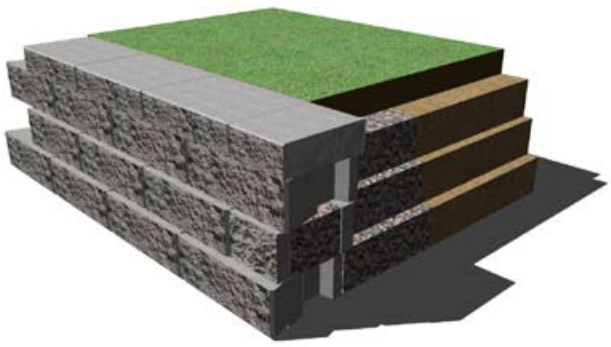
MIRASTONE™

Gravity Wall

A force to be reckoned with…

Gravity (SRW) segmental retaining wall systems are structures lower in height that use the MiraStone unit weight combined with gravel core infill to resist earth pressures behind and on top of the wall. The 1/2”/unit (4.5 degree or 1”/vertical foot) batter or setback of the MiraStone wall along with proper soil conditions below and behind the wall provide the stability of the structure. For walls 4.0ft (1.2m) and taller a qualified engineer should be consulted.



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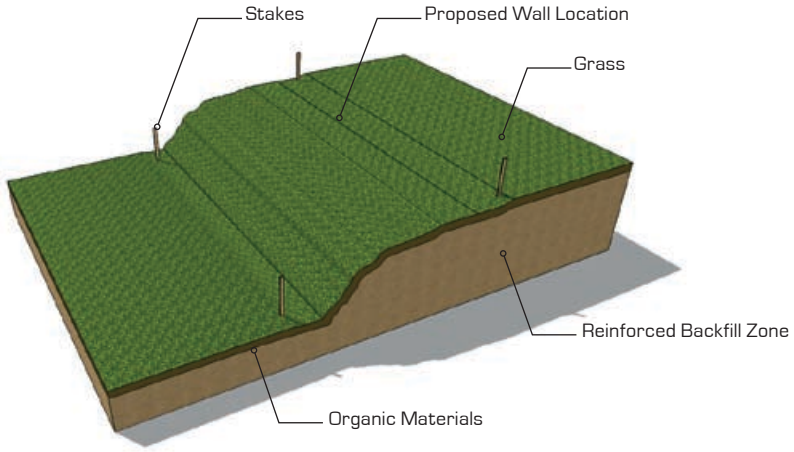
> > > STEP 1
PLANNING

· Mark the bottom and top of the wall excavation location with spray paint or stakes

· Establish proper elevation bottom and top of wall before excavating

· **Organic Materials** should not be used in **Structural Backfill Zone**

· Store and protect **Structural Backfill Materials** from inclement weather during construction



> > > STEP 2
EXCAVATION

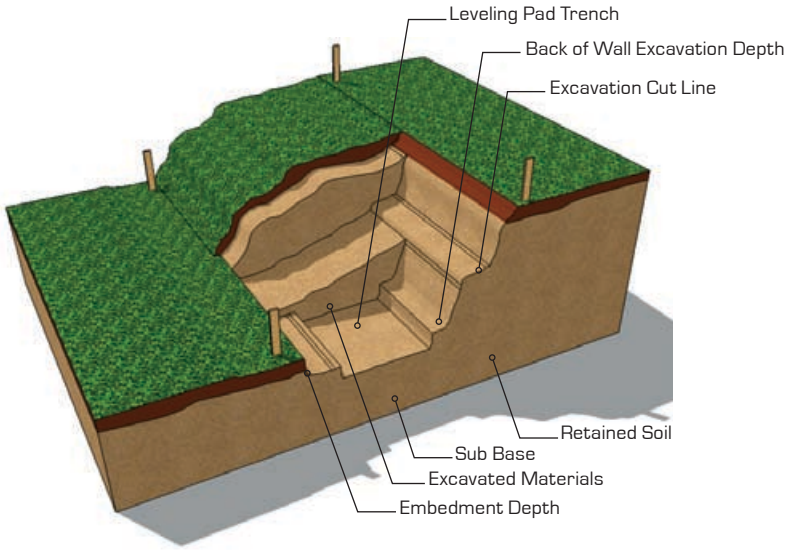
· Excavate and prepare **Sub Base Leveling Pad Trench** 6" below first course

· **Leveling Pad** trench is approximately 2.5' to 3' wide

· Normal wall **Burial Depth** or **Embedment Depth** is 6" to 12" or one block (for more information refer to design manual)

· Excavate cut line to a 2 to 1 slope or greater

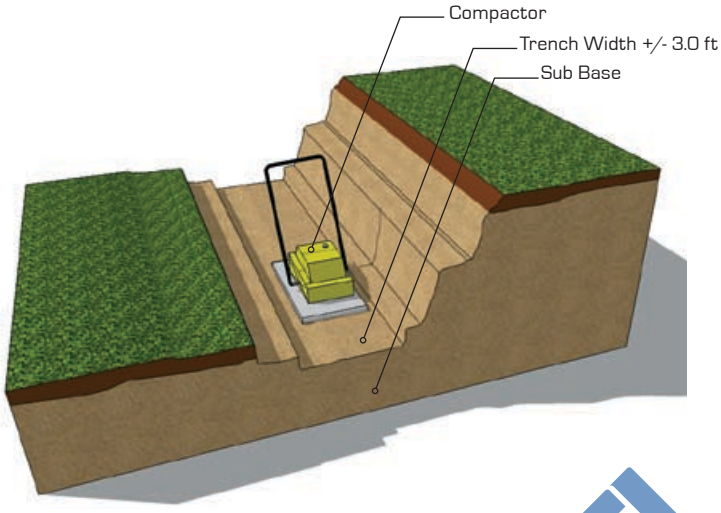
· Back of wall excavation depth into the bank should be 12" beyond the back of the **Sub Base Leveling Trench**



> > > STEP 3
SUB BASE COMPACTION

· Compact **Sub Base to 95% Standard Proctor Density** or greater

· Remove any **Organic** or poor soils in the **Sub Base** and replace with proper **Structural Fill Materials** before compacting



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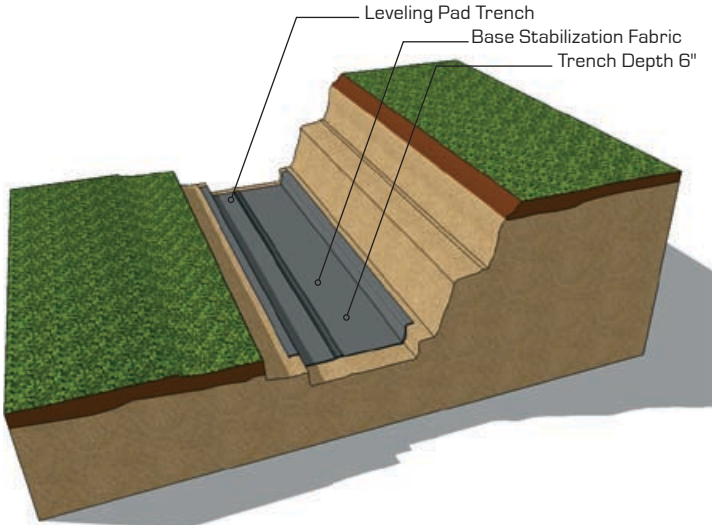
> > > STEP 4
BASE STABILIZATION

· (Optional) place 5' to 6' wide **Base Stabilization Fabric** on top of leveling pad trench

· **Base Stabilization Fabrics** will help prevent sub base materials from mixing with the gravel base leveling pad during compaction

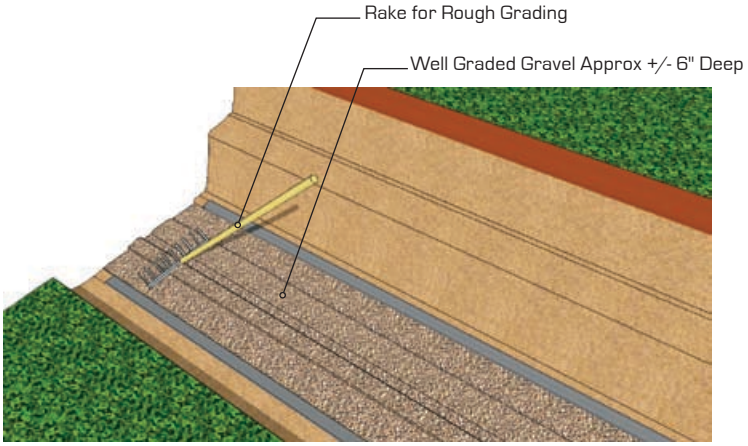
· Fabric also provides extra **Structural Bearing Stability** to the base leveling pad



> > > STEP 5
ROUGH LEVELING PAD

· Place **Well Graded Gravel** (also known as Road Base Aggregates) on top of fabric in the leveling pad trench approximately 6" deep

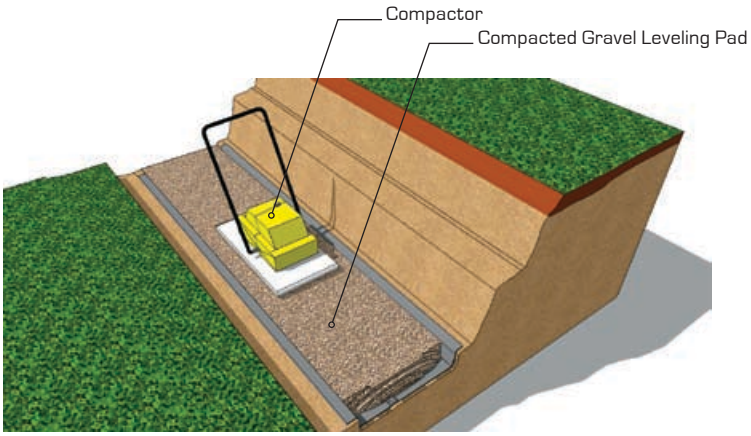
· Rough grade gravel with a rake close to finish base elevation



> > > STEP 6
COMPACT LEVELING PAD

· **Compact** the **Gravel Leveling Pad** to **95% Standard Proctor Density** or greater

· Correct **Moisture Content** in the gravel will help in reaching proper compaction



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> > > STEP 7
LEVEL SCREED PIPES

· Place first 3' long **Screed Pipe** across the trench at one end of the wall or at the lowest elevation

· Scratch a trench for the pipe in the compacted gravel with a chipping hammer

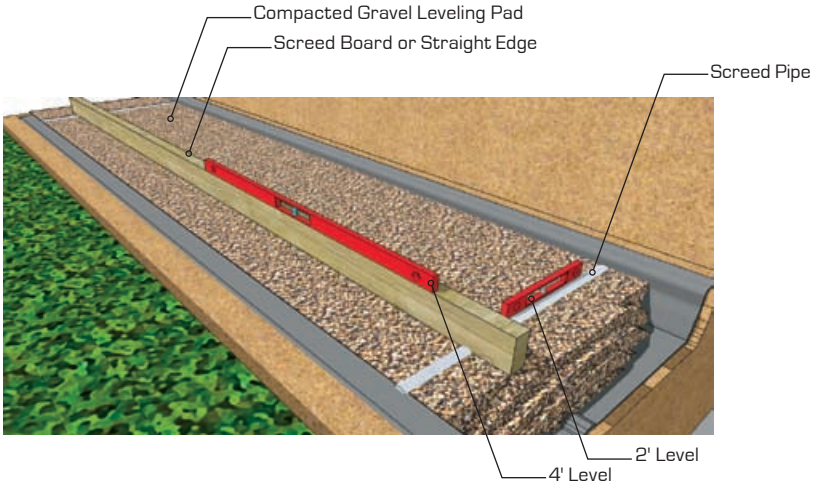
· Use a 2' level or **Laser Level** to set the screed pipe to the proper level

· Gravel is added underneath and around the screed pipe to support while leveling

· Place the second screed pipe across the trench approximately 9' from the first screed pipe

· Level the second screed pipe to the same elevation as the first screed pipe by using a 4' level on top of a **Screed Board, Straight Edge** or with a **Laser Level**

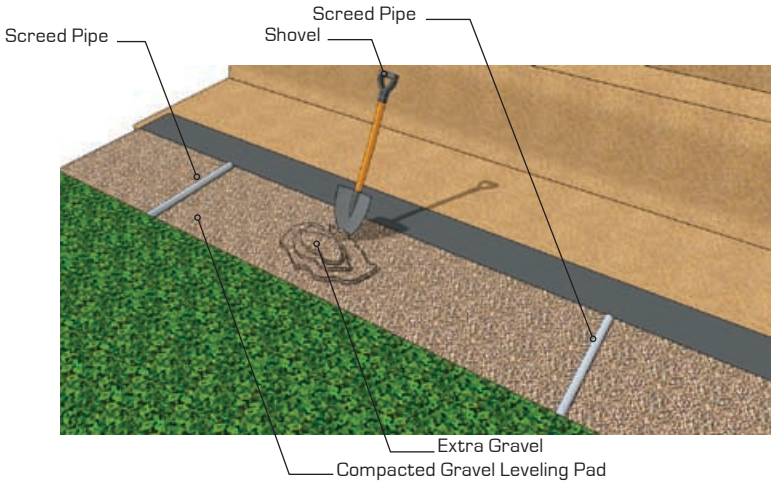
· Continue to place and level screed pipes the full length of the trench leveling pad or until reaching a base elevation change



> > > STEP 8
EXTRA GRAVEL

· Place or remove extra **Well Graded Gravel** (also known as Road Base Aggregates) level to the top of the screed pipes as needed

· (If more than 1 ½ inches of loose gravel is added, repeat the compaction steps again before screeding)



> > > STEP 9
SCREEDING LEVELING PAD

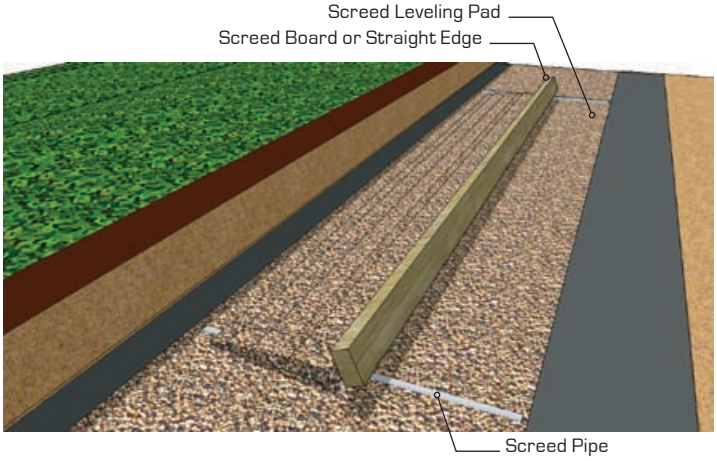
· **Screed** the gravel leveling pad with a **Screed Board** or **Straight Edge** across the trench on top of two screed pipes

· The coarser the gravel the more back and forth the screeding action when drawing the **Screed** across the leveling pad

· Too much pressure on the screed straight edge may dislodge the level of the screed pipes while screeding

· A second screed pass may be needed to insure an accurate level has been achieved

· Continue to screed the leveling pad until completing the full length of the trench or up to the first elevation change



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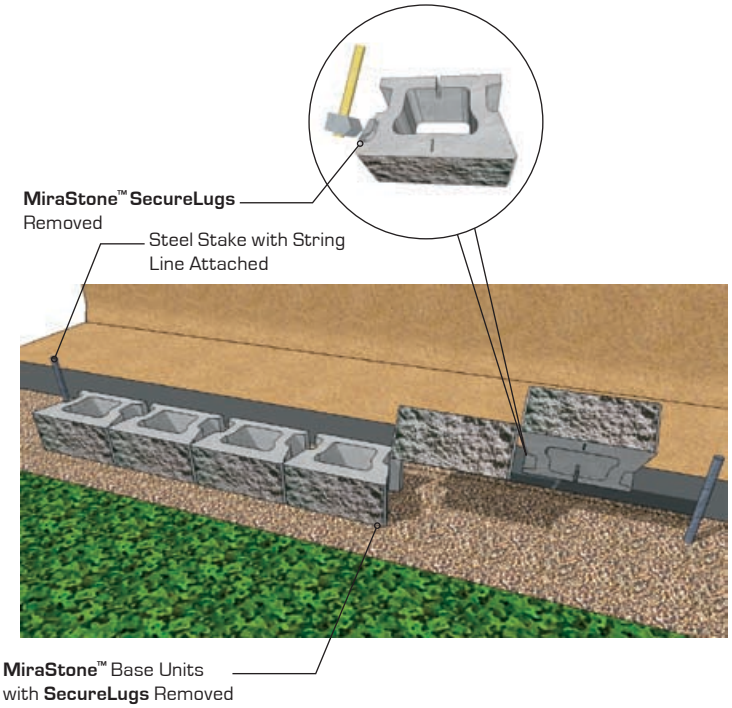
> > > STEP 10
REMOVE SECURELUGS

· **MiraStone™** base units will have the **SecureLugs** removed before placing on the leveling pad

· Place each unit on top of the leveling pad in such a way as not to disturb the level gravel



> > > STEP 11
LAY FIRST COURSE

· Remove the screed pipes from the leveling pad

· Place a steel stake or a **MiraStone™** unit at either end of the leveling pad to establish the back of the first course of units

· Secure tightly a string line to the stakes or **MiraStone™** units at either end which will provide the guide to line up the back of each **MiraStone™** base unit

· The distance of the string line between the steel stakes or **MiraStone™** units may vary due to heavy winds

> > > STEP 12
LEVEL UNITS

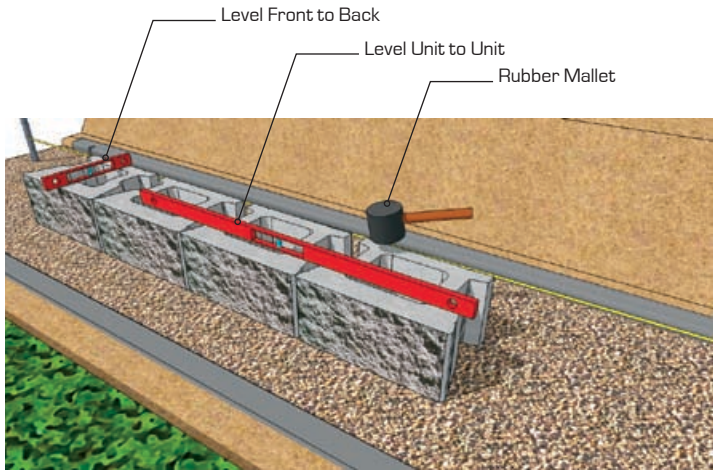
· Units are laid snug together and parallel to the straight or curved line

· A rubber mallet should be used if unit height and alignment adjustment is needed

· Use a short 2' level to make sure the units are level front to back

· Use a 4' level to make sure the units are level unit to unit along the length of the wall

· Correct batter and straight horizontal lines in the completed **MiraStone™** wall depend on the accuracy of the base leveling pad and units



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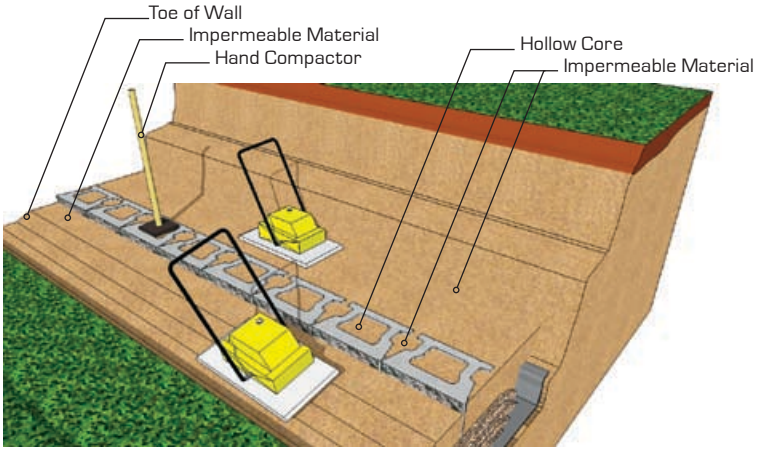
> > > STEP 13
IMPERMEABLE FILL

· Backfill behind, in front **(toe of wall)** and in the hollow cores of the units with **Impermeable Materials** up to the desired level of the **Perforated Drain Pipe** or to the top of the first course

· Compact the impermeable materials behind, in front and in the hollow cores of the units

· Sweep the top of the units clean of all rock and dirt before placing the next course of units

· Sweeping should create a 1/2" void in the core to accommodate the **SecureLug**'s interlock

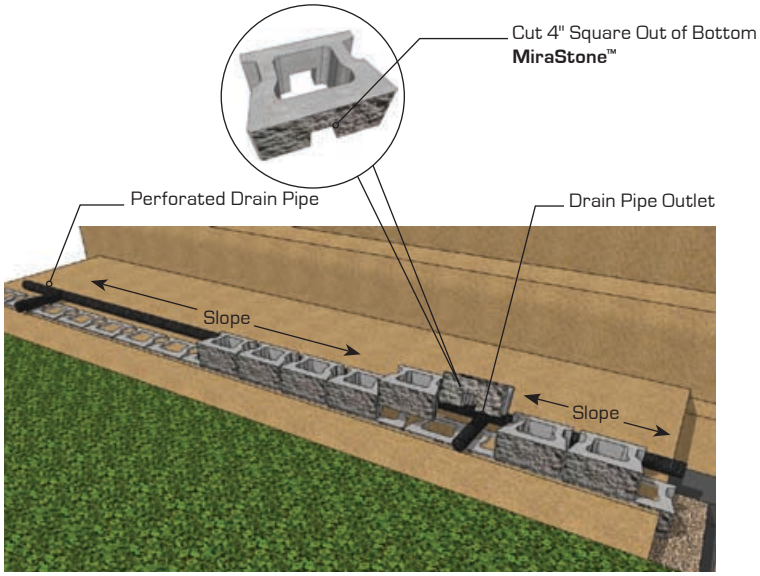


> > > STEP 14
DRAIN PIPE OUTLET

· **Perforated Drain Pipe** should have adequate slope to drain water in the right direction towards each **Drain Pipe Outlet**

· **Drain Pipe Outlet** can be every 30 or 50 feet

· **Perforated Drain Pipe** can be a **Sock Wrapped** system to help prevent fines from migrating into the pipe



> > > STEP 15
BACKFILL

· Place and compact **Backfill Materials** in maximum **Lifts** of 6"

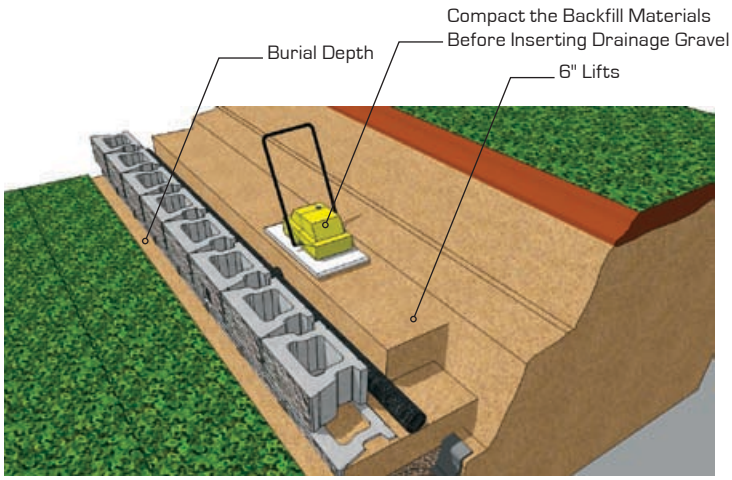
· Lifts may be less than 6" depending on the type of soil or size of equipment

· Backfill materials will be placed 6" to 12" behind the units allowing for **Clear Crush Drain Gravel** (Angular Aggregates free of fines) between the **MiraStone™** units and compacted backfill materials

By adding **Clear Crush Drain Gravel** (Angular aggregate free of fines) after compaction of the backfill materials, this will prevent undue pressure against the wall which can cause the units to move out of alignment

· Each lift should be compacted to **95% Standard Proctor** or greater

· The correct **Moisture Content** in the **Backfill Materials** will help in reaching proper **Compaction Density**



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> > > STEP 16
DRAINAGE GRAVEL

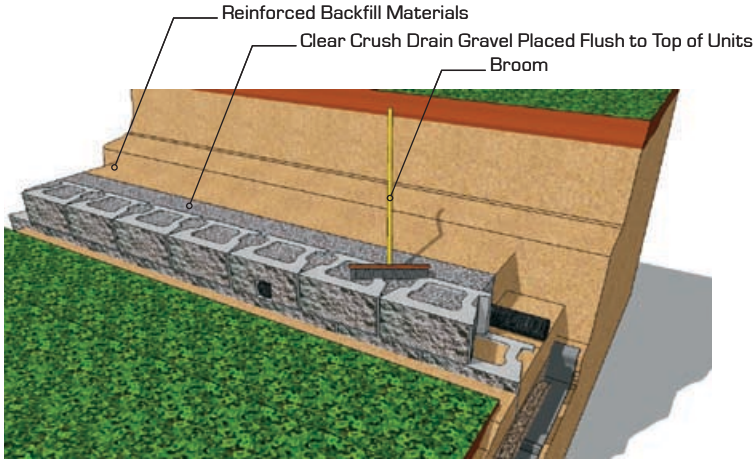
· **Clear Crush Drain Gravel** (Angular Aggregates free of fines) is placed in the hollow cores and 6" to 12" behind the wall units after compaction of the **Backfill Materials**. This will prevent undue pressure against the wall which can cause the units to move out of alignment

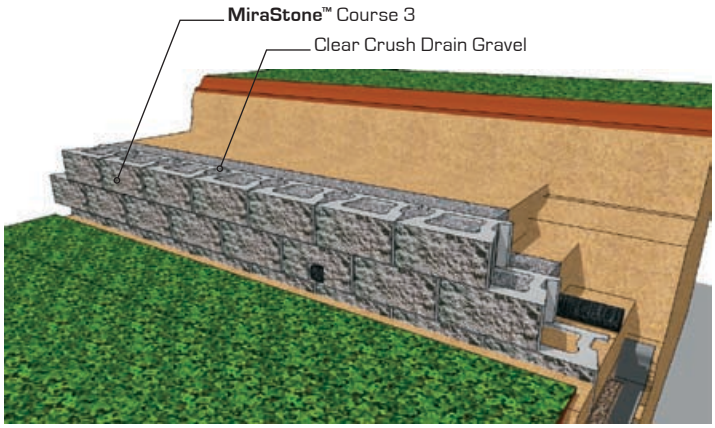
· **Clear Crush Drain Gravel** does not need to be compacted

· Sweep the top of the **MiraStone™** units clean of all rock and dirt before placing the next courses

· Make sure the **Clear Crush Drain Gravel** directly behind the wall units is placed flush to the top of the units

· Make sure the **Backfill Materials** are as well compacted and level as possible



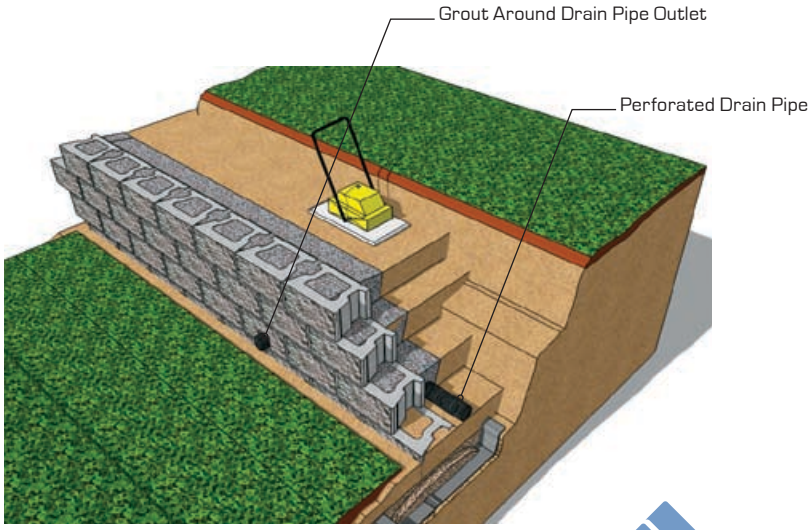


> > > STEP 17
CONTINUE INSTALLATION

· Continue to install each course of units following the same steps as above

· Install and compact **Backfill Materials** in 6" lifts until wall is complete

· Grout around **Drain Pipe Outlet** to prevent **Clear Crush Drain Gravel** or **Drainage Aggregates** (Angular Aggregates free of fines) from migrating



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> > > STEP 18
CAPPING

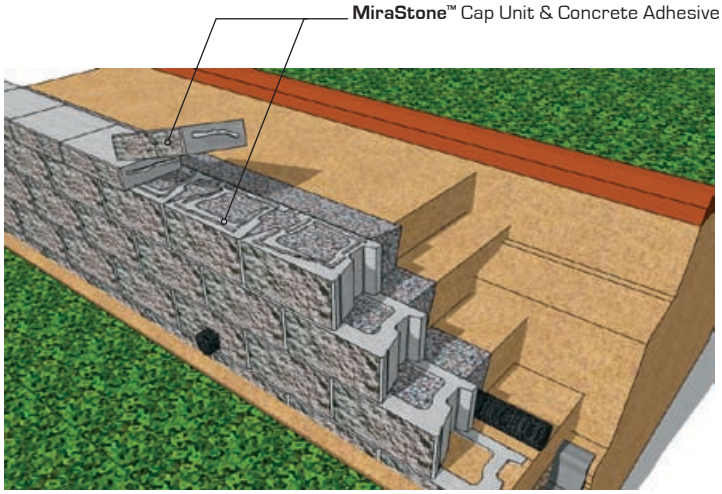
· Complete the top of the wall with **MiraStone™** cap units

· Properly secure the cap units using a **Concrete Adhesive**

· Make sure all units are free of dirt and stones before installing the caps

· Place a solid bead of **Concrete Adhesive** around the top of each **MiraStone™** unit

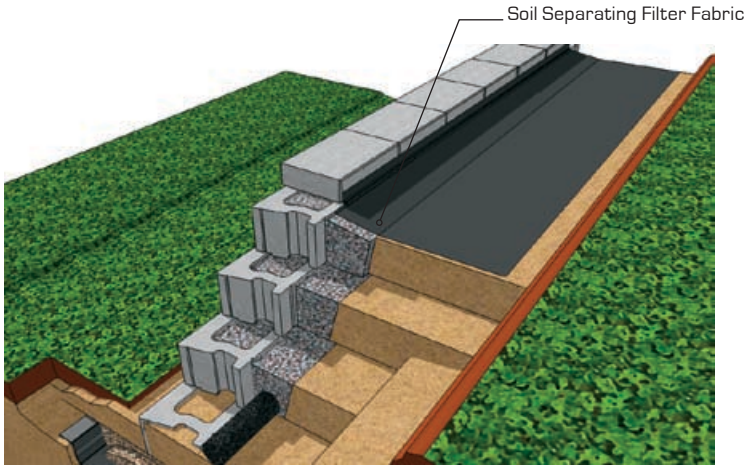
· Place a bead of adhesive between each joint of the cap units



> > > STEP 19
SOIL SEPARATION FABRIC

· Place a 6 ft wide **Soil Separating Filter Fabric** on top of the backfill and drainage gravel and against the back of the last units before placing the planting soils

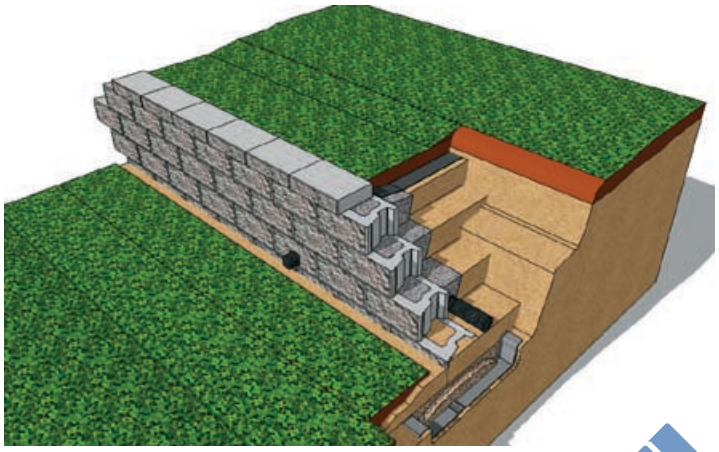
· The fabric will prevent planting soil fines from staining the face of the wall and migrating into the **Clear Crush Drain Gravel** (Angular Aggregate free of fines)



> > > STEP 20
FINAL GRADING

· Insure that final grading is done on top and bottom of the wall

· Make sure to protect newly placed planting soil from erosion during heavy rains or surface runoff



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