allanblock.in

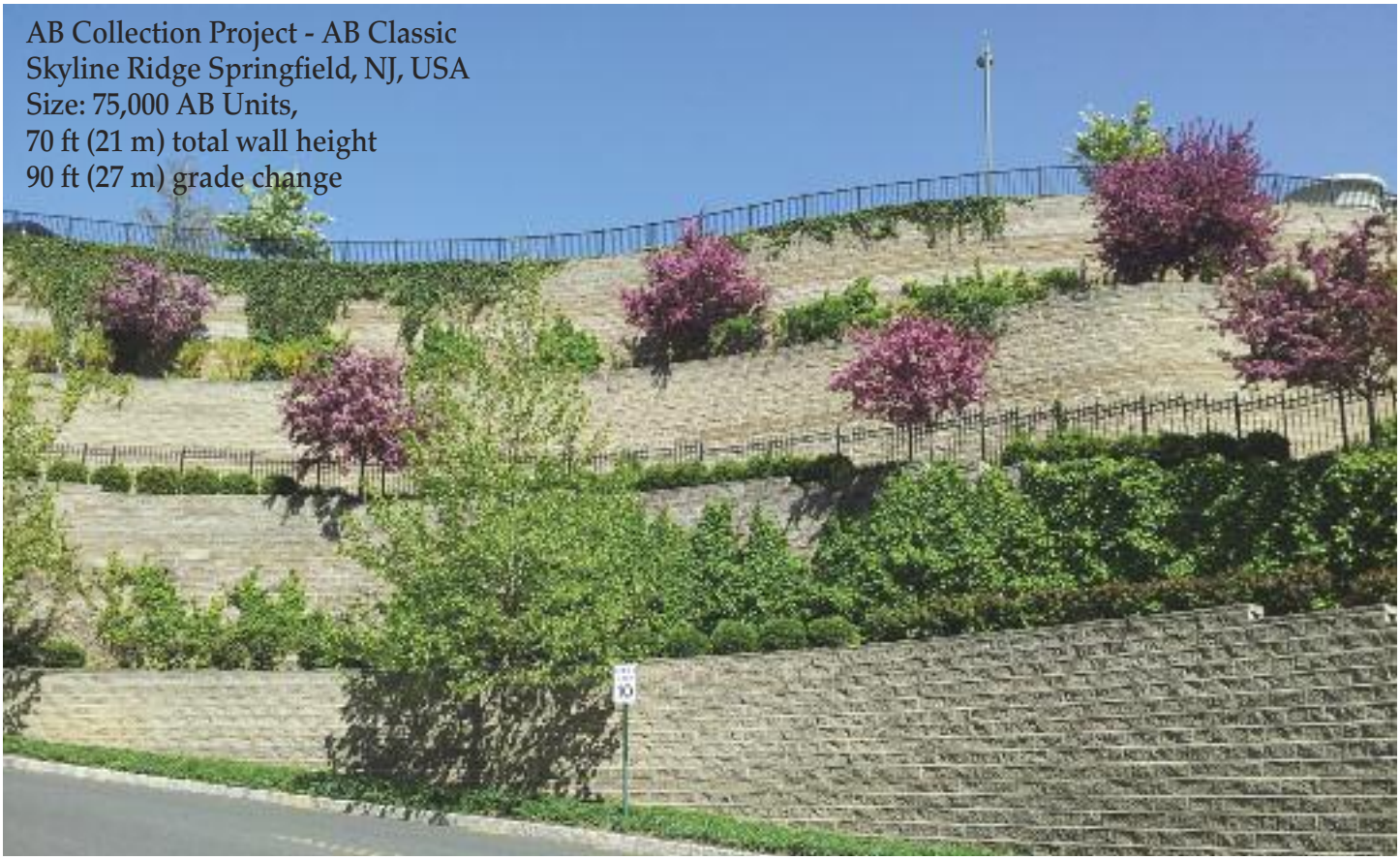
Allan Block® Retaining Walls

AB Collection Installation Manual

Represented in India by PraYoSa - Offering World Class Products to Beautify Indian Landscapes

PraYoSa Buildmat Pvt. Ltd.
2,Sachinam Opp. Sai. Point Honda,
Almeda Road,Panchpakhadi
Thane (W) 400602
Tel: +91 22 25401275/1065
+91 9619183462
Email: sales@prayosa.co.in

AB Collection Project - AB Classic
Skyline Ridge Springfield, NJ, USA
Size: 75,000 AB Units,
70 ft (21 m) total wall height
90 ft (27 m) grade change



allanblock.in

Table of Contents

For complete plan, design and build information for the Allan Block retaining wall products, see the Installation Manual for Allan Block Retaining Walls

A Complete Family of Wall Products

The Allan Block Collections give you a choice of styles to meet your site and design requirements. Use the basic gravity wall system for smaller wall projects. For taller wall projects use geogrid to reinforce the wall, or consider optional techniques using masonry, no-fines, rock bolts, soil nails, or earth anchors.

AB® Collection - Classic Cut Style

The **AB® Collection** has been a favorite of wall builders for years and offers the perfect blend of performance and style with maximum results.

The AB Collection offers a variety of sizes and weights to meet differing aesthetic and performance needs. Refer to the chart below or to our website - allanblock.in to help make the right choice for your project.

Table 1.1

AB® COLLECTION

Style & Performance	Name	Setback	Coverage	Weight	Approximate Dimensions
	AB Classic	6°	1 sq ft. approx. 11 blk per m²	75 lbs 34 kg	8 in. H x 12 in. D x 18 in. L 200mm H x 300mm D x 460mm L
	AB Jumbo Jr	6°	0.5 sq ft. approx. 22 blk per m²	35 lbs 16 kg	8 in. H x 9.5 in. D x 9 in. L 200mm H x 240mm D x 230mm L
	AB Lite Stone	6°	0.5 sq ft. approx. 22 blk per m²	35 lbs 16 kg	4 in. H x 12 in. D x 18 in. L 100mm H x 300mm D x 460mm L

Actual dimensions, weights and setbacks will vary by manufacturer. Check with your local Allan Block manufacturer for exact specifications and color availability. Caps and corner blocks are also available for each of the collections.

Individual Blocks and Patterned Walls

The design possibilities are endless. Use the blocks from the AB Collection individually or blend them together to create AB Ashlar Blend patterned wall. The interlocking blocks easily fit together without any materials or tools.

AB Ashlar Blend™ from the AB Collection

The Allan Block System

allanblock.in

Allan Block's built-in features make retaining walls easy to engineer and simple to build. These simple engineering features make the Allan Block Collections the most efficient and reliable products on the market.

Mortarless Construction

Mortarless technology works. Building "flexible" structures with interlocking dry-stacked materials provides superior performance over rigid construction techniques. Add the benefits inherent in a mortarless system - site adaptability, installation by general laborers, lower cost - and you have what we call the *Allan Block Advantage*.

Mortarless construction has been used for centuries.

Built-In Engineering

Built-In Interlock

Every Allan Block is firmly locked in place by the patented lip and notch configuration. No pins, no mortar, no fancy connectors.

Built-In Setback

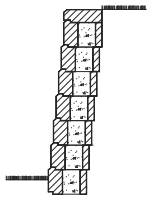
The raised lip automatically establishes the proper setback of 6°.

Built-In Drainage

The hollow-core design combines with mortarless construction to allow water to drain freely from behind the wall. Incidental water moves easily through a vertical drain that is formed by the layer of wall rock placed behind the block and in the block cores. The dry-stack construction technique allows the incidental water to escape by flowing around the blocks and out the wall face. This built-in drainage helps to eliminate water pressure. Please note that this area is not to be used as a primary water management element.

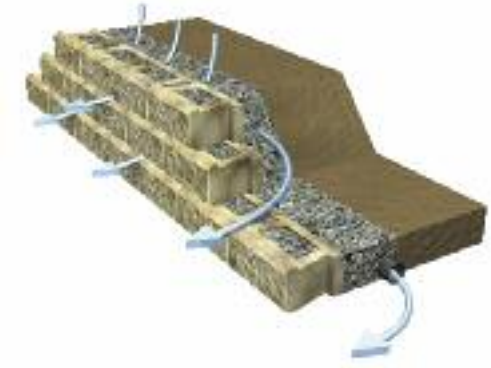
Built-In Interlock

Built-In Setback



6°±
approximate setback

Built-In Drainage



Hollow-Core System

Allan Block's exclusive hollow-core product design provides many benefits over solid systems.

- Superior drainage.
- Faster drying in wet environments.
- Better resistance to freeze-thaw cycles.
- Improved efflorescence control.
- Easier handling, faster installation, lower labor costs.
- Block-to-block interlock created from wall rock in the blocks.
- Lower production and freight costs.

Table 1.2

Standard Product Specifications

Compressive Strength	3000 psi	*20.67 MPA*
Absorption *Northern Climates*	7.5 lb/ft³	*120 kg/m³*
Absorption *Southern Climates*	10 lb/ft³	*160 kg/m³*
Unit Density - Hollow	125 lb/ft³	*2002 kg/m³*
Unit Shear Strength	645 lb/ft	*9406 N/m*

Reference ASTM 1372

Gravity and Reinforced Walls

A retaining wall that relies solely on it's own weight to stand up is called a gravity wall. Allan Block combines the basic engineering principles of setback, leverage and total unit mass with simple mechanics to make highly stable gravity walls.

When wall heights exceed those listed in the gravity wall chart, geogrid can be added to provide a stable wall condition. Layers of geogrid inserted between the blocks and extending behind the wall interlock with the surrounding soil to create a cohesive soil mass. This mass uses its own weight and internal shear strength to resist both the sliding and the overturning pressures from the soil being retained.

Gravity Wall Heights

Use the gravity wall chart to find the maximum height that can be built before reinforcement is required.

The gravity wall heights shown do not account for seismic loading. Check with a local engineer for assistance if you are in a seismic area.

Geogrids

Geogrids are flexible, synthetic meshes which are manufactured specifically for slope stabilization and earth retention. These "grids" are available in a variety of materials, sizes and strengths.

Wall Rock

Wall Rock is used when building any gravity or reinforced retaining walls. It must be compactible stone aggregate ranging in size from 0.25 in. to 1.5 in. (6 mm - 38 mm) with no more than 10% passing the #200 sieve with a minimum density of 120 lbs/ft^3 (1,923 kg/m^3). There needs to be a balanced mix of the sizes to achieve good compaction.

For complete plan, design and build information for the Allan Block retaining wall products, see the Installation Manual for Allan Block Retaining Walls or allanblock.in.

Table 1.3

Maximum Wall Heights AB Gravity Walls

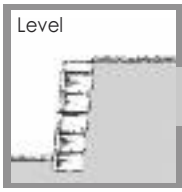
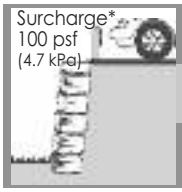
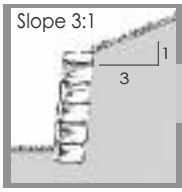
Condition above retaining wall	Soil Type	Friction Angle	6° (Ref) AB Collection
 Level	Clay	27°	3 ft. 2 in. 0.9 m
	Silty Sand	32°	4 ft. 7 in. 1.4 m
	Sand/Gravel	36°	5 ft. 2 in. 1.6 m
 Surcharge* 100 psf (4.7 kPa)	Clay	27°	1 ft. 4 in. 0.4 m
	Silty Sand	32°	3 ft. 1 in. 0.9 m
	Sand/Gravel	36°	3 ft. 6 in. 1.0 m
 Slope 3:1	Clay	27°	2 ft. 4 in. 0.7 m
	Silty Sand	32°	4 ft. 1 in. 1.2 m
	Sand/Gravel	36°	4 ft. 7 in. 1.4 m

Table 1.3 is based on Clay soil having an internal friction angle of 27° (Ref) or better and a Sandy soil having an internal friction angle of 32° (Ref) or better and a Sand/Gravel soils having an internal friction angle of 36° (Ref) or better. All heights based on exposed wall heights and include a cap block. The gravity wall heights shown above do not account for seismic loading. Check with a local engineer for assistance if you are in a seismic area. Final designs for construction purposes must be performed by a local registered Professional Engineer, using the actual conditions of the proposed site. *The Surcharge loading category above assumes a solid surface such as concrete, asphalt or pavers having a suitable supporting subgrade.

Table 1.4

AB Setback Chart

Setback	Wall Height			
	4 ft 1.2 m	6 ft 1.8 m	8 ft 2.4 m	10 ft 3.0 m
AB Collection 6°	5.0 in 125 mm	7.50 in 190 mm	10.0 in 255 mm	12.5 in 320 mm

All values are provided for reference only.

Gravity Wall Construction

allanblock.in

Step 1: Site Prep and Excavation

- Remove surface vegetation and organic soils.
- Per the approved plan, excavate base trench a minimum of 24 in. (610 mm) wide and 12 in. (300 mm) deep.*
- Remove unsuitable soils and replace with compactible materials.
- Buried block should be a minimum of 6 in. (150 mm). Check plans to see how much buried block is required.
- Compact and level trench.

Step 2: Install Base Material

- Per the approved plans, place a minimum of 6 in. (150 mm) of wall rock in the base trench and rake smooth.*
- Compact and level base material.
- Site Soils Engineer should verify that a proper base is established.

Step 3: Install Base Course

- **Begin at the lowest wall elevation**. Place all units top side up with the raised front lip facing up and in the center of the base material. Check and adjust for level and alignment of each unit.
- Drain pipe is required for walls over 4 ft. (1.2 m) tall or are constructed in silty or clay soils. See approved plans for location and specifications. See the Installation Guide for AB Fieldstone for details on an alternate drain location.

Step 4: Install Wall Rock and Backfill Materials

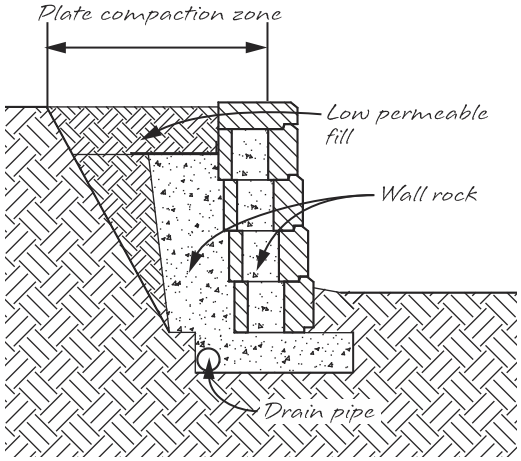
- Fill the hollow cores and a minimum of 12 in. (300 mm) behind the wall with wall rock.
- Use approved soils to backfill behind the wall rock and in front of the base course.
- Use a plate compactor to consolidate the area behind the block. **Compact in lifts of 8 in. (200 mm) or less**.

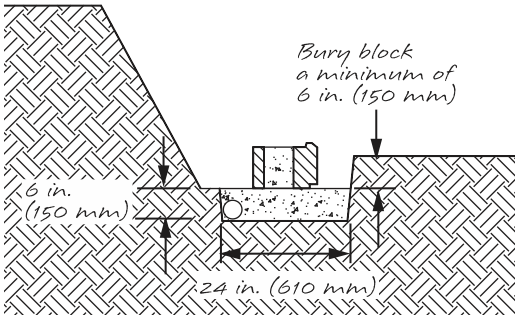
Step 5: Install Additional Courses

- Remove all excess material from the top surface of AB units. This can be done when installing the next course of block, by sliding the block into place.
- Stack the next course of blocks so that the vertical seams are offset from the blocks below by at least 3 in. (75 mm) or 1/4 the length of the block.
- Check and adjust for level, alignment and the wall batter as the wall stacks up.
- Fill the block cores and behind the block with wall rock a minimum of 12 in. (300 mm). Use approved soils to backfill behind the wall rock.
- **From course 2 and above use a plate compactor to <u>compact directly on the blocks</u> as well as the area behind the blocks. Compact in lifts of 8 in. (200 mm) or less.**
- Complete wall to required height. See page 16 for information on wall ending options.
- Use 8 - 12 in. (200 - 300 mm) of low permeable fill on the last lift to finish off wall.

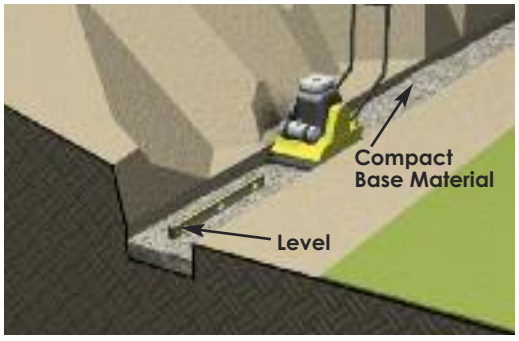
* **For walls under 4 ft. (1.2 m)**, an 18 in. (460 mm) wide by 10 in. (250 mm) deep trench with 4 in. (100 mm) of wall rock base material is acceptable.

Gravity Wall Typical Cross Section

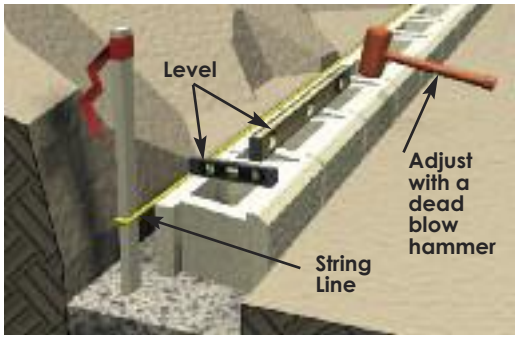




Gravity Wall Base Course Cross Section.



Install base material, level and compact.



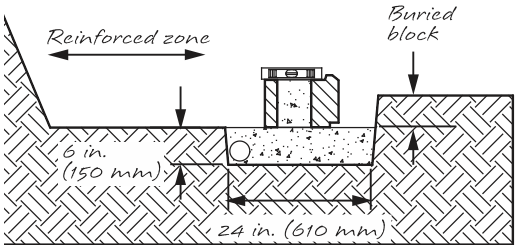
Level blocks, adjust where needed.

Reinforced Wall Construction

Step 1: Site Prep and Excavation

Foundation soils at the bottom of the base trench must be firm and solid. If the soils are made up of heavy clay or wet soils, or the areas have been previously excavated, remove entire material and replace with granular base, compacting in 8 in. (200 mm) lifts or less.

- Remove all surface vegetation and organic soils. This material should not be used as backfill.
- Excavate behind the wall to accommodate the design length of the geogrid. Refer to the approved plans for exact length.
- Excavate base trench at the wall location. Dig the trench, per the approved plans, a minimum of 24 in. (610 mm) wide and 6 in. (150 mm) deep plus the required amount to accommodate the buried block.
- Buried block should be a minimum of 6 in. (150 mm) or 1 in. (25 mm) for each 1 ft. (300 mm) of wall height. See approved plans for exact amount needed.
- Compact and level base trench to 95% of Standard Proctor.

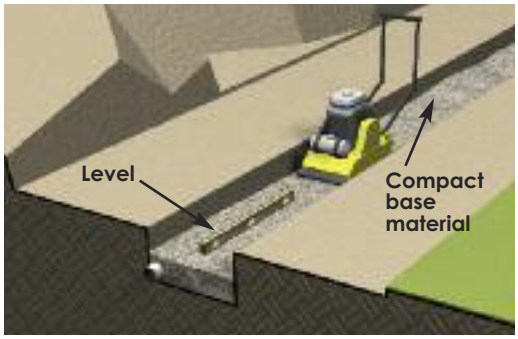


Reinforced Wall Base Course Cross Section.

Step 2: Install Base Material

The base material can be any compactible granular material. Allan Block recommends a well-graded aggregate, with a balanced mix of grain sizes, ranging from 0.25 in. to 1.5 in. (6 mm to 38 mm) diameter.

- Per the approved plans, place drain pipe at the back of the trench the length of the wall. The drain pipe will need to be vented to daylight or to a storm sewer system. See approved plans for location and specifications.
- Per the approved plan, place a minimum of 6 in. (150 mm) of base material in the base trench and rake smooth.
- Compact with a mechanical plate compactor.
- Check the entire length for level, and adjust as needed.



Install and compact base material.

Reinforced Wall Structure

Reinforced Zone

The reinforced zone is located directly behind the block in two sections, the consolidation and the compaction zone. Both zones require compacting in maximum lifts of 8 in. (200 mm), to 95% Standard Proctor. Refer to the specifications in the approved plan for compaction requirements in these zones for each project.

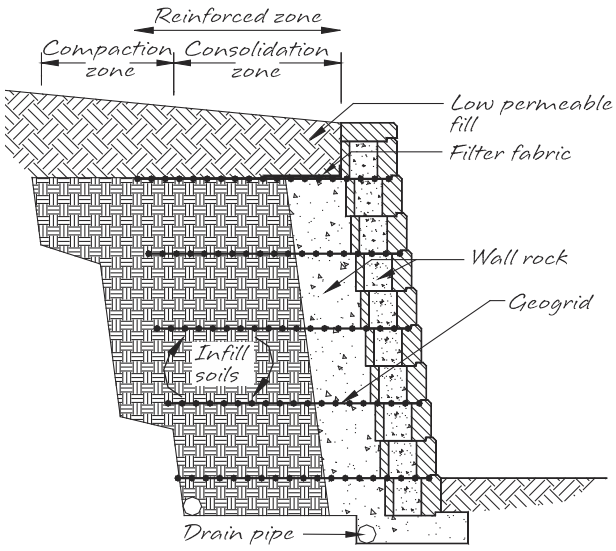
Consolidation Zone

The consolidation zone runs from the back of the block back 3 ft. (0.9 m) into the infill soil. Only mechanical plate compaction equipment shall be allowed within the consolidation zone.

Compaction Zone

The compaction zone runs from the back of the consolidation zone to the cut in the slope. Heavier compaction equipment can be used in this zone provided no sudden braking or sharp turning occurs.

Typical Reinforced Wall Cross Section

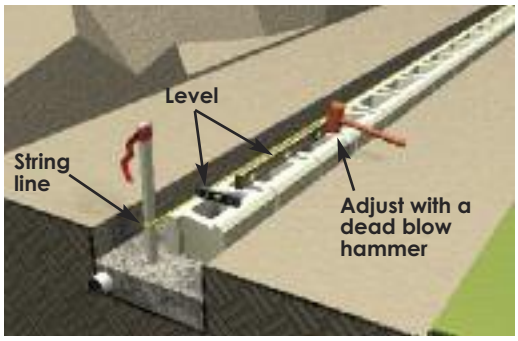


Reinforced Wall Construction

allanblock.in

Step 3: Install Base Course

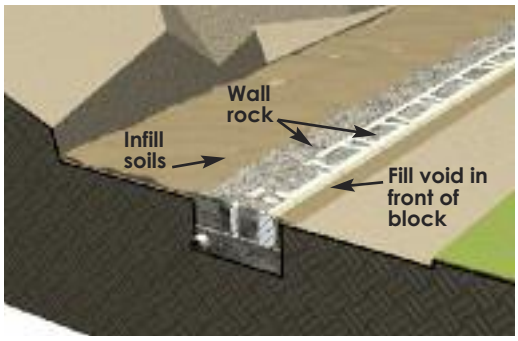
- **Begin at the lowest wall elevation.**
- Place all units top side up with the raised front lip facing up and in the center of the base material.
- Check and adjust for level and alignment of all AB units. Check block for level frequently from side-to-side and front-to-back. Verify the proper position of all AB units by examining a string line across the back of the blocks or by sighting down the back of the raised front lip.
- Make minor adjustments by tapping the AB units with a dead blow hammer or by placing up to 0.5 in. (13 mm) of coarse sand under the units.
- Irregularities in the base course become larger as the wall stacks up. Careful attention to a straight and level base course will ensure a quality finished wall.



Install base course.

Step 4: Install Wall Rock and Backfill Material

- Fill the hollow cores of the base course and 12 in. (300 mm) behind the block with wall rock. A compactible aggregate ranging in size from 0.25 in. to 1.5 in. (6 mm to 38 mm) in diameter, and containing less than 10% fines is recommended.
- Use approved infill soils to backfill behind the wall rock and in front of the base course.

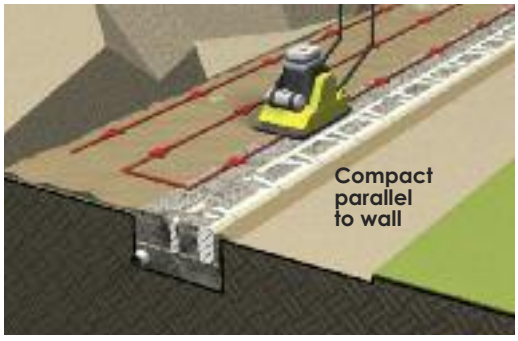


Install wall rock.

Step 5: Compact

Compaction of the material behind the block is critical for a quality wall.

- Use a mechanical plate compactor to consolidate the wall rock, then compact the backfill material immediately behind the block. Compact in a path parallel to the wall, working from the back of the block to the back of the backfill material See the Installation Guide for AB Fieldstone for additional details on compaction.
- Check the base course for level and adjust as necessary.
- All backfill soils must be compacted to a minimum 95% Standard Proctor. Use equipment appropriate for the soil being compacted.
- Remove all excess material from the top surface of all AB units. This prepares a smooth surface for placement of the next course. This can be assisted when installing the next course of block, by sliding the block into place.
- **Every course after the first course requires compaction starting on the block.**

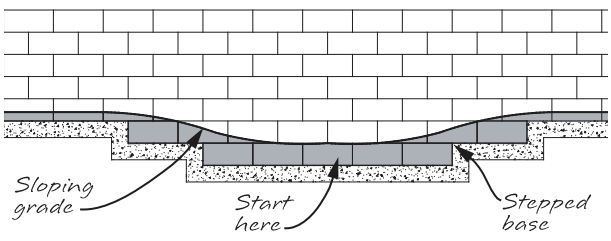


Compact wall rock and backfill soils.

Stepping Up The Wall Base

Walls built on a sloping grade require a stepped base.

- Begin excavation at the **lowest point** and dig a level trench into the slope until it is deep enough to accommodate the base material and one entire block.
- At this point step up the height of one block, and begin a new section of base trench.
- Continue to step up as needed to top of slope.
- **Always bury at least one full unit at each step.**

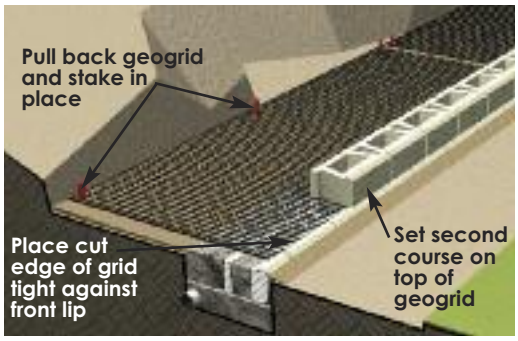


Reinforced Wall Construction

Step 6: Install Geogrid

Refer to the plans for placement of grid; this example starts on the base course.

- Cut sections of geogrid to specified lengths. Check manufacturer's grid specifications for strength, and roll or machine direction. Refer to the approved plans for exact size and location.
- Install the layer of geogrid by placing the cut edge to the back of the raised front lip and roll the layer out to the back of the excavation area. The excavation area must be fully compacted and level.
- Stack the next course of block on top of the geogrid, so that the blocks are offset from the blocks below. Each new course should be positioned so that the vertical seams are offset by at least 3 in. (75 mm) and are tight against the front edge of the units below. Perfect running bond is not required.
- Sight down the wall line to check for a straight wall. Blocks may be adjusted slightly to form straight lines or smooth flowing curves.
- Pull on the back of the grid to remove any slack. Stake in place before installing wall rock and approved infill soils.



Install geogrid, stake in place.

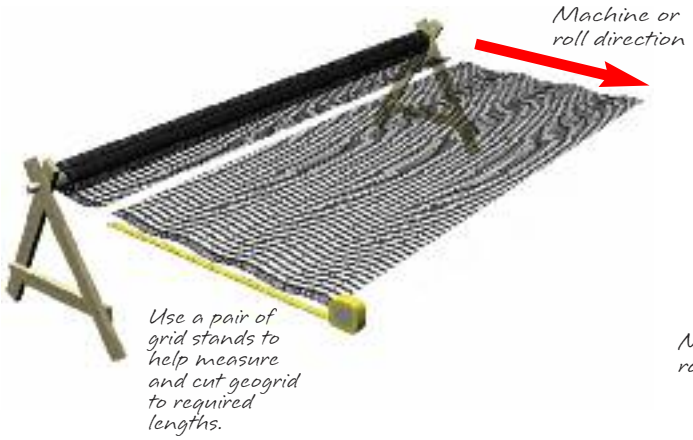
Working With Geogrid

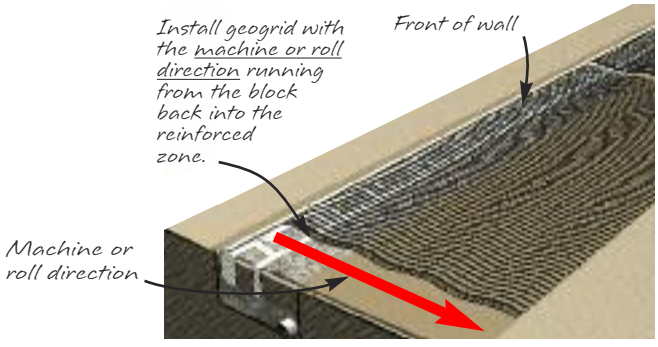
Geogrid typically comes in large rolls up to 13 ft (4 m) wide and 250 ft (76 m) in length. These "grids" also come in a variety of weights and strengths. Taller walls often require heavier strength grids, especially in the bottom portions of the wall.

It is critical that the correct grid is installed in the wall. Check the engineered plans and specifications.

Most grids are strongest along the roll or machine direction. Reinforced grid designs require that all grids are placed with the machine direction running from the face of the wall towards the back of the excavation area.

See page 19-21 for information on using grid with corners and curves.





Reinforced Wall Construction

allanblock.in

Step 7: Backfill and Compact

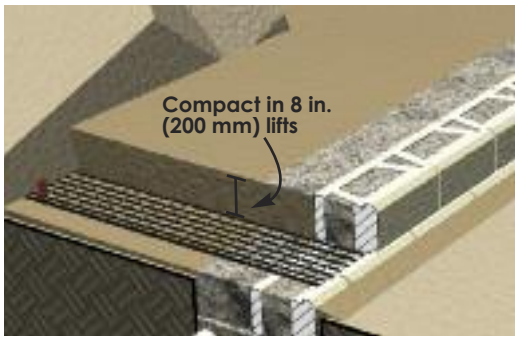
- Install wall rock in block cores and 12 in. (300 mm) behind wall. Use approved infill soils to backfill behind the wall rock in the reinforced zone.
- All wall rock and infill soils within 3 ft. (0.9 m) of the wall must be properly compacted using a mechanical plate compactor. **Compact in maximum 8 inch lifts (200 mm)**, this time **starting on the block** and working in a path that runs parallel to the block towards the back of the reinforced zone. Compact all materials to a minimum 95% Standard Proctor.
- Never operate compaction equipment directly on geogrid.
- **All heavy equipment must be kept at least 3 feet (0.9 m) from the back of the wall.** Wall designs typically do not account for surcharges from heavy compaction equipment. Even a properly installed and compacted wall will rotate forward when extreme surcharges from heavy equipment are applied to the top of the wall during construction and final grading.
- Check and adjust for level, alignment and the wall batter as the wall stacks up. It is acceptable to shim under blocks to compensate for a build up of tolerances or an out of level base condition. Asphalt shingles or geogrid work well when shims are required. The maximum allowable shim thickness per course is 1/8 in. (3 mm).
- Remove all excess wall rock and ridges or slag material from the top surface of all AB units. This prepares a smooth surface for placement of the next course. Plate compactors operated on top of the block will remove most slag material and prep the block for the next course. When installing the next course of block, sliding the block into place will also remove any slag material.

Step 8: Install Additional Courses

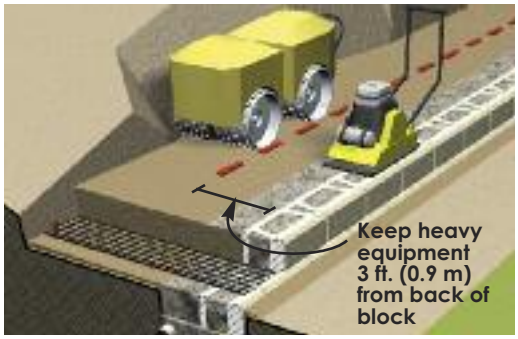
- Repeat steps 6 & 7 to complete wall to height required, installing grid where needed per the approved plans.
- Use 8 in. (200 mm) of impermeable fill on the last lift to finish off wall.
- See page 16 for information on ending and topping off the wall.

For information on Allowable Construction Tolerances see the AB Spec Book.

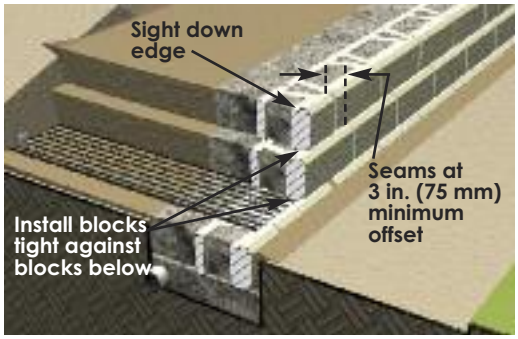
For complete information on proper compaction, no fines concrete for the Allan Block retaining wall products, see the Installation Manual for Allan Block Retaining Walls or allanblock.in.



Compact in 8 in. (200 mm) lifts.



Keep heavy equipment away from the back of the block.



Install additional courses.

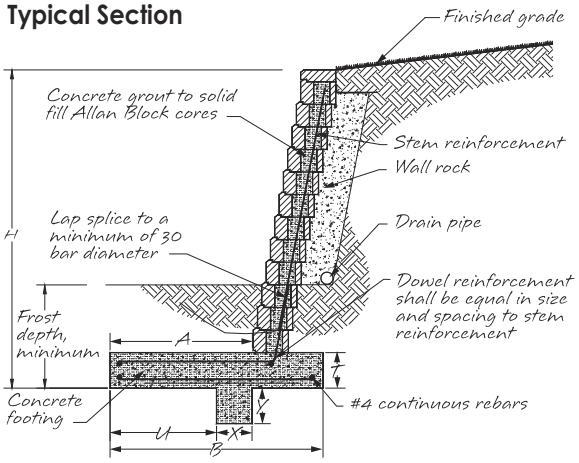
Other Reinforcement Options

Masonry Reinforcement

Allan Block retaining walls can be reinforced with the same proven techniques used for conventional masonry walls. Allan Block masonry walls are useful on sites where geogrids are not feasible or cost effective because they rely on a reinforced footing and vertical pilasters to counteract lateral earth pressures. These walls combine the mortarless stability of an Allan Block wall with the tensile strength of the steel rods in pilasters and the stability of the footing. The design and construction of these walls meet all building code requirements, while factoring in the benefit of an inclined Allan Block wall. The specific design requirements depend on site and soil conditions, and wall heights.

See reference 11

Typical Section



When considering special applications, unusual job sites, or unique reinforcement requirements, contact the Allan Block Corporation for engineering and design support.

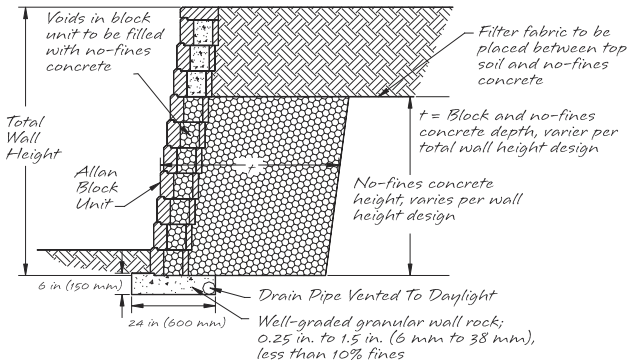
The Allan Block *Engineering Department* provides assistance to engineering and design professionals worldwide. For additional information and case studies call 800-899-5309.

Other System Options

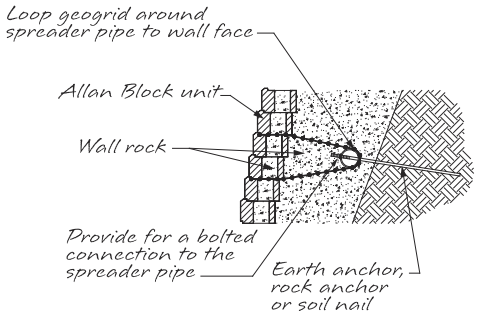
In addition to basic masonry wall systems, Allan Block can accommodate special reinforcement systems such as no-fines concrete, rock bolts, earth anchors and soil nailing.

See the Installation Guide for AB Fieldstone for more information on No-Fines Concrete and installation information.

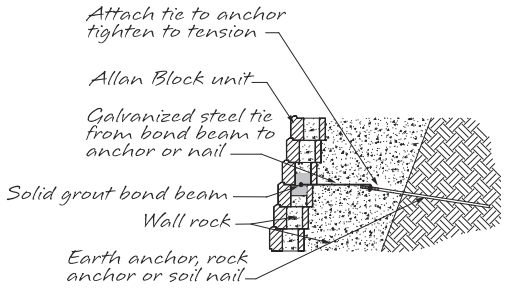
No-Fines Concrete (NFC Backfill)



Earth Anchor



Soil Nailing



Wall Patterns

allanblock.in

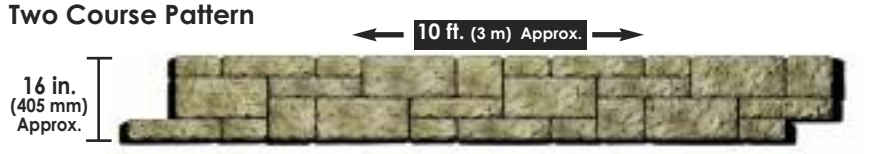
All of the Allan Block Collections can be used to create a variety of pre-set and random patterns. A pre-set pattern is repeated every two or three courses of block. A single course consists of a full size block, approx 8 in. (200 mm) tall. Random patterns used on a reinforced wall require a level surface every 2 or 3 courses for proper installation of geogrid. See the approved plans for which layers the geogrid reinforcement will be required.

Note:

- Patterned walls will have a 6° setback.
- Walls with curves should always use the 2 course pattern to minimize cutting and fitting.
- The base course needs to be a full course of full size blocks. For each 10 ft. (3 m) length you will need 7 blocks.

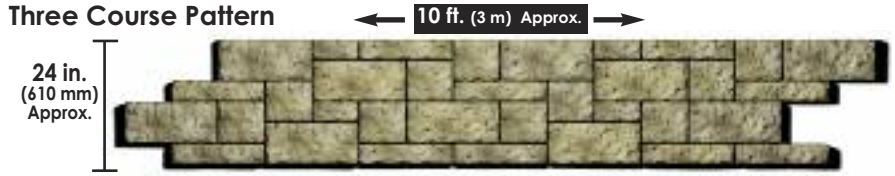
Standard Patterns - Uses all blocks in the collections

Two Course Pattern



AB Collection Blocks Required
6 AB Classic
4 AB Jumbo Junior
8 AB Lite Stone
8 AB Junior Lite*

Three Course Pattern

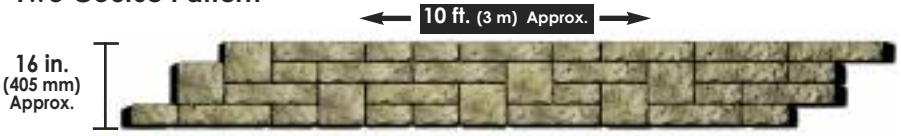


AB Collection Blocks Required
10 AB Classic
10 AB Jumbo Junior
10 AB Lite Stone
4 AB Junior Lite*

*** Note:** In the AB Collection, if the AB Junior Lite is not available an AB Lite Stone will need to cut in half. See page 15 for more information.

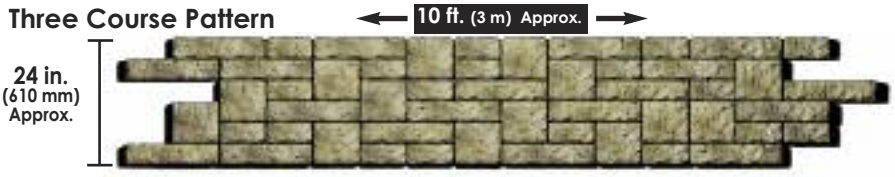
Lite Patterns - Uses only the smaller blocks in the collections

Two Course Pattern



AB Collection Blocks Required
7 AB Jumbo Junior
15 AB Lite Stone
12 AB Junior Lite*

Three Course Pattern



AB Collection Blocks Required
14 AB Jumbo Junior
19 AB Lite Stone
18 AB Junior Lite*

Note: Maximum recommended wall height for Lite Patterns is 6 ft. (1.8 m).

For more information see the Allan Block Patterns document available at allanblock.in

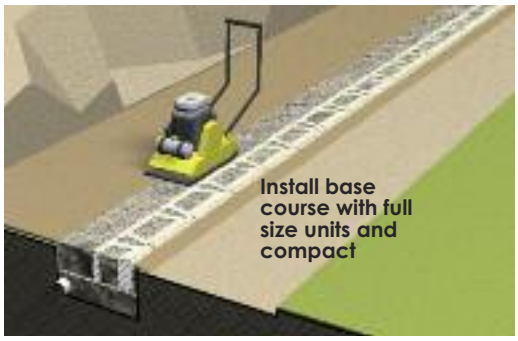
Patterned Wall Construction

Step 1: Excavate and Install Base Course

Refer to page 5 for a detailed description on how to install the base course.

Basic steps include: 1) Site prep and excavation, 2) Install base material, 3) Install base course 4) Install wall rock and backfill materials, geogrid if necessary, and 5) Compact.

Note: Full-sized blocks should always be used for the base course. This will speed the leveling and installation of the first course.

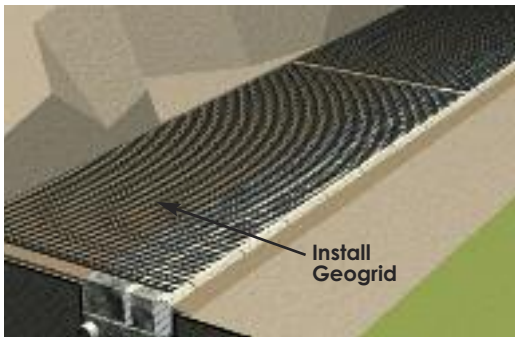


Install base course and compact.

Step 2: Install Geogrid

Refer to the plans for placement of grid; this example requires grid on top of the base course.

- Remove all excess material and slag from the top surface of the base course. This prepares a smooth surface for placement of the geogrid and the next course of blocks.
- Cut sections of geogrid to specified lengths. Check manufacturer's grid specifications for strength and roll or machine direction. Refer to the approved plans for exact size and location.
- Install the layer of geogrid by placing the cut edge up to the back of the raised front lip and roll the layer out to the back of the excavation area to the length specified in the approved plans.

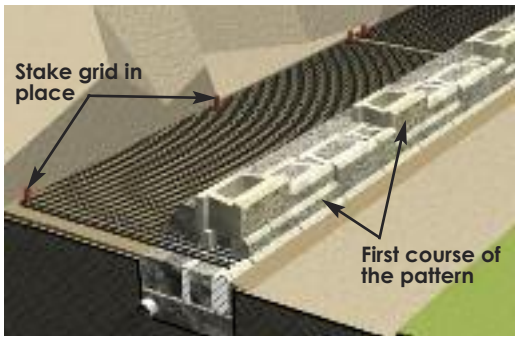


Install geogrid.

Step 3: Install the Multiple-Course Pattern

The example shown here uses a 2 course pattern. Check the approved plans to determine the best pattern option for the project. See page 11 for more information on patterns.

- Stack the first course of the pattern on top of the geogrid and the base course.
- Check blocks for level, and make adjustments as needed. Pull on the back of the geogrid to remove any slack. Stake geogrid in place.
- Install wall rock in the block cores and 12 in. (300 mm) behind the blocks. Compact using a shovel handle inside the cores. Check blocks for level. See below for more information on compaction in the block cores.



Stack first course of pattern and backfill wall rock in block cores.

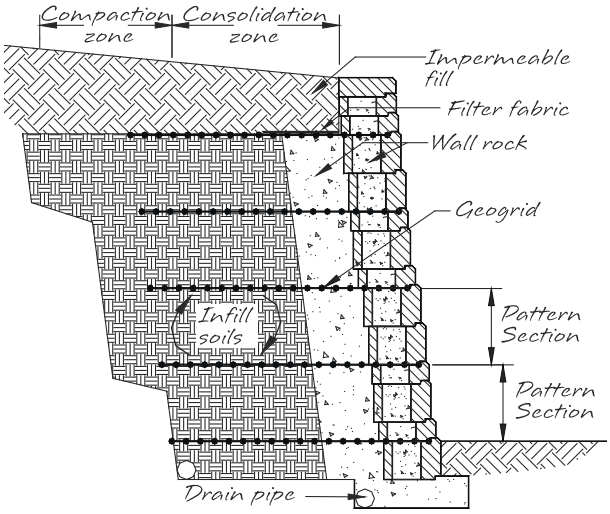
Compaction on Patterned Walls

Compaction in the block cores needs to be done regularly when working with patterned walls. This can be done by using the end of a shovel to compact the wall rock, adding additional rock if necessary.

At each 8 in. (200 mm) lift, compact the block cores with the end of a shovel, and the area directly behind the block with a plate compactor per the procedures described in this manual.

At the conclusion of each pattern, the top of the wall will be level. Run the plate compactor over the top of the blocks to consolidate the wall rock. Place grid if required, and begin the next pattern.

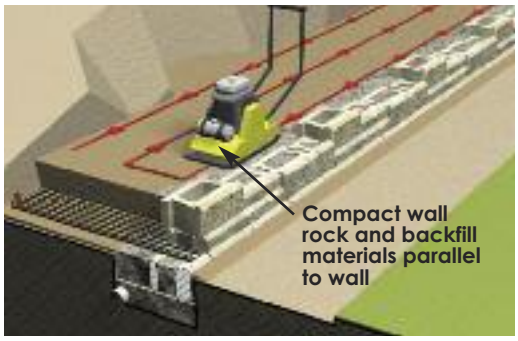
Typical Reinforced Patterned Wall



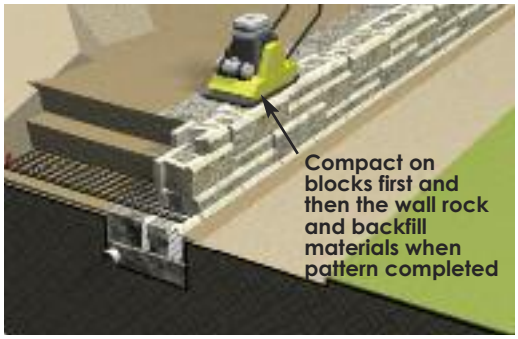
Patterned Wall Construction

allanblock.in

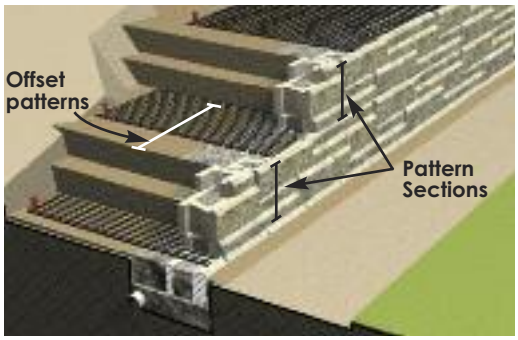
- Use approved infill soils to backfill behind the wall rock in the reinforced zone. **The height of the wall rock and backfill material cannot exceed 8 in. (200 mm) before compacting.** The top of the blocks will not always match up with each lift of soil.
- Using a mechanical plate compactor, compact the wall rock and infill materials behind the wall in **maximum 8 in. (200 mm) lifts**. Compact immediately behind the wall in a path parallel to the wall, working from the back of the wall to the back of the excavated area. Compact to a minimum of 95% Standard Proctor.
- Check blocks for level. and then install the remainder of the 2 course pattern. Install wall rock in the block cores and behind the blocks as before. Use approved infill soils to backfill behind wall rock. Check blocks for level and for batter.
- With the first multiple-course pattern completed, use a plate compactor to compact the wall rock in the block cores and the wall rock behind the blocks. The first pass of the plate compactor should be directly over the top of the block cores.
- After running the plate compactor on top of the blocks and wall rock, compact the infill material immediately behind the wall. Compact in a path parallel to the wall, working from the front of the wall to the back of the infill material. Compact to a minimum of 95% Standard Proctor.
- Check and adjust for level and alignment and wall batter as the wall stacks up. It is acceptable to shim under blocks to compensate for a build up of tolerances or an out of level base condition. Asphalt shingles or geogrid work well when shims are required. The maximum allowable shim thickness per course is 1/8 in. (3 mm).



Compact behind the wall.



Complete pattern and compact.



Install geogrid and additional patterns.

Step 4: Install The Second Multiple-Course Pattern

Refer to the approved plans to determine if geogrid reinforcement will be required on the next course of the pattern being used.

- Repeat Step 2 to install geogrid between the patterns when required per the approved plans.
- Repeat Step 3 for each pattern being installed. Each additional pattern will need to be offset from the pattern below to avoid a repetitive look.

Note: Keep all heavy equipment at least 3 feet (0.9 m) away from the back of the wall.

Step 5: Ending and Topping off Wall

Completing a patterned wall is the same as for a standard wall. See page 16 for finishing details. The only requirement is that a multiple course pattern must be completed so that the top course of the blocks form a level surface.

- Use 8 in. (200 mm) of impermeable fill on the last lift to finish off wall.

Patterned Wall Construction Tips

Reinforced Wall Construction

- For walls that require geogrid reinforcement, selection of which pattern to use is determined by the grid spacing shown on the approved plans. If grid is required every 2 courses, then use a 2 course pattern; if 3 course grid spacing is required, use a 3 course pattern.
- If building with a random pattern, the pattern must be leveled off at the appropriate courses to allow for the installation of geogrid on a flat surface.

Ending Patterned Walls

Ending Patterned Walls - Step Downs

Patterned walls may be ended with step ups or turn-ins. When ending a patterned wall, discontinue the pattern and randomly adjust as necessary to meet the site conditions. See page 16 for more information on ending walls.

Curves

When building curves, the 2 course pattern is easier to work with than the 3 course pattern. The 3 course pattern will require more custom fitting or cutting of blocks to ensure a tight fit.

Inside curved walls are easily constructed by maintaining a tight spacing at the front of the wall face. For tighter radii, it may be necessary to cut out parts of the bottom notch in order for the blocks to fit tightly together. See page 17.

Outside curved walls The wall will "tighten" as the height increases. There are three methods to adjust for the tightening effect:

- On the first course of the pattern, open the spacing between blocks slightly so that the top course(s) of the pattern will need minimal cutting.
- Reduce the lengths of the blocks by shortening them, using a saw with a diamond blade.
- Remove parts of the bottom notch for the blocks to fit tightly together. See page 17.

The best answer is to always use the 2 course pattern when building curves.

Dash of Ashlar

The AB Collections have been created in modular sizes to allow for easy construction of patterned walls. Selected areas of non-patterned walls can also contain patterns. With the modular design, the blocks can be installed with ease.

Patterned Wall Construction Tips

allanblock.in

Corners

Outside corners are easily built using AB Corner Blocks.

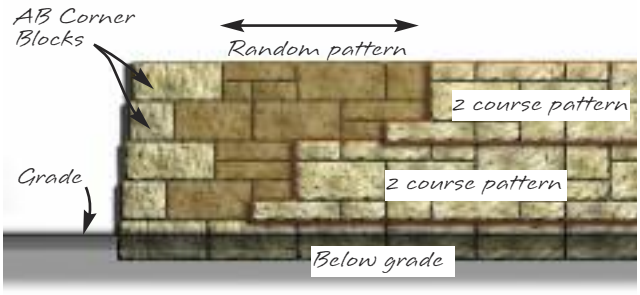
- Start at the corner and build the wall working out in both directions.
- When ending a patterned wall with a corner, use a random selection of blocks to transition from the patterned courses into the AB Corner Blocks.

Note: Always start the base course at the lowest elevation, then beginning additional courses at the corner will minimize cutting.

Inside corners are constructed in the same manner as for non-patterned walls.

- Remove the top lip of the course where the walls intersect. See page 20.

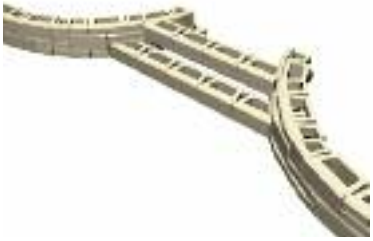
Patterned Walls With Corners



Stairs

When building steps into patterned walls, use the full-sized AB Blocks for step blocks. See page 22 for stair construction details.

Patterned Walls With Stairs



Step-Ups

When building a wall always start the base course at the lowest elevation. See page 7 for more information on construction.

Additional Construction Tips

- If an AB Junior Lite is needed and not available, an AB Lite Stones will need to be cut to produce 2 half lite blocks. Pre-cut the desired number of blocks to speed installation.
- Offset each new pattern from the pattern below to maintain the "random" appearance.
- With walls that have numerous inside and outside curves, use a 2 course pattern to ease the installation process.

Cutting A Block In Half

Construction Details - Finishing Walls

Ending and Topping Off Walls

Allan Block offers a great variety of finishing options for the wall.

Mulches: Allan Block's patented raised front lip provides a built-in edging for landscape rock, mulch, grass or soil.

AB Capstones: AB Capstones can be used to finish off the top of a wall. Use a high grade, waterproof flexible masonry adhesive to secure AB Capstones in place.

See allanblock.in for information on cutting AB Capstones for curves or corners.

Mulch or Soil

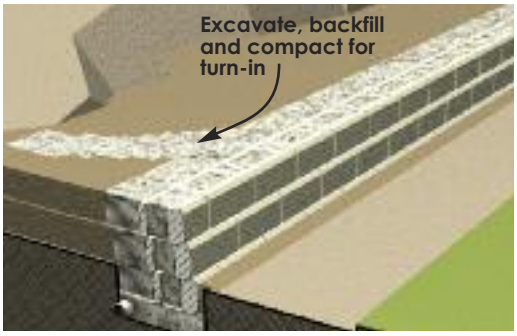
AB Capstones

AB Capstones with step ups

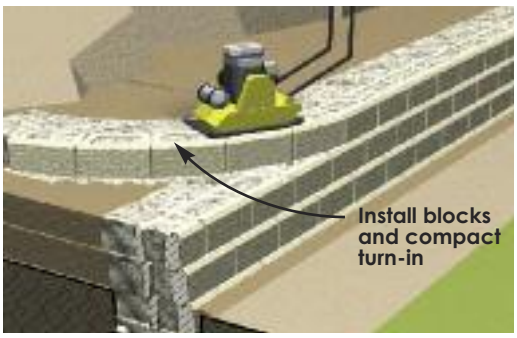
Building Step Downs

Walls with step downs can be easily finished by adding a AB Lite Stone, or turning the ends back into the hillside. For tips with patterned wall Step Downs, see page 15.

Our recommendation for a gradual step-down is using the AB Lite Stone.



Building Turn-Ins



Building Turn-Ins

For a graceful, flowing end to the wall, curve the wall to create a plantable area that can soften the look of the wall.

When building a turn-in, a base trench will need to be excavated, backfilled and compacted, the same as the base course of blocks.

Proper backfilling and compaction is important, where the wall turns back into the slope. To ensure the turn-in area doesn't settle differently than the rest of the wall, make sure the entire area below the new base is compacted thoroughly.

Flowing turn-in of wall

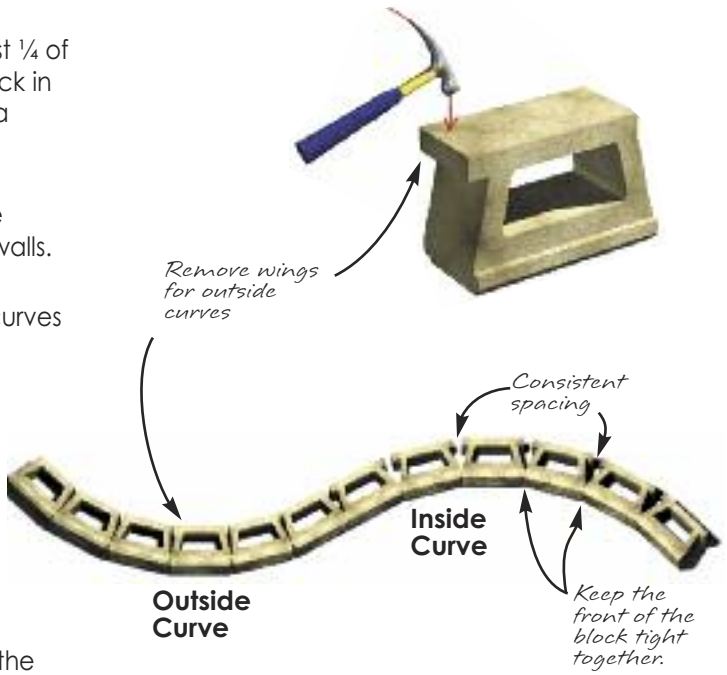
For a natural flow into the landscape, curve the wall back into the hillside.

Construction Details - Curves

allanblock.in

Building curved and serpentine walls is simple. AB's patented design allows for easy installation of both inside and outside curves. **Most curves can be built with no cutting involved.**

- Try to maintain an offset of the vertical seams by at least ¼ of the block length from the courses below. Cutting a block in half or using the half width blocks, will assist in creating a proper offset.
- Before beginning construction, review the plans and layout the wall to eliminate tight radii. More gentle sweeping curves produce more aesthetically pleasing walls. See page 18 for the radius chart.
- Use blocks with lower setbacks or half width blocks on curves for smoother transitions.



Inside Curves

- To build a flowing inside curve, butt the block end to end to match the smooth curve required on the project. Try to keep spacing consistent between the backs of the blocks.

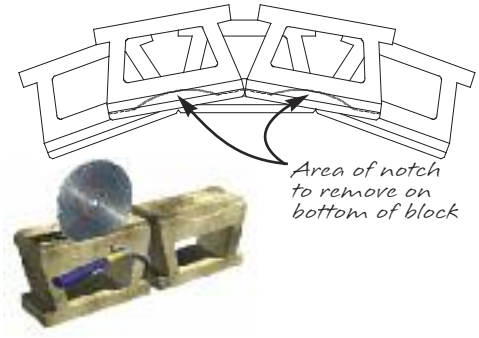
Outside Curves

- To build smooth outside curves, remove one or both of the "wings" from the back of the blocks and tighten the radius of the curve. Break wings off by tapping on the back of the wing to obtain a clean break.

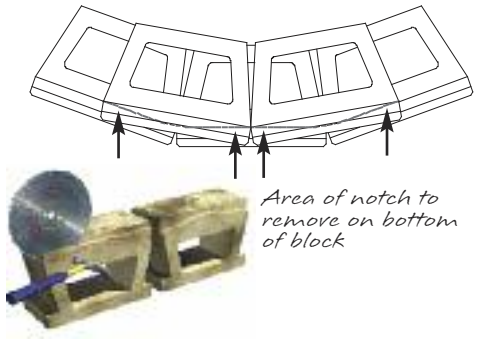
Tighter Curves

- Using full size blocks in tight curves will create a gap between the courses. For cleaner lines, it may be necessary to remove parts of the bottom notch to fit the blocks closer together.

Cutting The Bottom Notch For Tighter Inside Curves



Cutting The Bottom Notch For Tighter Outside Curves



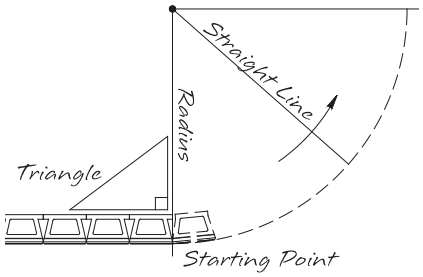
Construction Details - Curves

Working with Radii

- Refer to Table 6.1 to confirm that the AB product you are using will accommodate the desired wall radius.
- The tightest or smallest radius at the top of any AB wall using full size block is 4 ft. (1.2 m), and 2.5 ft. (0.8 m) using the half width blocks. The final height of the wall will determine what the minimum radius at the base course must be. The wall creates a coning effect as it is stacked up, creating the need for a larger radius at the base course. Use the **Radius Chart** to determine what the radius of the base course of the wall needs to be, so the top course of the wall will not be less than 4 ft. (1.2 m).

Starting a Radius

From the point of where the curve will start, measure straight back from the wall the required amount (shown in the Radius Chart) and drive a stake into the ground. This will be the center of the curve. Attach a string line to the stake the length of the radius and rotate it around to mark the location of the base course. Install the blocks with the front of the blocks lining up with the mark.



- To transition the curve back into a straight wall or another curve, lay out the curve and the first couple blocks of the next section. Adjusting 1 or 2 of the blocks will help in the transition of the next section of wall.

Base Course Radius for an outside curve on a 4 ft tall 6° wall

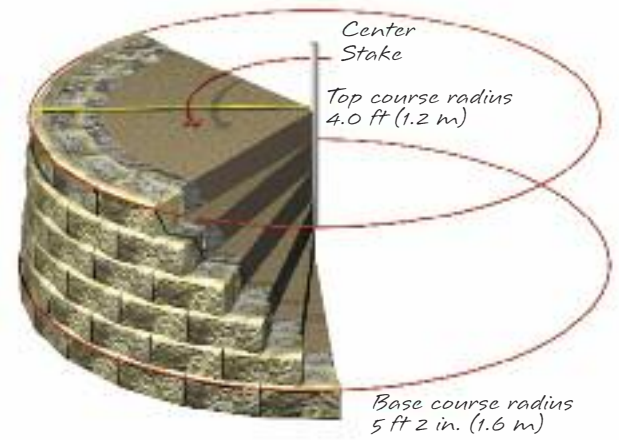


Table 1.5

AB Radius Chart for the Base Course

Setback	Wall Height			
AB Collection Full Size Blocks	4 ft 1.2 m	6 ft 1.8 m	8 ft 2.4 m	10 ft 3.0 m
6° (Ref)	5 ft. 2 in. 1.6 m	5 ft. 6 in. 1.7 m	5 ft. 11 in. 1.8 m	6 ft. 4 in. 1.9 m
AB Collection Half Size Blocks	2 ft 0.6 m	4 ft 1.2 m	6 ft 1.8 m	
6° (Ref)	3.0 ft 0.9 m	3 ft. 5 in. 1.0 m	3 ft. 10 in. 1.15 m	

Use this chart to find the minimum recommended radius at base of wall. Note all lengths, dimensions and setbacks are approximate.

For a smooth curve with less cutting, use our half width blocks to help build the curve.

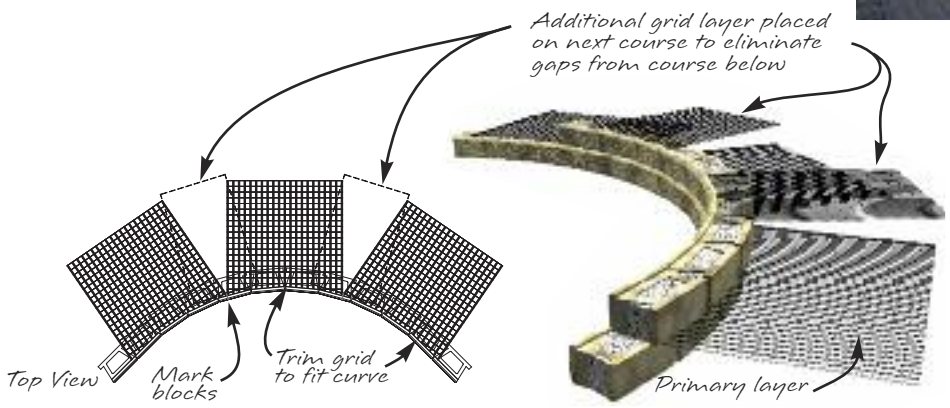
Construction Details - Curves with Geogrid

allanblock.in

Inside Curves

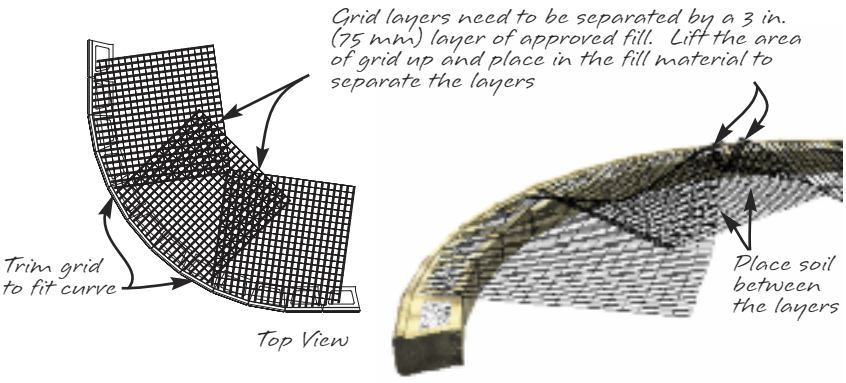
Geogrid needs to have 100% coverage around an inside curve. To achieve this, additional layers need to be installed either above or below the course where the grid is required to fill voids that are created.

- Cut geogrid to required lengths per the approved plan.
- Lay out the primary geogrid around the curve butting front edges together. Make sure strength direction runs perpendicular to wall face. Mark the blocks or take note of the areas where there are voids in the grid placement.
- Place the filler piece of grid on the next course (or the course below) to cover the void left on the primary layer.



Outside Curves

- Cut geogrid to required lengths per the approved plans.
- Lay out the geogrid around the curve.
- Lift the section of grid that overlaps and place the fill material to separate. Grid layers need to be separated by a 3 in. (75 mm) layer of approved fill material.
- Never compact directly on the geogrid.

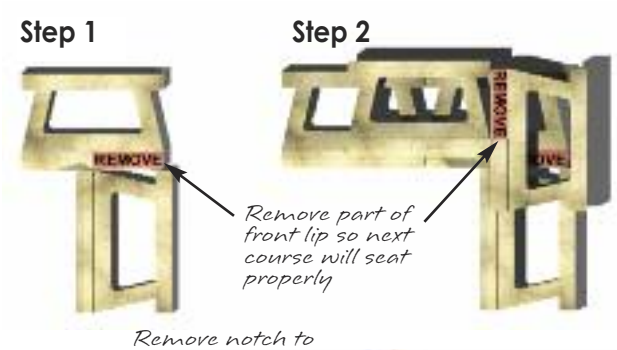


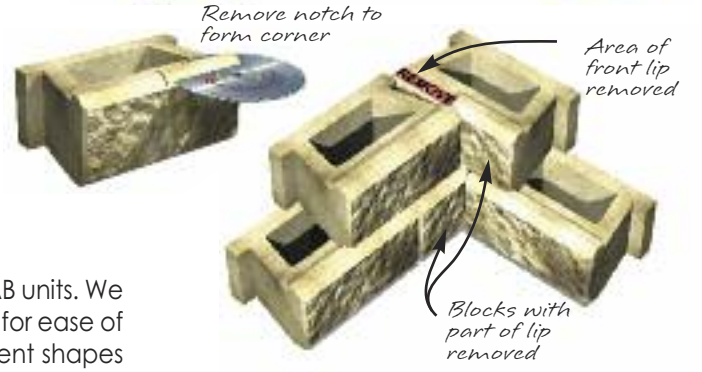
Construction Details - Corners

Inside Corners

AB Blocks are easily modified to build inside corners. To construct an inside corner, you will remove part of the raised lip on one block on each course.

- Use a saw with a diamond blade or a chisel to remove half of the raised front lip. This allows the next course to be installed on a level surface (Step 1).
- Lay the modified block perpendicular to another AB unit. This creates the corner (Step 1).
- On the next course, remove *the opposite half* of the lip of an AB unit and position it over the right angle corner (Step 2).
- On each successive course, simply reverse the position of the modified block to obtain an interlocked corner.

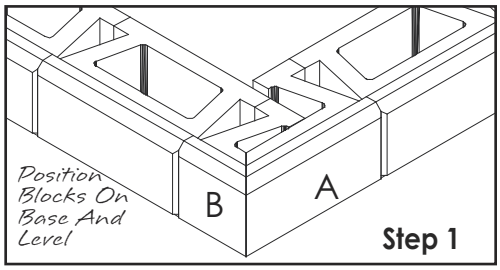


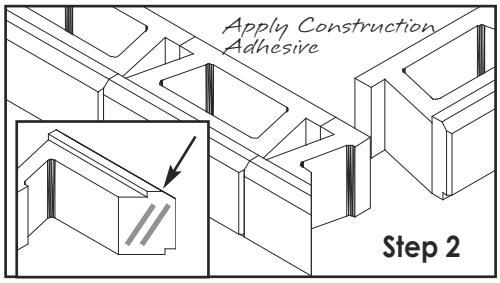


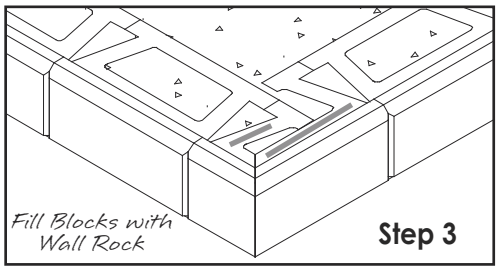
Outside Corners

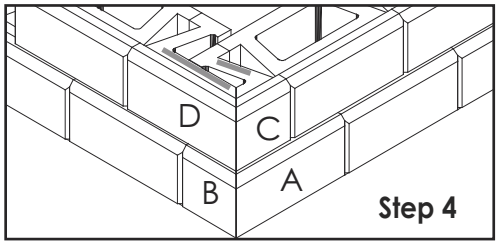
Outside corners can be easily constructed by cutting standard AB units. We recommend using curves in place of corners whenever possible for ease of installation. Building corners requires cutting blocks into 4 different shapes and alternating the position of these blocks from course to course. Additional corner construction information can be found at allanblock.in.

- Use a saw with a diamond blade to cut AB units as shown below. NOTE: Cutting three AB blocks will provide two complete corners.
- Position two of the cut blocks on the compacted base material and level the blocks from side to side and front to back. (Step 1)
- Remove 1 side of corner and apply 0.25 in. (6 mm) bead of construction adhesive on the mitered edge. Place the unit back on the base material to form a tight and square corner. (Step 2)
- Once adhesive has cured, carefully place wall rock in block cores and 12 in. (300 mm) behind blocks to lock them in position. Sweep the top of the AB blocks clean and apply 0.25 in. (6 mm) bead of construction adhesive along top surface of corner pieces. (Step 3)
- Position the cut blocks on 2nd course, offsetting the joints between blocks. Place a bead of construction adhesive on the mitered edge. (Step 4)
- Carefully place wall rock in block cores and 12 in. (300 mm) behind blocks to lock them in position.
- Sweep the top of the AB blocks clean and apply 0.25 in. (6 mm) bead of construction adhesive along top surface of the corner pieces.
- For gravity walls, place a 2 ft x 2 ft (0.6 m x 0.6 m) layer of geogrid on top of 2nd course blocks. Repeat this procedure on every other layer of block. For reinforced walls, follow approved plans for geogrid placement.

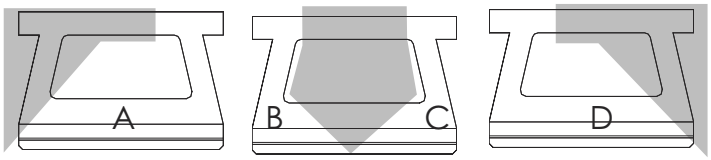








3 AB Blocks Will Yield 2 Complete Corners



Construction Details - Corners with Geogrid

allanblock.in

Installing Geogrid on Inside 90° Corners

On inside corners additional geogrid is required to extend past the end of the wall, 25% of the completed wall height (H/4).

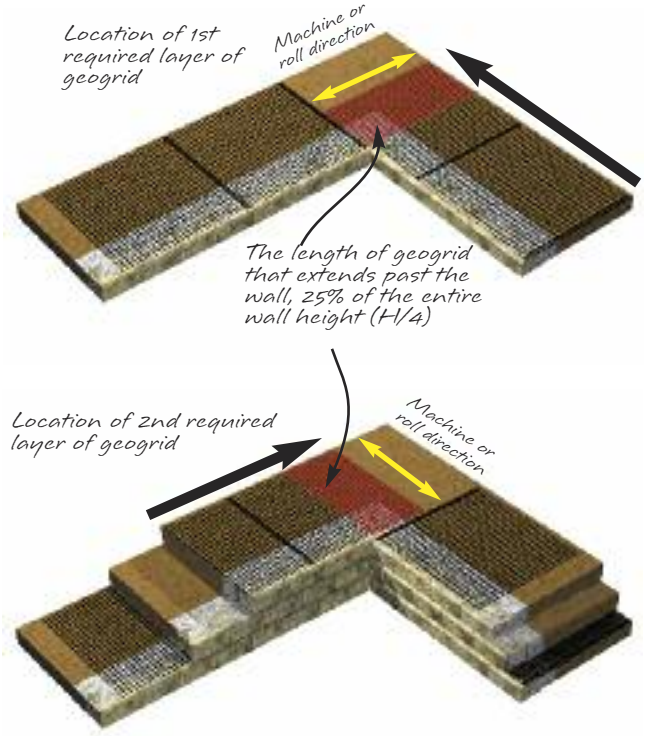
- Cut geogrid to required lengths per the approved plan. As a general rule the length of the geogrid needs to extend a minimum of 25% of the wall height past the end of the inside corner.
- Install the layer of geogrid with the geogrid extending past the inside corner.
- Alternate the next layer of geogrid to extend the past the inside corner in the opposite direction.

EXAMPLE:

Finished wall height is 12 ft. (3.7 m), divide by 4 which equals 3 ft. (0.9 m).

The length the grid will need to extend past the corner is 3 ft. (0.9 m).

Geogrid with Inside 90° Corners

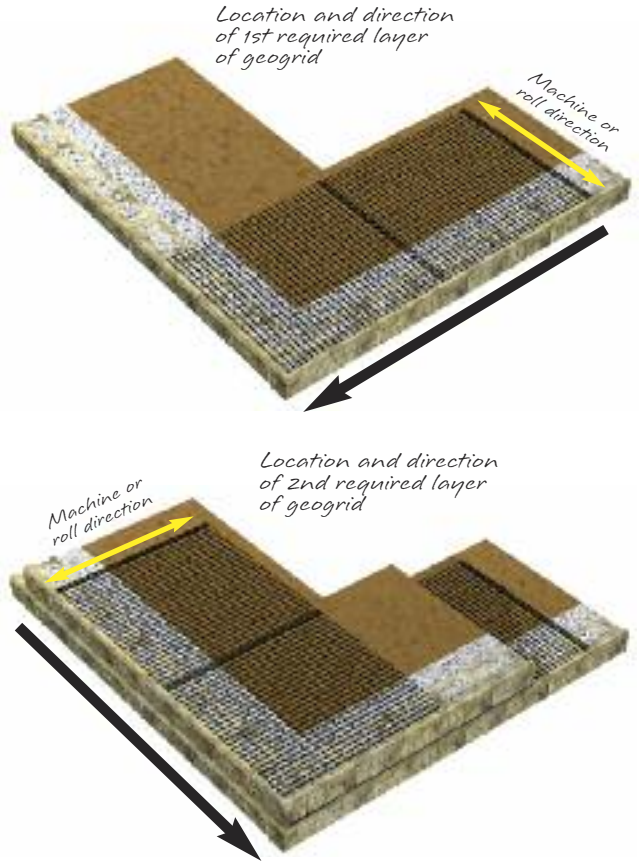


Installing Geogrid on Outside 90° Corners

Geogrid must always be installed with its strong direction perpendicular to the face of the wall. To accomplish this with 90° outside corners:

- Cut geogrid to required lengths per the approved plans.
- Install geogrid to the outside corner with the roll direction running back into the excavated site.
- On the next course of block, lay the next layer of grid perpendicular to the previous layer.

Geogrid with Outside 90° Corners



Construction Details - Stairs

Basic Stair Construction

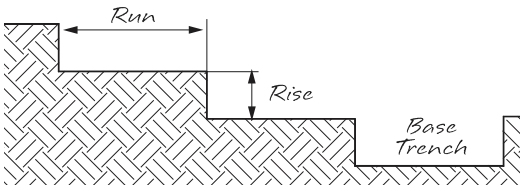
Always check local code requirements before building any type of stair application. The steps below are general guidelines for building stairways. By understanding the basic installation elements, stairways can be easily incorporated into the wall installation.

- Before excavation can begin, the rise and run of the stair treads must be determined and code requirements must be met. With that information, the entire base trench can then be excavated. Some examples of different stair tread options are illustrated below.

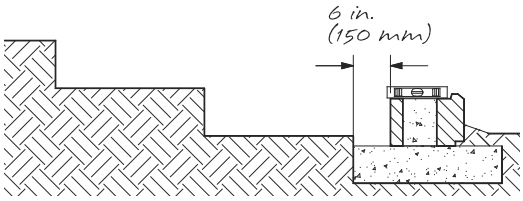
Our example here uses a base trench of 6 in. (150 mm) and a stair tread of AB Capstones and pavers.

- Excavate to the necessary depth and width for each stair riser and **thoroughly compact the entire area** to 95% Standard Proctor with a mechanical plate compactor.
- Check for level.
- Starting at the first step, fill the base trench with 6 in. (150 mm) of wall rock. Rake smooth.
- Compact and check for level. **Stairs need extra compaction to avoid any settling later.** Better compaction is achieved by backfilling and compacting in 4 in. lifts (100 mm) or less when able.
- Install blocks on the base material. Allow for a space of at least 6 in. (150 mm) behind the blocks for wall rock.
- Adjust for level and alignment of each block as it's installed.
- Install wall rock in the block cores, fill any space in front of and behind the block. When backfilling behind the blocks, fill the entire area that was earlier excavated to create the base for the next stair riser. This should produce a level base for the next set of risers. We recommend backfilling and compacting behind the block in 4 in. lifts (100 mm) to achieve better compaction when able.
- Rake wall rock smooth and compact with the first pass of the compactor directly on the tops of the block and then working in a path that runs parallel to the block. Compact to 95% Standard Proctor.
- Repeat this process for each additional course of steps needed.

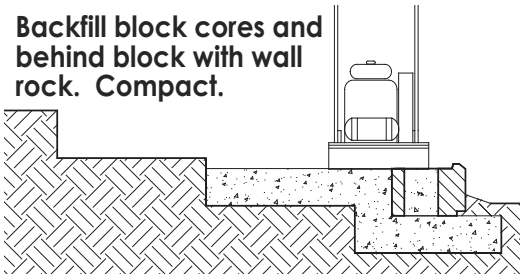
Excavate for stairs and compact.



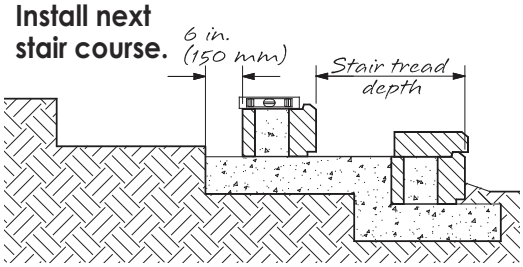
Install and level blocks on base material.



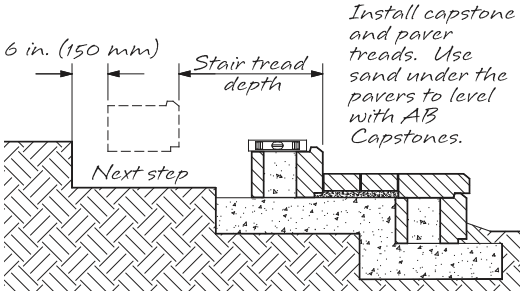
Backfill block cores and behind block with wall rock. Compact.



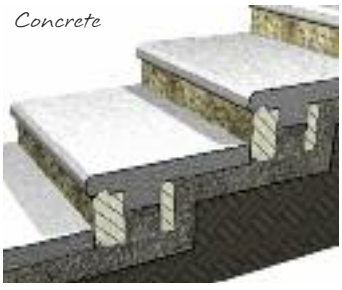
Install next stair course.



Continue for each new stair.



Stair Tread Options

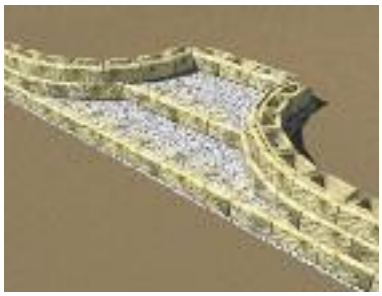


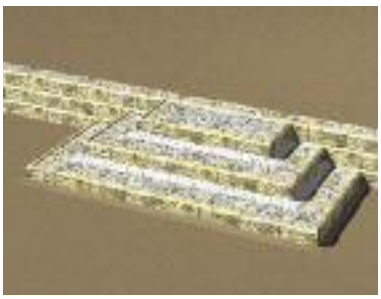
Stairs can be designed with flowing curves or straight lines. Curved sidewalls create a softer, natural look. Straight sidewalls and corners offer a crisp, traditional style; however they require AB Corner Blocks and take more time to build.

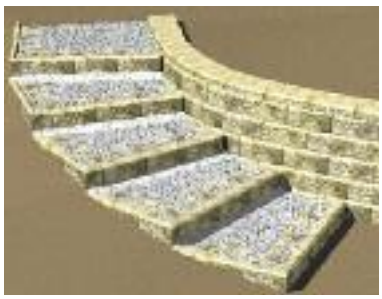
Allan Block's patented front lip provides a built-in edging that works well when installing the stair tread material. Allan Block Capstones, pavers, poured concrete, crushed rock, mulches and flagstone are good stair tread examples. Ensure that stair treads are secured in place for safe use.

Additional stair designs and technical information explaining the construction process is available on our website at allanblock.in or from your local Allan Block representative.

Remember to always check with the local codes before construction.

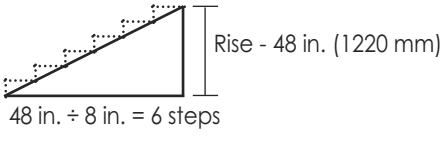






How Many Steps?

To find the number of steps needed, measure the total rise of your slope in inches (mm) and divide by 8 in. (200 mm) which is the height of a step.



Construction Details

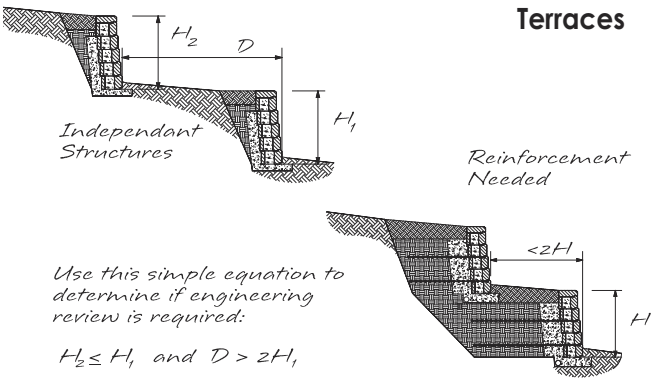
Terraces

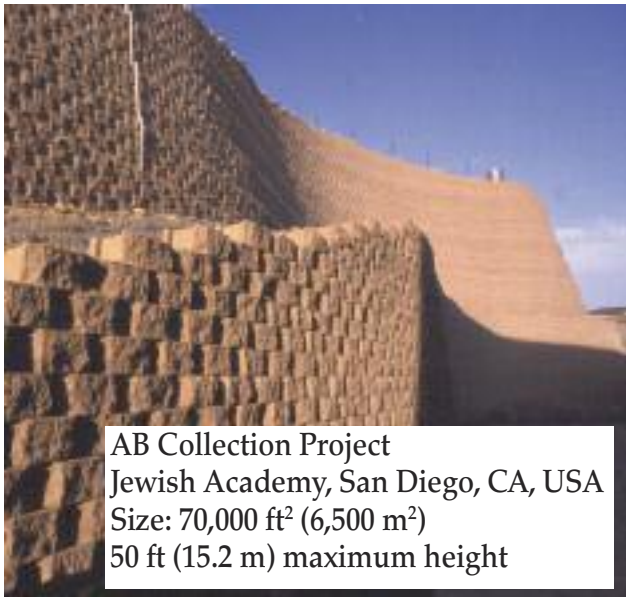
It is often more aesthetically pleasing to replace one large retaining wall with two or more smaller terraced walls. Terraced walls can act as surcharges and may create global instability, therefore reinforcement may be necessary. Always check with a local qualified engineer when building terraces.

Walls perform **independently** and may not need engineering when the distance between gravity walls is at least two times the height of the lower wall, and the height of the upper wall is equal to or less than the height of the lower wall. Use the Gravity Wall Chart on page 4 to determine if geogrid is required or check with a local wall engineer.

Walls that must be **evaluated by an engineer** are any walls needing geogrid reinforcement, walls closer than two times the height of the lower wall, walls with more than two terraces, and terraced walls with any structures above.

Terraced walls that do not perform independently must also be evaluated for global stability, and the lower walls must be designed to resist the load of the upper walls.





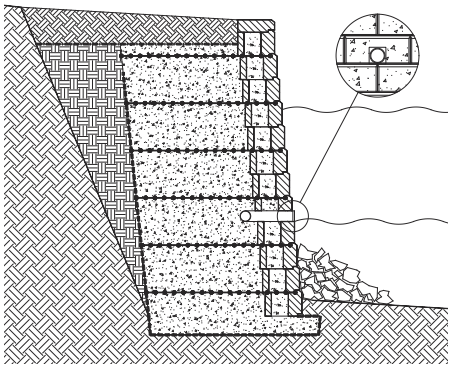
AB Collection Project
Jewish Academy, San Diego, CA, USA
Size: 70,000 ft² (6,500 m²)
50 ft (15.2 m) maximum height

Water Applications

Retaining walls constructed in conditions where there is moving water (streams), standing water with wave action (lakes), or retention ponds are considered water applications.

Water applications must be evaluated and designed to fit the unique characteristics of the site. Consult with a local qualified engineer for design assistance.

Water Application



Fences/Guide-Rails

There are several options for installing fences and guide rails on top of an Allan Block wall. The structure and wind loads of the materials used will determine the placement of the fence relative to the AB wall and if additional reinforcement is required. Refer to the approved plans for construction details.

Lighting

Allan Block's hollow core design makes it easy to install lighting. Cut a hole in the location where the light will be to accommodate the wiring and attachment of the light to wall face. Carefully follow the manufacturer's instructions for lighting and electrical installation, as various fixtures may be assembled differently. Always check local building codes for electrical installation requirements.

For more information on the Allan Block design details, specifIcations geogrid design tables and more, see the Installation Manual for Allan Block Retaining Walls or allanblock.in.

The information and product applications illustrated in this manual have been carefully compiled by the Allan Block Corporation and, to the best of our knowledge, accurately represent Allan Block product use. Final determination of the suitability of any information or material for the use contemplated and its manner of use is the sole responsibility of the user. Structural design analysis shall be performed by a qualified engineer.

This document is an excerpt. For complete information for the AB Collection of retaining wall products, see the Installation Guide for AB Fieldstone or allanblock.in.

ALLAN BLOCK

allanblock.in