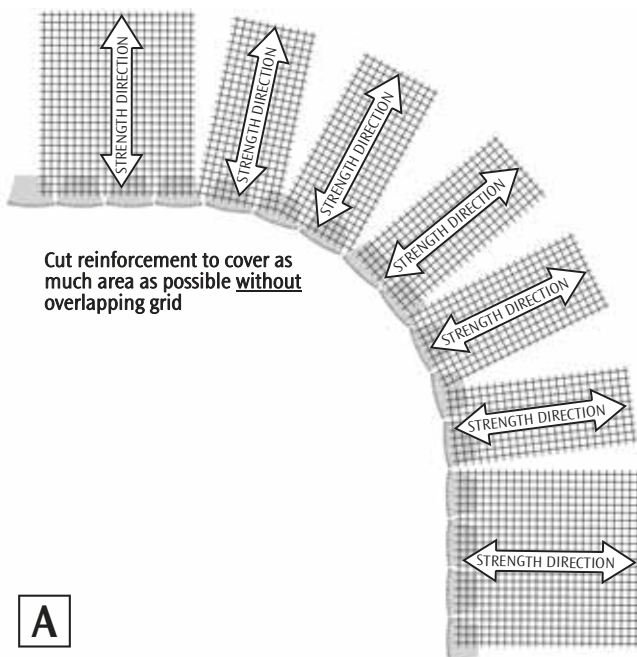


INSIDE CURVES - REINFORCEMENT

Retaining walls are designed assuming 100% coverage of the reinforcement. When building a curve the reinforcement will have gaps. To ensure 100% coverage, additional lengths of reinforcement are used to fill those gaps on the **next** course of blocks. Never overlap the grid on one course to avoid slippage.

A FIRST COURSE WITH REINFORCEMENT

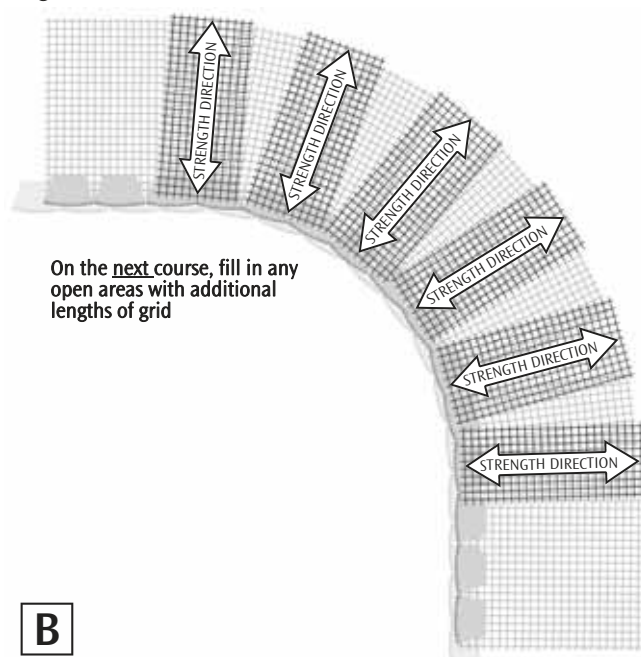
Cut reinforcement to the lengths specified in the wall plan. Lay segments of reinforcement within 50mm of the face of the wall, making sure that the strength direction of



each section is perpendicular to the wall face. Place the next course of blocks, marking the backs of blocks to identify the middle of un-reinforced areas. Backfill and compact.

B On the next course, centre subsequent sections of the reinforcement on the marked blocks to ensure full reinforcement coverage. This step is important because when this course is backfilled, it is impossible to locate the un-reinforced areas. Repeat this procedure throughout the construction of the radius curve when reinforcement is required.

Ensure the reinforcement grid is installed in accordance with the INSTALLING WITH REINFORCEMENT details shown on Page 5.



OUTSIDE CURVES

MINIMUM RADIUS

The radius of the top course of an Anchor Bayfield® Wall will always be less than the radius of the base course because of the batter of the wall.

For Bayfield® walls built with outside curves the minimum radius of the **top course** of blocks must not be less than a radius of 1.2 metres.

The table below shows the minimum allowed radius of the base course for various wall heights. For each wall height, provided that the actual base course radius is greater than the minimum shown, the radius of the top course will always be greater than the allowed minimum of 1.2 metres.

Wall Height (metres)	Minimum allowed radius of base course (metres) to back of block
1.80	1.57
1.65	1.54
1.50	1.51
1.35	1.47
1.20	1.44
1.05	1.40
0.90	1.37
0.75	1.34
0.60	1.30
0.45	1.27
0.3	1.23
0.15	1.20

Example: A 1.65 metre wall is being built with an outside curve. The radius of the base course is 1.7 metres. The minimum allowed radius of a base course for a 1.65m high wall is 1.54 metres, so the curve can be built successfully.

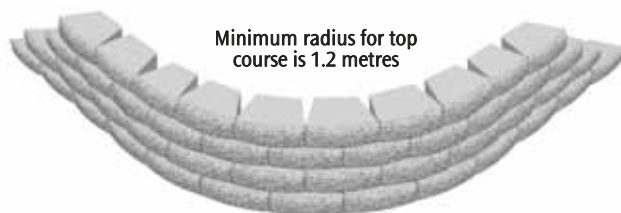
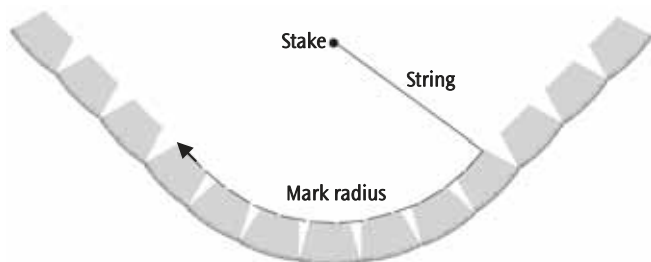
BASE COURSE

Drive a stake into the ground at the desired centre of the curve. Attach a string and rotate it in a circle around the stake to mark the radius in the levelling pad (footing or base). Align the back of the block (not the front) with the radius curve and ensure level placement from side to side and front to back.

ADDITIONAL COURSES

On each course, the lip of each block must be in contact with the back of the units below to ensure structural stability. The setback of the block will cause the radius of each course to gradually decrease and eventually affect the running bond of the wall. To maintain proper running bond, use split units* as needed. Once a split unit is cut to size, bond in place with a concrete adhesive. *See Page 10 for bonding agent details.*

*Cutting or splitting blocks - Use a hydraulic or mechanical splitter, or split manually by using a hammer and chisel to score the block on all sides. A circular masonry saw may also be used. **Safety Note: See Page 8**



OUTSIDE CURVES - REINFORCEMENT

Retaining walls are designed assuming 100% coverage of the reinforcement. When building a curve the reinforcement will have gaps. To ensure 100% coverage, additional lengths of reinforcement are used to fill those gaps on the **next** course of blocks. Do not overlap the grid on one course to avoid slippage.

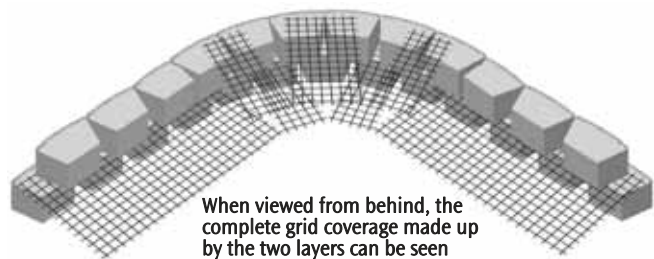
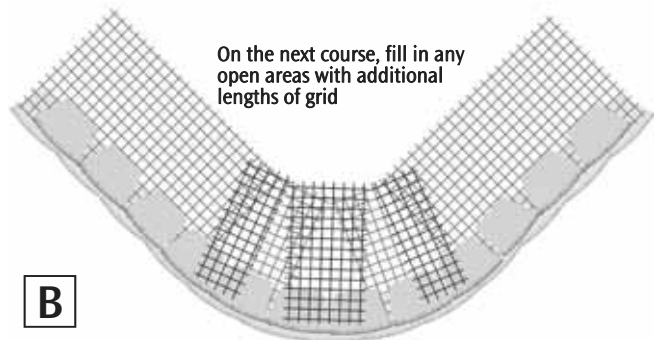
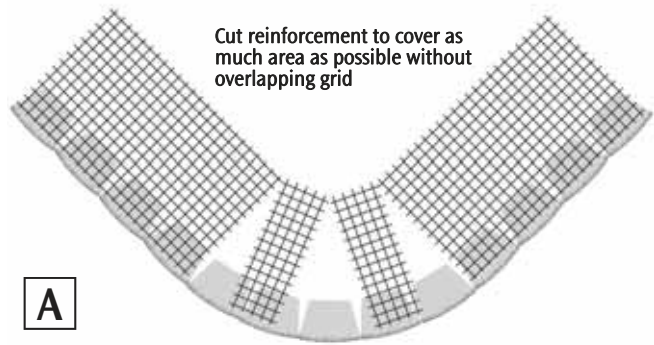
A FIRST COURSE WITH REINFORCEMENT

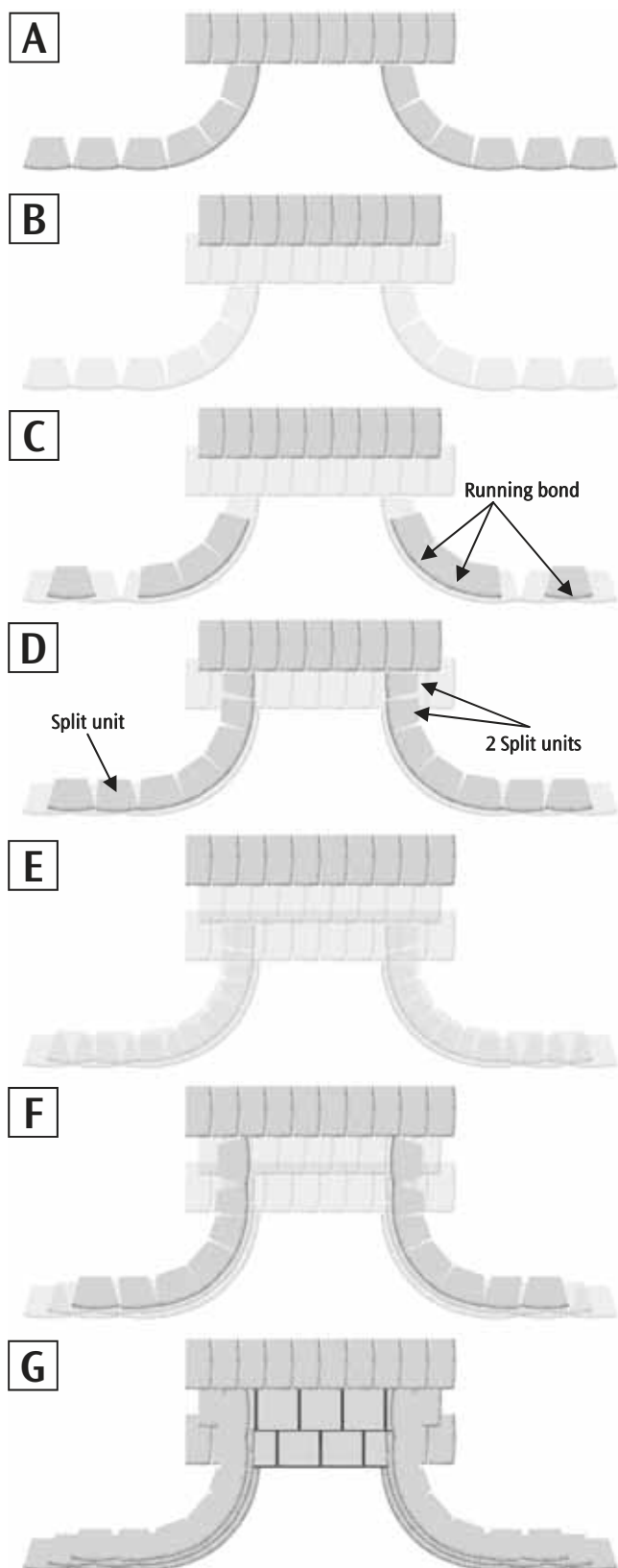
Cut reinforcement to the lengths specified in the wall plan. Lay sections of the reinforcement within 50mm of the face of the wall with the strength direction perpendicular to the wall face. Avoid overlapping the reinforcement by separating each section.

B NEXT COURSE

Place the next course of blocks, marking the backs of blocks to identify un-reinforced areas. This step is important because when this course is backfilled, it is impossible to locate the un-reinforced areas. Use the marked blocks as a guide, placing subsequent sections of reinforcement to overlap the gaps left on the previous course. This will ensure total reinforcement coverage. Repeat this procedure throughout the construction of the radius curve whenever reinforcement is required.

Ensure the reinforcement grid is installed in accordance with the INSTALLING WITH REINFORCEMENT details shown on Page 5.





STEPS

BASE COURSE

- A** Lay out the first course of the step run, using corner/step units close butted and with the split end facing forward. The units should be laid this way to ensure a sufficient tread will be formed in the finished steps. When the full base course, including the wall blocks, has been laid, backfill and compact behind and along the sides of the corner/step units and wall blocks.

FIRST STEP COURSE

- B** Apply concrete adhesive to the top of the corner/step blocks, approx 50mm in from the back edge of the units. Place the next course of step units so the front edge (the face) of the step overlaps the previous step course by 80 to 100mm. Check the step units are level front-to-back as well as along the length of the step. Adhere each of the front of the corner/step units to the back edge of the preceding course with the concrete adhesive.

FIRST BLOCK COURSE

- C** Place standard blocks on the curve, maintaining running bond with the base course below.
- D** Measure and cut or split blocks to fit the space remaining between the step unit and the course of the wall. Use two blocks to avoid creating cut units which are less than 215mm long in size. Place the units in the wall, making sure that edges fit tight against both the step and standard units. Remove the rear lip on the blocks when necessary and fix all split or cut units with a concrete adhesive. Backfill and compact behind and along the sides of each course of step and wall units as each course is formed and laid.

NEXT STEP COURSES

- E** Position and form the next step course, following the same procedure as outlined above.
- F** Repeat these steps for each course of the wall, ensuring that the steps and wall blocks remain level and compaction takes place as each course is completed.
- G** If required, decorative flags can be used to give the step treads a contrasting colour and texture.

*Cutting or splitting blocks - Use a hydraulic or mechanical splitter, or split manually by using a hammer and chisel to score the block on all sides. A circular masonry saw may also be used. **Safety Note:** See Page 8



TERRACES

INDEPENDENT TERRACED WALLS

For each wall to be independent of others, it must be built using a 2:1 ratio — the upper wall must be built a distance away from the lower wall of at least twice the height of the lower wall. In addition, the upper wall must also be equal to or less than the height of the lower wall. Exceptions to this general rule include weak soil conditions or where slopes exist above, below or between wall locations.

Example: The lower terrace wall is 900mm tall. The distance between the terraces must be at least 1800 mm (1.8 metres) and the upper wall must not be higher than 900mm.

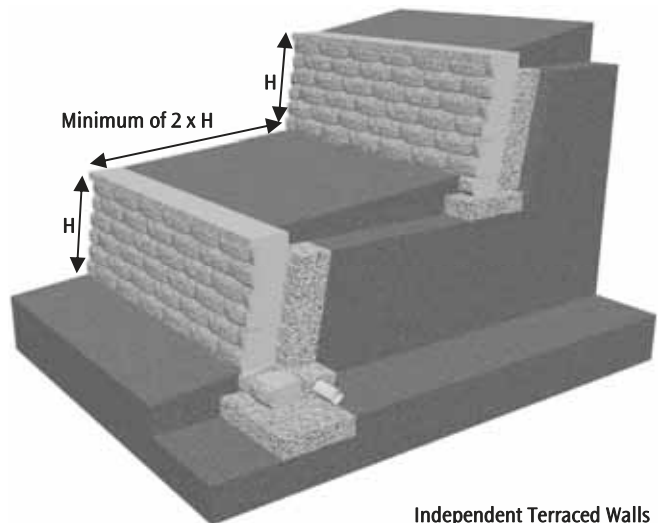
Drainage is vital to maintaining stable, long-lasting terraced walls. Drainage pipe must be installed so that the water is directed around or under the lower wall (never place the drain tile outlet for the upper wall above or behind the lower wall).

DEPENDENT TERRACED WALLS

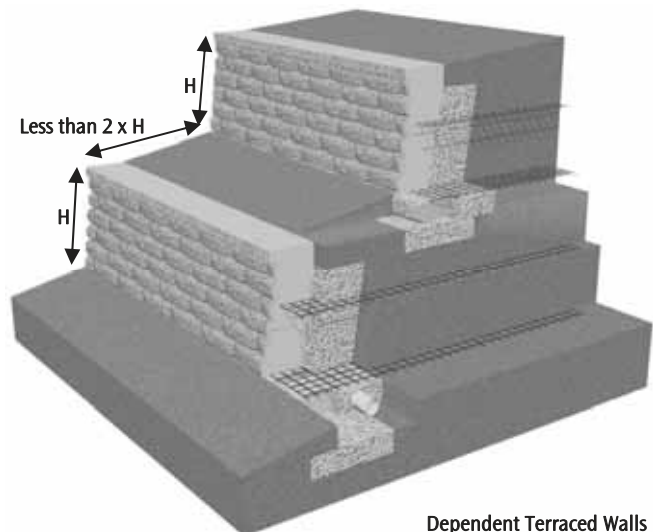
When the distance between the lower and upper walls is less than twice the height of the lower wall, the walls become structurally dependent on each other. In this situation, it is important to take global stability (the resistance to overall mass movement of the whole SRW system in a circular or sliding mode) into account, incorporating additional reinforcement - and longer layers - into the wall plan. In addition, structurally dependent walls require even more excavation, backfill and time.

For dependent walls, consult a suitably qualified engineer.

Acheson & Glover can supply names and contact details of engineers in your area.



Independent Terraced Walls

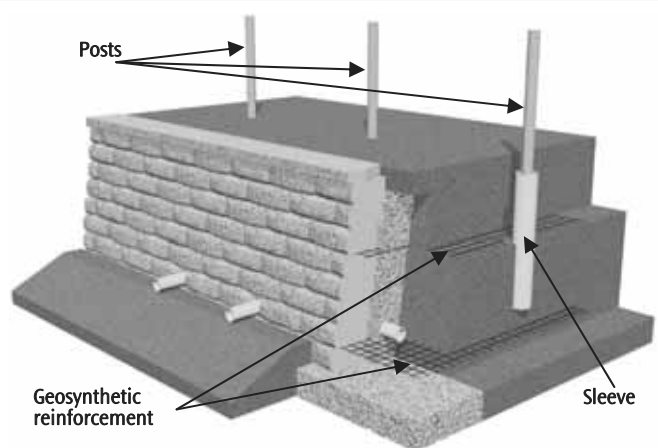


Dependent Terraced Walls

FENCES

Know the specific dimensions of the fence to determine the placement of the sleeves. Sleeves should be at least 25mm larger in diameter than the fence posts to allow for mortar and grout. Install the sleeves according to the wall plan during the construction of the wall. If the fence is at least 900mm back from the wall, generally no additional reinforcement is required. If the fence is installed within 900mm from the back of the wall, there may be some load transferred to the wall from wind or pedestrians and additional reinforcement around the fence sleeves will be needed. *Consult a suitably qualified engineer.* Acheson & Glover can supply names and contact details of engineers in your area.

Grout the fence post into the sleeve after the wall is built.





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RETAINING WALL SYSTEMS

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