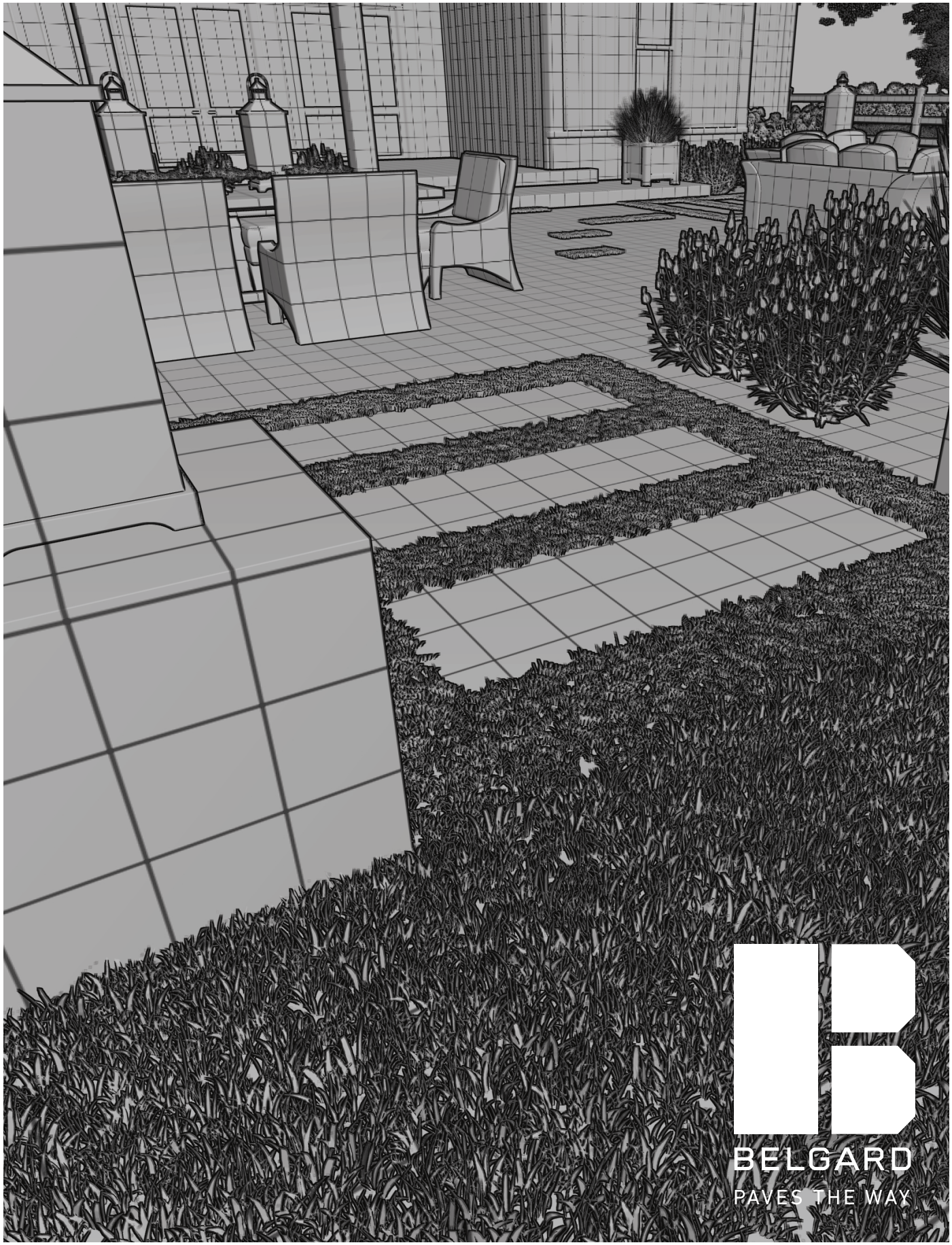


RESOURCE GUIDE | MID-ATLANTIC

LIFETIME TRANSFERABLE LIMITED WARRANTY

Oldcastle® Architectural, Inc. ("Belgard") is proud to inform you that all of our interlocking concrete paver and retaining walls ("Products") meet and/or exceed the requirements of ASTM C-936 and ASTM C-1372. Belgard® guarantees its Products against these standards for the lifetime of the Product defined by *ICPI*. This guarantee does not apply to splitting, chipping or other breakage that could be caused by impact, abrasion or overloading. This warranty is transferable. The original proof of purchase is required.

This warranty is only valid if the material is installed under the guidelines of the ICPI (www.ICPI.org), The NCMA (www.NCMA.org) or the Belgard Installation Guideline Manual. Improper installation voids this warranty. This warranty is for residential applications only and does not apply to commercial applications. It is recommended that the job be installed by a Belgard Authorized Contractor who guarantees their workmanship for a minimum of 3 years from the date of install. For warranty service, contact Belgard at 1-877-BELGARD. A service representative will investigate your claim within 10 business days. If the Belgard product fails to meet the specifications, Belgard will replace the defective product at no charge. Color matching cannot be guaranteed. Belgard will not be responsible for any replacement labor, consequential damages or incidental damages. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. SOME STATES DO NOT ALLOW FOR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

For specific information regarding warranty coverage and exclusions in regards to the Elements and Porcelain Paver products, please visit: **Belgard.com/Warranty**

ABOUT US

At Belgard®, we take our role as industry leaders seriously. Our rigorous research and development program is centered on innovation and quality. We never take it for granted that our products are the best in the business and constantly strive to improve and take the industry to the next level. Our overarching goal is to continue to find new and exciting ways to create beautiful outdoor spaces while maintaining incredibly high standards for product quality and performance.

Since 1995, our locally made and nationally backed products have transformed thousands of residential and commercial properties across North America. With more shapes, styles and textures than any other brand, Belgard's Outdoor Living paving and wall products aren't just functional, they infuse outdoor spaces with distinctive atmosphere and style.

Every day, our network of Belgard Authorized Dealers and Contractors helps customers realize their outdoor dreams. And every year, we strive to improve our product and service offerings by dedicating more than 20,000 hours to research and development. By staying ahead of design trends, we are able to provide design-forward products that homeowners envision for their backyard spaces.

All of our outdoor products—when installed by a Belgard Authorized Contractor—are covered by a transferable lifetime limited warranty. That's just part of our commitment to lasting outdoor beauty.

INSTALLATION & PRODUCT INFORMATION

PAVERS & SLABS

PERMEABLE PAVER

PORCELAIN PAVERS & PLANKS

WALLS

VERSATILE LANDSCAPING

FIRE FEATURES

ACCESSORIES

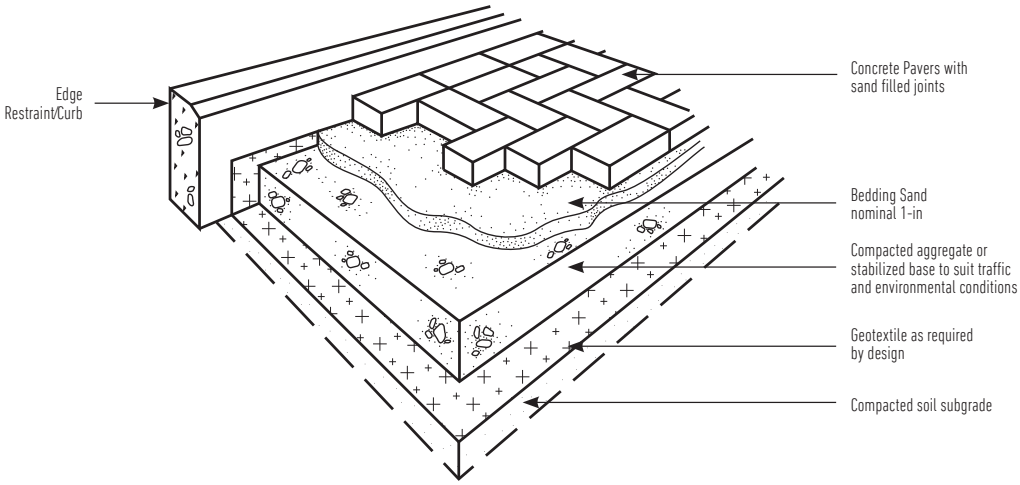
PAVERS & SLABS

PAVER INSTALLATION GUIDE

PAVERS & SLABS

PAVER LAYING GUIDE*

TYPICAL COMPONENTS OF INTERLOCKING CONCRETE PAVEMENT



PAVER & BEDDING LAYER

Attribute	Tolerance
Paver Joint Width	1/16–in to max. 3/16–in
Paver Surface Flatness	±3/8–in 10-ft (non cum.)
Lippage at Catch Basins/Drains	1/8–in to 3/8–in (non ADA)

Lippage between individual pavers maximum 1/8-in for pedestrian access routes.

Attribute	ICPI Recommendation
Paver aspect ratio (l:t) (length divided by thickness)	max. 4:1 for pedestrian & driveways max. 3:1 for street/parking
Joint fill depth	max.1/2-in measured from top of pavement
Bond lines[1]	±1/2-in max. over 50-ft
Slope for drainage	min. 2%
Cut pavers[5]	No less than 1/3-in for vehicular application No less than 3/8-in for all other applications
Paver laying pattern[2]	Acceptable for application
Minimum paver thickness	31/8-in for street/parking 23/8-in for pedestrian & driveways
Bedding layer thickness	1-in nominal
Joint sand gradation	ASTM C144 or C33 CSA A23.1 FA1 or CSA A179
Bedding sand gradation	ASTM C33 or CSA A23.1 FA1

BASE AND SUBBASE LAYER

Attribute	Tolerance
Top of base surface variation	**± 3/8-in over 10-ft (non cum.)**

Attribute	ICPI Recommendation
Base thickness variation[3]	+ 3/4-in to -1/2-in
Compaction	min. 98% standard Proctor
Over-excavation (dense graded bases)	greater of 6-in or equal to base thickness
Geotextile	as needed

Minimum base thickness

Sidewalks, patios, pedestrian	4-in
Residential driveways	6-in
Parking lot/residential street	8-in

Edge Restraint/Curb Edge

Attribute	Tolerance
No Movement	Firmly in place
Proper Restraint	Acceptable for application (see "Guide References on next page)

NOTES:

*This guide does not apply to permeable interlocking concrete pavements or tumbled pavers.

[1]Bond lines: Unless it is deemed that the pavement is not adequately restrained at the edges the bond line tolerance is considered cosmetic

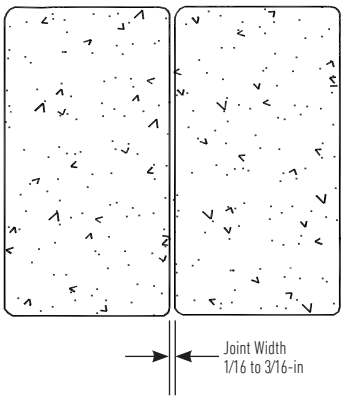
[2]Paving layer pattern: ICPI recommends herringbone laying pattern for all vehicular applications

[3]Base thickness variation: An example of an acceptable variation is 71/2 in. to 83/4-in for an 8-in required total base thickness. The excavated cut should have the same slope and contouring as the final surface profile.

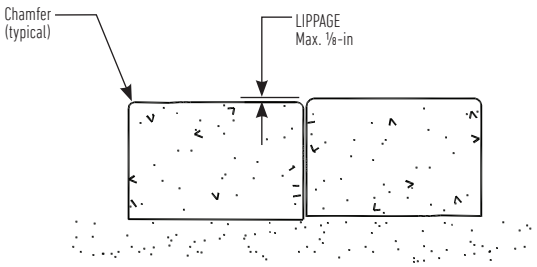
[4]Minimum base thickness: These are for well drained soils. Increase thickness in colder climates or weak soils.

[5]The contractor should have the discretion on cuts no less than 1/3 paver size. Sometimes it is not possible to adjust the cuts to less than 1/3 paver size without adjusting laying pattern, and sometimes it is not possible to adjust laying pattern with certain shapes.

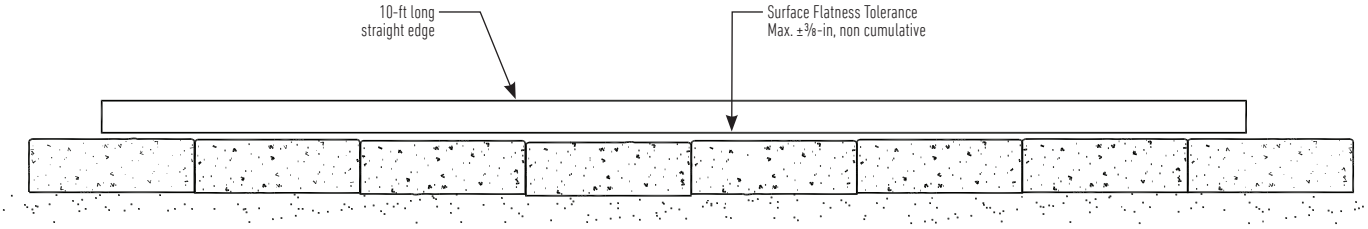
TOLERANCE MEASUREMENT GUIDANCE



Joint widths are measured with a ruler from inside edge of paver to inside edge paver between adjacent pavers.



Lippage is measured from the top of a paver to the top of the adjacent paver.



Paver surface flatness and top of base surface variation are measured with a straight edge for simple slopes and with a transit for complex contours

GUIDE REFERENCES

Specification and design references

ASCE 58-10 Structural Design of Interlocking Concrete Pavements for Municipal Streets and Roadways
ICPI Tech Spec 4–Structural Design of Interlocking Concrete Pavement for Roads and Parking Lots
ICPI Tech Spec 9–Guide Specification for the Construction of Interlocking Concrete Pavement

Pavement system references

ASTM C936 Standard Specification for Solid Interlocking Concrete Paving Units
CSA A231.2 Precast Concrete Pavers
ICPI Tech Spec 1–Glossary of Terms for Segmental Concrete Pavement
ICPI Tech Spec 2–Construction of Interlocking Concrete Pavements
ICPI Tech Spec 4–Structural Design of Interlocking Concrete Pavement for Roads and Parking Lots
ICPI Tech Spec 5–Cleaning, Sealing and Joint Sand Stabilization of Interlocking Concrete Pavement

Bedding and joint sand references

ASTM C33 Standard Specification for Concrete Aggregates
CSA A23.1 Concrete Materials and Methods of Construction
ASTM C144 Standard Specification for Aggregate for Masonry Mortar
CSA A179 Mortar and Grout for Unit Masonry
ICPI Tech Spec 17–Bedding Sand Selection for Interlocking Concrete Pavements in Vehicular Applications

Base, subbase and subgrade layer references

ASTM D 2940 Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports
ICPI Tech Spec 2–Construction of Interlocking Concrete Pavements
ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort

Edge restraint references

ICPI Tech Spec 3–Edge Restraints for Interlocking Concrete Pavements

PAVING SYSTEMS INSTALLATION GUIDE

INSTALL THE EDGE RESTRAINTS

Install edge restraints.

Place edge restraint on one or two sides of the area to be paved to create a square area. If installing a circle or curve, edging can be installed after pavers are placed. Anchor the edging with fasteners, approximately one fastener every 12 inches (follow instructions per edge restraint manufacturers). Before compacting pavers into the sand bed, all edging should be installed. The edging goes on the base, not on top of the sand. Remove excess sand from the edge of the paved area before installing the edging.

INSTALL THE BEDDING SAND

Install bedding sand.

Place at least two pipes of 1-inch outside diameter directly on the base. Place them 6 to 8 feet apart and parallel to each other. Spread the sand between the pipes. Use a shovel and rake to smooth it out. The sand should be moist but not wet or saturated.

Use a straight piece of wood (an 8-foot 2 x 4) to screed the sand smooth

Pull the wood across the pipes several times until the area of sand is perfectly smooth. Remove the pipes and fill the voids with sand. Level these areas with a trowel. Don't walk on or disturb the screeded and leveled sand.

PLACE THE CONCRETE PAVERS

Start in the corner, if you have one in your design, and check to see that it is a 90-degree corner. Place a border course around the entire edge, then place the pavers in the desired pattern. See pattern and border on pages 105-114- for reference.

Continue to screed bedding sand and place pavers on the sand while maintaining consistent joint widths. String lines will help keep pavers straight.

Cut pavers as needed to fill in at the edges next to the border course. Use a diamond blade to cut the pavers.

Helpful hint for Rinn™ and Texturgard™ pavers for optimal aesthetics leave joint space between cut pavers.

Place pavers.

INSTALL REMAINING EDGE RESTRAINTS

Installing edge restraints after pavers have been installed allows for adjustments in size of paved area to help reduce pavers needing to be cut. Based on the shape and pattern we are using our 10- x 20-foot area may come to just under or over without having to cut pavers. When installing remainder of edging remember to remove sand from edge of pavers so edging sits on the base.

Compact pavers.

COMPACT THE PAVERS USING A PLATE COMPACTOR

Make at least two passes over all pavers, starting at the outside of the pavement, working around the edges toward the inside. Then compact back and forth like mowing grass. Remove and replace any pavers that crack from the compaction equipment. Adjust joints so they are consistent. A large screwdriver is effective for aligning paver joints.

SPREAD DRY JOINT SAND OVER THE SURFACE

Sweep some sand into the joints, then vibrate and compact it into the joints, sweeping and compacting as you go. Filling the joints with sand will take several passes with the plate compactor. After compaction, the sand in the joints might settle, especially after rainstorms. Apply extra sand to fill these joints as needed.

NOTE: Many recommend using polymeric jointing sand to fill the joints between pavers, which helps to stabilize the sand in the joints and control ants and weeds. Belgard® carries Techniseal® products such as HP NextGel Jointing sand. Make sure to follow all manufacturer recommendations in using and applying these products.

HELPFUL HINT FOR PAVER PROTECTION

Manufacturers of plate compactors recommend the use of mats or membranes between the compactor and pavers to protect the pavers from surface damage. Most plate compactor manufacturers sell accessories for this purpose.

Pavers with profiled tops, non-tumbled pavers and Rinn™ and Texturgard™ paver surfaces are more susceptible to damage from plate compactors. We recommend that you always protect the pavers with any of the following materials between the paver and the plate compactor.

- Cardboard
- Thin carpeting
- Luan plywood
- Urethane rubber mat

Find additional resources and technical specifications available online at www.icpi.org

PEAK PERFORMANCE FROM CONCRETE PAVERS

Quality concrete pavers create a surface that can last for generations when placed on a well-prepared base. They need practically no maintenance when installed to ICPI guidelines. This guide will help you get the most value from your concrete paver installation.

JOINT SAND

During the course of normal use, the sand-filled joints receive dust from traffic on the pavement. This dust settles into the top of the joints, helping to hold the sand in place. Installations exposed to driving winds or

runoff, however, may lose some joint sand that can be simply replenished with dry sand. Stabilized sand can be used instead of mason sand to reduce joint sand loss. Sealers can also help hold the sand in the joints. These are applied over the entire paver surface as a liquid and allowed to soak and cure in the joints. Ask your concrete paver manufacturer or distributor about these products and their application.

PREVENTING WEEDS AND ANTS

Weeds can germinate between pavers from windblown seeds lodged in the joints. They don't grow from the bedding sand, base or soil. Weeds can be removed by hand or with herbicides. Take care in using herbicides to not damage adjacent vegetated areas. Use biodegradable products that won't damage other vegetation or pollute water supplies when washed from the pavement surface. Besides stabilizing the joint sand, sealers can prevent seeds from germinating and discourage ants from entering.

SNOW AND ICE REMOVAL

Concrete pavers offer outstanding freeze-thaw resistance. They can resist damage from de-icing salts better than most pavement surfaces. Snow and ice are removed with shovels or plows like any other pavement. Electric or liquid snow-melting systems work well under concrete pavers, eliminating plowing and reducing slip hazards.

EFFLORESCENCE

Efflorescence is a white haze that may appear on the surface of pavers sometime after installation. It forms as a result of a natural chemical reaction that occurs when the lime or water soluble calcium oxide, produced by the cement contained in the pavers, reacts with water. When the water enters the microscopic capillaries in the pavers, calcium hydroxide is formed. The calcium hydroxide rises to the surface of the paver, reacts with the carbon dioxide in the air, and forms a white haze of calcium carbonate when the moisture evaporates from the surface. The appearance of efflorescence stops when there isn't any more calcium hydroxide available to move to the surface. This process sometimes can take several months.

Efflorescence does not damage pavers. However, it can be unappealing. The white haze may give the impression that the paver color is fading but this is not the case.

Pavers with effloescence

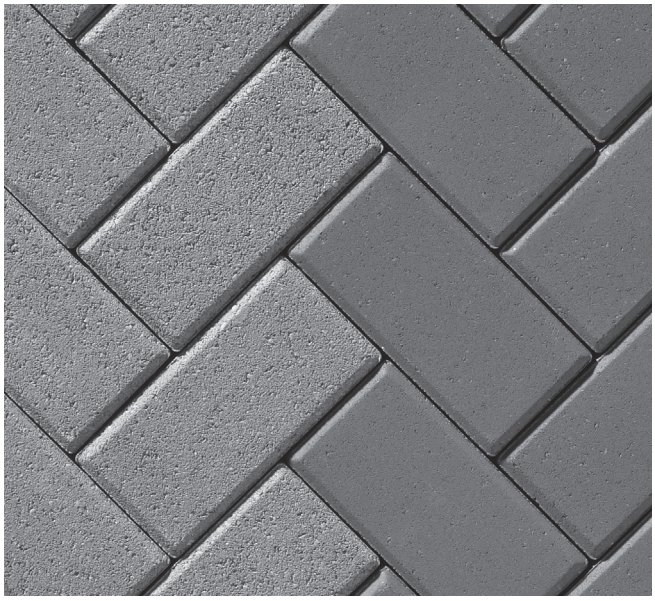
Pavers after cleaning

Efflorescence may occur randomly or be concentrated in certain areas. Dark colored pavers show efflorescence more than lighter-colored ones. If efflorescence does

occur, it can be removed with cleaners specially made for concrete pavers. Careless or improper cleaning can result in damage and discoloration to the concrete paver surfaces. Contact your Belgard sales representative for further information on efflorescence cleaners.

COLOR AND WEAR

Color in concrete pavers is achieved by adding pigment to the concrete mix during production. The cement in the concrete mix holds the pigments in place. They are very stable, showing little change in their properties over time. As the paver wears from traffic or weather, the cement and pigment particles gradually erode causing a color change over time. Like all pavements, concrete pavers receive dirt from foot or tire traffic which also changes the surface color. One way to moderate the rate of color change is by cleaning and sealing the surface of the concrete pavers. Besides enhancing their color, sealers can prevent dirt from lodging in the surface.



Unsealed Sealed

SETTLEMENT AND UTILITY REPAIRS

Settlement is often caused by inadequate soil or base compaction. Other factors can be water in the base or soil, too thick a layer of bedding sand, or washed out bedding and joint sand. Loose or inadequate edge restraints cause pavers to move apart and can also contribute to settlement. If the base or soil has settled and is stable, remove the pavers and bedding sand, place and compact additional base material to the correct level, then add bedding sand. The removed pavers can then be reinstated with no wasted paving materials or unsightly patches. Concrete pavers can be removed for access to underground utilities, and reinstated after repairs. When utility repairs are complete, fill the trench with base material and compact it. Remove about 18 in. (0.5 m) of pavers on either side of the opening, level the bedding sand and replenish as necessary. Reinstate the pavers, compact, fill the joints with sand and compact the surface again, filling joints as needed.

REMOVING OIL STAINS

Concrete pavers aren't damaged by oil leaking from cars, but the stains can be difficult to remove. Stains should be treated as soon as possible since the longer they remain on the surface, the deeper they penetrate making removal harder. Wipe excess oil from the surface as soon as possible and apply liquid detergent. Allow it to soak for several minutes. Then scrub and wash the pavers with hot water. Several treatments may be necessary for particularly stubborn stains. Cleaners specially made for removing oil stains from concrete pavers are available and yield good results. In some cases, it may be simpler to replace the stained pavers with new ones. Cleaning and sealing concrete pavers early in their life can make removing stains easier since sealers prevent stains from soaking into the surface.

NEW

DIMENSIONS™ 3-PIECE SYSTEM

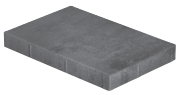
PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓				✓

SHAPES & SIZES

Dimensions™ *6*

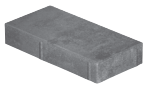
3 x 6 x 2⅜

6 x 6 x 2⅜



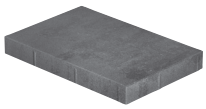
9 x 6 x 2⅜

Dimensions™ *12*



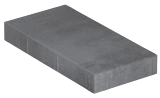
6 x 12 x 2⅜

12 x 12 x 2⅜

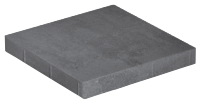


18 x 12 x 2⅜

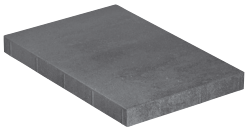
Dimensions™ *18*



9 x 18 x 2⅜

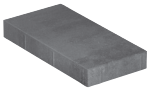


18 x 18 x 2⅜



27 x 18 x 2⅜

Accent 60MM



6 x 9 x 2⅜

NEW
DIMENSIONS™ 3-PIECE SYSTEM

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
DIMENSIONS™ *6*							
3 X 6 X 2⅜	20	2	10	160	–	–	–
6 X 6 X 2⅜	40	4	10	160	–	–	–
9 X 6 X 2⅜	60	6	10	160	–	–	–
TOTAL	120	12	10	480	–	–	3165
DIMENSIONS™ *12*							
6 X 12 X 2⅜	20	2	10	40	–	–	–
12 X 12 X 2⅜	40	4	10	40	–	–	–
18 X 12 X 2⅜	60	6	10	40	–	–	–
TOTAL	120	12	10	120	–	–	3205
DIMENSIONS™ *18*							
9 X 18 X 2⅜	22.5	2.25	10	20	–	–	–
18 X 18 X 2⅜	22.5	2.25	10	10	–	–	–
27 X 18 X 2⅜	67.5	6.75	10	20	–	–	–
TOTAL	112.5	11.25	10	50	–	–	3025
ACCENT 60MM							
6 X 9 X 2⅜	112.5	11.25	10	300	–	–	2985

DIMENSIONS™ 3-PIECE

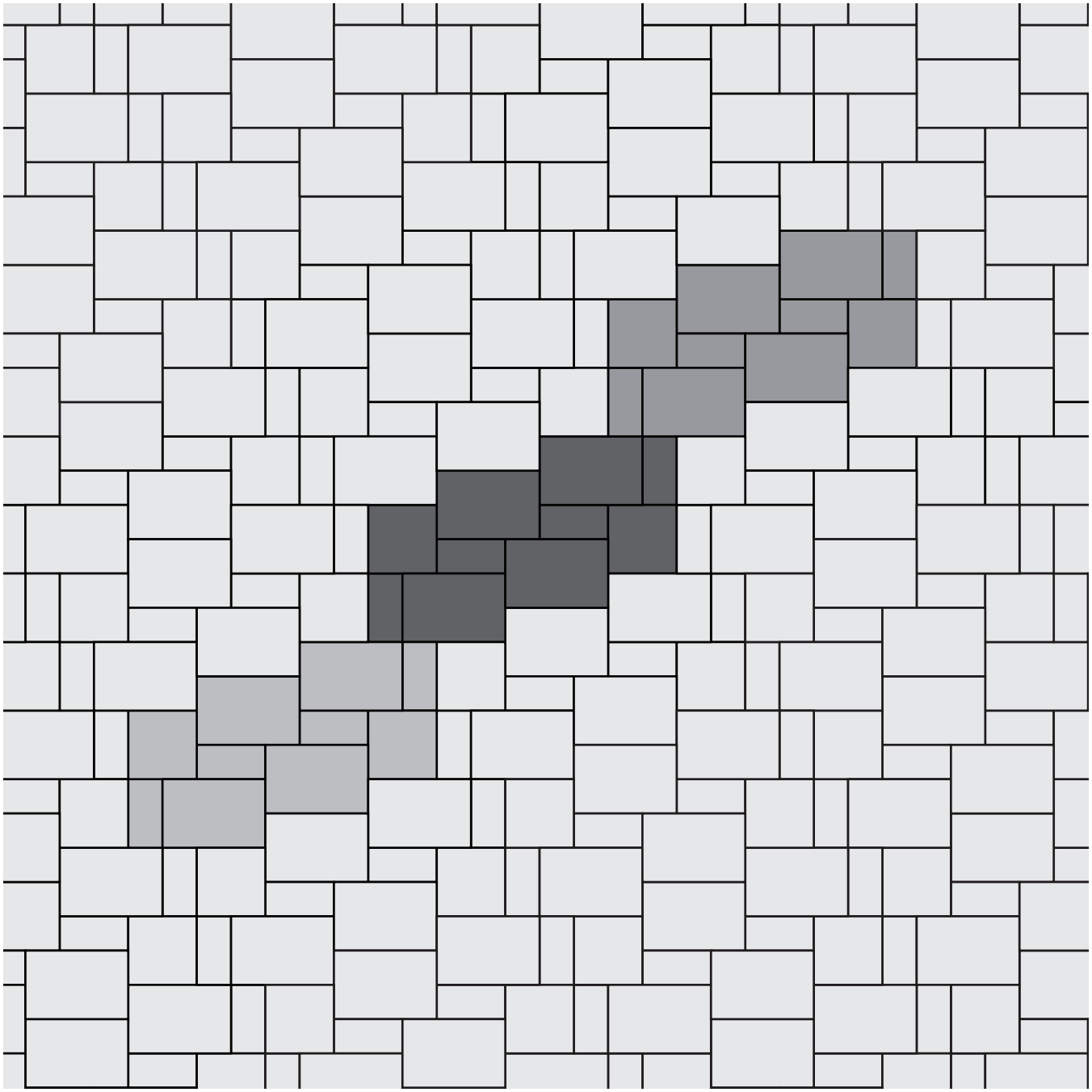
3-PIECE PATTERN A

NOTES:
AutoCAD® hatch pattern files can be downloaded from belgard.com for use in architectural drawings

Some patterns may not necessarily reflect the percentages of stone sizes within a particular pallet. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

Percentages are based on area by paver.

21% 3 x 6	21% 6 x 12	21% 9 x 18
23% 6 x 6	23% 12 x 12	23% 18 x 18
56% 6 x 9	56% 12 x 18	56% 18 x 27



DIMENSIONS™ 3-PIECE

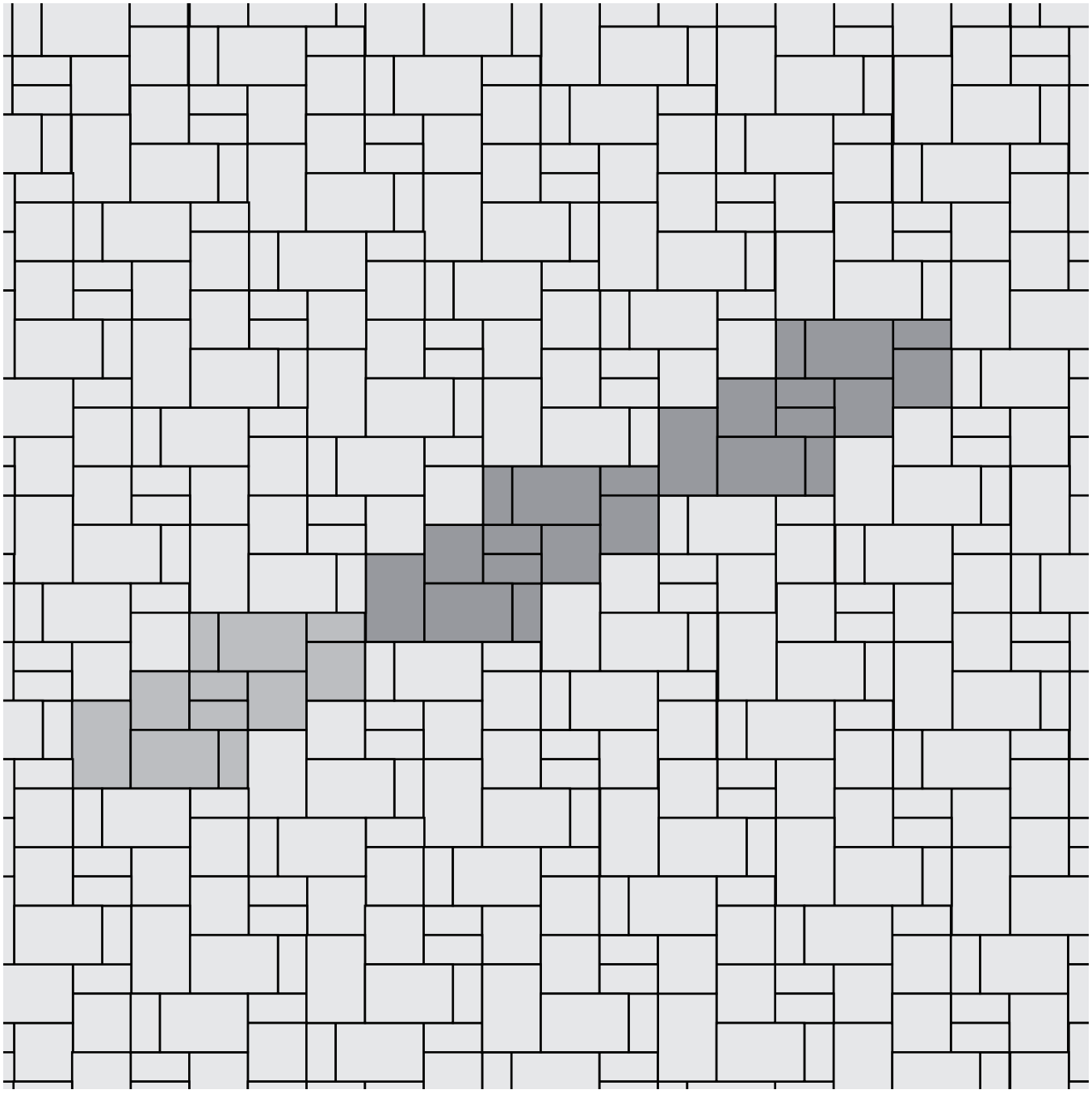
3-PIECE PATTERN B

NOTES:
AutoCAD® hatch pattern files can be downloaded from belgard.com for use in architectural drawings

Some patterns may not necessarily reflect the percentages of stone sizes within a particular pallet. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

Percentages are based on area by paver.

21% 3 x 6	21% 6 x 12	21% 9 x 18
23% 6 x 6	23% 12 x 12	23% 18 x 18
56% 6 x 9	56% 12 x 18	56% 18 x 27



DIMENSIONS™ 3-PIECE

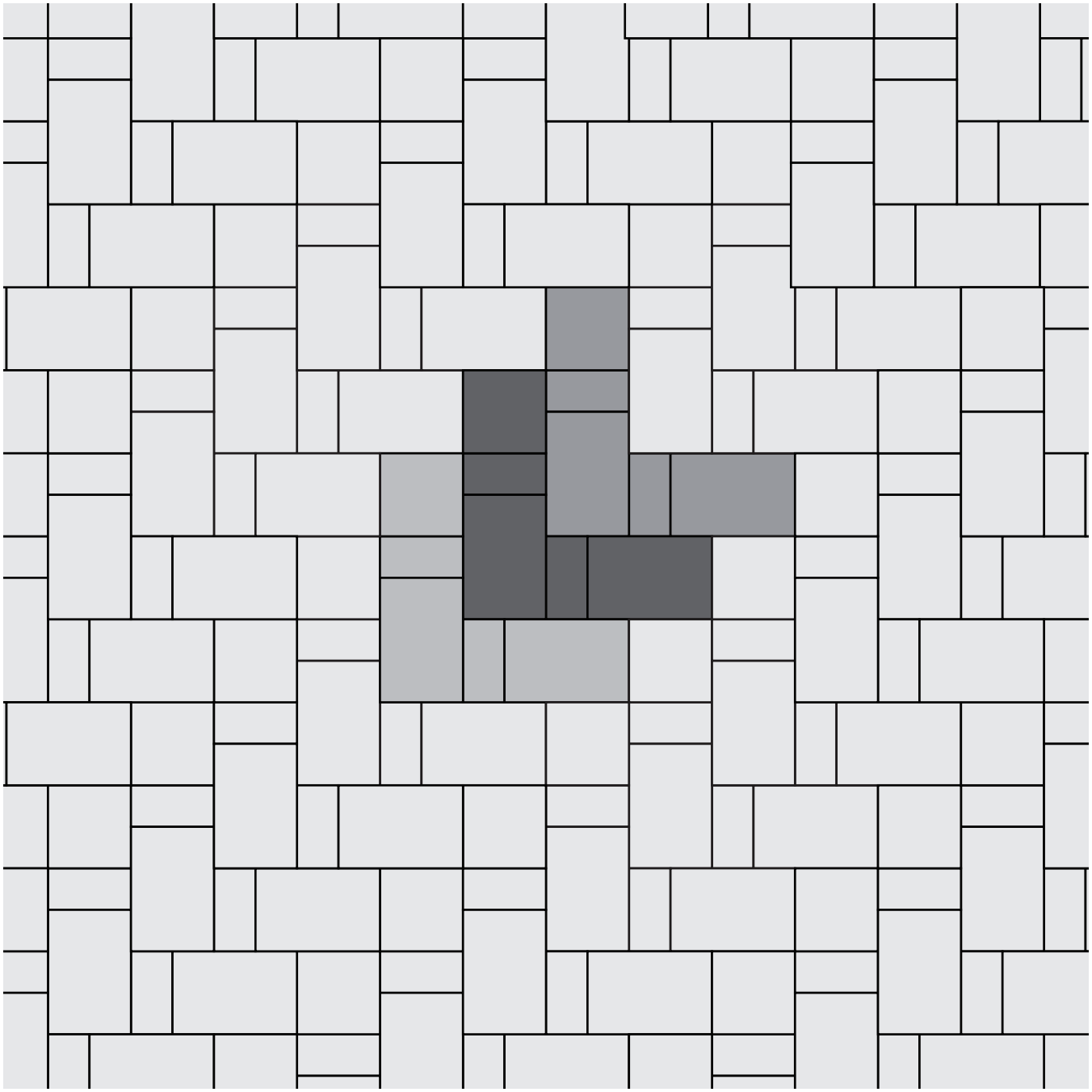
3-PIECE PATTERN C

NOTES:
AutoCAD® hatch pattern files can be downloaded from belgard.com for use in architectural drawings

Some patterns may not necessarily reflect the percentages of stone sizes within a particular pallet. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

Percentages are based on area by paver.

21% 3 x 6	21% 6 x 12	21% 9 x 18
23% 6 x 6	23% 12 x 12	23% 18 x 18
56% 6 x 9	56% 12 x 18	56% 18 x 27



DUBLIN COBBLE®

PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓	✓		✓	

SHAPES & SIZES

3-Piece Modular

2 15/16 x 5 15/16 x 2 3/8

5 15/16 x 5 15/16 x 2 3/8

5 15/16 x 8 7/8 x 2 3/8

Large Square

5 15/16 x 8 7/8 x 2 3/8

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
3-PIECE MODULAR							
2 15/16 X 5 15/16 X 2 3/8	20	2	10	160	–	–	–
5 15/16 X 5 15/16 X 2 3/8	40	4	10	160	–	–	–
5 15/16 X 8 7/8 X 2 3/8	60	6	10	160	–	–	–
TOTAL	120	12	10	480	–	–	3165

DUBLIN COBBLE®

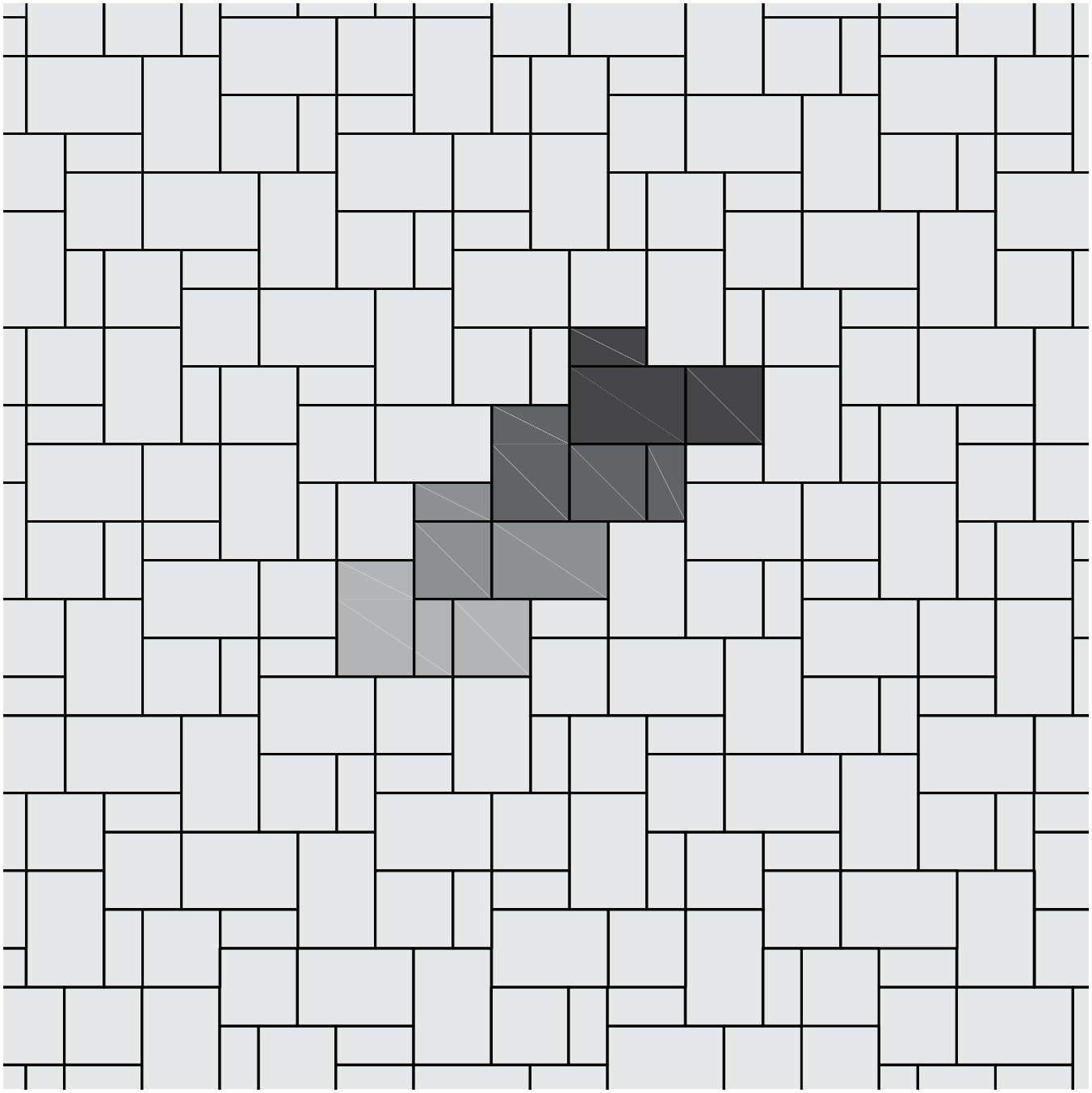
3-PIECE PATTERN

NOTES:
AutoCAD® hatch pattern files can be downloaded from belgard.com for use in architectural drawings

Some patterns may not necessarily reflect the percentages of stone sizes within a particular pallet. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

Percentages are based on area by paver.

17% 2 15/16 x 5 15/16
33% 5 15/16 x 5 15/16
50% 5 15/16 x 8 7/8



DUBLIN COBBLE®

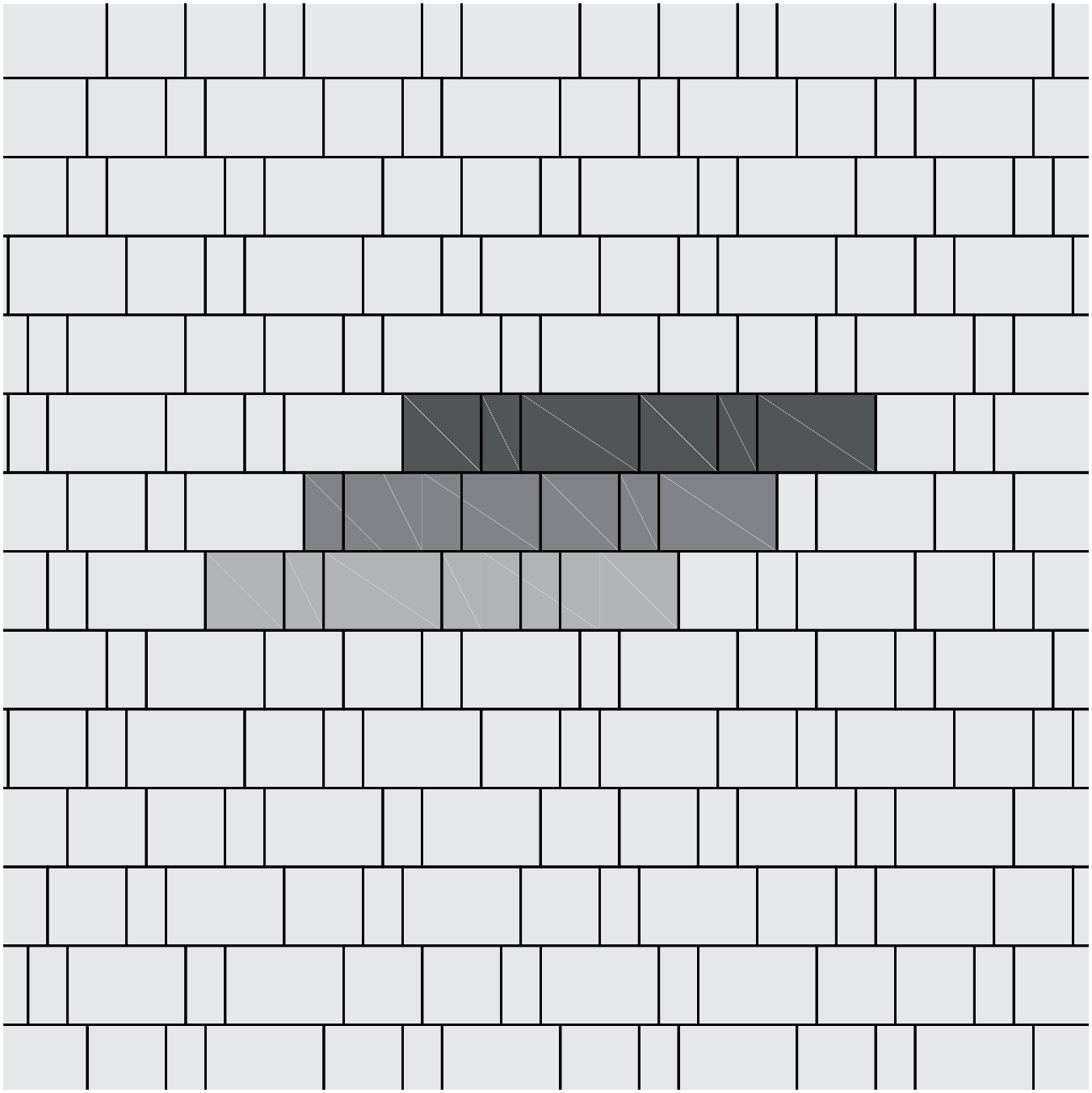
3-PIECE RUNNING BOND PATTERN

17% 2 15/16 x 5 15/16
33% 5 15/16 x 5 15/16
50% 5 15/16 x 8 7/8

NOTES:
AutoCAD® hatch pattern files can be downloaded from belgard.com for use in architectural drawings

Some patterns may not necessarily reflect the percentages of stone sizes within a particular pallet. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

Percentages are based on area by paver.



HOLLAND STONE

PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓	✓			✓

SHAPES & SIZES

60mm

3 15/16 x 7/8 x 2 3/8

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
60MM							
3 15/16 X 7/8 X 2 3/8	120	12	10	540	–	–	3120

HOLLAND STONE

1-PIECE HERRINGBONE PATTERN

100% 3 15/16 x 7 7/8

NOTES:
AutoCAD® hatch pattern files can be downloaded from belgard.com for use in architectural drawings

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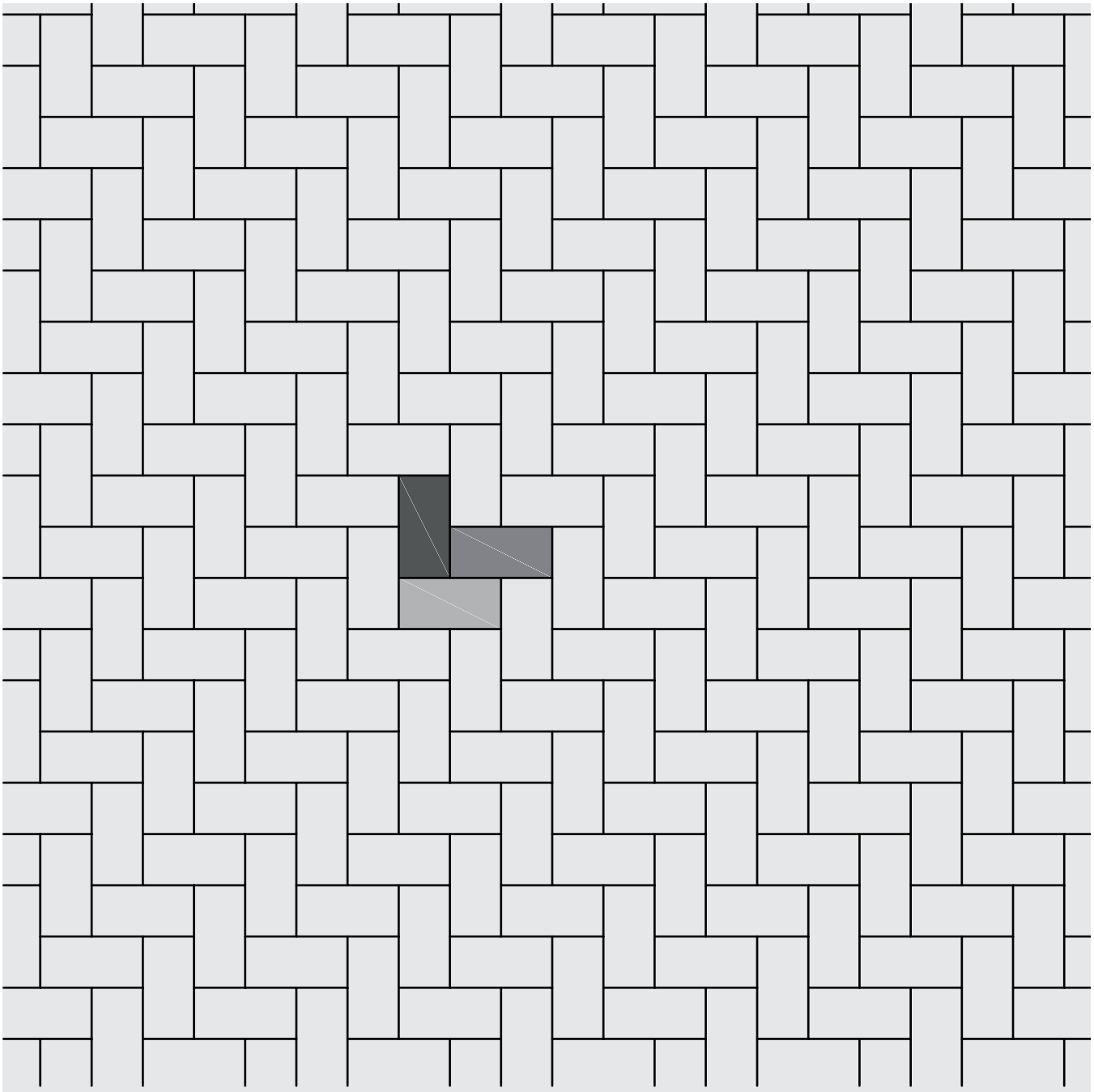
Percentages are based on area by paver.



HOLLAND STONE

1-PIECE BASKET WEAVE PATTERN

100% 3 15/16 x 7/8

NOTES:
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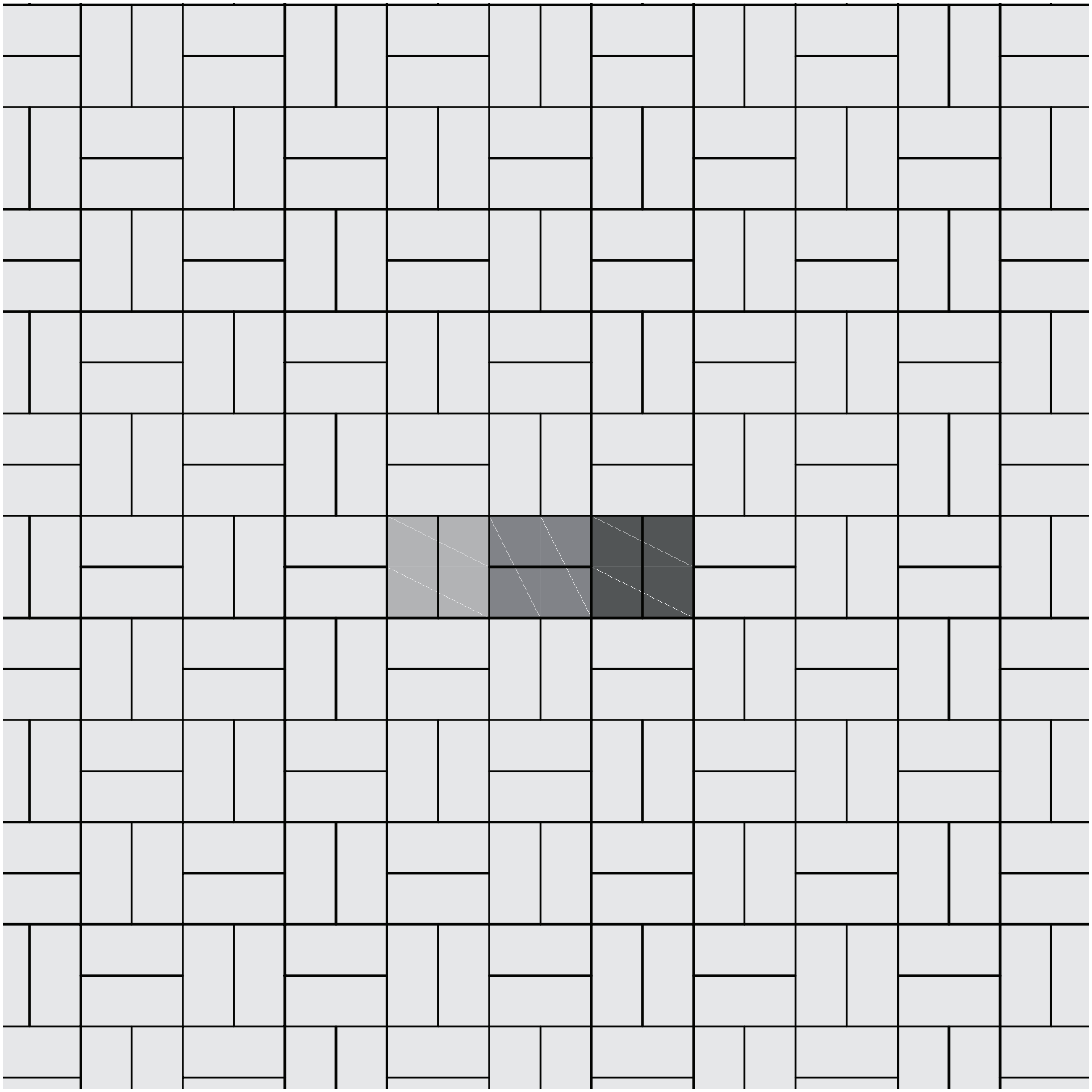
Percentages are based on area by paver.



HOLLAND STONE

1-PIECE RUNNING BOND PATTERN

100% 3 15/16 x 7 7/8

NOTES:
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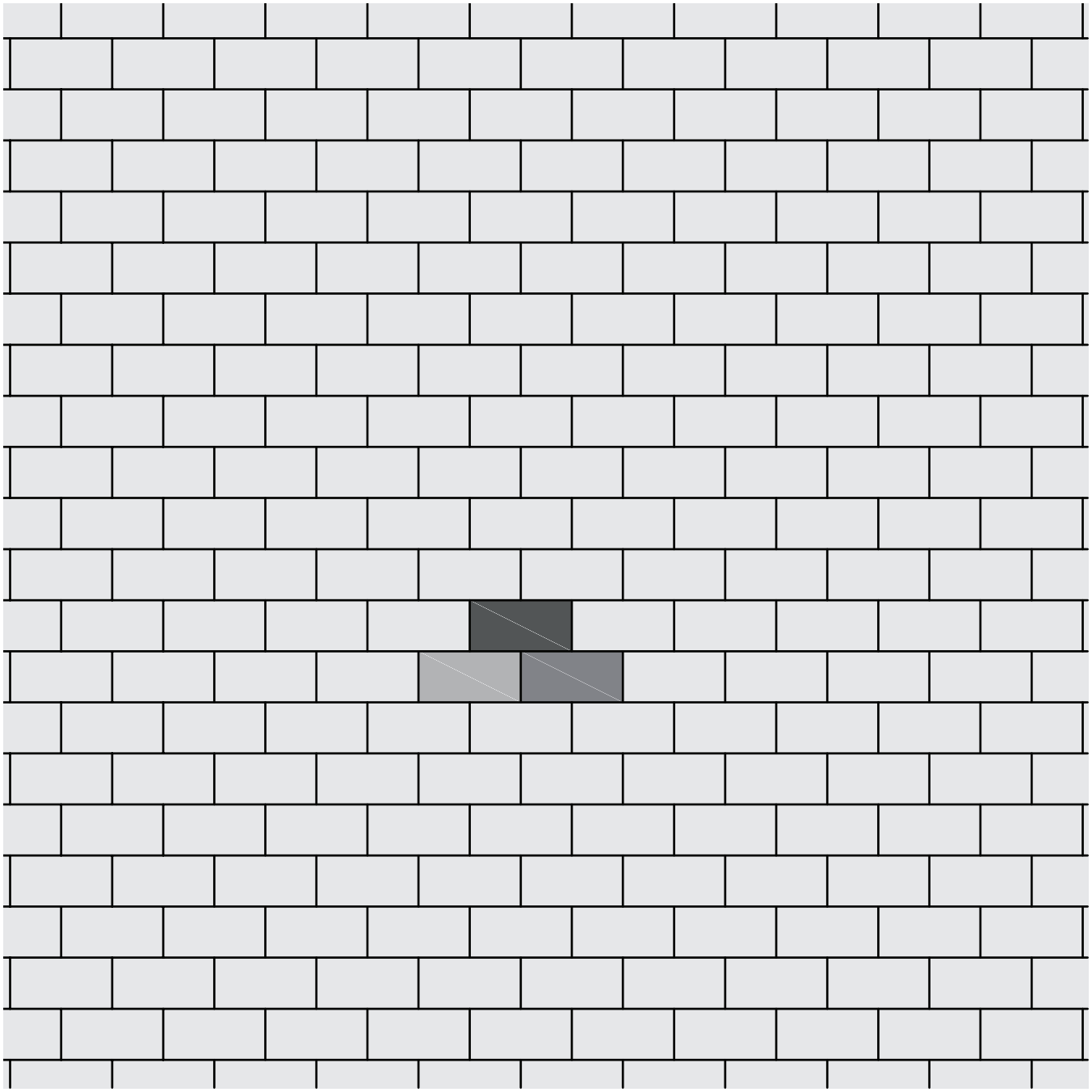
Percentages are based on area by paver.



LONDON COBBLE

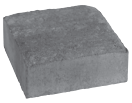
LEGACY COLLECTION

PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓	✓			

SHAPES & SIZES

3-Piece Modular 60mm

3 x 6 x 2⅜



6 x 6 x 2⅜

6 x 9 x 2⅜

6 x 6

6 x 6 x 2⅜

6 x 9

6 x 9 x 2⅜

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
3-PIECE MODULAR 60MM							
3 X 6 X 2⅜	20	2	10	160	–	–	–
6 X 6 X 2⅜	40	4	10	160	–	–	–
6 X 9 X 2⅜	60	6	10	160	–	–	–
TOTAL	120	12	10	480	–	–	3090
6 X 6							
6 X 6 X 2⅜	120	12	10	420	–	–	3090
6 X 9							
6 X 9 X 2⅜	112.5	11.25	10	300	–	–	2940

LONDON COBBLE

1-PIECE RUNNING BOND PATTERN

100% 6 x 9

NOTES:
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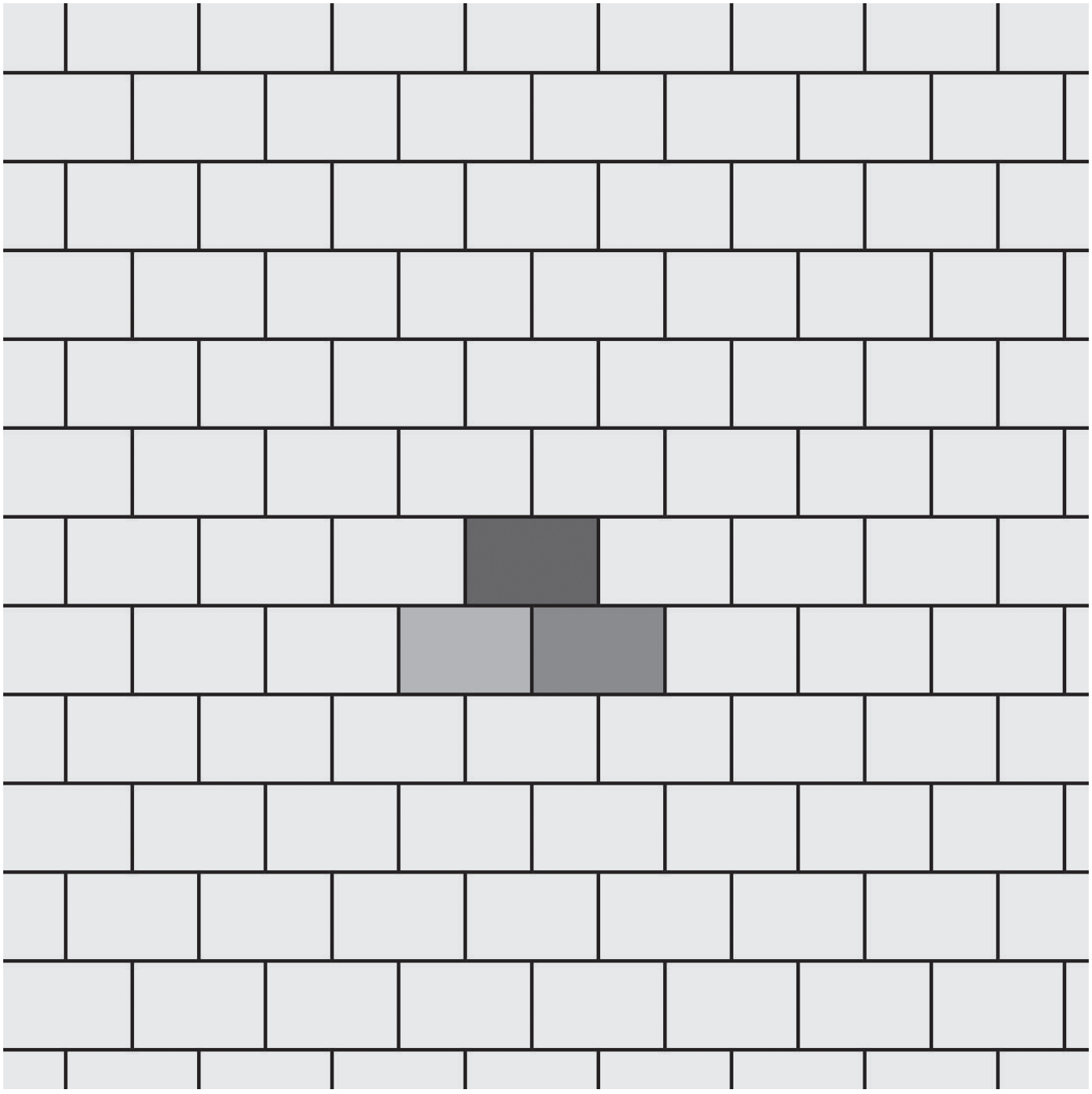
Some patterns may not necessarily reflect the percentages of stone sizes within a particular pallet. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

Percentages are based on area by paver.



LONDON COBBLE

2-PIECE PATTERN

NOTES:
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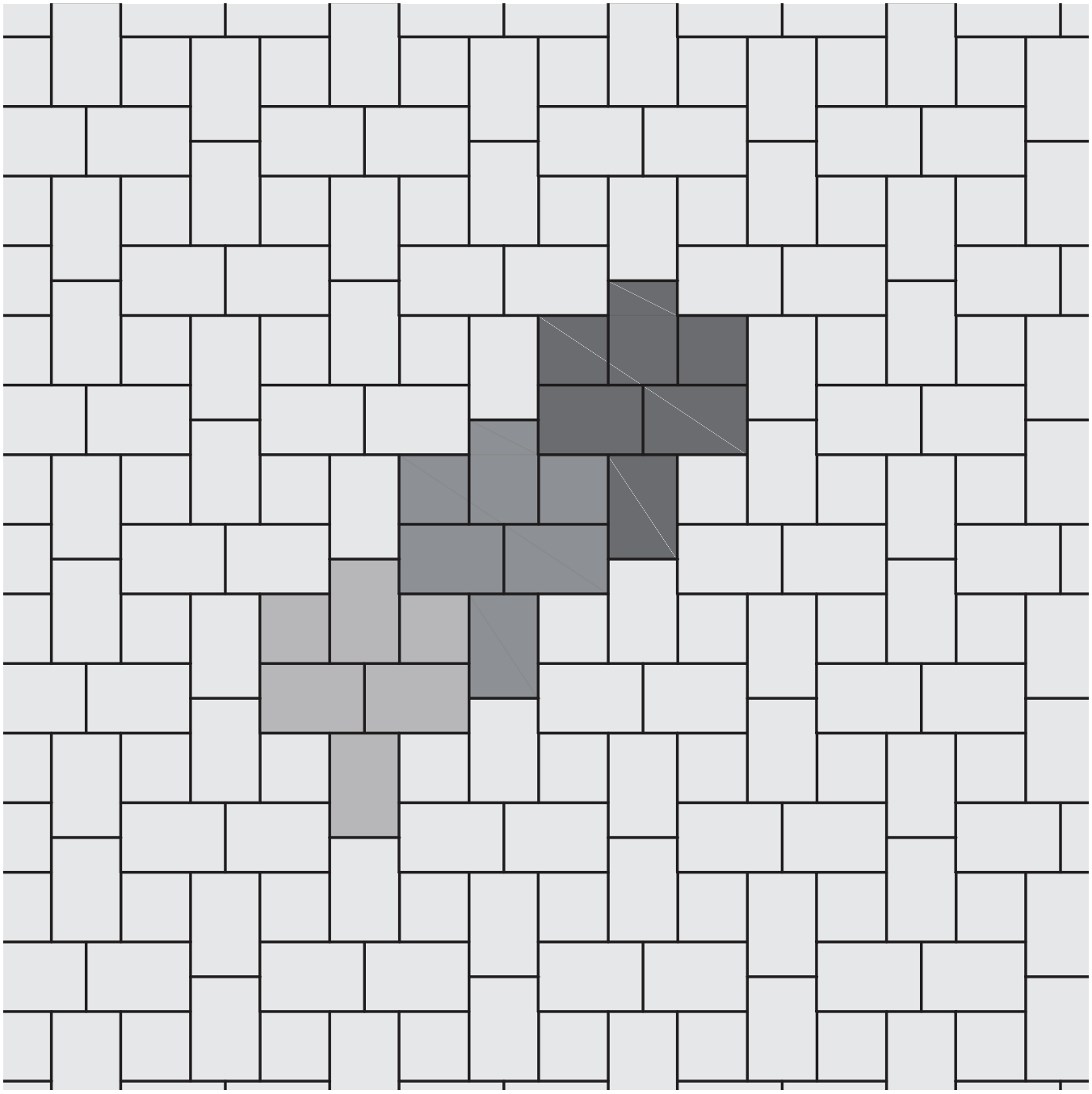
Some patterns may not necessarily reflect the percentages of stone sizes within a particular pallet. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

Percentages are based on area by paver.

25% 6 x 6
75% 6 x 9



LONDON COBBLE

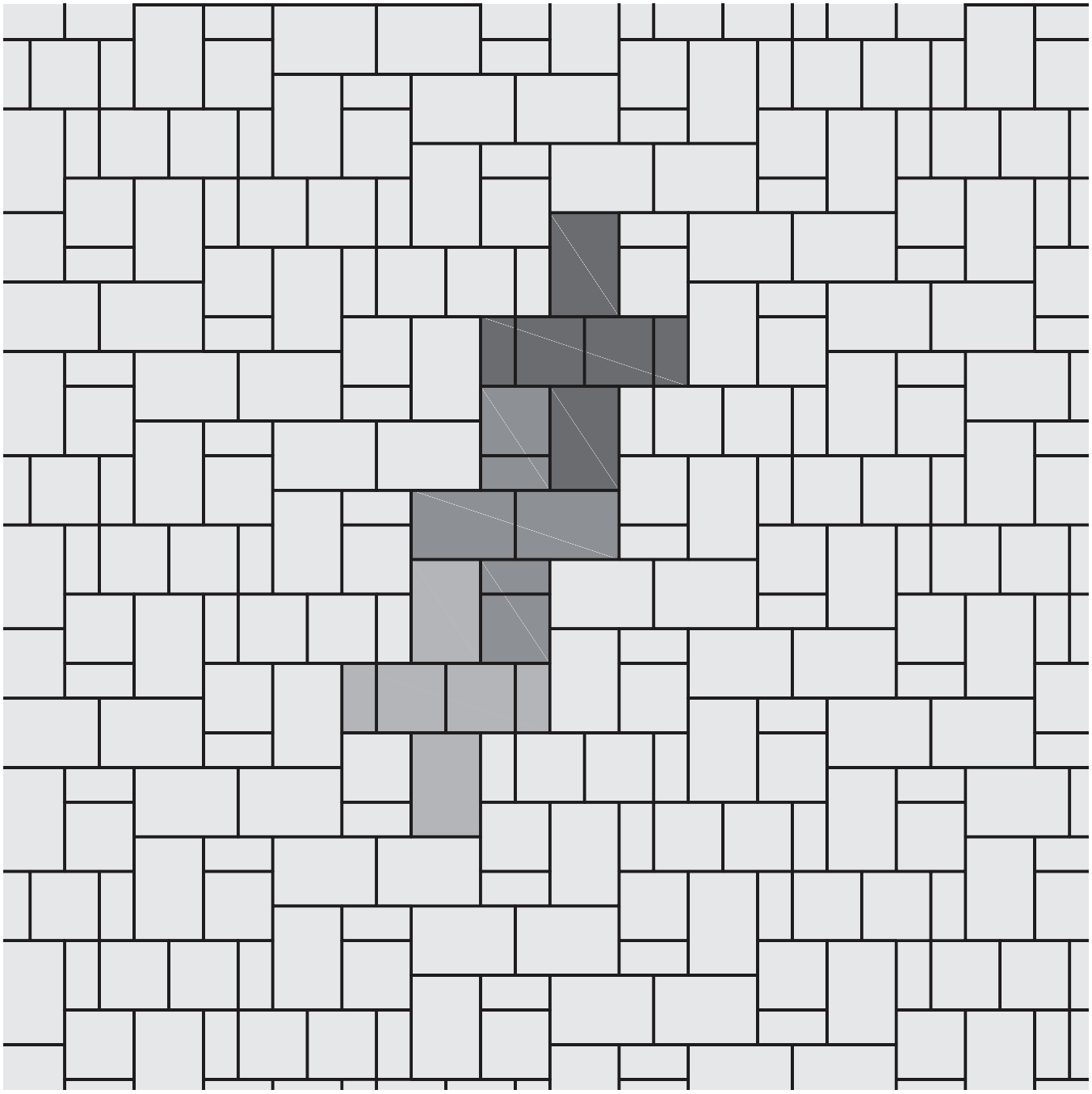
3-PIECE PATTERN A

NOTES:
AutoCAD® hatch pattern files can be downloaded from belgard.com for use in architectural drawings

Some patterns may not necessarily reflect the percentages of stone sizes within a particular pallet. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

Percentages are based on area by paver.

17% 3 x 6
33% 6 x 6
50% 6 x 9



MEGA ARBEL® PATIO SLAB

NATURAL COLLECTION

PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓				

SHAPES & SIZES

Patio Slab 60mm

15⅜ x 21 x 2⅜

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
PATIO SLAB 60MM							
15⅜ X 21 X 2⅜	104.4	8.7	12	72	6	0.7	2925

MEGA ARBEL®

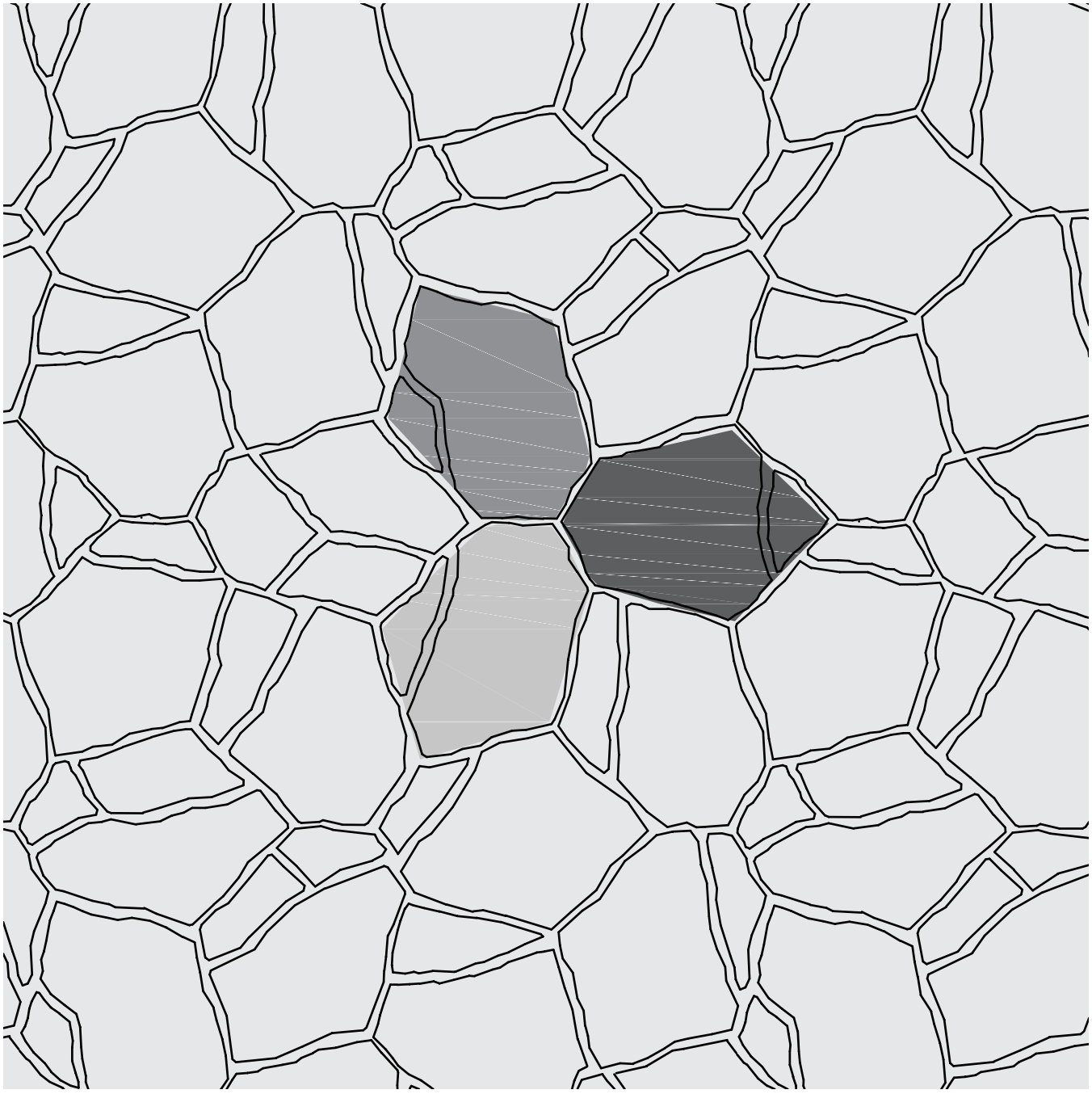
1-PIECE CLOVERLEAF PATTERN

100% 15⅜ x 21 x 2⅜

NOTES:
AutoCAD® hatch pattern files can be downloaded from belgard.com for use in architectural drawings

Some patterns may not necessarily reflect the percentages of stone sizes within a particular pallet. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

Percentages are based on area by paver.



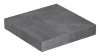
NEW
ORIGINS™ 3-PIECE SYSTEM

PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓				

SHAPES & SIZES

Origins™ *6*

3 x 6 x 2⅜



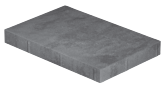
6 x 6 x 2⅜

9 x 6 x 2⅜

Origins™ *12*

6 x 12 x 2⅜

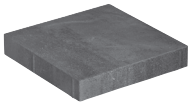
12 x 12 x 2⅜



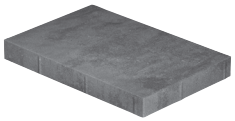
18 x 12 x 2⅜

Origins™ *18*

9 x 18 x 2⅜



18 x 18 x 2⅜



27 x 18 x 2⅜

Accent 60mm

6 x 9 x 2⅜

NEW
ORIGINS™ 3-PIECE SYSTEM

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
ORIGINS™ *6*							
3 X 6 X 2⅜	20	2	10	160	–	–	–
6 X 6 X 2⅜	40	4	10	160	–	–	–
9 X 6 X 2⅜	60	6	10	160	–	–	–
TOTAL	120	12	10	480	–	–	3165
ORIGINS™ *12*							
6 X 12 X 2⅜	20	2	10	40	–	–	–
12 X 12 X 2⅜	40	4	10	40	–	–	–
18 X 12 X 2⅜	60	6	10	40	–	–	–
TOTAL	120	12	10	120	–	–	3205
ORIGINS™ *18*							
9 X 18 X 2⅜	22.5	2.25	10	20	–	–	–
18 X 18 X 2⅜	22.5	2.25	10	10	–	–	–
27 X 18 X 2⅜	67.5	6.75	10	20	–	–	–
TOTAL	112.5	11.25	10	50	–	–	2950
ACCENT 60MM							
6 X 9 X 2⅜	112.5	11.25	10	300	–	–	2985

ORIGINS™ 3-PIECE

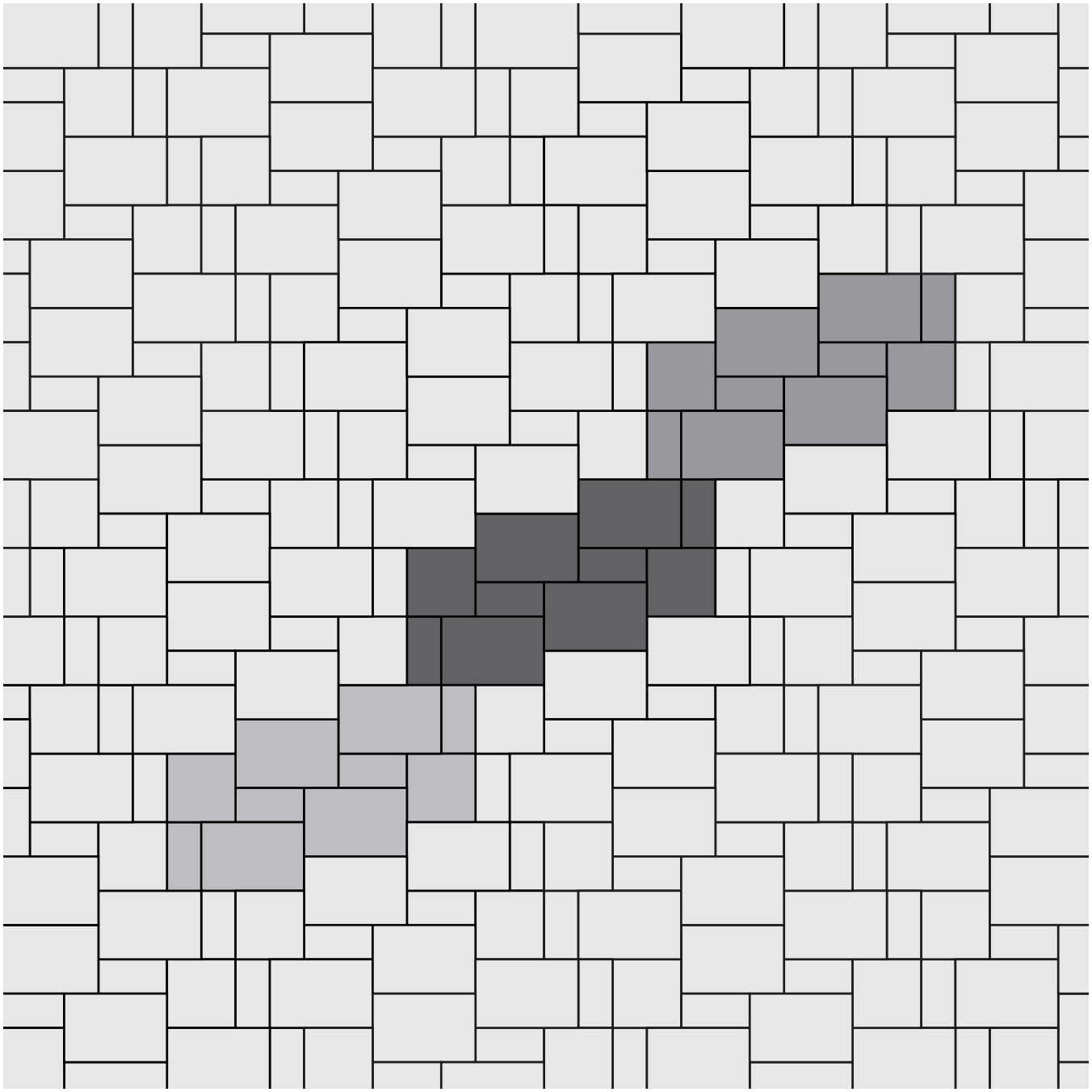
3-PIECE PATTERN A

NOTES:
AutoCAD® hatch pattern files can be downloaded from belgard.com for use in architectural drawings

Some patterns may not necessarily reflect the percentages of stone sizes within a particular pallet. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

Percentages are based on area by paver.

21% 3 x 6	21% 6 x 12	21% 9 x 18
23% 6 x 6	23% 12 x 12	23% 18 x 18
56% 6 x 9	56% 12 x 18	56% 18 x 27



ORIGINS™ 3-PIECE

3-PIECE PATTERN B

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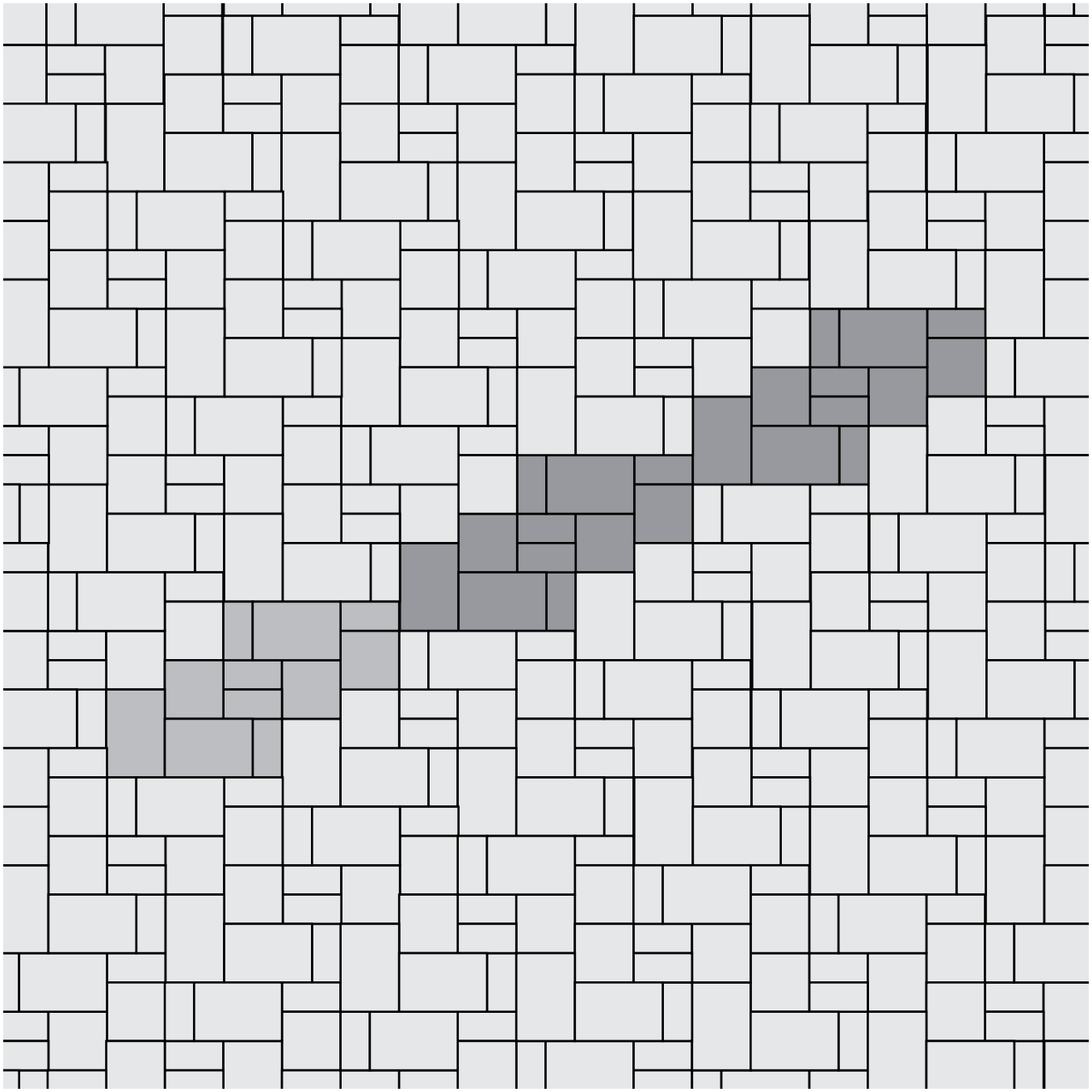
Percentages are based on area by paver.

21% 3 x 6	21% 6 x 12	21% 9 x 18
23% 6 x 6	23% 12 x 12	23% 18 x 18
56% 6 x 9	56% 12 x 18	56% 18 x 27



ORIGINS™ 3-PIECE

3-PIECE PATTERN C

21% 3 x 6	21% 6 x 12	21% 9 x 18
23% 6 x 6	23% 12 x 12	23% 18 x 18
56% 6 x 9	56% 12 x 18	56% 18 x 27

NOTES:
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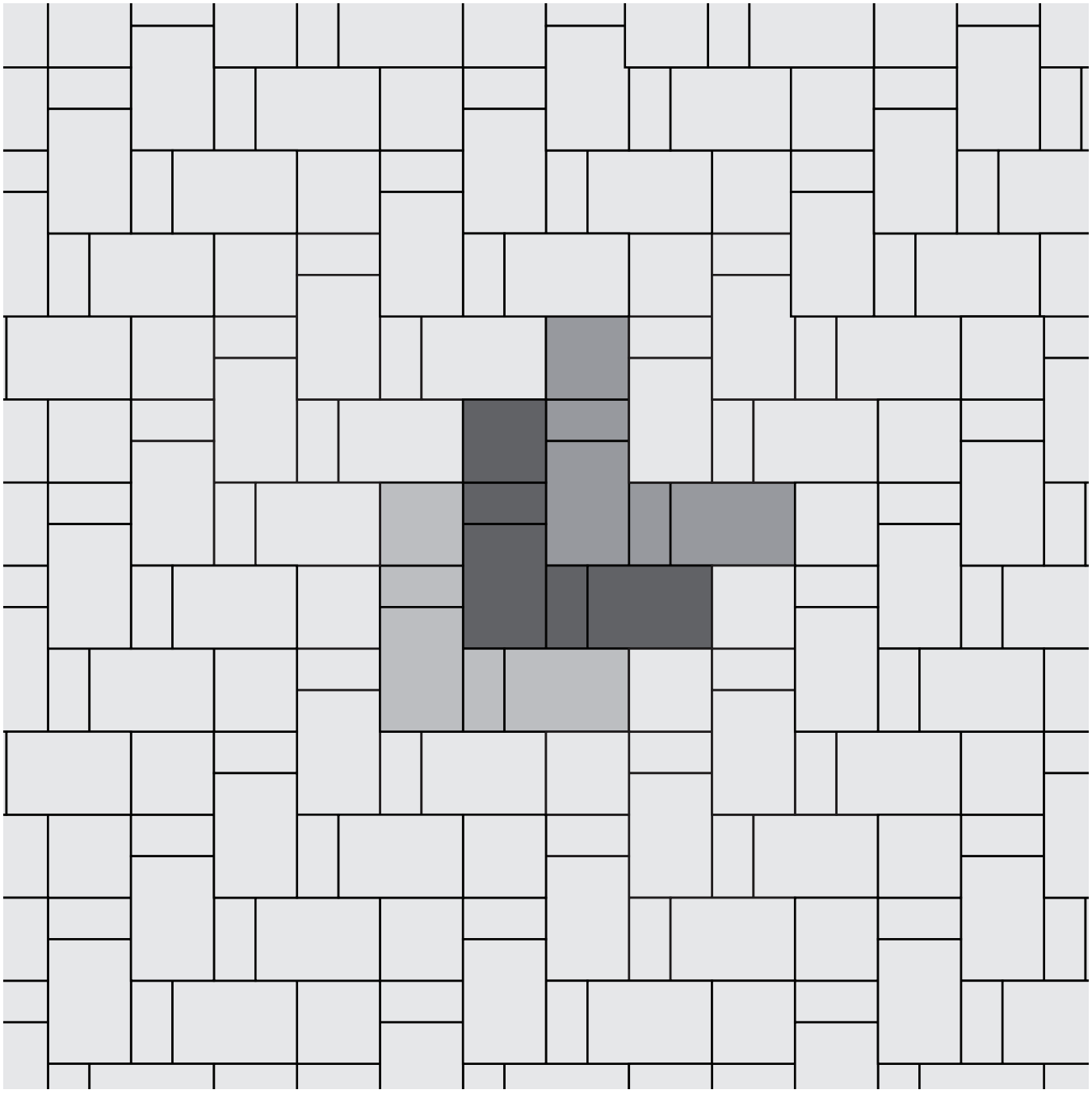


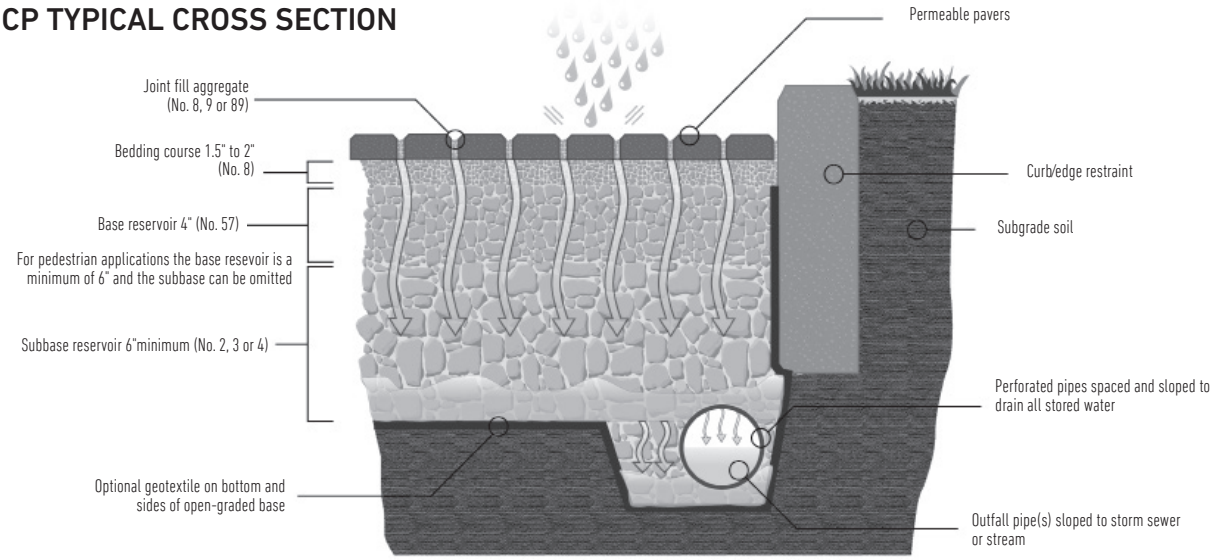
PERMEABLE PAVERS

PERMEABLE PAVER INSTALLATION GUIDE

PERMEABLE PAVERS

PERMEABLE INTERLOCKING CONCRETE PAVEMENT (PICP)

PICP TYPICAL CROSS SECTION



SITE EVALUATION

When evaluating a site, the following characteristics should be considered:

- Runoff from contributing at-grade impervious areas does not exceed five times the area of the PICP receiving the runoff.
- The estimated depth from the bottom of the pavement base, for full or partial infiltrations systems, to the seasonal high level of the water table is greater than 2 feet (0.6 m). Greater depths may be required to obtain additional filtering of pollutants through the soil.
- PICP is down slope from building foundations and the foundations have piped drainage at the footers. Waterproofing such as an impermeable liner is recommended on basement walls against PICP.
- The slope of the permeable pavement surface is at least 1 percent and no greater than 12 percent.
- At least 100 feet (30 m) should be maintained between PICP and water supply wells. (Local jurisdictions may provide additional guidance or regulations.)

BASIC PICP SYSTEMS

PICP can be built with full, partial or no infiltration of the open-graded stone base into the soil subgrade.

Full Infiltration

Full infiltration directs water through the base/subbase and exfiltrates it to the soil subgrade. This is the most common application over high infiltration soils such as gravels and sands. Overflows are managed via perimeter drains to swales, bioretention areas, or storm sewer inlets.

Partial Infiltration

Partial infiltration relies on drainage of the base/subbase into the subgrade soil and drainage pipes to direct excess water to a rain garden or storm sewer. This controls the amount of time the subgrade is saturated. This design is common to lower infiltration rate soils such as silts and clays.

Perforated drain pipes are typically raised some inches (cm) above the soil subgrade to allow some water capture and infiltration into the soil subgrade below them. When the water level rises to the pipes it drains away through them.

No Infiltration

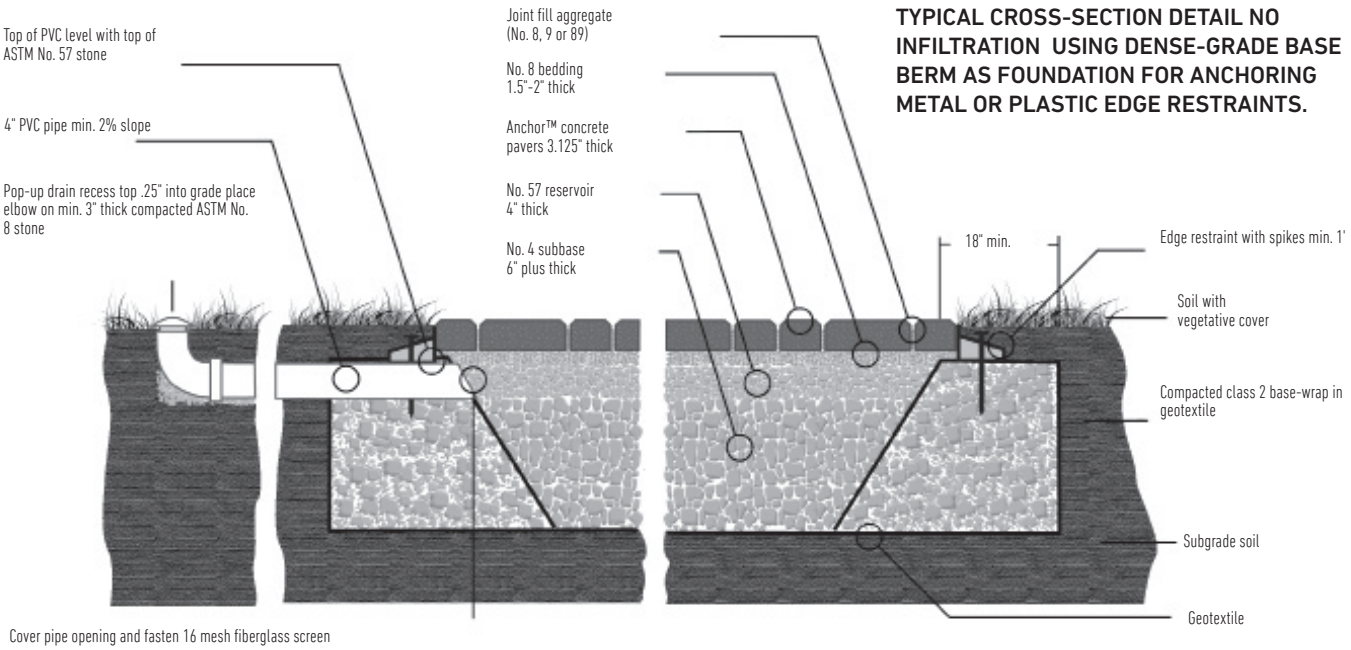
This is required when the soil has very low permeability or low strength, or there are other site limitations. The assembly performs like a detention pond with an outlet.

CONSTRUCTION OVERVIEW

Excavate to the proper depth as required based on engineered design. ICPI minimum would be 2 inches No. 8 bedding courses, 4 inches No. 57 base and a minimum of 6 inches No. 2 subbase. If equipment needs to traverse the bottom of the excavation, tracked vehicles can reduce the risk of soil compaction.

Compacted soil can be remedied by scarifying to increase its infiltration. This is done by back-dragging loader bucket teeth across the soil prior to placing the aggregate subbase. This loose layer will receive subbase or base aggregate compacted into it to reduce the risk of surface settlement.

PERMEABLE INTERLOCKING CONCRETE PAVEMENT (PICP)



TYPICAL CROSS-SECTION DETAIL NO INFILTRATION USING DENSE-GRADE BASE BERM AS FOUNDATION FOR ANCHORING METAL OR PLASTIC EDGE RESTRAINTS.

Cover pipe opening and fasten 16 mesh fiberglass screen

INSTALL GEOTEXTILES, IMPERMEABLE LINERS AND DRAIN PIPES IF REQUIRED IN THE PLANS AND SPECIFICATIONS

Geotextiles are used in some permeable pavement applications per the design engineer. If there are no concrete curbs and soil is restraining the sides of the base/subbase at its perimeter, then geotextile should be applied to prevent lateral migration of soil into the base/subbase aggregates. Geotextile is applied vertically against the soil with at least 1 foot (0.3 m) extending horizontally under the subbase and resting on the soil subgrade. A minimum 1-foot (0.3 m) overlap is recommended in stronger subgrade soils and 2-feet (0.6 m) overlap on poor-draining weaker soils (CBR<5%).

Drain pipes are installed according to plans and specifications and should be rigid PVC. Designs should have curb cut-outs or drain pipes from the PICP entering swales or storm sewer catch basins to handle overflow conditions.

Use 13,500 lbf (60 kN) plate compactor minimum two passes.

Place and compact the aggregate subbase

Subbase material should be spread in minimum 6-inch (150 mm) lifts. Compaction is typically done with a 10 ton (9 T) steel vibratory roller or a 13,500 lbf (60 kN) plate compactor. Greater lift thicknesses are normal (e.g., 12 inch or 0.3 m) when using either of these compactors. When using a roller, the first two passes are in vibratory mode and the last two are in static mode. Compaction is completed when no visible movement can be seen in the base when rolled by the compactor.

INSTALL CURBS OR OTHER EDGE RESTRAINTS

For pedestrian areas and residential driveways, an edge restraint option is using compacted, dense-graded berms around PICP base perimeter with plastic or metal edging fastened to their surface. The dense-graded base is a foundation for metal or plastic edging secured with steel spikes. These edge restraints are installed on the dense-graded berms in a manner identical to those on interlocking concrete pavement driveways. The edge restraint contains some of the bedding layer such that at least the bottom half of the pavers is also contained by the edging.

Place and compact the aggregate base

The ASTM No. 57 base layer is spread and compacted as one 4-inch (100 mm) lift. Like the subbase aggregate, the initial passes with the roller can be with vibration to consolidate the base material or a plate compactor also

can be used to compact the No. 57 base layer. Surface tolerance of the compacted No. 57 stone shall be ± 3⁄4-inch (19 mm) over a 10 feet (3 m) straightedge.

Place and screed the bedding layer

When subbase and base lifts are compacted the surface should then be topped with a 1 1⁄2- to 2-inch (50 mm) thick layer of No. 8 crushed stone bedding. This layer is screeded and leveled over the No. 57 base. Metal rails are placed on the compacted No. 57 layer and are used to guide screeding elevations. The surface tolerance of the screeded No. 8 bedding material should be ±3⁄8-inch over 10 feet (±10 mm over 3 m). Install the pavers manually or with mechanical installation equipment.

Manually screeding the No. 8 stone setting bed.

Geotextiles are used in some permeable pavement applications per the design engineer. If there are no concrete curbs and soil is restraining the sides of the base/subbase at its perimeter, then geotextile should be applied to prevent lateral migration of soil into the base/subbase aggregates. Geotextile is applied vertically against the soil with at least 1 foot (0.3 m) extending horizontally under the subbase and resting on the soil subgrade. A minimum 1-foot (0.3 m) overlap is recommended in stronger subgrade soils and 2-feet (0.6 m) overlap on poor-draining weaker soils (CBR<5%).

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PICP paver compaction shows that pavers need to be set about 3/4-inch (19 mm) above their final elevation before compaction and 3/8-inch (10 mm) after compaction to account for downward movement.

After screeding the bedding material, the pavers are placed on this layer. Paver installation can be by hand or with mechanical equipment. Border courses consisting of mostly whole (uncut) pavers are typically used against curbs at PICP edges and at transitions to other pavement surfaces. Paving units abutting border courses should be cut to fill spaces prior to compaction. Cuts should provide gaps around the entire perimeter of the stone that are consistent with the typical joint size — this will allow for proper interlock between units and prevent direct paver-on-paver contact. Cut units should be no smaller than one-third of a whole unit if subject to vehicular traffic.

Fill the paver joints and sweep the surface clean

The paver joints are filled with ASTM No. 8, 9 or 89 stone. Depending on the PICP area, spreading and sweeping can be done with shovels and brooms, or larger areas with machines, sweeping into the paver joints with powered brooms or sweepers. Once the joints are full (within 1⁄4-inch or 6 mm of the paver surface), the surface must be swept clean prior to compaction as loose stones on the surface can mar the pavers when in contact with a plate compactor.

Compact the pavers

After the PICP surface is swept clean, compact it with a plate compactor. Make a minimum of two passes with the second pass in a perpendicular direction from the first pass. The plate compactor should exert a minimum 5,000 lbf (22 kN) at
75-90 Hz.

Top up joints with joint filling stone as needed and sweep the surface clean

Compaction can cause some settlement of the aggregates inside the joints. If the aggregates are more than 1⁄4-inch (6 mm) from the paver surface, they should be topped up to this level with additional aggregates.

Additional resources and technical specifications online at www.icpi.org.
Source: ICPI Tech Spec, issue number 18

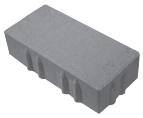
AQUALINE™ SERIES

ENVIRONMENTAL COLLECTION

PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓	✓		✓	

SHAPES & SIZES

4½x9



4½ x 9 x 3⅛

9x9

9 x 9 x 31/8

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	LNFT/ PALLET (SOLDIER)	LNFT/ PALLET (SAILOR)	WEIGHT/ PALLET
			4½X9				
4½ X 9 X 3⅛	90	11.25	–	352	63	–	3170
			9X9				
9 X 9 X 3⅛	–	–	–	–	30	–	–

AQUALINE™ SERIES

1-PIECE BASKET WEAVE PATTERN

100% 4½ x 9 x 3⅛

NOTES:
AutoCAD® hatch pattern files can be downloaded from belgard.com for use in architectural drawings

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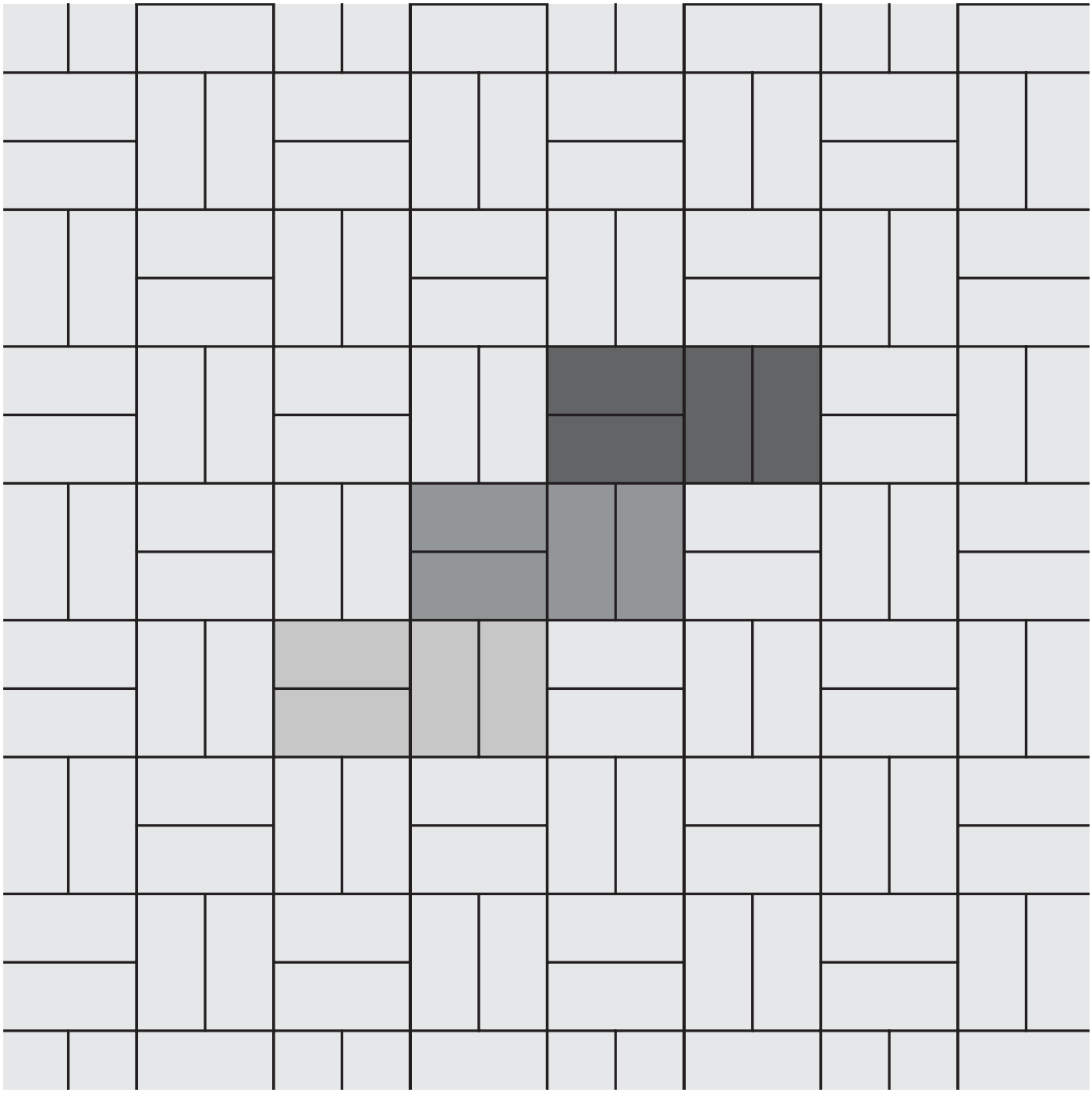
Percentages are based on area by paver.



AQUALINE™ SERIES

1-PIECE HERRINGBONE PATTERN

100% 4½ x 9 x 3⅛

NOTES:
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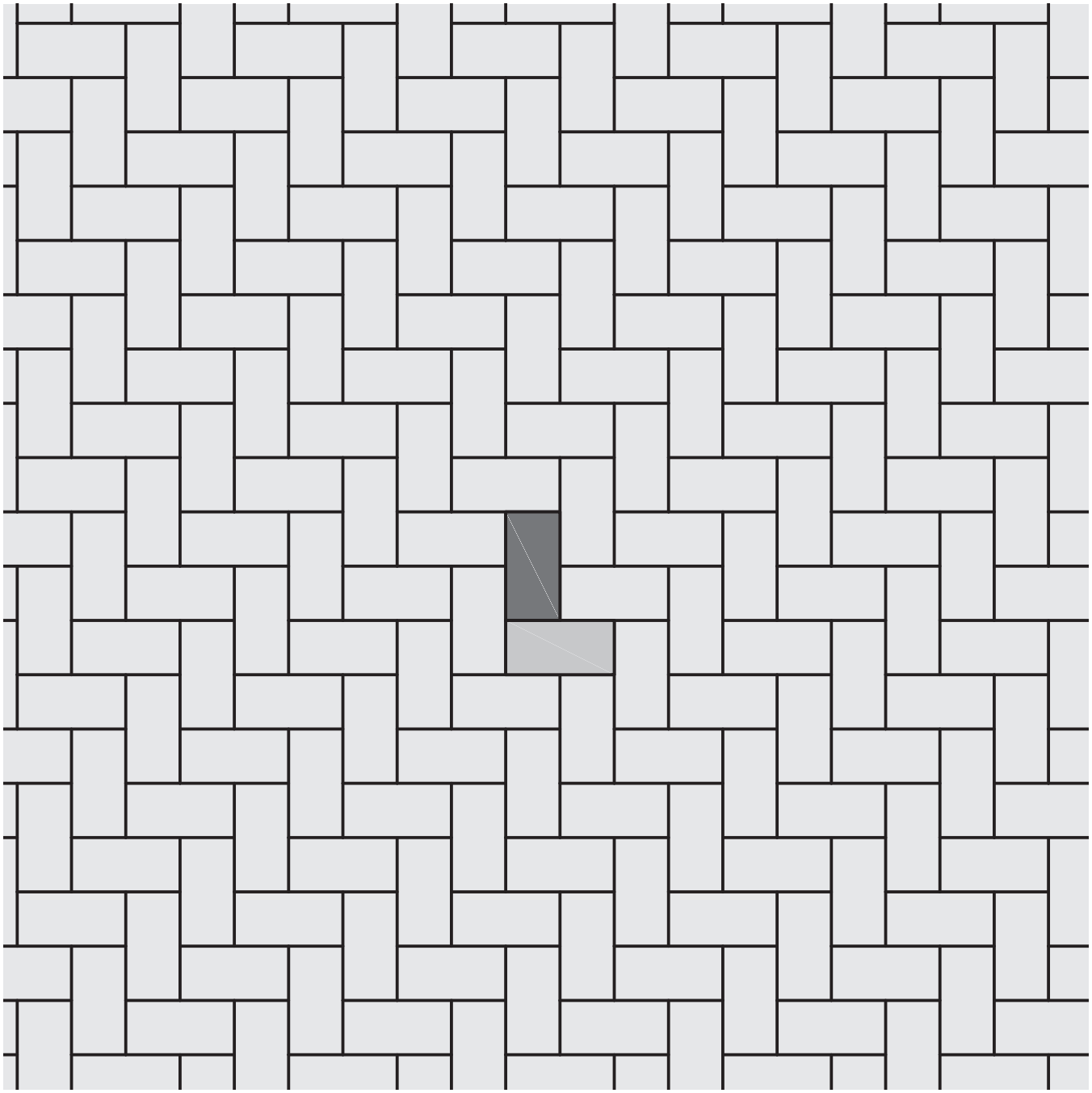
Percentages are based on area by paver.



AQUALINE™ SERIES

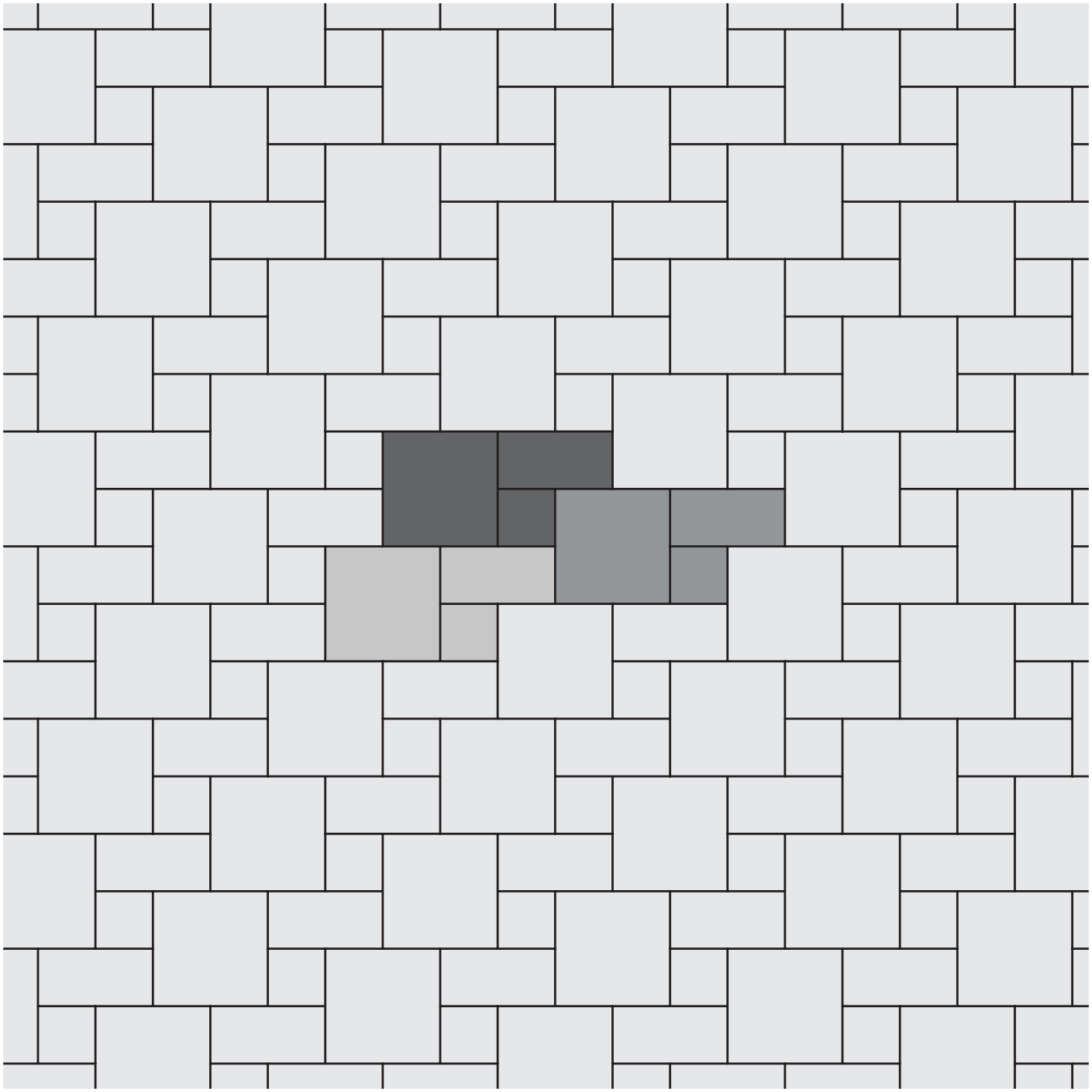
3-PIECE BOX PATTERN

14% 4½ x 4½ x 3⅛
29% 4½ x 9 x 3⅛
57% 9 x 9 x 3⅛

NOTES:
AutoCAD® hatch pattern files can be downloaded from belgard.com for use in architectural drawings

Some patterns may not necessarily reflect the percentages of stone sizes within a particular pallet. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

Percentages are based on area by paver.



TURFSTONE™

PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓	✓		✓	

SHAPES & SIZES

80mm

15¾ x 23⅝ x 3⅛

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	LNFT/ PALLET (SOLDIER)	LNFT/ PALLET (SAILOR)	WEIGHT/ PALLET
TURFSTONE™ 80MM							
15¾ X 23⅝ X 3⅛	107	13.375	8	40	–	–	2900

TURFSTONE™

1-PIECE STACK BOND PATTERN

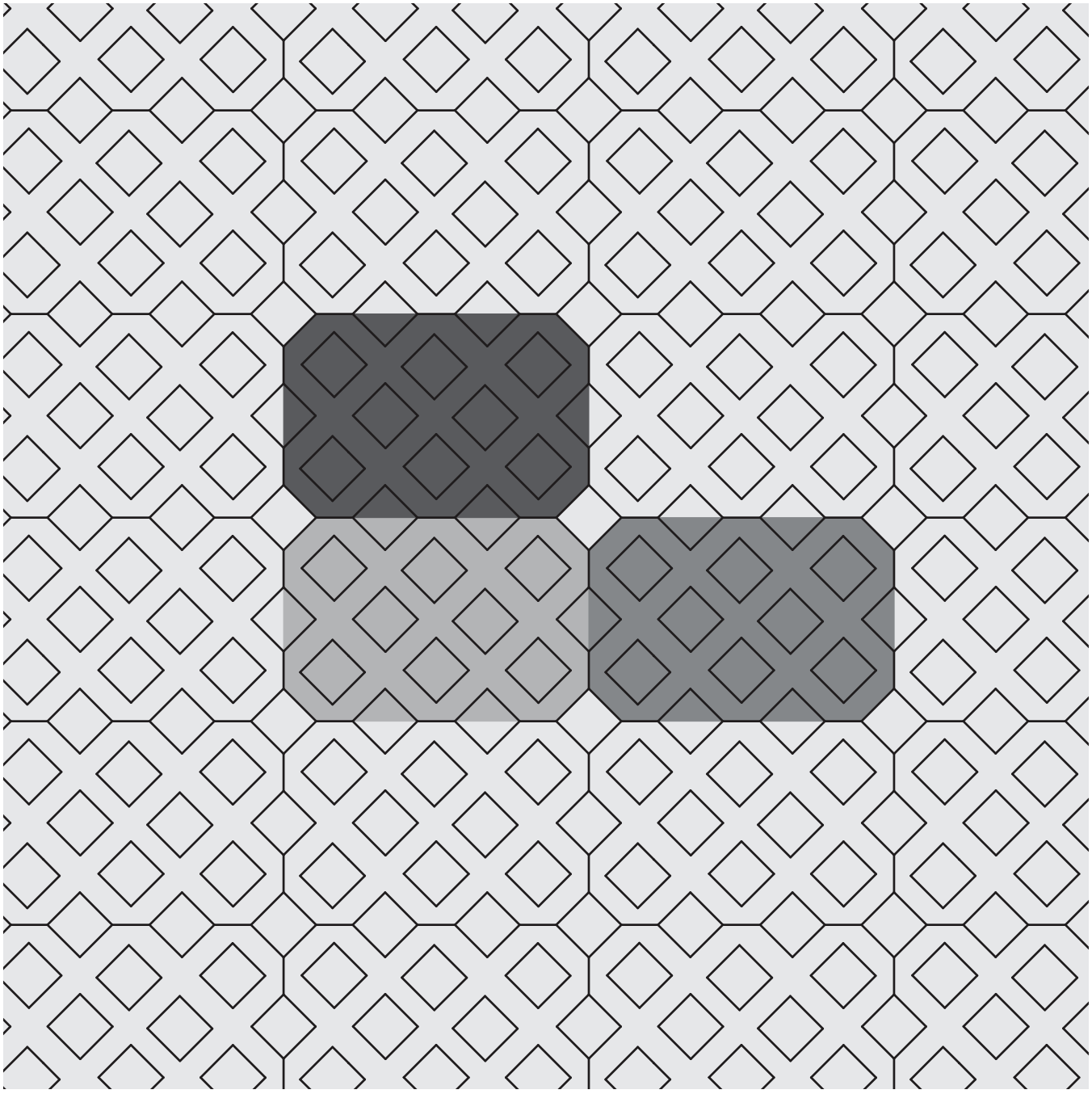
NOTES:
AutoCAD® hatch pattern files can be downloaded from belgard.com for use in architectural drawings

Some patterns may not necessarily reflect the percentages of stone sizes within a particular pallet. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

Percentages are based on area by paver.

100% 15¾ x 23⅝ units

Must install with joints facing up



TURFSTONE™

1-PIECE STAGGERED RUNNING BOND PATTERN

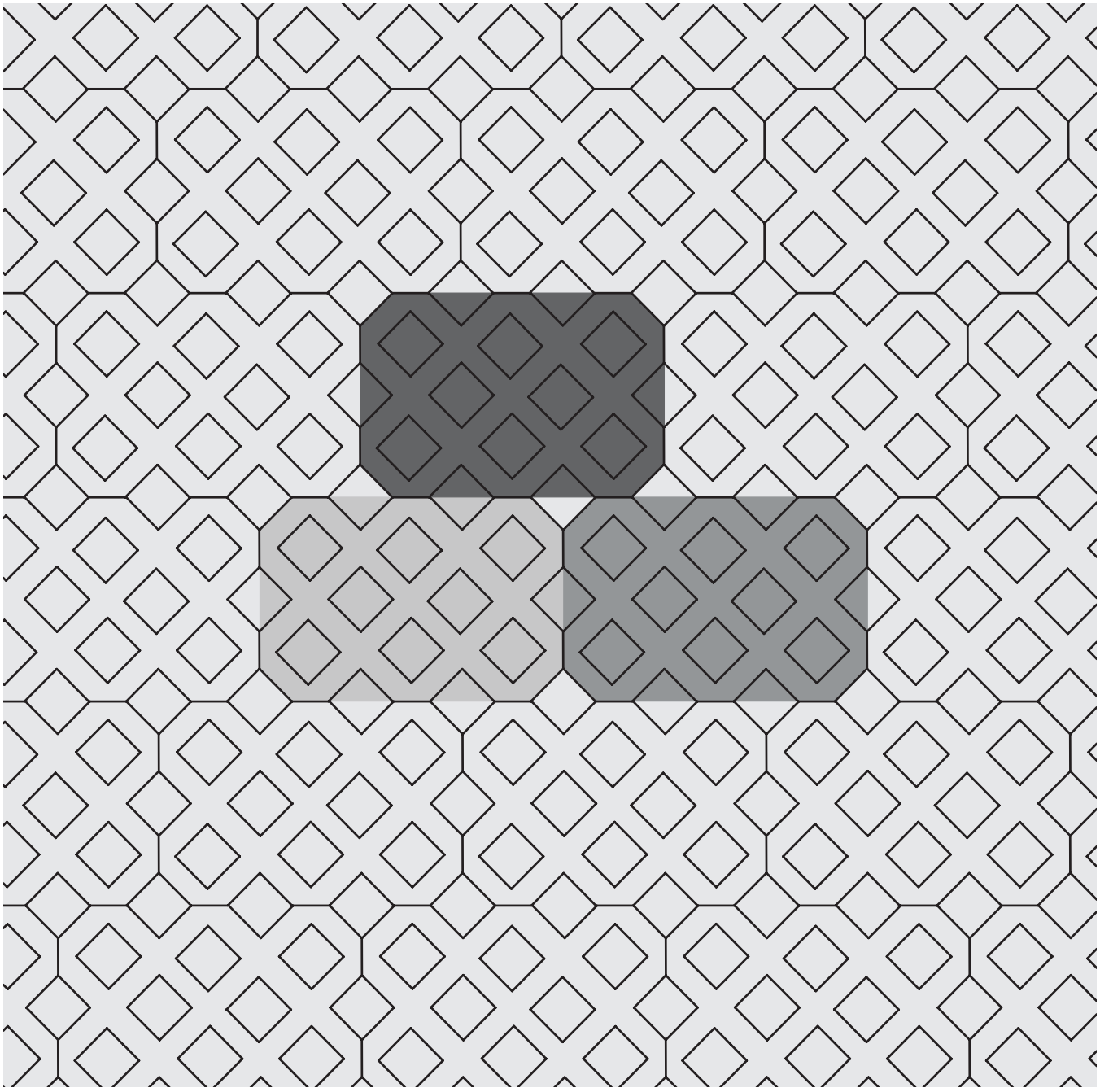
NOTES:
AutoCAD® hatch pattern files can be downloaded from belgard.com for use in architectural drawings

Some patterns may not necessarily reflect the percentages of stone sizes within a particular pallet. In some cases you may have extras in one or more of the sizes. This must be accounted for in your planning and design.

Percentages are based on area by paver.

100% 15¾ x 23⅝ units

Must install with joints facing up



PORCELAIN PAVERS & PLANKS

PORCELAIN INSTALLATION GUIDE

PORCELAIN PAVERS & PLANKS

PORCELAIN PAVERS

Belgard Porcelain Pavers are formed by pressing, followed by vitrification: this process involves the total fusion into a single material made from natural raw materials (sand, quartz, feldspars, kaolin, clays and inorganic pigments) which, fired at temperatures above 1226.67° C (2240° F), are transformed into a product with exceptional hardness, ultra-low absorption rate and unmatchable mechanical characteristics. Belgard porcelain pavers are eco-compatible and ecolabel-certified. Each unit is 20mm (0.7874") standard thickness or ¾" nominal thickness and is durable enough to withstand use in exterior applications.

PORCELAIN PAVERS ADVANTAGES:

- Freeze thaw resistant—They are 100% frost-free and their properties remain unaltered at temperatures ranging from -51.1° to + 60° C (-60° F to +140°F).
- Color durability—Color is fused by vitrification, becomes an integral part of the porcelain surface and is not affected by elements.
- Easy installation—Perfect fit and for fast installs.
- Low absorption rate—Spills, salt and other materials will not seep into pours.
- Easy to clean—Household cleaners can be used to wipe down spills and dirt; can even be pressure washed with a low pressure washing device* (see pressure washing warning below).*
- Stylish—Matches what homeowners are currently doing inside the home.
- Durable—High breakage loads of up to 3,587 lbs (1,627 kg) per foot based on ASTM-C648.
- Resistant— High compressive strength and ultra-low absorption rate creates a dense surface that resists mold, moss, dirt and other staining.
- Skid-resistant—Structured paver top textures create slip resistant surfaces for safety; perfect for around pools/spas or in wet climates.
- Modular Design—Superior accuracy in dimensional sizing and linear sides, the slabs allow for perfectly executed installations with tight and accurate lines.
- Light weight—16.8 kg (37 lbs) for the 24"x24" paver permit for easy installation, removal and serviceability and even reusability (Excluding adhered installations).
- Available in colors that have an SRI that qualifies for a LEED certification. The SRI on some units ranges between 60-80. To receive LEED credit, the SRI must be at least 29.
- Impermeable— Deicing salt and other deicing materials can be used without concern of damage.

* It is important that all pressure washing of your porcelain pavers be done with a low pressure washer with a maximum of 1600 psi and nothing more powerful. When pressure washing your installation, care should be taken to prevent damage to the grout (adhesive and grout installations) and some re-sanding will be necessary when power washing an installation with sand or polymeric sand joints.

SPECIALTY TOOLS FOR PORCELAIN PAVER CONSTRUCTION:

- Wet cut tile saw equipped with a diamond blade manufactured for wet cutting porcelain. The saw should be designed to safely cut a 24 inch length porcelain paver.
- A paver clamp for easy handling, which can be used to both install and remove pavers.
- The use of gloves is highly recommended while handling and installing porcelain slabs.
- Appropriate notched trowels and grout float tools for cementitious adhesive and grout installation. The appropriate tool selection would be based on the adhesive and grout manufacturer's recommendation
- Pallets of porcelain pavers are manufactured and shipped with a Heavy Duty plastic protective pallet cover and the individual porcelain pavers are packaged in protective card board boxes. To prevent damage to your pavers, do not remove the protective card board boxes until you are ready to install them.
- Caution: Removing pavers from their protective packaging and handling multiple loose stones together creates the possibility for chipping.

Once the Heavy Duty plastic pallet covers have been removed from the pallet, the unused boxed pavers should be protected from the elements to insure the integrity of the protective cardboard boxes.

CLEANING & MAINTENANCE FOR PORCELAIN PRODUCTS

Post-laying cleaning is obligatory after on site works. Inadequate or late removal of the grouting used on the joints can leave marks difficult to remove and create, on the flooring, a cement film able to absorb all types of dirt, thus giving the impression that it is the material that has become dirty.

It is indispensable to dissolve and remove these residues completely using buffered acids diluted in water (follow the instructions on the packs of the products used), which must then be removed completely and quickly, rinsing the floor with plenty of water to avoid residues or drops on the floor which could damage the tiles.

Allow the product to act on the wet floor, without letting it dry and rubbing it with colorless rags. Next, rinse it thoroughly with water to ensure that the floor is free of detergent residues. If necessary, repeat the operation.

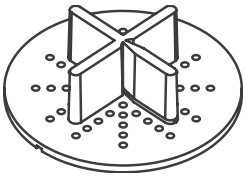
We suggest performing a preliminary wash on a sample surface of a few square meters; if the test is successful, extend clearing over the entire surface. When you have done the above wash, carry out a basic or alkaline wash using degreasing detergents. This is because acid can leave grease on the floor, which could contribute to retaining dirt.

PORCELAIN PAVER INSTALLATION

Each of the following option details will include specific information relative to the selected installation. Base thicknesses vary between different geographical and climatic locations and the contractor will be installing typical base thicknesses for paving installations in their location.

Installing porcelain pavers requires the bedding course sand to be pre-compacted and then struck off with a screed to the required thickness as shown in the detail drawings. The porcelain pavers are not compacted and therefore the sand layer beneath them requires pre-compaction. Do not compact dry sand, but insure the sand has a 5 to 6% moisture content so that it will compact cohesively and allow for a smooth strike off finish.

INSTALLATION INFORMATION THAT MUST BE FOLLOWED :

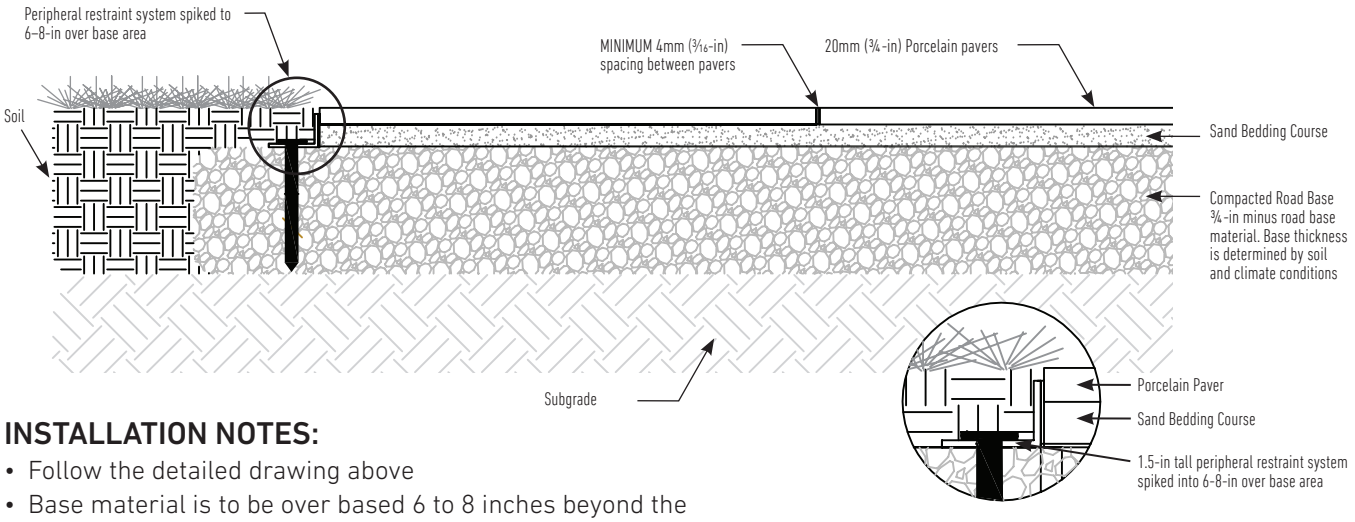


4mm spacers

- NEVER compact porcelain pavers with a plate compactor.
- ALWAYS pre-compact and strike off your sand leveling course before installing your porcelain pavers in sand set installations.
- Porcelain pavers should only be wet cut with a tile saw equipped with a wet cut porcelain blade.
- NEVER install porcelain pavers without the required 4mm spacing between them. The porcelain pavers should never be installed with a porcelain to porcelain contact. Plastic 4mm spacers (shown at right) should be used on Sand Set and Permeable installations. The photo on the left illustrates the spacer installed in a perspective to support and space 4 paver corners and the photo on the right illustrates the installed spacer snapped apart (as designed) to form Space T that supports 2 paver corners. This versatility will permit your porcelain pavers to be installed in a stack bond pattern, a running bond patterns as well as a flush installation against another structure.

- For a 100 sf. project, approximately 34 spacers are needed; this allows for overages if needed.

SAND SET OVER COMPACTED ROAD BASE INSTALLATION (PEDESTRIAN FOOT TRAFFIC)

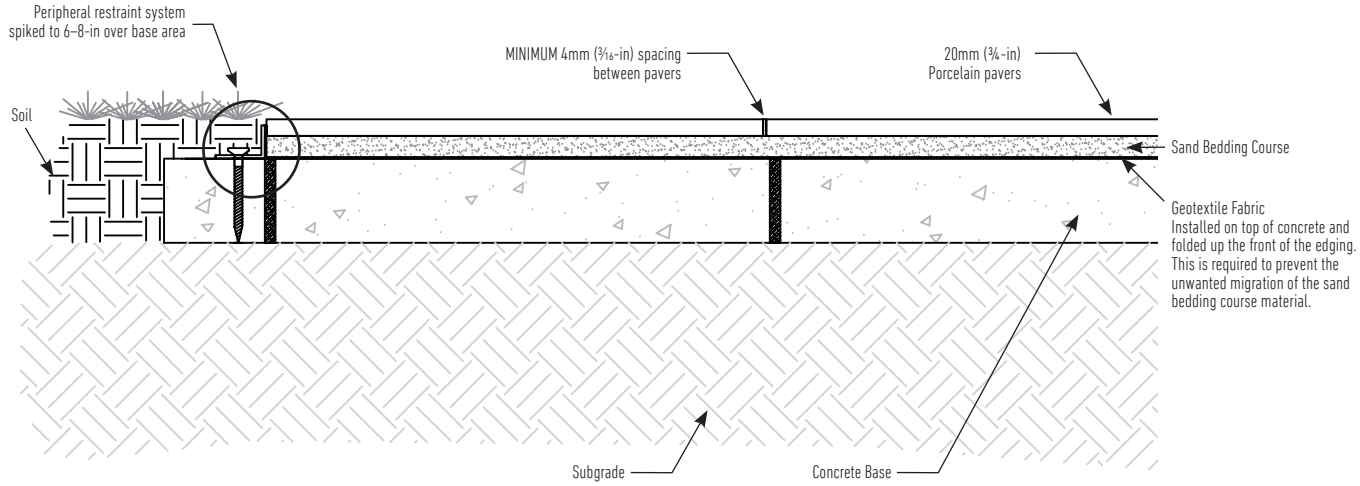


INSTALLATION NOTES:

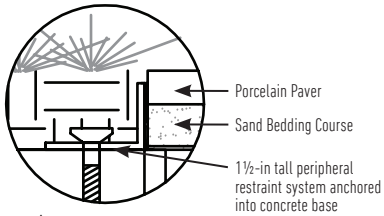
- Follow the detailed drawing above
- Base material is to be over based 6 to 8 inches beyond the edge of the pavement.
- Precompact the sand bedding course and screed to 1-in thickness with smooth surface
- The required edge restraint system is a low profile edge restraint with a vertical height of 1½-in as shown in the drawing.
- Insure that pavement is constructed with a 1 ½ to 2% slope that it is pitched away from any building.
- Insure the plastic 4mm spacers are installed at all corners of the installed pavers.

Belgard porcelain pavers can also be installed as a permeable system. Replace sand with 2 inch thick bedding course or 3/8 inch crushed open grade aggregate. Replace 3/4 minus base with 3/4 crushed open grade aggregate

SAND SET OVER CONCRETE OVERLAY INSTALLATION (PEDESTRIAN FOOT TRAFFIC)

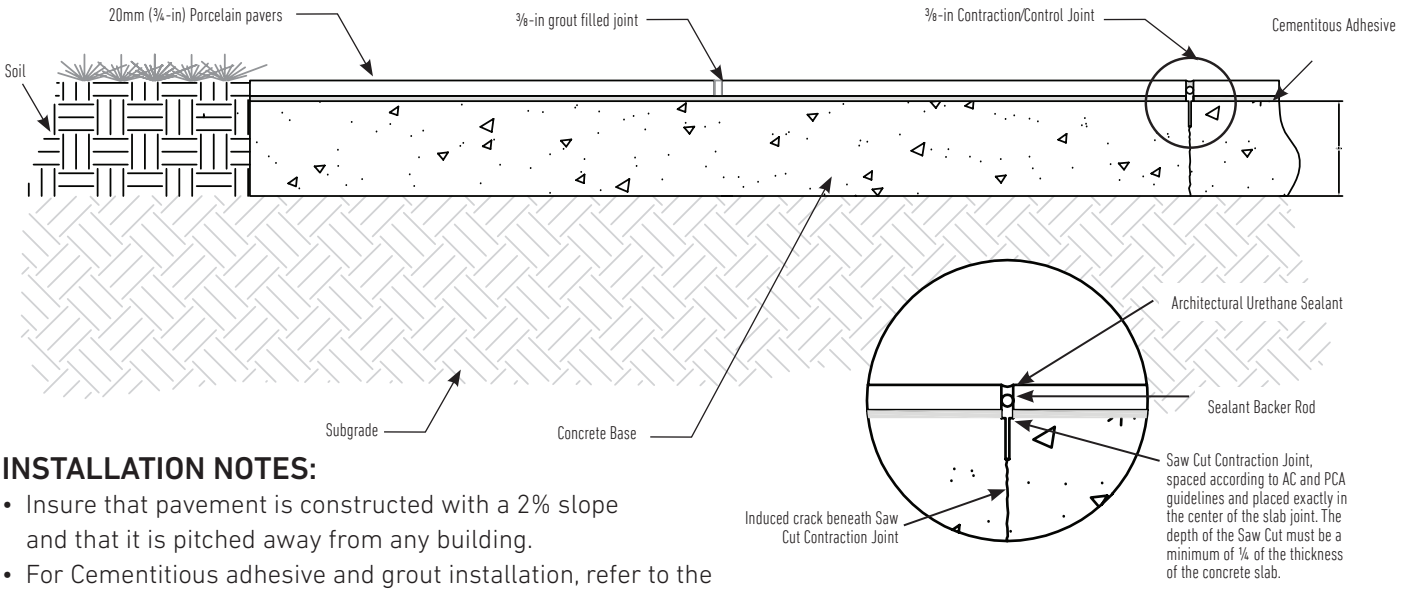


INSTALLATION NOTES:



- The required edge restraint system is a low profile edge restraint with a vertical height of 1½ inches as shown in the drawing.
- Precompact the sand bedding course and screed to 1-in thickness with smooth surface
- Mechanically anchor edge restraint into the concrete base.
- Insure geotextile is installed directly on top of the concrete to contain the bedding sand.
- Insure that pavement is constructed with a 1½ to 2 percent slope and that it is pitched away from any building.
- Insure the plastic 4mm spacers are installed at all corners of the installed pavers.

CEMENTITIOUS ADHESIVE OVERLAY, CONCRETE BASE INSTALLATION (LIGHT VEHICULAR TRAFFIC)



INSTALLATION NOTES:

- Insure that pavement is constructed with a 2% slope and that it is pitched away from any building.
- For Cementitious adhesive and grout installation, refer to the manufacturer's technical instructions and specifically as they relate to outdoor installations.
- For concrete foundation slabs that are not large enough to require contraction / control joints, a minimum 4mm (⅛" to 3⁄16") grout joint is acceptable, but for larger concrete foundation slabs that do require contraction / control joints, the joint width should be a ⅜". It is absolutely imperative that all contraction / control joints be located in the joint line of installed porcelain pavers and not beneath a paver.
- Caution: If a Porcelain Paver is installed over a control joint, the paver will reflectively crack along the contraction / control joint beneath it.

GLOCAL

PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓	✓*			

**Porcelain must be wet laid on concrete and concrete must be designed by an engineer to support the traffic load that will be imposed.*

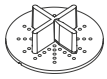
**Only available for the 24 x 24 size.*

SHAPES & SIZES

24 X 24

23.54 x 23.54 x ¾

Spacers are recommended for all porcelain paver installations. PLEASE NOTE: For vehicular applications, must be a mortar install over a concrete slab. Please refer to the MIRAGE install guide for driveway install procedure.



UNIT	SQFT/ PALLET	PCS/ BOX	SQFT/ BOX	BOXES/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
GLOCAL							
23.54 X 23.54 X ¾	232.5	2	7.75	30	–	–	2160

MIRAGE®
Porcelain.Design.Sustainability

NOON

PORCELAIN COLLECTION

PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓				✓

SHAPES & SIZES

8 x 48

7.64 x 47.17 x ¾

Spacers are recommended for all porcelain paver installations. PLEASE NOTE: For vehicular applications, must be a mortar install over a concrete slab. Please refer to the MIRAGE install guide for driveway install procedure.

UNIT	SQFT/ PALLET	PCS/ BOX	SQFT/ BOX	BOXES/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
			8 X 48				
7.64 X 47.17 X ¾	151.8	2	5.06	30	–	–	1380

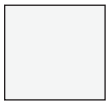
QUARZITI 2.0

PORCELAIN COLLECTION

PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓	✓			

SHAPES & SIZES

Quarziti 2.0



23.54 x 23.54 x ¾

UNIT	SQFT/ PALLET	PCS/ BOX	SQFT/ BOX	BOXES/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
QUARZITI 2.0							
23.54 X 23.54 X ¾	232.5	2	7.75	30	–	–	2160

MIRAGE®
Porcelain.Design.Sustainability

SPECIAL ORDER
SILVERLAKE

PORCELAIN COLLECTION

PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓	✓			

SHAPES & SIZES

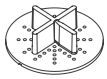
24 x 24

23.54 x 23.54 x ¾

24 x 48

23.54 x 47.17 x ¾

Spacers are recommended for all porcelain paver installations. PLEASE NOTE: For vehicular applications, must be a mortar install over a concrete slab. Please refer to the MIRAGE install guide for driveway install procedure.



UNIT	SQFT/ PALLET	PCS/ BOX	SQFT/ BOX	BOXES/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
SILVERLAKE							
23.54 X 23.54 X ¾	232.5	2	7.75	30	–	–	2160
23.54 X 47.17 X ¾	271.25	1	7.75	35	–	–	2621

MIRAGE®
Porcelain.Design.Sustainability

PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓				✓

SHAPES & SIZES

Verona™

23.54 x 23.54 x ¾

UNIT	SQFT/ PALLET	PCS/ BOX	SQFT/ BOX	BOXES/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
VERONA							
23.54 X 23.54 X ¾	232.5	2	7.75	30	–	–	2160

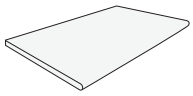
UNICO

PORCELAIN COLLECTION

PEDESTRIAN	LIGHT/REGULAR TRAFFIC	HEAVY TRAFFIC	PERMEABLE	ADA
✓				

SHAPES & SIZES

Unico



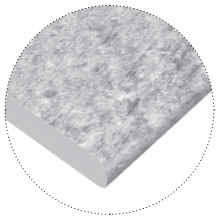
12.99 x 23.54 x ¾

UNIT	SQFT/ PALLET	PCS/ BOX	SQFT/ BOX	BOXES/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
UNICO							
12.99 X 23.54 X ¾	254.82	3	6.37	40	–	–	2080

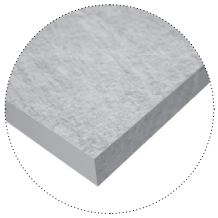
MIRAGE®
Porcelain.Design.Sustainability

Two installation needs a single solution. UNICO, size 12.99" x 23.51" x 3/4", is processed on both sides, on one side it has a rounded edge and on the other a square edge.

An extremely versatile special piece, which can be used both as a step and as a special piece for swimming pools, with bullnose edge or straight edge, both colored along the side.



ROUNDED EDGE



STRAIGHT EDGE

WALLS

WALL INSTALLATION GUIDE

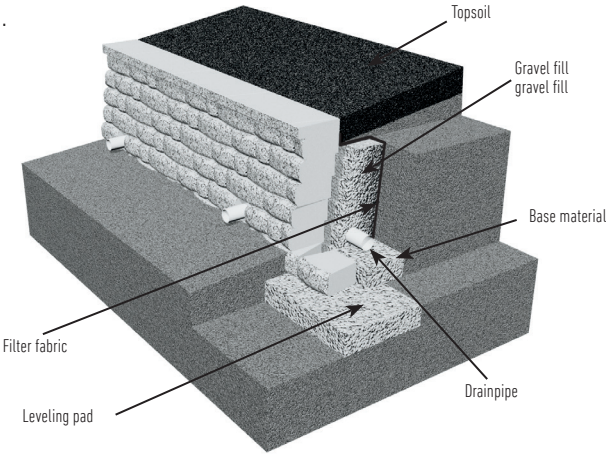
WALLS

SEGMENTAL RETAINING WALL TYPES

Segmental retaining walls typically fall into one of three categories.

GRAVITY RETAINING WALL

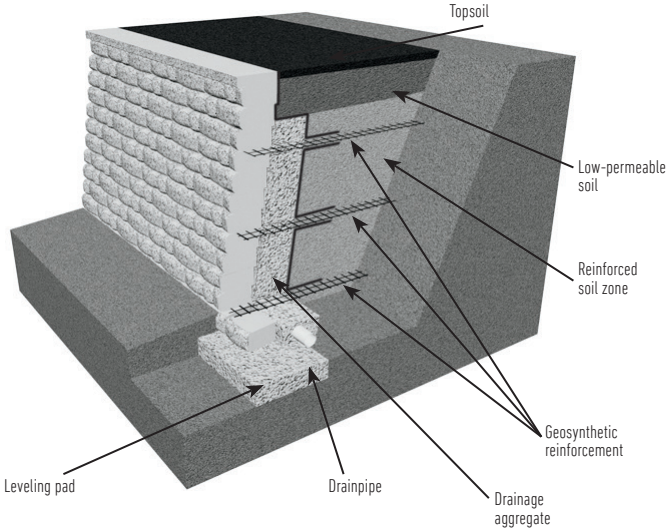
The first category — a gravity wall — is a retaining wall that does not use soil reinforcement. A gravity wall has height limitations specific to each product. An advantage of this type of retaining wall is that it requires a smaller work area behind the wall.
A gravity wall relies on the weight and setback of the block to resist the soil forces being exerted on the wall.



GEOSYNTHETIC-REINFORCED RETAINING WALL

The second category is a geosynthetic-reinforced wall, which needs to be designed by a qualified engineer. There are (theoretically) no height limitations with reinforced retaining walls, and they are used in larger applications. It requires more work area behind the structure.

The block of soil is stabilized by introducing reinforcement layers into the soil mass behind the facing units. The larger the stabilized soil mass, the more soil can be retained or held back. The geogrid in the soil extends past the theoretical failure plane and serves to create a large, rectangular mass of block and soil, restraining the retained soil.

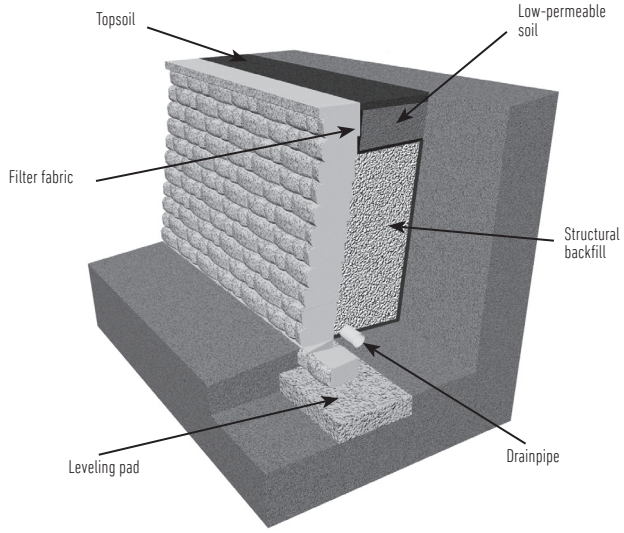


ANCHORPLEX® SYSTEM

The third category is the Anchorplex system, which offers a unique, non-conventional solution to problematic wall construction sites. It is a retaining wall built with Anchor™ products and structural backfill specified by Anchor Wall Systems, and backed by engineering support tools developed by Anchor.

Use of the Anchorplex system completely eliminates the need for the construction of a mechanically stabilized earth zone behind the wall facing and requires substantially less excavation than is usually necessary in geosynthetic-reinforced wall construction.

Contact Anchor Wall Systems at 1-877-295-5415 for more information about designing and building with the Anchorplex system.

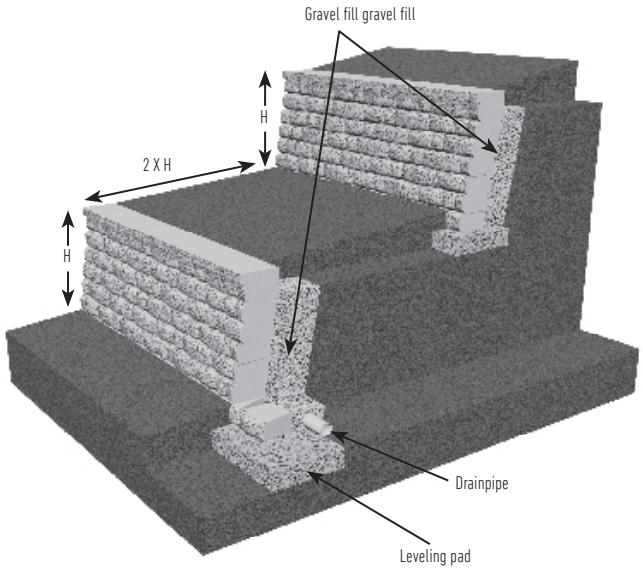


OTHER SEGMENTAL WALL APPLICATIONS

INDEPENDENT TERRACED WALLS

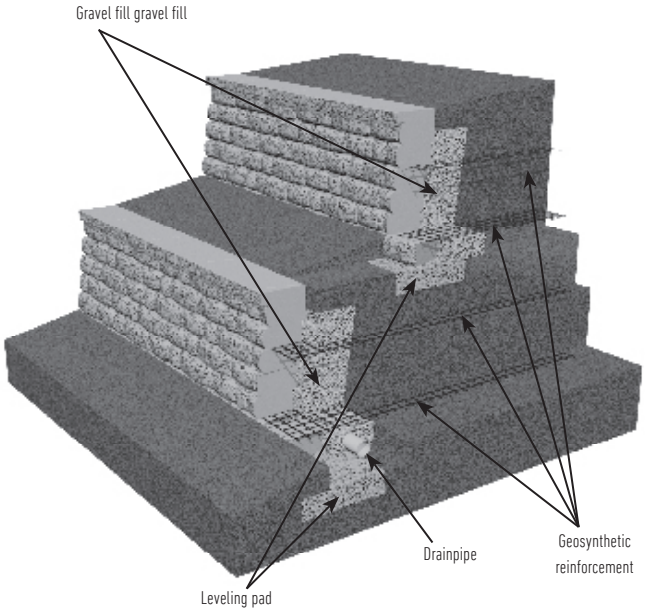
For each wall to be independent of others, they must be built using a 2:1 ratio: The upper wall must be built a distance away from the lower wall of at least twice the height of the lower wall. In addition, the upper wall must also be equal to or less than the height of the lower wall. Exceptions to this general rule include weak soil conditions or where slopes exist above, below or between wall locations. For example, if the lower terrace is 4 feet tall, the distance between the terraces must be at least 8 feet and the upper wall must not be higher than 4 feet.

Proper drainage is vital to maintaining stable, long-lasting terraced walls. A drainpipe must be installed so that the water is directed around or under the lower wall. Never place the drainpipe 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 into account, incorporating additional reinforcement — and longer layers — into the wall plan. In addition, structurally dependent walls require even more excavation, backfill and time. So plan ahead and be sure to check the wall plan for specific requirements. For structurally dependent walls, consult with a qualified engineer.

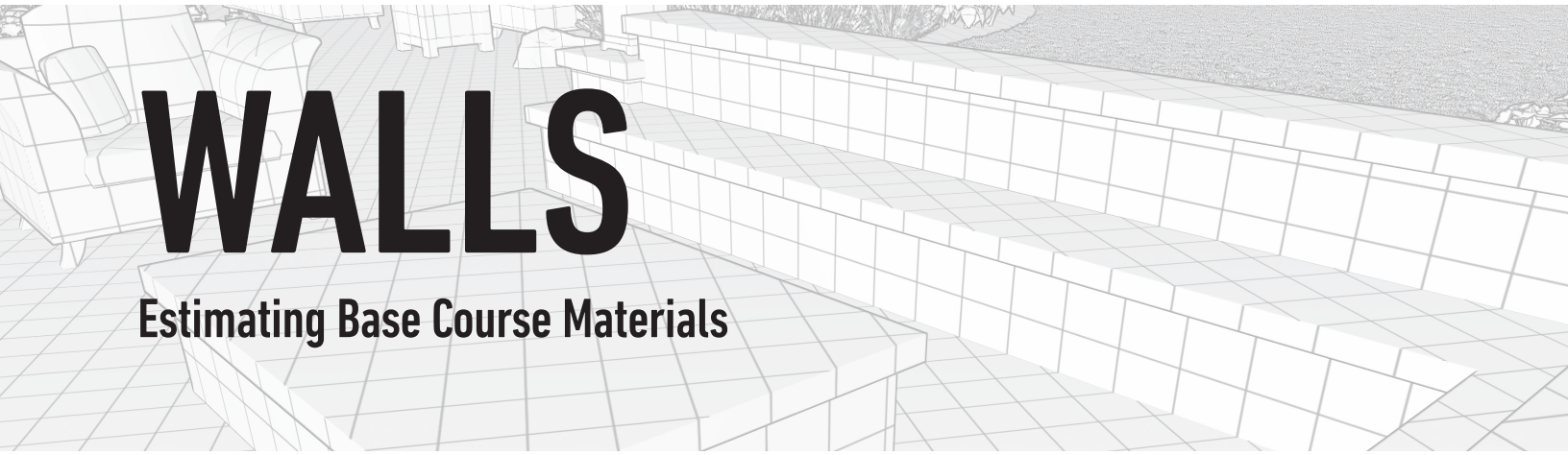


BEFORE YOU BEGIN

Advance planning and careful layout at the job site help ensure a successful retaining and freestanding wall project.

- Review the site plan to confirm lot lines, wall location, length and elevations.
- Understand on-site soils. Ideal soils are sand and gravel. For walls built in clay or poor soils, work with a local engineer to confirm the wall design and the required soil reinforcement. Black or organic soils should not be used as backfill.
- Confirm the location of underground utilities. Call 811.
- Seek all necessary building permits.
- Prepare a drawing of the site with the wall location, lengths and elevations.
- Plan drainage to avoid erosion or buildup of water behind the wall. Consider where the water will drain through the wall, where downspouts will expel and whether there's an underground sprinkler. For walls greater than three feet in height, a perforated drainpipe is recommended at the base of the aggregate to quickly remove large amounts of water.
- A best practice is to divert water away from the wall before it has an opportunity to enter the reinforced soil and gravel fill zone.
- Check the block delivered to ensure it is the correct product and color. Check the geogrids to confirm that it's the strength and weight specified in the engineering plans.
- Be sure to use the right tools. Hand tools include a shovel, 4-foot level, dead-blow hammer, 2- or 3-pound hammer, chisel, hand tamper, hydraulic splitter and string line. Power tools may include a circular saw with a diamond blade and a plate compactor.
- Always wear protective eye wear.

For additional wall installation references go to Belgard.com.



WALLS

Estimating Base Course Materials

1. HOW DO I ESTIMATING LEVELING PAD AGGREGATE?

Leveling pad aggregate is a compactible base material of ¾-inch minus (with fines). The leveling pad extends at least 6 inches in front of and behind the wall units and is at least 6 inches deep after compaction.

Wall length in feet (L) x width of trench in feet (W) ÷ 200 x depth of base in inches (D) x 1.25 = _____ tons.

2. HOW DO I ESTIMATE GRAVEL FILL?

Gravel fill gravel fill is clear 1-inch crushed stone (with no fines). The drainage column extends 12-inches behind the wall units. Wall length (L) in feet x total wall height (H) in feet = sq. ft. ÷ 27 x 1.1 = cubic yards (cu. yd.). cu. yd. x 1.6 = tons.

sq. ft. ÷ 27 x 1.1 = _____ cu. yd.

cu. yd. x 1.6 x 1.25 = _____ tons of aggregate with compensation for compaction.

BASIC INSTALLATION CONSTRUCTION GUIDE - RETAINING WALL

STAKE OUT THE WALL

- Have a surveyor stake out the wall's placement. Verify the locations with the project supervisor.

EXCAVATION

- Excavate for the leveling pad according to the lines and grades shown on the approved plans and excavate enough soil behind the wall for the geogrids material, if needed.
- The trench for the leveling pad should be at least 12 inches wider than the block you are installing and 6 inches deeper than the height of the block. *See Diagram 1.*

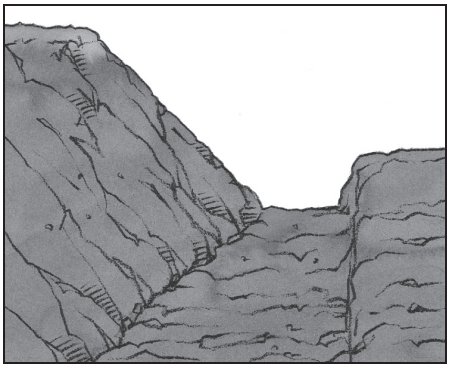


Diagram 1 – Excavation

LEVELING PAD

- An aggregate leveling pad is made of compactable base material of ¾-inch minus (with fines).
- The pad must extend at least 6 inches in front of and behind the first course of block and be at least 6 inches deep after compaction.
- If the planned grade along the wall front will change elevation, the leveling pad may be stepped up in 6-inch increments to match the grade change. Start at the lowest level and work upward whenever possible.
- Compact the aggregate and make sure it's level front to back and side to side. Mist lightly with water before compaction. *See Diagram 2.*

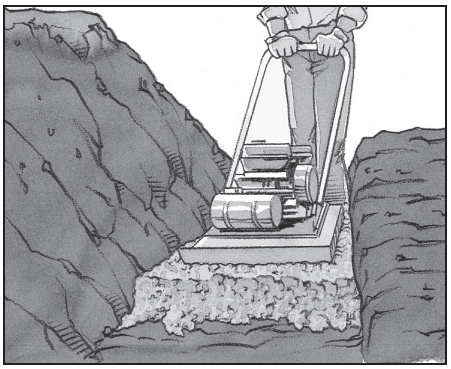


Diagram 2 – Leveling Pad

BASE COURSE

- This is the most important step in the installation process. Bury the base course of block.
- Begin laying block at the lowest elevation of the wall. Remove the rear lip (if applicable) of the block by hitting from the back so that it will lie flat on the leveling pad. *See Diagram 3.*
- Place first block and level, front to back and side to side; lay subsequent blocks in the same manner.
- Place the blocks side by side, flush against each other, and make sure they are in full contact with the leveling pad.
- If the wall is on an incline, don't slope the blocks; step them up so they remain consistently level.
- Use string line along the back edge of block to check for proper alignment.
- For multi-piece products, use the largest unit, 18 inches wide, for the base course.
- Fill cores (if applicable) and voids between blocks with 3/4-inch free-draining aggregate prior to laying the next course of block. Clean any debris off the top of the blocks. *See Diagram 4.*
- Install any location devises, such as pins, prior to placing the second course of blocks."

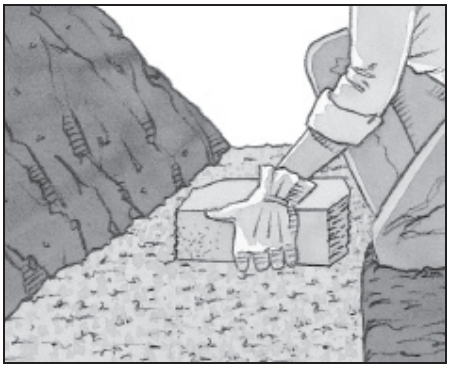


Diagram 3 – Base Course

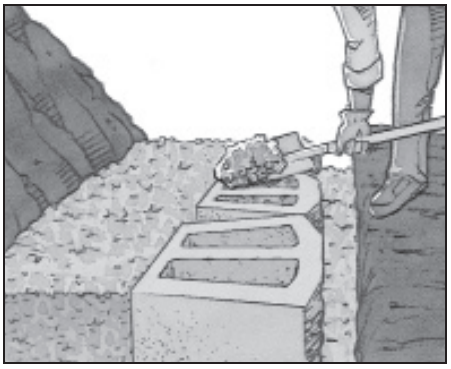


Diagram 4 – Core Fill

CONSTRUCTION OF SUBSEQUENT COURSES

- Clean any debris off the top of the blocks.
- Place the second course of blocks on top of the base course. Maintain running bond. Pull each block forward as far as possible to ensure the correct setback. *See Diagram 5.*
- Fill cores (if applicable) and voids between blocks with 1-inch free-draining aggregate prior to laying the next course of block. Clean any debris off the top of the blocks.
- Backfill with ¾-inch free-draining aggregate directly behind the block, adding 6 inches at a time followed by proper compaction. Fill thickness will be dependent on compaction equipment
- Add retained soil behind the aggregate. Compact before the next course is laid.
- Don't drive heavy equipment near the wall. Self-propelled compaction equipment should not be used within 3 feet from the back of the wall
- Keep the wall bond by placing units in a staggered relationship to the course beneath.
- You may need partial units to stay on bond. A saw with a diamond blade is recommended for cutting partial units. Use safety glasses and other protective equipment when cutting.

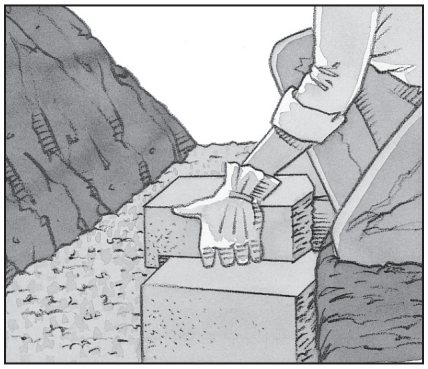


Diagram 5 – Next Course Construction

DRAINAGE DESIGN

- Each project is unique. The grades on your site will determine at what level to install the drainpipe.
- Place the drainpipe as low as possible behind the wall so water drains down and away from the wall into a storm drain or to an area lower than the wall. *See Diagram 6.*
- Fill in the area behind the blocks with 3/4-inch free-draining aggregate, at a minimum of 12-inches from behind the back of the block or 24-inches from the back of the block, whichever is greater.
- You may need to place and backfill several courses to achieve the proper drainage level. *See Diagrams 7 and 8.*
- The drainpipe outlets should be spaced not more than every 50 feet and at low points of the wall. In order for the gravel fill to function properly, it must keep clear of regular soil fill. See below diagram of daylight drainage system.

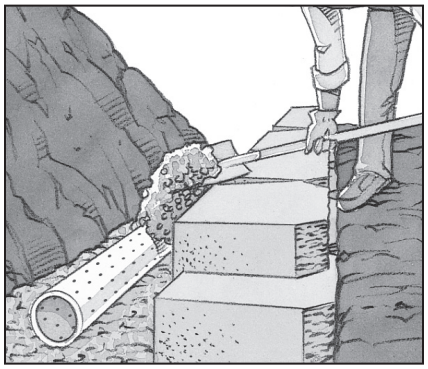


Diagram 6 – Drainage

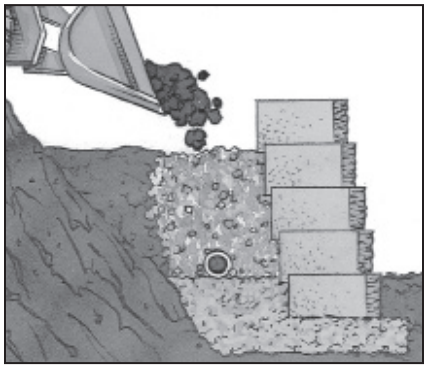


Diagram 7 – Backfill

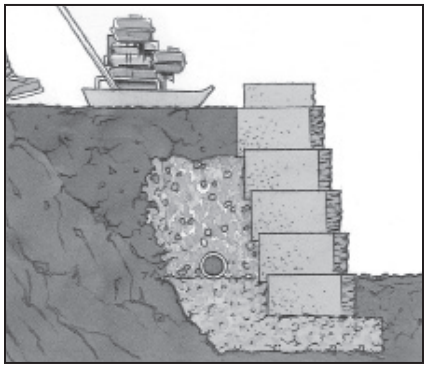
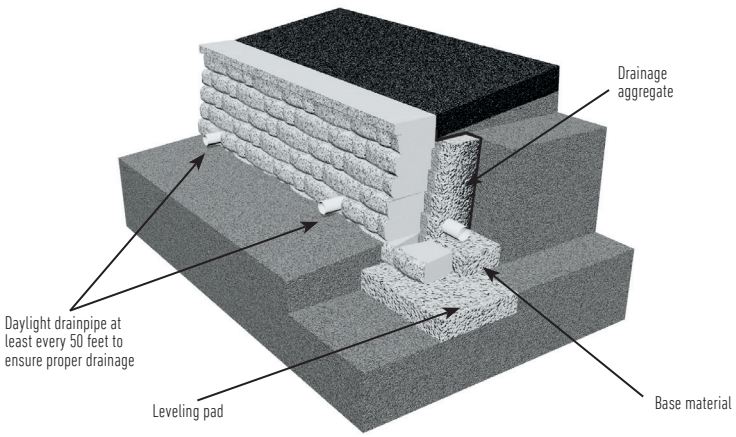


Diagram 8 – Compaction



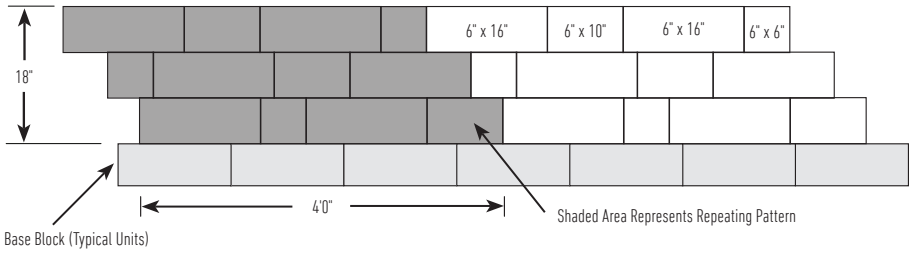
LAYING PATTERN AND INSTALLATION GUIDE FOR MULTI-PIECE SEGMENTAL RETAINING WALLS

USING A PATTERN FOR SINGLE-HEIGHT RETAINING WALLS

When using a pattern, begin at one edge, laying the units as indicated. Install at least one repeat of the pattern to establish the pattern before proceeding to the next course. Stagger the patterns as shown to avoid vertical bonds.

One set of 6-inch-high retaining wall blocks consists of 2 large units, 1 medium unit and 1 small unit, and is 2 square feet.

6" Multipiece wall system, 18-inch by 4-foot pattern = 6 sq. ft.



Blocks required	
6 Sets	
12	6" x 16"
6	6" x 10"
6	6" x 6"

Blocks required	
3 Sets	
6	6" x 16"
3	6" x 10"
3	6" x 6"

STEPPING UP THE BASE AT LOWEST POINT

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 height of one entire block.

STEP-UP

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.

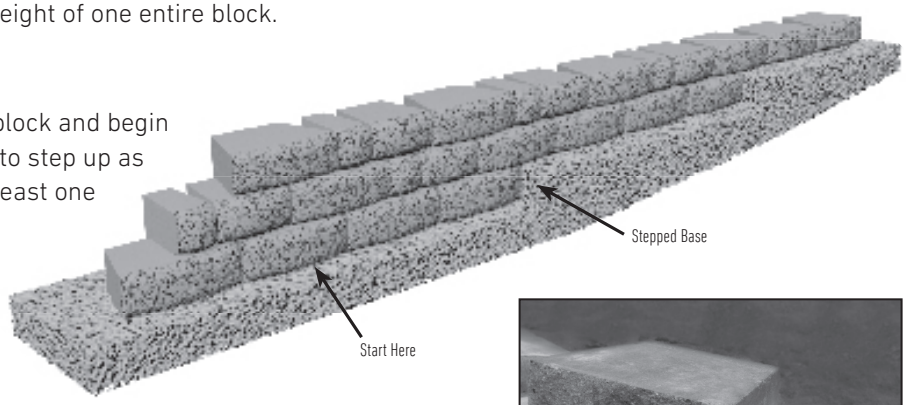
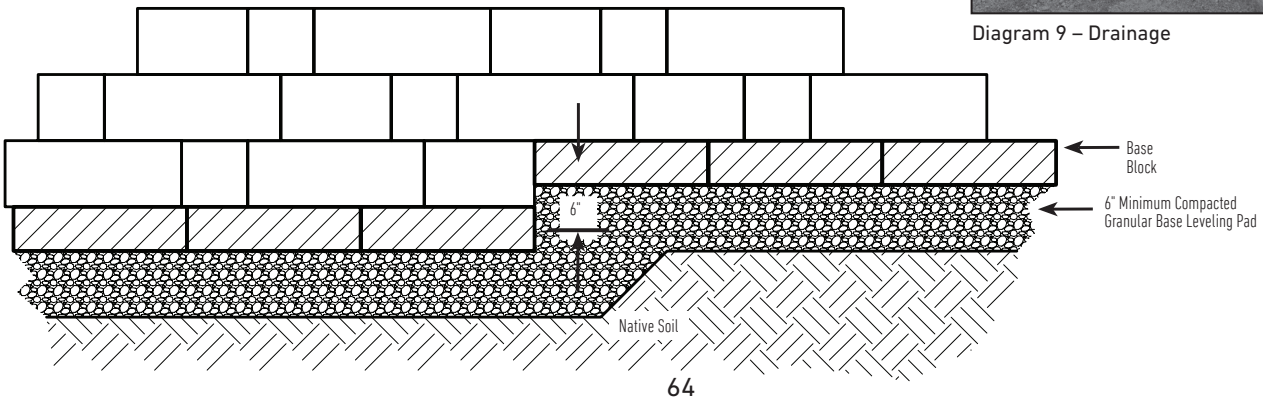


Diagram 9 – Drainage

STEPPING UP THE BASE USING THE U START BASE BLOCK

Walls built on a sloping grade require a stepped base. Begin excavation at the lowest point and dig a level trench, 24 inches wide, into the slope until it is deep enough to accommodate the base material and one entire base block. *See Diagram 9.*



ABUTTING AN EXISTING STRUCTURE

FIRST COURSE

Begin with the first block next to the wall and place the first course. Place filter fabric behind the first two units and extend it 2 feet along the existing structure.

First course

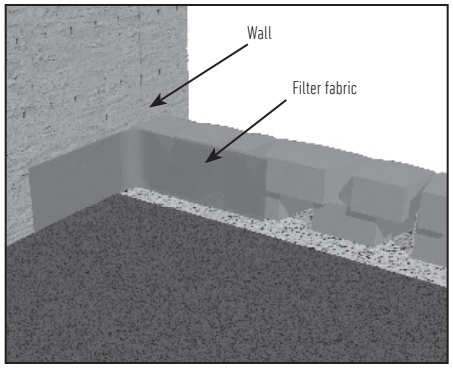
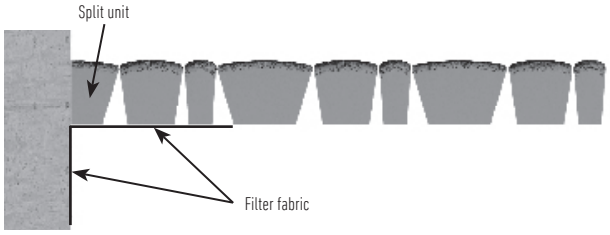


Diagram 10 – Extend Filter Fabric

SECOND COURSE

Build second course with standard installation techniques. A split unit is shown but may not be necessary in every installation. Extend filter fabric to the top edge of the final course. *See Diagram 10*. A rubber membrane may be placed between the units and a non-concrete wall to prevent moisture damage to the structure.



Second course

Note: To split a block, use a hydraulic splitter or split manually by using a hammer and chisel to score the block on all sides. Pound the chisel on the same line until the block splits. If partial unit sides are not exposed, use a saw with a diamond blade to achieve a tighter fit.

OUTSIDE CURVES

CALCULATE THE RADIUS

When building an outside curve, begin by determining the desired radius of the top course. This will be the smallest radius in the wall and must not be less than the minimum radius for the wall system used.

To determine the approximate base course radius:

1) Add ¼-inch to the setback of the block used. Multiply that by the number of courses in the finished wall.
2) Add desired radius length of the top course to the result of step 1. This number equals the approximate radius length of the base course.
3) To determine the radius for the front edge of the trench, add 6 inches to the approximate radius length of the base course.

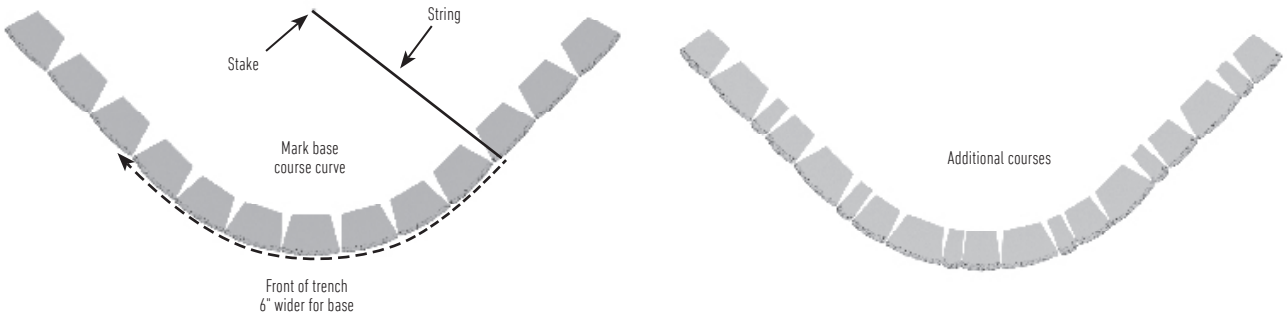
Example: Setback of the Highland Stone® product is 1⅛ inch. The wall is 8 courses high. The desired radius of the wall measured to the front of the block on the top course is 6 feet.

1) Setback multiplied by number of courses
   1⅛" + ¼" = 1⅜" x 8 courses = 11"
2) Desired radius plus setback
   6' + 11" = 6'11"
3) Front of trench
   6'11" + 6" = 7'5"

TIP: Subtract the depth of the block if you prefer to mark the curve from the back of the block.

LAY OUT THE TRENCH

Drive a stake into the ground at the desired radius point of the curve. Attach a string and rotate it in an arc at the desired length to mark the curve in the soil. Dig the trench.



BASE COURSE

Using the existing radius point stake and string, mark the base course curve on the leveling pad. Align the front of the block with the marked curve and ensure level placement from side to side and front to back.

ADDITIONAL COURSES

On each course, some of the rear 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 partial units as needed. Once a split or cut unit is cut to size, glue in place with a concrete adhesive.

INSIDE CURVES

CALCULATE THE RADIUS

Check the wall plan to determine the radius of the top course. This will be the biggest radius in the wall and you will need it to determine the radius at the base course, which will be the smallest radius of the wall and must not be less than the minimum for the block system used.

A QUICK WAY TO DETERMINE THE BASE COURSE RADIUS:

1) Add ¼-inch to the setback of the block used. Multiply that by the number of courses in the finished wall.
2) Subtract the result of step 1 from the radius of the top course. This number equals the approximate radius length of the base course.
3) To determine the radius for the front edge of the trench, subtract 6 inches from the approximate radius length of the base course.

Example: The setback of the Highland Stone® product is 1⅛ inches. The wall is 8 courses high. The desired radius of the wall measured to the front of the block on the top course is 10 feet.

1) Setback multiplied by number of courses
   1⅛" + ¼" = 1⅜" x 8 courses = 11"
2) Desired radius minus setback
   10' - 11" = 9'1"
3) Front of trench
   9'1" - 6" = 8'7"

TIP: Add the depth of the block if you prefer to mark the curve from the back of the block.

LAY OUT THE TRENCH

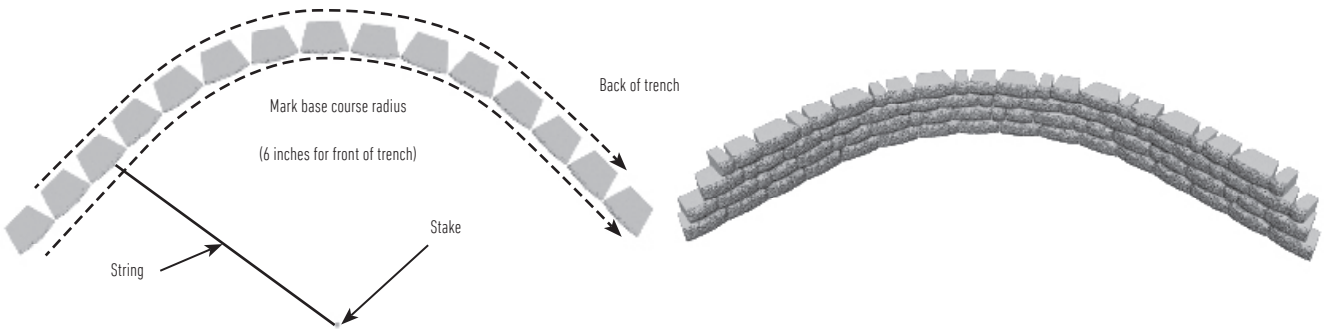
Drive a stake into the ground at the desired radius point of the curve. Attach a string and rotate it in an arc at the desired length to mark the curve in the soil. Dig the trench.

BASE COURSE

Using existing radius point stake and string, mark the base course curve on the leveling pad. Align the front of the block with the marked curve and ensure level placement from side to side and front to back.

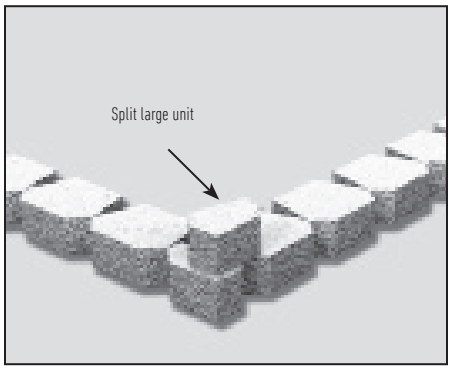
ADDITIONAL COURSES

On each course, some of the lips of each block must be in contact with the back of the units below to ensure structural stability. If not, use construction adhesive to adhere blocks together. To maintain proper running bond, use partial units as needed. Once a split unit is cut to size, glue in place with a concrete adhesive.

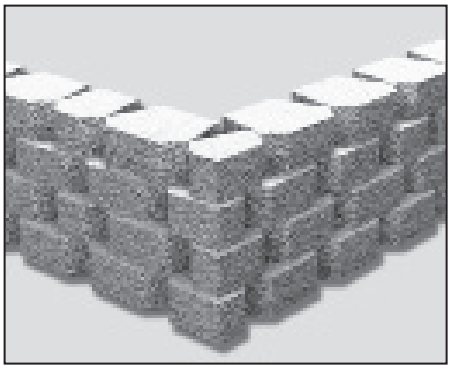


OUTSIDE 90-DEGREE CORNERS

FOR SYSTEMS WITHOUT A CORNER UNIT



Outside 90-Degree Corner
without Corner Unit



Additional Courses

BASE COURSE

To build an outside 90-degree corner, begin by splitting a unit in half. Place this unit with both split faces out at the corner. If needed, remove the rear lip so that the block lies flat. Then lay the rest of the base course working from the corner block out.

ADDITIONAL COURSES

Begin the next course with the other half of the split unit faced in the opposite direction at the corner.
Place the second and third blocks on either side of the corner unit. Once the corner unit is in position, glue block in place with a concrete adhesive. Continue to alternate the corner unit orientation with each course and always use a concrete adhesive on the corner units. Use cut or split units as necessary to maintain running bond.

OUTSIDE 90-DEGREE CORNERS

FOR SYSTEMS WITHOUT A CORNER UNIT

90-degree corners are built by alternating corner/column units so the long side is on different sides of the wall. Build the pattern from the corner unit when possible. Install corner units level from front to back.

Depending on the wall layout, there may be a need to go off the pattern and randomly place wall blocks near the corner. Set back corner units to reflect the batter of the wall block units and glue from bottom to top.

Outside 90-Degree Corner
with Corner/Column Unit

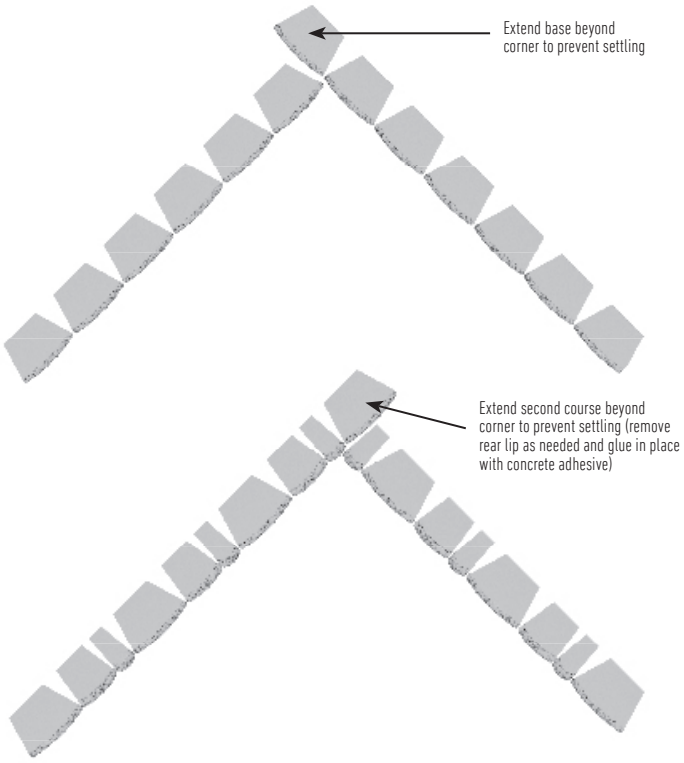
NOTE: To split a block, use a hydraulic splitter or split manually by using a hammer and chisel to score the block on all sides. Pound the chisel on the same line until the block splits. If partial unit sides are not exposed, use a saw with a diamond blade to achieve a tighter fit.

INSIDE 90-DEGREE CORNERS

BASE COURSE

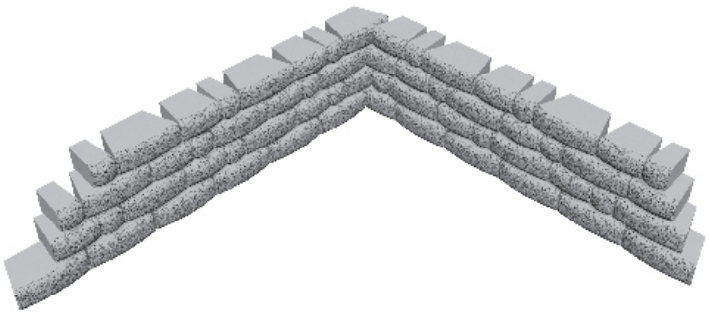
To create an inside 90-degree corner, begin by placing a block at the corner. Then lay a second block perpendicular to the first and continue laying out the rest of the base course working from the corner out. Make sure to construct the base course according to standard site prep and installation procedures.

Example Inside 90-Degree Corner



ADDITIONAL COURSES

On the second course, place all blocks on bond along one side of the corner. Once the second course of one wall is established, begin the second course of the adjacent wall. Split units or units of varying sizes may be required on this wall to maintain running bond. Continue to alternate the corner unit orientation with each course and always use a concrete adhesive on the corner units.



NOTE: To split a block, use a hydraulic splitter or split manually by using a hammer and chisel to score the block on all sides. Pound the chisel on the same line until the block splits. If partial unit sides are not exposed, use a saw with a diamond blade to achieve a tighter fit.

GEOGRIDS (IF REQUIRED)

- Geogrids is recommended for walls taller than the gravity height of each product, or walls situated in poor soils, supporting a driveway, etc. Consult an engineer for design assistance.
- Check the wall construction plan for which courses will need geogrids.
- Clean any debris off the top layer of blocks.
- Measure and cut the geogrids to the design length in the plans.
- Many geogridss have a design strength direction, which must be laid perpendicular to the wall.
- Place the front edge of the geogrids on top of the block, making sure it's within 1 inch of the face of the block. Correct placement ensures that you maximize the connection strength and keep the batter consistent.
- Apply the next course of blocks to secure it in place.
- A minimum of 6 inches of backfill is required prior to operating vehicles on the geogrids. Avoid sudden turning or braking.

COMPACTION

- Place the backfill soil behind the gravel fill and compact to 95% standard PROCTOR density with a hand-operated compactor."
- Make sure the aggregate is level with or slightly below the top of the course.
- Place soil in front of the base course and compact. The base course should be buried.
- Continue to fill and compact.

FINISH GRADE AND SURFACE DRAINAGE

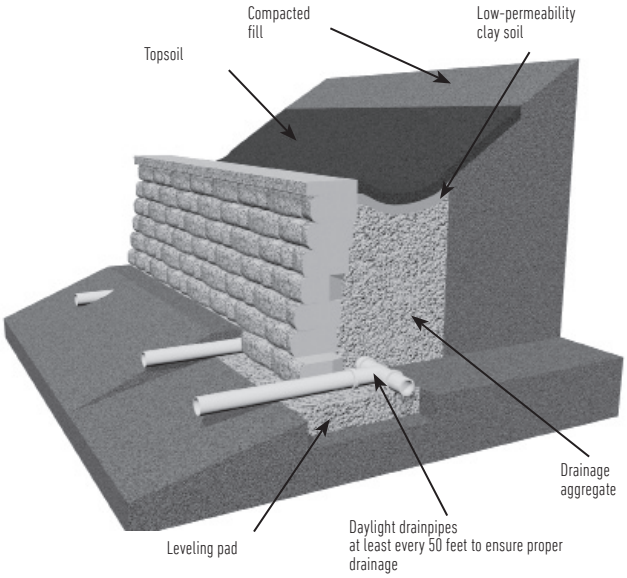
- Protect the wall with a finished grade at the top and bottom.
- To ensure proper water drainage away from the wall, use 8 inches of soil with low permeability. This will minimize water seeping into the soil and gravel fill behind the wall. *See Drainage Swales.*

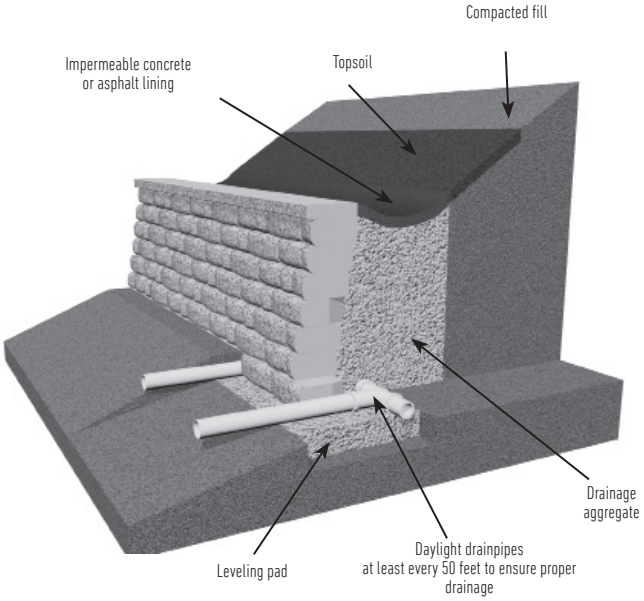
SITE CLEANING AND RESTORATION

- Brush off the wall and pick up any debris left from the construction process.
- Notify the job superintendent in writing of the project's completion and that it is ready for final inspection and acceptance.
- Planting vegetation in front and on top of the wall will help reduce the chance of erosion.
- Following the best practices for construction will ensure the successful installation of Anchor™ products.

DRAINAGE SWALES

- Design and performance of most retaining walls are based on keeping the reinforced zone relatively dry. Appropriate drainage swales to help control water should be designed into the wall construction plan.





SAFETY NOTE: Always use appropriate equipment, including safety glasses or goggles and respirators, when splitting, cutting or hammering units. Refer to the NCMA Segmental Retaining Wall Installation Guide at www.ncma.org.

ANCHORPLEX® SYSTEM CONSTRUCTION GUIDE

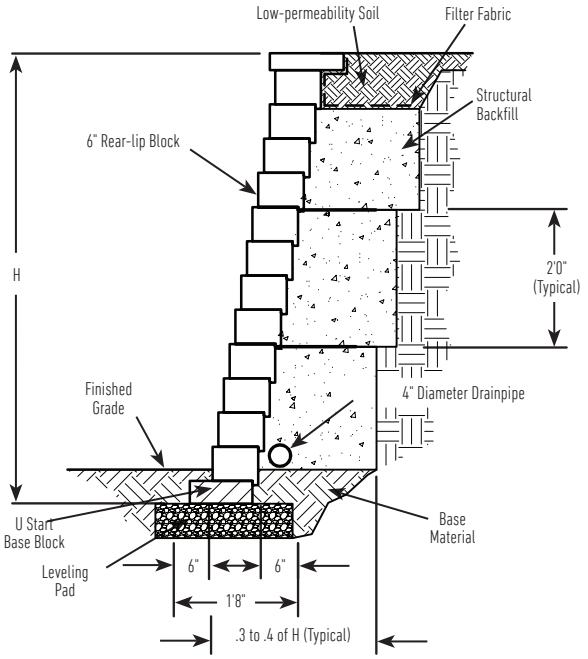
HOW TO USE THIS GUIDE

Use this information to gain a general understanding of the basics of building retaining walls with the Anchorplex system. Do not use this in lieu of construction drawings provided by a qualified engineer. Contact Anchor Wall Systems at 1-877-295-5415 for more information about designing and building with the Anchorplex system.

ABOUT THE ANCHORPLEX® SYSTEM

The Anchorplex system is a retaining wall built with Anchor products and self-compacting structural backfill, also known as "no-fines" concrete, which is a highly-porous mixture of clean stone, cement and water. The mixing ratios (by weight) of aggregate to cementitious material should be between 6:1 and 7:1. The mixing rate (by weight) of water to cementitious material should be no more than 1:2. The resulting material, upon curing, should have at least 25 percent voids and should exhibit a minimum compressive strength (f1c) of 1,500 psi.

EXAMPLE: 6" MULTI-PEICE RETAINING WALL SYSTEM USING THE ANCHORPLEX SYSTEM

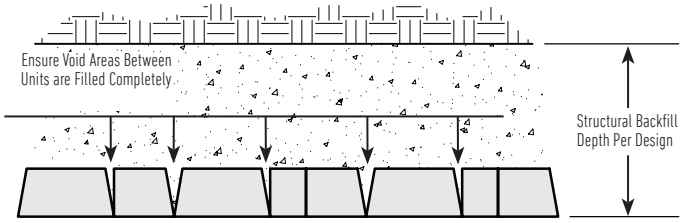


RETAINING WALL CONSTRUCTION

Setting out the wall and excavation is no different for an Anchorplex system construction than for conventional construction, except that the amount of excavation will probably differ. Construction of the leveling pad, base course, subsequent courses and drainage is no different for an Anchorplex system construction than for conventional construction.

INSTALLATION OF STRUCTURAL BACKFILL

After completion of the leveling pad, base course, drainpipe installation and stacking block 2 feet above grade, the first lift of structural backfill that meets Anchor Wall Systems' specifications can be installed. Do not exceed 2 feet vertical stacking of block before placing a lift of structural backfill



The structural backfill can be placed directly from delivery vehicle or with skid-type loader or other equipment. It should be placed behind the blocks and worked into all voids and cores of the blocks (if applicable). When properly formulated, the structural backfill will not leak through the face of the wall.

After installation of the first lift of structural backfill, install additional courses and repeat the process. Place additional lifts every 8 to 24 inches depending on site conditions and project scale. Subsequent pours can be made as soon as the structural backfill in the previous lift has set — usually within 2 to 3 hours.

INSTALLATION OF FILTER FABRIC

Place a layer of filter fabric over the structural backfill and up the back of the top course and the cap. Then fill behind the top course and cap with low-permeability soil.

CAPPING & FINISHING

Follow standard practice when capping the wall. Protect the wall with a finish grade at the top and bottom.

STEPS IN A CURVED WALL

These drawings show Highland Stone®, Diamond® and Diamond Stone Cut® step units. Caps or pavers can be used for treads. Check local building codes for any tread depth standards.

BASE COURSE

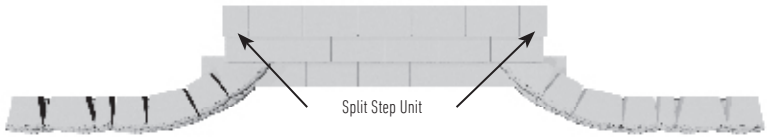
Thoroughly compact the leveling pad. Lay out the base course according to the wall design. Place step units first, working from the center to each side. Remember, it is very important to backfill and compact behind and along the sides of each course of step units.

FIRST STEP COURSE

Place the first course of step units directly on top of the base course so there is no setback. Stagger them from the previous course and glue in place.

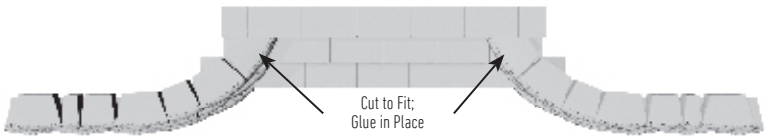
SECOND STEP COURSE

Add the second course of steps, staggering them from the previous course to maintain running bond. Overlap the lower course by a minimum 2 inches and glue to lower course. Place and compact base material prior to installing next course.



NEXT WALL COURSE

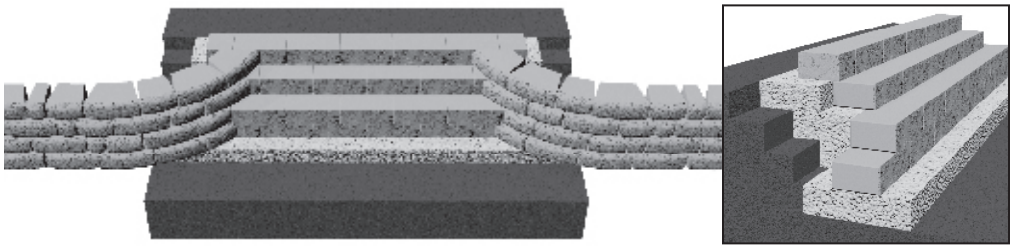
Place a block near the second course of steps, maintaining running bond with the base course. Measure and cut a block to fit the space remaining between the step unit and the next course of the wall. Place the unit in the wall, making sure that both vertical edges fit tight against both the step and standard unit. Remove the rear lip on the blocks when necessary, and angle the blocks flush with the face of the previous course. Glue in place with a concrete adhesive. Repeat these steps until the wall is finished.



ADDITIONAL COURSES

Beginning in the center, add the third course of steps, lining up the units with the first course. Overlap a minimum 2 inches and glue in place. Repeat until the steps are finished.

DRAINAGE TIP: Drain pipe can be placed behind the lowest step units at grade or behind each wall adjacent to the steps.

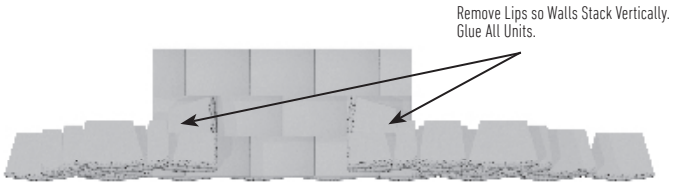


STEPS IN A 90-DEGREE WALL

These drawings show Highland Stone®, Diamond® and Diamond Stone Cut® step units. Caps or pavers can be used for treads. Check local building codes for any tread depth standards.

BASE COURSE

Thoroughly compact the leveling pad. Lay out the base course according to the wall design. Place step units first, working from the center to each side. Remember, it is very important to backfill and compact behind and along the sides of each course of step units.



FIRST STEP COURSE

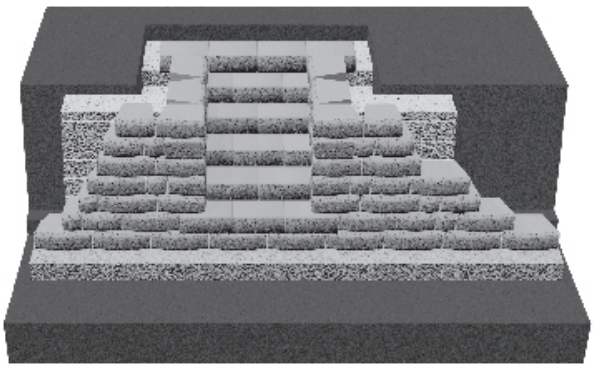
Place the first course of step units directly on top of the base course so there is no setback. Stagger them from the previous course and glue in place.

SECOND STEP COURSE

Add the second course of steps, staggering them from the previous course to maintain running bond. Overlap the lower course by a minimum 2 inches and glue to lower course. Place and compact base material prior to installing next course.

SECOND WALL COURSE

Build the second course of the wall. Corner units are used at the end of steps tied into wall and glued in place. Alternate long and short direction of corner unit every other row.

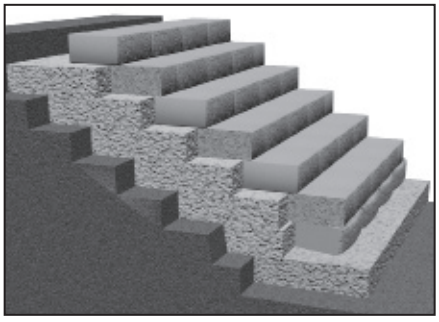


THIRD STEP COURSE

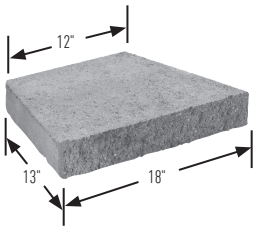
Beginning in the center, add the third course of steps, lining up the units with the first course. Overlap the lower course by 2 inches and glue to lower course.

ADDITIONAL COURSES

Build the third course of the wall. Repeat these steps until the wall is finished.

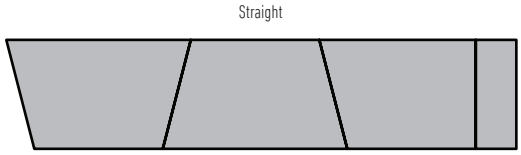


XL™ CAP



STRAIGHT WALL

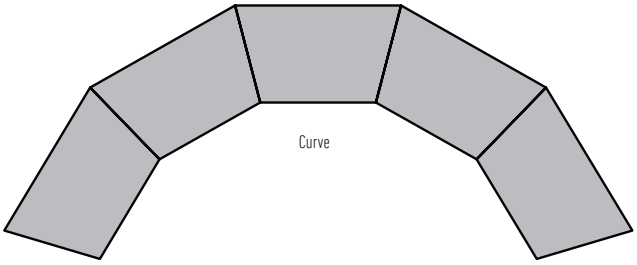
The XL™ cap must be laid alternately, short and long faces for a straight line. Always start capping from the lowest elevation. Once caps are aligned, caps should be glued in place using a concrete adhesive.



CURVES

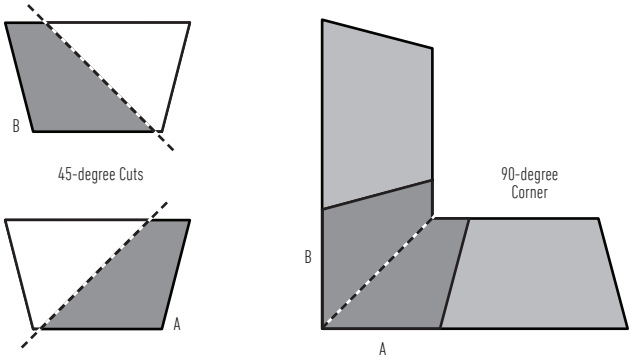
Lay out the cap units side by side with the same face facing out (long faces for outside curves; short face to inside curves). If there's a need to adjust for project's radius, make cuts at least every other cap as needed for the most pleasing aesthetic.

- Minimum radius with XL™ cap: 2 feet 2 inches



90-DEGREE CORNERS

Saw-cut two caps to achieve a 45-degree mitered corner.

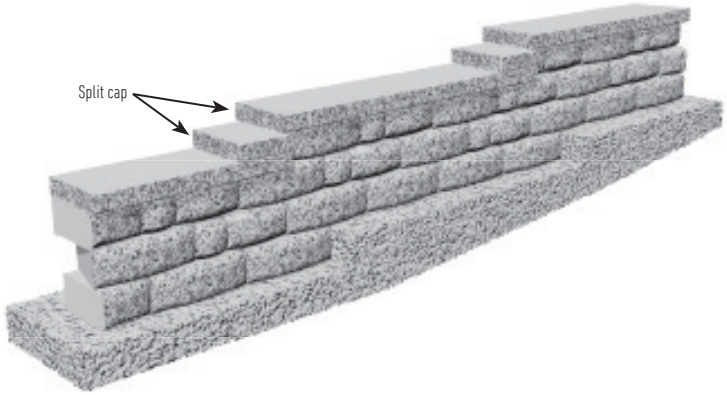


STEPPING UP CAPS WITH XL™ CAP

If the wall elevation changes, caps can be stacked where the wall steps up. Begin laying caps at the lowest elevation change and work your way toward the next step up. Split* a cap unit to fit. Place the split unit directly on top of the capped portion of the wall with all three split faces exposed.

FINISHING WITH XL™ CAP

After layout is complete and caps are saw-cut or split to size, carefully place concrete adhesive on wall top course and then place caps.

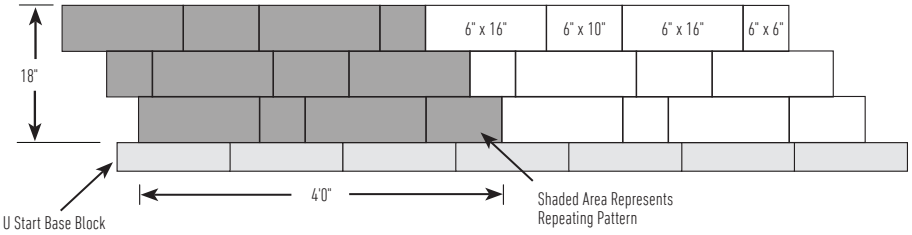


***NOTE:** To split a block, use a hydraulic splitter or split manually by using a hammer and chisel to score the block on all sides. Pound the chisel on the same line until the block splits. If partial unit sides are not exposed, use a saw with a diamond blade to achieve a tighter fit.

LAYING PATTERN AND INSTALLATION GUIDE FOR MULTI-PIECE FREESTANDING WALL

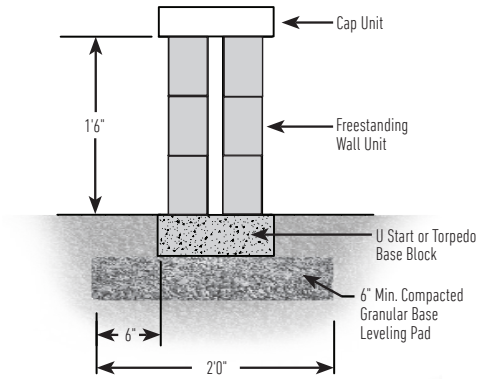
WHEN TO USE A PATTERN FOR FREESTANDING WALLS

One set of 6-inch-high blocks consists of 2 large units, 1 medium unit and 1 small unit, and is 1 square foot of two sided wall.



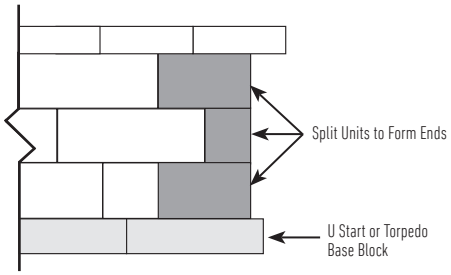
NOTE: These freestanding wall installation patterns show only one side of the freestanding wall. The same number of blocks are needed to build the other side of a freestanding wall when using a back-to-back freestanding wall systems. Freestanding wall installation patterns are measured in length by height of one side of the wall, and are expressed in square feet. Sets of blocks required include the number of blocks needed to build both sides of the wall.

TYPICAL CROSS SECTION



ENDING A WALL WITH WALL ENDS

Start pattern next to a wall end unit if the wall does not end with a column. Using a column unit, every other unit is cut in half to stagger bond. Glue all pieces in place using concrete adhesive.



BELAIR WALL® 2.0

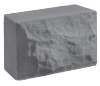
NATURAL COLLECTION

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓	✓	✓	✓	✓	✓	✓	✓

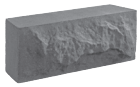
SHAPES & SIZES

6" Freestanding Wall

6 x 6 x 5



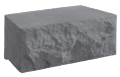
6 x 10 x 5



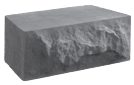
6 x 16 x 5

6" Retaining Wall

6 x 6 x 8

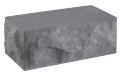


6 x 10 x 8



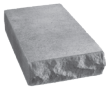
6 x 16 x 8

Column/ Corner



6 x 16 x 8

Cap



(F)8 x 13½ x 3
(B)7 x 13½ x 3

Cap End Unit

3 x 8 x 13½

Wall End Unit

6 x 8 x 11

U Start Base Block

3½ x 18½ x 12

Recommended for use with all available wall block units. (SOLD SEPARATELY)
NOTE: U Start Base Block actual coverage length is $16^{11}/_{16}$"

ENGINEERED SOLUTIONS BY ANCHOR WALL SYSTEMS

BELAIR WALL® 2.0

NATURAL COLLECTION

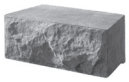
RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
							
✓	✓	✓	✓	✓	✓	✓	✓

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ UNIT	WEIGHT/ LAYER	WEIGHT/ PALLET
6" FREESTANDING WALL									
6 x 6 x 5	3.75	.75	–	30	6	8	11.25	67.5	337.5
6 x 10 x 5	6.25	1.25	–	30	6	4.80	18.75	112.5	562.5
6 x 16 x 5	20	4	–	60	12	3	30	360	1800
TOTAL	30	6	5	120	24	–	–	540	2700
6" RETAINING WALL									
6 x 6 x 8	3.75	1.25	–	15	5	4	20.4	102	306
6 x 10 x 8	6.25	2.08	–	15	5	2.4	34.06	170.33	511
6 X 16 X 8	20	6.66	–	30	10	1.5	54.26	542.66	1628
TOTAL	30	10	3	60	20	–	–	815	2445
COLUMN/CORNER									
3 X 8 X 13½	96	12	8	144	18	1.5	25.33	456	3648
CAP									
3 X 8 X 13½ 3 X 7 X 13½	90	11.25	8	144	18	1.6	24.37	438.75	3510
CAP END UNIT									
3 X 8 X 13½	24	12	2	36	18	1.5	25.33	456	912
WALL END UNIT									
6 x 8 x 11	14	7	2	42	21	3	43.61	916	1832
U START BASE BLOCK (SOLD SEPARATELY)									
18½ x 12 x 3½	77.88	11.13	7	56	8	.72	54	440	3080

ESTIMATING FOR BELAIR WALL® 2.0 - RETAINING WALL

1. HOW DO I ESTIMATE FOR BURIED BASE UNITS?

Build buried base course using ***large wall units*** or ***U Start Base Blocks***. Determine the length of the wall in feet and divide by either the unit length or product factor.



L ÷ unit length or coverage = _____ number of each.

Linear feet of wall ÷ by 1.3 = _____ base blocks needed. *56 base blocks per pallet.*

Torpedo® Base Block/

2. HOW MANY RETAINING WALL BLOCKS DO I NEED?

Square feet of wall divided by 2 = _____ sets needed. ***15 sets per pallet.*** Number of sets divided by 15 = _____ pallets needed.

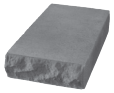
ONE SET = *2 large, 1 medium & 1 small.*

3. HOW MUCH FILTER FABRIC IS NEEDED (OPTIONAL)

Non-woven, 4- to 6-ounce filter fabric. Determine the sq. ft. of total wall.
sq. ft. ÷ 9 = _____ square yards fabric.

4. HOW MANY CAP UNITS WILL I NEED?

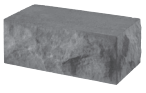
Convert wall length (L) to inches: L x 12 = _____ L in inches (LI). Cap factor (CF) = cap front inches + cap back inches ÷ 2. (Additional caps will be needed for elevation changes and curves, factor 10%.)
LI ÷ CF = _____ caps.



2-sided trapezoidal cap unit

5. HOW MANY CORNER/COLUMN UNITS DO I NEED?

Height of column in feet divided by 8 = _____ of units needed. *20 Corner/column units per pallet.*



2-sided corner/column unit

BELAIR WALL® 2.0 INSTALLATION CONSTRUCTION GUIDE - RETAINING WALL

BEFORE BASE COURSE SEE BASIC INSTALLATION FOR RETAINING WALL CONSTRUCTION GUIDE FOR BASE PREP AND LEVELING PAD INSTRUCTIONS ON PAGE 104.

IMPORTANT TIP FOR BASE COURSE:

Due to the manufacturing process of this block, pitch the base course back slightly to keep the wall level on higher courses. For walls over 30 inches in height, soil reinforcement is generally necessary. A qualified engineer should be consulted for design and analysis of structures.

BASE COURSE

This is the most important step in the installation process. Bury the base course of block. Begin laying block at the lowest elevation of the wall. Remove the rear lip (if applicable) of the block by hitting from the back so that it will lie flat on the levelling pad. When using Belair Wall® 2.0 retaining wall blocks, pitch the base course back 1/16-inch for each foot of wall height to keep the wall plumb on higher courses. Example: If wall is 3 feet high, pitch the back of the base blocks into your slope a minimum of 3/16-inch. Place first block and level, front to back and side to side; lay subsequent blocks in the same manner. *See Diagram 1.*

Place the blocks side by side, flush against each other, and make sure they are in full contact with the levelling pad. If the wall is on an incline, don't slope the blocks; step them up so they remain consistently level. Use string line along the back edge of block to check for proper alignment. For multipiece products, use the largest unit, 18 inches wide, for the base course. Fill cores (if applicable) and voids between blocks with ¾-inch free-draining aggregate prior to laying the next course of block. *See Diagram 2.* Clean any debris off the top of the blocks.

Diagram 1 - Base Course

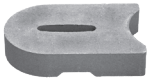
Diagram 2 - Backfill and Compact

ESTIMATING FOR BELAIR WALL® 2.0 - FREESTANDING WALL

1. HOW DO I ESTIMATE FOR BURIED BASE UNITS?

Build buried base course using ***U Start Base Blocks***. Determine the length of the wall in feet and divide by either the unit length or product factor.

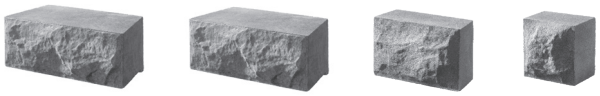
Linear feet of wall ÷ by 1.3 = _____ base blocks needed. *56 base blocks per pallet.*



U Start Base Block

2. HOW MANY FREESTANDING WALL BLOCKS DO I NEED?

Square feet of wall = _____ sets needed. ***60 sets per pallet.*** Number of sets divided by 30 = _____ pallets needed.



ONE SET = *2 large, 1 medium & 1 small.*

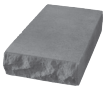
3. HOW MUCH FILTER FABRIC IS NEEDED? (OPTIONAL)

Non-woven, 4- to 6-ounce filter fabric. Determine the sq. ft. of total wall.

sq. ft. ÷ 9 = _____ square yards fabric.

4. HOW MANY CAP UNITS WILL I NEED?

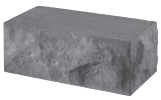
Convert wall length (L) to inches: L x 12 = _____ L in inches (LI). Cap factor (CF) = cap front inches + cap back inches ÷ 2. (Additional caps will be needed for elevation changes and curves, factor 10%.) LI ÷ CF = _____ caps.



2-sided trapezoidal cap unit

5. HOW MANY CORNER/COLUMN UNITS DO I NEED?

Height of column in feet divided by 8 = _____ of units needed. *20 Corner/column units per pallet.*



2-sided corner/column unit

BELAIR WALL® 2.0 INSTALLATION CONSTRUCTION GUIDE - FREESTANDING WALL

BEFORE BASE COURSE SEE BASIC INSTALLATION FOR RETAINING WALL CONSTRUCTION GUIDE FOR BASE PREP AND LEVELING PAD INSTRUCTIONS ON PAGE 104.

IMPORTANT TIP FOR BASE COURSE:

Due to the manufacturing process of this block, pitch the base course back slightly to keep the wall level on higher courses. For walls over 30 inches in height, soil reinforcement is generally necessary. A qualified engineer should be consulted for design and analysis of structures.

BASE COURSE

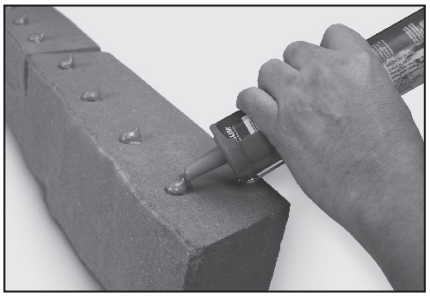
Install the U Start Base Block with the hand-holds down. Place blocks so the outside curve of one block fits into the inside curve of the block next to it. Blocks should touch. Level blocks front to back and side to side with a dead-blow hammer. *See Diagram 1.* The base course will be buried.

WALL COURSES

Glue all courses. Use ½-inch-diameter dots of glue 3 inches apart on the front half of the block to help keep the wall level and prevent oozing through the face. Build one layer of the pattern and glue to base units. Work from the appropriate side of the pattern. *See Diagram 2.*

Build a separate wall on each side of the base unit. Maintain a consistent gap of roughly 1 inch between the parallel walls. The width of a level can be a guide. Continue to build one layer of the pattern on each side of the wall, maintaining a uniform distance between the two walls. Check horizontal and vertical levels of each wall. *See Diagram 3.*

Periodically check the distance between the wall faces to ensure consistent spacing. Gaps will vary on curves. To avoid cutting blocks, flip blocks over on curves as needed. *See Diagram 4.*



TIP:
Use ½-inch-diameter dots of glue 3 inches apart. The dots of glue help with minimizing oozing of the glue onto the face of the units.

Diagram 1 – Base Course

Diagram 2 – Wall Course

Diagram 3 – Subsequence Courses

Diagram 4 – Check gaps

BEFORE BASE COURSE SEE BASIC INSTALLATION FOR RETAINING WALL CONSTRUCTION GUIDE FOR BASE PREP AND LEVELING PAD INSTRUCTIONS ON PAGE 104.

IMPORTANT TIP FOR BASE COURSE:

Due to the manufacturing process of this block, pitch the base course back slightly to keep the wall level on higher courses. For walls over 30 inches in height, soil reinforcement is generally necessary. A qualified engineer should be consulted for design and analysis of structures.

BASE COURSE

Install the U Start Base Block with the hand-holds down. Place blocks so the outside curve of one block fits into the inside curve of the block next to it. Blocks should touch. Level blocks front to back and side to side with a dead-blow hammer. *See Diagram 1.* The base course will be buried.

WALL COURSES

Glue all courses. Use ½-inch-diameter dots of glue 3 inches apart on the front half of the block to help keep the wall level and prevent oozing through the face. Build one layer of the pattern and glue to base units. Work from the appropriate side of the pattern. *See Diagram 2.*

Build a separate wall on each side of the base unit. Maintain a consistent gap of roughly 1 inch between the parallel walls. The width of a level can be a guide. Continue to build one layer of the pattern on each side of the wall, maintaining a uniform distance between the two walls. Check horizontal and vertical levels of each wall. *See Diagram 3.*

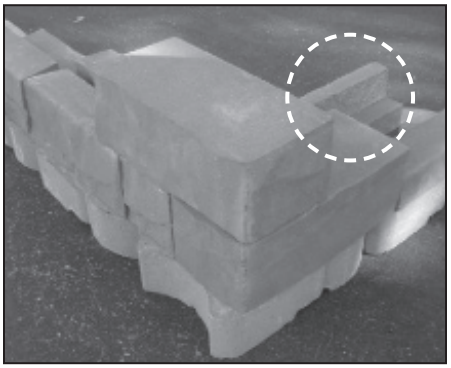


Diagram 5 – 90-Degree Corner

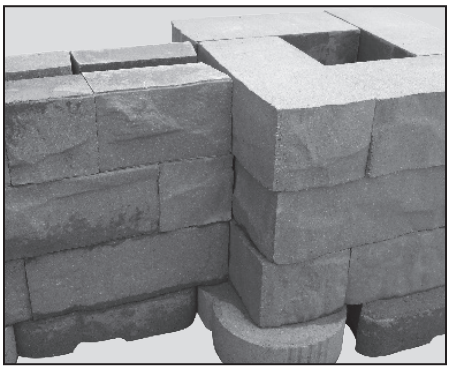


Diagram 6 – Abutting to a Column

Periodically check the distance between the wall faces to ensure consistent spacing. Gaps will vary on curves. To avoid cutting blocks, flip blocks over on curves as needed. *See Diagram 4.*

FREESTANDING WALL WITH 90-DEGREE CORNERS

A freestanding wall corner could be built by putting a column in the corner and building away from it. An alternative is to alternate corner/column units and work into the pattern at the corner. Cut 2 inches off the wall blocks on the inside side of the corner/column units to make them fit. All units should be glued bottom to top. *See Diagram 5.*

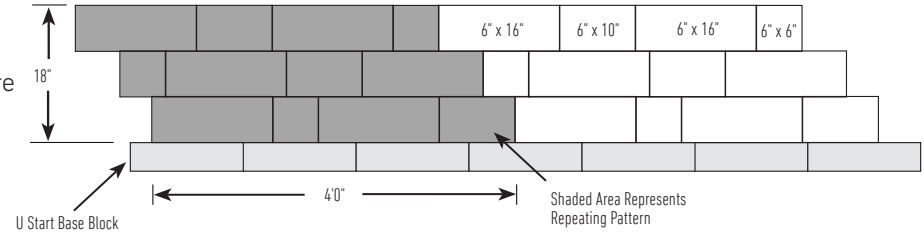
WALL ABUTTING A COLUMN

When abutting the wall in the middle of the column face, some sculpting of the blocks will give a clean, finished look to a project. Mark or scribe the freestanding wall block to fit the face of the column unit into the edge of the wall unit. This is easily achieved with a small hand-held grinder with a diamond blade. Start second row by placing blocks in a staggered relationship to the course beneath. *See Diagram 6.*

TIP:
Leave approximately 1" space between walls. A good tool to help maintain that consistent spacing is level.

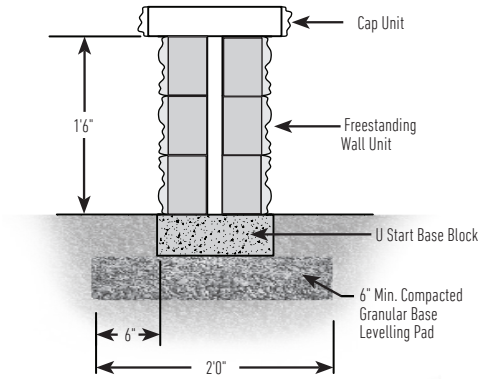
WHEN TO USE A PATTERN FOR FREESTANDING WALLS

One set of 6-inch-high blocks consists of 2 large units, 1 medium unit and 1 small unit, and is 1 square foot of two sided wall.

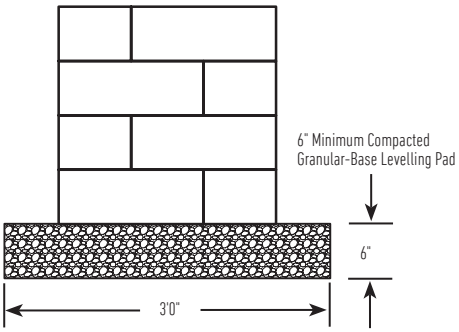


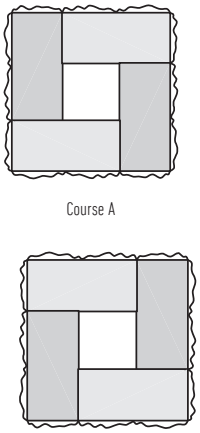
NOTE: *These freestanding wall installation patterns show only one side of the freestanding wall. The same number of blocks are needed to build the other side of a freestanding wall when using Belair Wall 2.0 freestanding wall systems. Freestanding wall installation patterns are measured in length by height of one side of the wall, and are expressed in square feet. Sets of blocks required include the number of blocks needed to build both sides of the wall.*

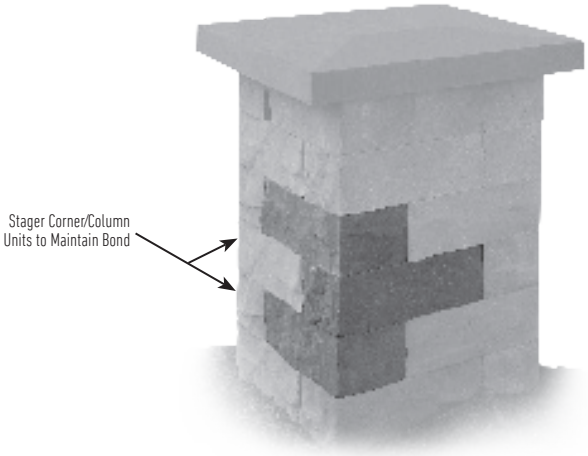
TYPICAL CROSS SECTION



COLUMN CONSTRUCTION

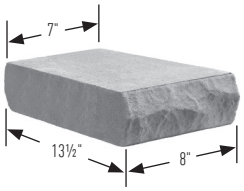






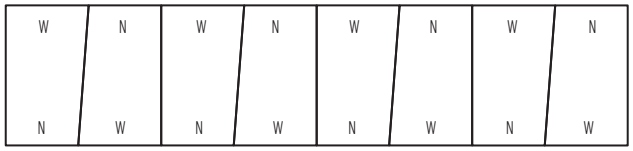
TRAPEZOID DOUBLE-SIDED CAP

The double-sided cap has a right-angle side and an offset-angle side. The caps can be used in any of four directions since there is no specific top or bottom.



STRAIGHT WALL

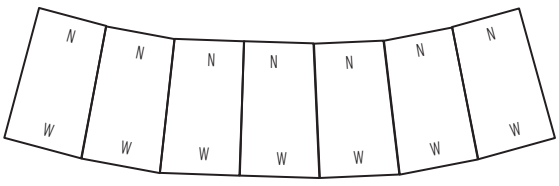
The cap must be laid alternately, narrow (N) and wide (W) faces, for a straight line. Always start capping from the lowest elevation.



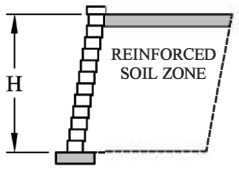
CURVES

Lay out the cap units side by side with same face facing out (wide faces for outside curves; narrow faces for inside curves). Occasional cutting of some pieces may be necessary.

Minimum radius: 7'6"

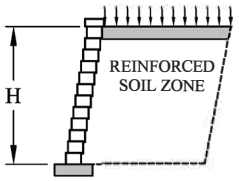


Estimating Chart Geosynthetic
Belair Wall® Retaining Walls
No Slopes / No Surcharges



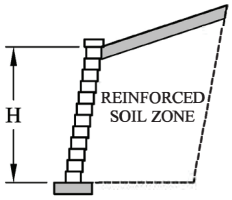
	Clay and Silt Soils φ = 26° γ = 120 pcf (19 kN/m^3)	Silty / Clayey Sand Soil φ = 30° γ = 120 pcf (19 kN/m^3)	Clean Sand and Gravel Soil φ = 34° γ = 120 pcf (19 kN/m^3)
2'-0" (600 mm) 4 Courses	4.0' (1200 mm)	NO REINFORCEMENT REQUIRED	NO REINFORCEMENT REQUIRED
3'-0" (900 mm) 6 Courses	4.0' (1200 mm) 4.0' (1200 mm)	4.0' (1200 mm) 4.0' (1200 mm)	4.0' (1200 mm) 4.0' (1200 mm)
4'-0" (1200 mm) 8 Courses	4.0' (1200 mm) 4.0' (1200 mm) 4.0' (1200 mm)	4.0' (1200 mm) 4.0' (1200 mm) 4.0' (1200 mm)	4.0' (1200 mm) 4.0' (1200 mm) 4.0' (1200 mm)
5'-0" (1500 mm) 10 Courses	4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm)	4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm)	4.0' (1200 mm) 4.0' (1200 mm) 4.0' (1200 mm) 4.0' (1200 mm)
6'-0" (1800 mm) 12 Courses	5.5' (1650 mm) 5.5' (1650 mm) 5.5' (1650 mm) 5.5' (1650 mm) 5.5' (1650 mm)	5.0' (1500 mm) 5.0' (1500 mm) 5.0' (1500 mm) 5.0' (1500 mm) 5.0' (1500 mm)	4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm)

Estimating Chart Geosynthetic
Belair Wall® Retaining Walls
250 PSF Surcharge



	Clay and Silt Soils φ = 26° γ = 120 pcf (19 kN/m^3)	Silty / Clayey Sand Soil φ = 30° γ = 120 pcf (19 kN/m^3)	Clean Sand and Gravel Soil φ = 34° γ = 120 pcf (19 kN/m^3)
2'-0" (600 mm) 4 Courses	4.0' (1200 mm)	4.0' (1200 mm)	NO REINFORCEMENT REQUIRED
3'-0" (900 mm) 6 Courses	4.0' (1200 mm) 4.0' (1200 mm)	4.0' (1200 mm) 4.0' (1200 mm)	4.0' (1200 mm) 4.0' (1200 mm)
4'-0" (1200 mm) 8 Courses	4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm)	4.0' (1200 mm) 4.0' (1200 mm) 4.0' (1200 mm)	4.0' (1200 mm) 4.0' (1200 mm) 4.0' (1200 mm)
5'-0" (1500 mm) 10 Courses	5.0' (1500 mm) 5.0' (1500 mm) 5.0' (1500 mm) 5.0' (1500 mm)	4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm)	4.0' (1200 mm) 4.0' (1200 mm) 4.0' (1200 mm) 4.0' (1200 mm)
6'-0" (1800 mm) 12 Courses	5.5' (1650 mm) 5.5' (1650 mm) 5.5' (1650 mm) 5.5' (1650 mm) 5.5' (1650 mm)	5.0' (1500 mm) 5.0' (1500 mm) 5.0' (1500 mm) 5.0' (1500 mm) 5.0' (1500 mm)	4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm)

Estimating Chart Geosynthetic
Belair Wall® Retaining Walls
3:1 Crest Slope



	Clay and Silt Soils φ = 26° γ = 120 pcf (19 kN/m^3)	Silty / Clayey Sand Soil φ = 30° γ = 120 pcf (19 kN/m^3)	Clean Sand and Gravel Soil φ = 34° γ = 120 pcf (19 kN/m^3)
2'-0" (600 mm) 4 Courses	4.0' (1200 mm)	4.0' (1200 mm)	NO REINFORCEMENT REQUIRED
3'-0" (900 mm) 6 Courses	4.0' (1200 mm) 4.0' (1200 mm)	4.0' (1200 mm) 4.0' (1200 mm)	4.0' (1200 mm) 4.0' (1200 mm)
4'-0" (1200 mm) 8 Courses	4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm)	4.0' (1200 mm) 4.0' (1200 mm) 4.0' (1200 mm)	4.0' (1200 mm) 4.0' (1200 mm) 4.0' (1200 mm)
5'-0" (1500 mm) 10 Courses	5.5' (1650 mm) 5.5' (1650 mm) 5.5' (1650 mm) 5.5' (1650 mm)	5.0' (1500 mm) 5.0' (1500 mm) 5.0' (1500 mm) 5.0' (1500 mm)	4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm) 4.5' (1350 mm)
6'-0" (1800 mm) 12 Courses	6.5' (1950 mm) 6.5' (1950 mm) 6.5' (1950 mm) 6.5' (1950 mm) 6.5' (1950 mm)	5.5' (1650 mm) 5.5' (1650 mm) 5.5' (1650 mm) 5.5' (1650 mm) 5.5' (1650 mm)	5.0' (1500 mm) 5.0' (1500 mm) 5.0' (1500 mm) 5.0' (1500 mm) 5.0' (1500 mm)

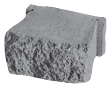
CELTIK® WALL

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓	✓	✓	✓	✓	✓	✓	✓

SHAPES & SIZES

6" Retaining


6 x 8⅞ x 6⅞


6 x 8⅞ x 10⁷⁄₁₆


6 x 8⅞ x 13⁹⁄₁₆


6 x 8⅞ x 17⅛

6" Freestanding


6 x 8⅞ x 6⅞


6 x 8⅞ x 10⁷⁄₁₆

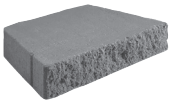

6 x 8⅞ x 13⁹⁄₁₆


6 x 8⅞ x 17⅛

3" Single-Sided Cap


3 x 15¾ x 12

3" Double-Sided Cap


3 x 17¼ / 12 x 10⅜

Universal Column Kit 27" x 27"


6 x 18 x 9

U Start Base Block


3½ x 18½ x 12

CELTIK® WALL

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
							
✓	✓	✓	✓	✓	✓	✓	✓

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ UNIT	WEIGHT/ LAYER	WEIGHT/ PALLET
6" RETAINING WALL									
6 X 8⅞ X 6⅞	–	–	–	–	–	–	–	–	–
6 X 8⅞ X 10⅞16	–	–	–	–	–	–	–	–	–
6 X 8⅞ X 13⅜16	–	–	–	–	–	–	–	–	–
6 X 8⅞ X 17⅛	–	–	–	–	–	–	–	–	–
6" FREESTANDING WALL									
6 X 8⅞ X 6⅞	–	–	–	–	–	–	–	–	–
6 X 8⅞ X 10⅞16	–	–	–	–	–	–	–	–	–
6 X 8⅞ X 13⅜16	–	–	–	–	–	–	–	–	–
6 X 8⅞ X 17⅛	–	–	–	–	–	–	–	–	–
3" SINGLE-SIDED CAP									
3 X 15¾ X 12	–	–	–	–	–	–	–	–	–
3" DOUBLE-SIDED CAP									
3 X 17¼ 12 X 10⅜	–	–	–	–	–	–	–	–	–
UNIVERSAL COLUMN KIT 27" X 27"									
6 X 18 X 9	–	–	–	–	–	–	–	–	–
U START BASE BLOCK (SOLD SEPARATELY)									
3½ X 18½ X 12	–	–	–	–	–	–	–	–	–

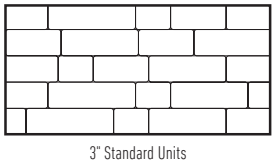
CELTIK® WALL INSTALLATION GUIDE

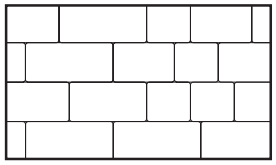
Select one of the following arrangements:

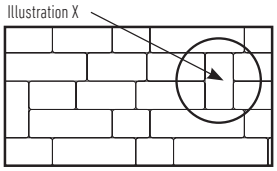
1. 3" standard units
2. 6" standard units
3. Combination of 3" and 6" standard units

A. Installation of the first row: It is preferable to use the longest units for the first row, and lay them on the compacted foundation. It is important to carefully align the first-row units horizontally to ensure that the wall will be level. Even if the selected arrangement is a combination of 3" and 6" units, the first row must contain only one size (3" or 6"). At this stage no pins are used.

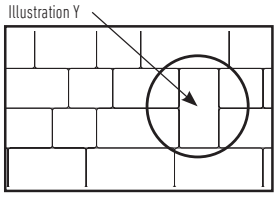
B. Installation of following rows, walls of 3" or 6" standard units: Harmoniously lay units of following rows, not forgetting, however, to insert a pin in each unit before installation. First insert pins in units to be installed. Use appropriate grooves, depending on whether the wall is to be vertical or 9-sloped. Lay each row by overlapping joints of the last row installed.


3" Standard Units

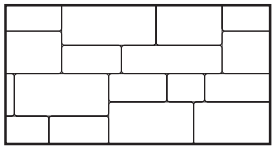

6" Standard Units

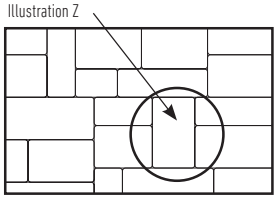


3" Standard Units with Jumper



6" Standard Units with Jumper


50% 3" Standards Units
50% 6" Standard Units



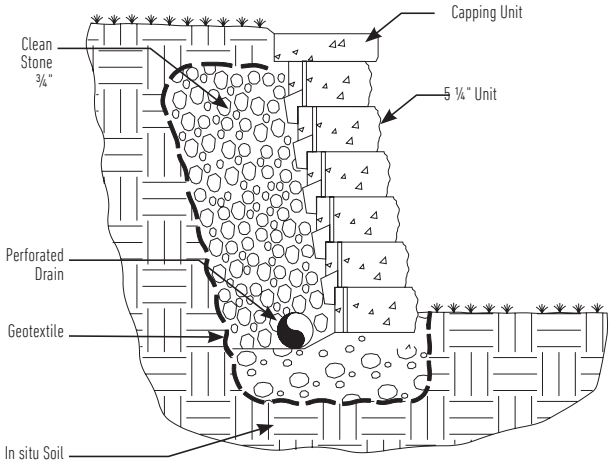
50% 3" Standards Units
50% 6" Standard Units with Jumper

Supplied radiuses may be used vertically to give a natural and original look to the layout. Two of those radiuses measure two rows high. Use a small radius (6 3/4") to match two 3" unit rows (see illustration X), and a medium radius (10 1/4") to cover two 6" unit rows (see illustration Y).

Combination of 3" and 6" standard units Carefully distribute different sizes of units to give a well-balanced, natural look to the layout (see opposite arrangement examples). To integrate vertical elements to the arrangement, split 17 1/4"-long units (3" or 6" high) in halves. A split half covers the total height of a 3" unit plus a 6" unit. (see illustration Z).

C. Back filling: Every two rows, fill the space behind units with 3/4" clean stone. Repeat steps B and C up to the desired height.

NOTE: When combining 3" and 6" units, spaces may appear between some units in the structure.



3' RETAINING WALL

Maximum Gravity Wall Height*: 42"

Batter: 4° (2° vertical wall available on special order)

Minimum Inside Radius: 8'6"

Minimum Outside Radius: 5'6"

6' RETAININGWALL

Maximum Gravity Wall Height*: 42"

Batter: Vertical or 9°

Minimum Inside Radius: 33 ⅛" to 63" depending on combination of units

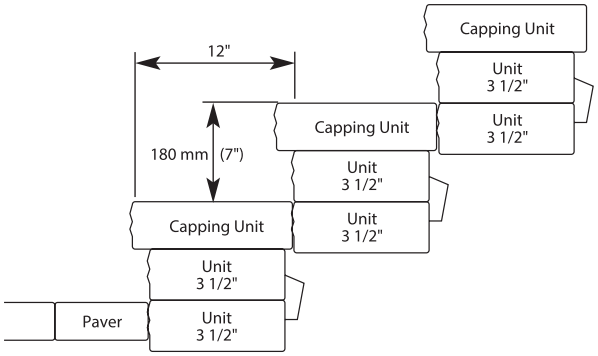
Minimum Outside Radius: 45 ⅛" to 75" depending on combination of units

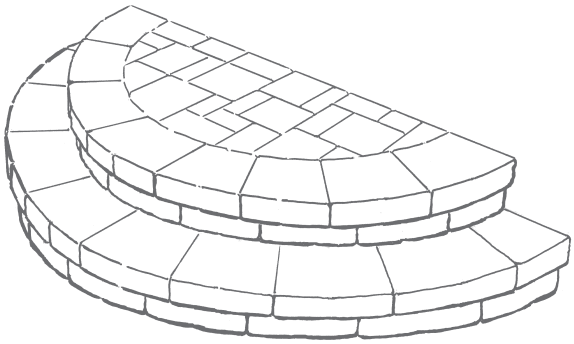
* Assumes ideal soil and site conditions. Retaining walls over their gravity wall limitations should be designed by a licensed and qualified engineer. Some municipalities may require engineering for walls less than their gravity wall height limitations.

BUILDING STEPS USING CELTIK® CAPPING UNITS

Creating straight steps or curved landings: Steps or landings can be laid using Celtik standard wall and Celtik capping units. Semicircular landings can also be created using the Celtik beveled capping units.

Note: Celtik steps and risers have a combined height of 7". If the height of the wall and that of the steps must be the same, it is important that the height of the wall containing the steps is in multiples of 7".



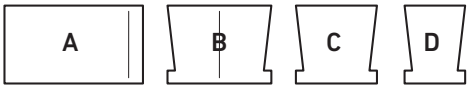


Curved steps using Celtik standard wall units and Celtik bevelled capping units

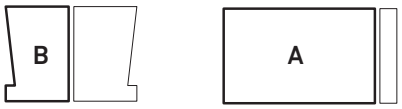
CELTIK WALL PIER KIT CONSTRUCTION

Building Pillars Using Retaining Wall and Straight Capping Units

To build a pillar minimizing joint alignment and better stability, be sure to follow the laying order for each step and by rows, as illustrated.



For the corners, cut a B and A units as illustrated:



- Trim the B unit in the middle
- Trim the A unit along one of the two grooves (left or right)

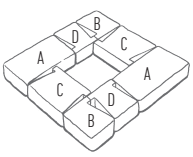
1. Installing the first row: Lay the first four units as illustrated (A, B, C and D), followed by the next four.
2. Installing the second, third and fourth rows: For each row, proceed as illustrated.

Starting from the fifth row, lay as for the first row, followed by the next until the desired height is reached (see illustration).

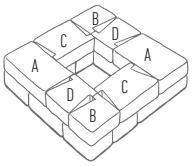
3. Capping: Use Celtik straight capping units.

Notes: Measure the site for the pillar(s). Each pillar has a side of approximately 29".

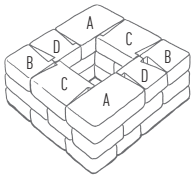
Always secure each row with adhesive to ensure stability.



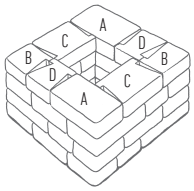
Step 1 (rows 1 and 5)



Step 2 (rows 2 and 6)

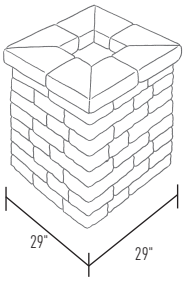


Step 3 (rows 3 and 7)

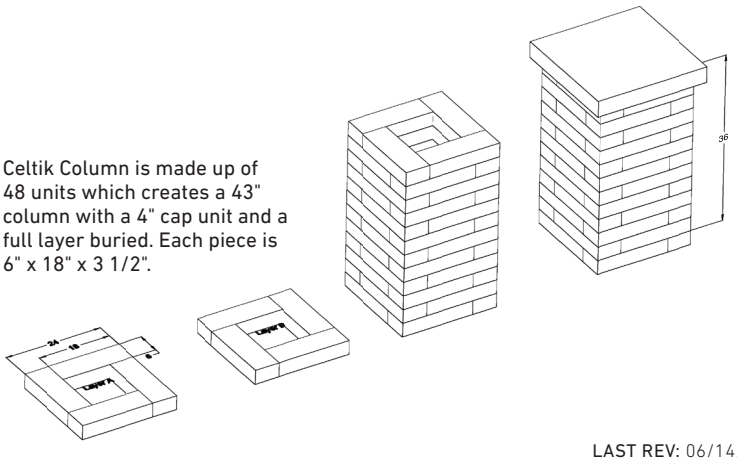


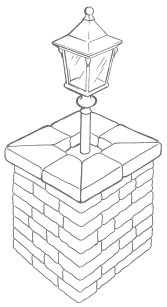
Step 4 (rows 4 and 8)

Pillar may be capped using Celtik cutting capping units

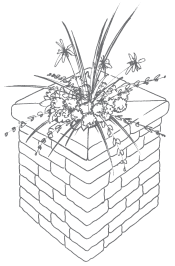


Celtik Column is made up of 48 units which creates a 43" column with a 4" cap unit and a full layer buried. Each piece is 6" x 18" x 3 1/2".





WARNING: If a lighted pillar is desired, make sure all electrical wiring is laid before the units are laid.



If flowers are to be planted atop the pillar, install a geotextile membrane inside the pillar before filling with earth.

DIAMOND® 9D STONE CUT

LEGACY COLLECTION

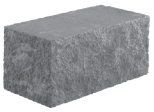
RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓	✓	✓	✓				✓

SHAPES & SIZES

Formal Face

6 x 18 x 9

Corner

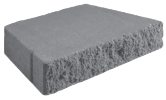


6 x 18 x 9

6" FSW Large

3 x 18/16 x 9

3" Double-Sided Cap

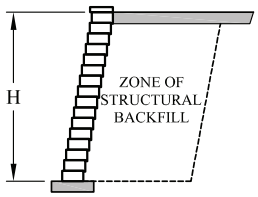


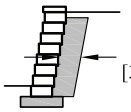
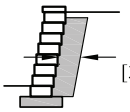
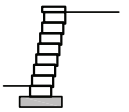
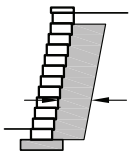
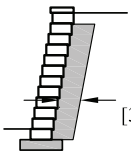
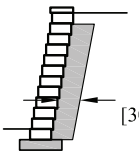
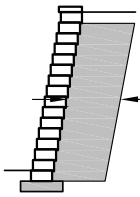
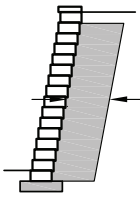
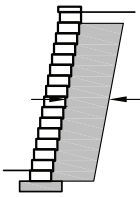
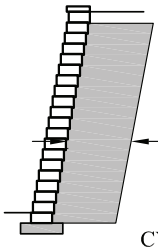
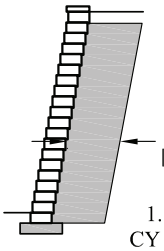
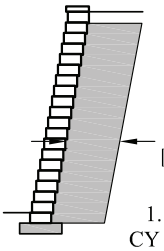
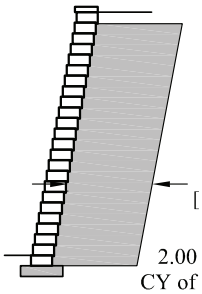
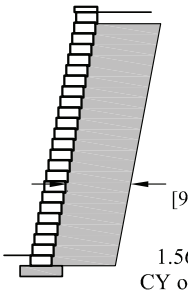
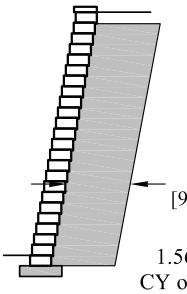
3 x 17¼ / 12 x 10⅜

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ SQFT	WEIGHT/ UNIT	WEIGHT/ PALLET
FORMAL FACE							
6 X 18 X 9	44.4	8.88	5	60	–	11	3198
CORNER							
6 X 18 X 9	30	7.5	4	40	–	10.5	2954
6" FSW LARGE							
3 X 18/16 X 10⅜	30	7.5	4	40	–	28	2030
3" DOUBLE-SIDED CAP							
3 X 17¼/12 X 10⅜	18	3	6	48	–	28	2112

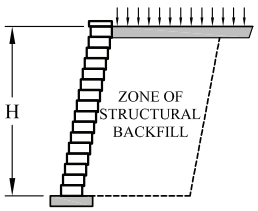
ENGINEERED SOLUTIONS BY ANCHOR WALL SYSTEMS

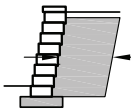
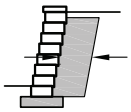
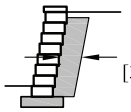
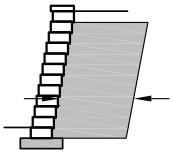
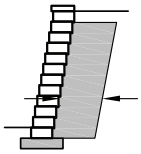
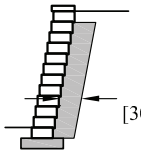
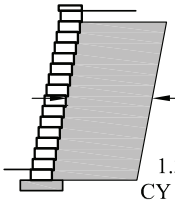
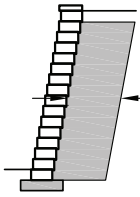
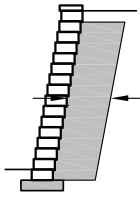
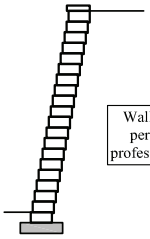
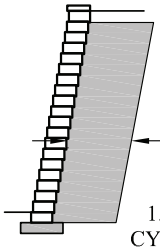
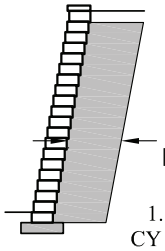
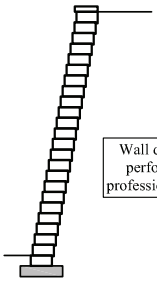
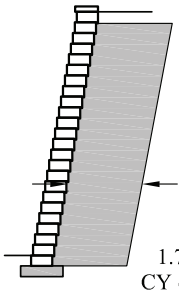
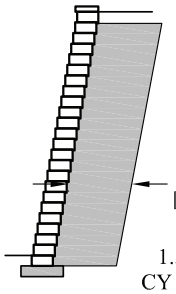
Estimating Chart for Structural Backfill Using Grid with Diamond® 9D Retaining Wall Systems
No Slope / No Surcharge



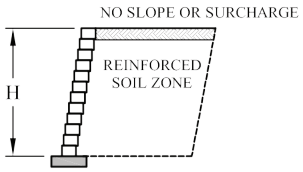
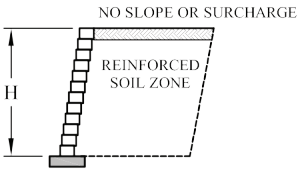
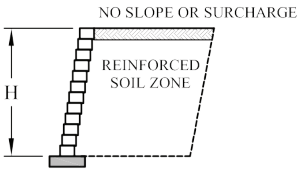
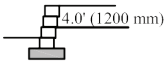
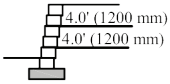
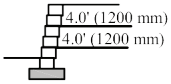
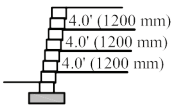
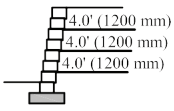
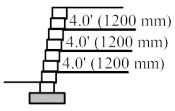
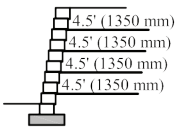
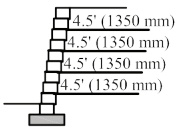
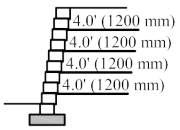
	Clay and Silt Soils φ = 26° γ = 120 pcf (19 kN/m^3)	Silty / Clayey Sand Soil φ = 30° γ = 120 pcf (19 kN/m^3)	Clean Sand and Gravel Soil φ = 34° γ = 120 pcf (19 kN/m^3)
4'-0" (1200 mm) 6 Courses	 1'-0" [300 mm] 0.22 x Wall Length = CY of Structural Backfill	 1'-0" [300 mm] 0.22 x Wall Length = CY of Structural Backfill	
6'-0" (1800 mm) 9 Courses	 1'-6" [450 mm] 0.44 x Wall Length = CY of Structural Backfill	 1'-0" [300 mm] 0.33 x Wall Length = CY of Structural Backfill	 1'-0" [300 mm] 0.33 x Wall Length = CY of Structural Backfill
8'-0" (2400 mm) 12 Courses	 2'-6" [750 mm] 0.89 x Wall Length = CY of Structural Backfill	 2'-0" [600 mm] 0.74 x Wall Length = CY of Structural Backfill	 2'-0" [600 mm] 0.74 x Wall Length = CY of Structural Backfill
10'-0" (3000 mm) 15 Courses	 3'-0" [900 mm] 1.30 x Wall Length = CY of Structural Backfill	 2'-6" [750 mm] 1.11 x Wall Length = CY of Structural Backfill	 2'-6" [750 mm] 1.11 x Wall Length = CY of Structural Backfill
12'-0" (3600 mm) 18 Courses	 4'-0" [1200 mm] 2.00 x Wall Length = CY of Structural Backfill	 3'-0" [900 mm] 1.56 x Wall Length = CY of Structural Backfill	 3'-0" [900 mm] 1.56 x Wall Length = CY of Structural Backfill

Estimating Chart for Structural Backfill Using Grid with Diamond® 9D Retaining Wall Systems
250 PSF Surcharge

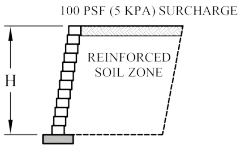
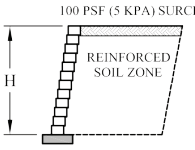
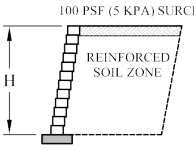
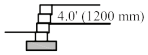
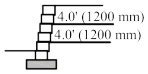
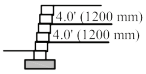
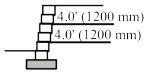
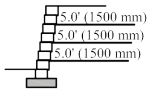
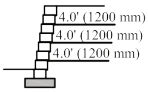
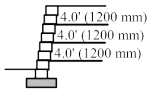
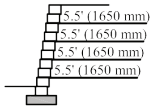
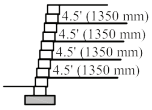
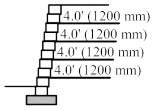
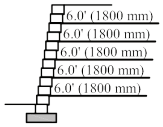
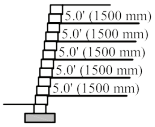
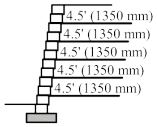


	Clay and Silt Soils φ = 26° γ = 120 pcf (19 kN/m^3)	Silty / Clayey Sand Soil φ = 30° γ = 120 pcf (19 kN/m^3)	Clean Sand and Gravel Soil φ = 34° γ = 120 pcf (19 kN/m^3)
4'-0" (1200 mm) 6 Courses	 2'-6" [750 mm] 0.44 x Wall Length = CY of Structural Backfill	 1'-6" [450 mm] 0.30 x Wall Length = CY of Structural Backfill	 1'-0" [300 mm] 0.22 x Wall Length = CY of Structural Backfill
6'-0" (1800 mm) 9 Courses	 3'-6" [1050 mm] 0.89 x Wall Length = CY of Structural Backfill	 2'-0" [600 mm] 0.56 x Wall Length = CY of Structural Backfill	 1'-0" [300 mm] 0.33 x Wall Length = CY of Structural Backfill
8'-0" (2400 mm) 12 Courses	 4'-0" [1200 mm] 1.33 x Wall Length = CY of Structural Backfill	 2'-6" [750 mm] 0.89 x Wall Length = CY of Structural Backfill	 2'-0" [600 mm] 0.74 x Wall Length = CY of Structural Backfill
10'-0" (3000 mm) 15 Courses	 Wall design to be performed by a professional engineer	 3'-0" [900 mm] 1.30 x Wall Length = CY of Structural Backfill	 2'-6" [750 mm] 1.11 x Wall Length = CY of Structural Backfill
12'-0" (3600 mm) 18 Courses	 Wall design to be performed by a professional engineer	 3'-6" [1050 mm] 1.78 x Wall Length = CY of Structural Backfill	 3'-0" [900 mm] 1.56 x Wall Length = CY of Structural Backfill

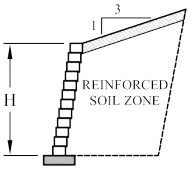
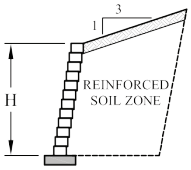
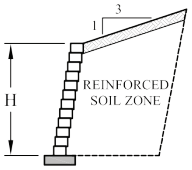
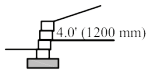
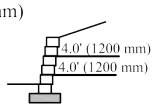
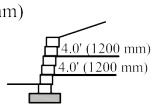
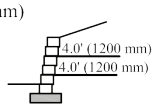
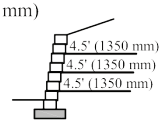
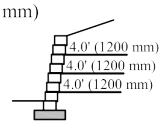
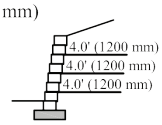
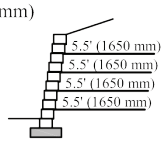
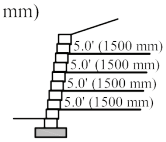
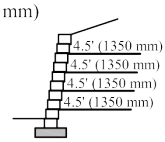
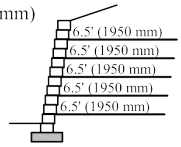
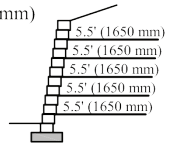
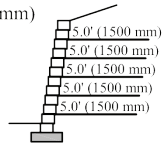
Estimating Chart for Geosythnetic Reinforcement
Diamond 9D® Retaining Walls
No Slopes / No Surcharges

CLAY AND SILT SOIL	SILTY/CLAYEY SAND SOIL	CLEAN SAND AND GRAVEL SOIL
H $\Phi = 26°$ $\gamma = 120$ pcf (19 kN/m^3) 	H $\Phi = 30°$ $\gamma = 120$ pcf (19 kN/m^3) 	H $\Phi = 34°$ $\gamma = 120$ pcf (19 kN/m^3) 
Total Height: 1'-0" (300 mm) 	Total Height: 1'-0" (300 mm) 	Total Height: 1'-0" (300 mm) 
Total Height: 2'-0" (600 mm) 	Total Height: 2'-0" (600 mm) 	Total Height: 2'-0" (600 mm) 
Total Height: 3'-0" (900 mm) 	Total Height: 3'-0" (900 mm) 	Total Height: 3'-0" (900 mm) 
Total Height: 4'-0" (1200 mm) 	Total Height: 4'-0" (1200 mm) 	Total Height: 4'-0" (1200 mm) 
Total Height: 5'-0" (1500 mm) 	Total Height: 5'-0" (1500 mm) 	Total Height: 5'-0" (1500 mm) 

Estimating Chart for Geosythnetic Reinforcement
Diamond 9D® Retaining Walls
100 PSF Surcharge

CLAY AND SILT SOIL	SILTY/CLAYEY SAND SOIL	CLEAN SAND AND GRAVEL SOIL
H Φ = 26° γ = 120 pcf (19 kN/m³) 	H Φ = 30° γ = 120 pcf (19 kN/m³) 	H Φ = 34° γ = 120 pcf (19 kN/m³) 
Total Height: 1'-0" (300 mm) 	Total Height: 1'-0" (300 mm) 	Total Height: 1'-0" (300 mm) 
Total Height: 2'-0" (600 mm) 	Total Height: 2'-0" (600 mm) 	Total Height: 2'-0" (600 mm) 
Total Height: 3'-0" (900 mm) 	Total Height: 3'-0" (900 mm) 	Total Height: 3'-0" (900 mm) 
Total Height: 4'-0" (1200 mm) 	Total Height: 4'-0" (1200 mm) 	Total Height: 4'-0" (1200 mm) 
Total Height: 5'-0" (1500 mm) 	Total Height: 5'-0" (1500 mm) 	Total Height: 5'-0" (1500 mm) 
Total Height: 6'-0" (1800 mm) 	Total Height: 6'-0" (1800 mm) 	Total Height: 6'-0" (1800 mm) 

Estimating Chart for Geosythnetic Reinforcement
Diamond 9D® Retaining Walls
3:1 Crest Slope

CLAY AND SILT SOIL	SILTY/CLAYEY SAND SOIL	CLEAN SAND AND GRAVEL SOIL
H $\Phi = 26°$ $\gamma = 120$ pcf (19 kN/m^3) 	H $\Phi = 30°$ $\gamma = 120$ pcf (19 kN/m^3) 	H $\Phi = 34°$ $\gamma = 120$ pcf (19 kN/m^3) 
Total Height: 1'-0" (300 mm) 	Total Height: 1'-0" (300 mm) 	Total Height: 1'-0" (300 mm) 
Total Height: 2'-0" (600 mm) 	Total Height: 2'-0" (600 mm) 	Total Height: 2'-0" (600 mm) 
Total Height: 3'-0" (900 mm) 	Total Height: 3'-0" (900 mm) 	Total Height: 3'-0" (900 mm) 
Total Height: 4'-0" (1200 mm) 	Total Height: 4'-0" (1200 mm) 	Total Height: 4'-0" (1200 mm) 
Total Height: 5'-0" (1500 mm) 	Total Height: 5'-0" (1500 mm) 	Total Height: 5'-0" (1500 mm) 
Total Height: 6'-0" (1800 mm) 	Total Height: 6'-0" (1800 mm) 	Total Height: 6'-0" (1800 mm) 

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓	✓						✓

SHAPES & SIZES

Stone Cut

8 x 18 x 12

Corner

8 x 18 x 9

4" Universal Cap

4 x 17¼/12 x 10⅜

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ SQFT	WEIGHT/ UNIT	WEIGHT/ PALLET
STONE CUT							
8 X 18 X 12	45	9	5	45	1	81.5	3667
CORNER							
8 X 18 X 9	48	12	4	48	1	20	2880
4" UNIVERSAL CAP							
4 X 17¼/12 X 10⅜	–	–	5	50	–	105	5250

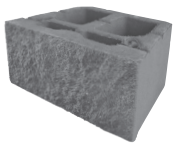
DIAMOND PRO® PS

LEGACY COLLECTION

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓	✓						✓

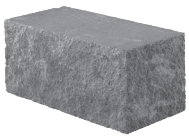
SHAPES & SIZES

Straight Face



8 x 18 x 12

Corner



8 x 18 x 9

4" Universal Cap

4 x 17¼/12 x 10⅜

Anchor™ Pins

5" L x .05" dia.

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ SQFT	WEIGHT/ UNIT	WEIGHT/ PALLET
STONE CUT							
8 X 18 X 12	40	10	4	40	1	81.5	4060
CORNER							
8 X 18 X 9	30	7.5	4	40	1	20	2030
4" UNIVERSAL CAP							
4 X 17¼ / 12 X 10⅜	34	3.8	9	72	–	105	4125
ANCHOR™ PINS							
5" L X .05" DIA.	–	–	–	100/BOX	–	–	–

DIAMOND PRO PS INSTALLATION INSTRUCTIONS

STAKE OUT THE WALL

- A surveyor shall locate the proposed base of wall location. Verify the wall location with the project supervisor.

EXCAVATION

- Excavate for the leveling pad to the lines and grades shown on the approved plans and excavate enough soil behind the wall for the geosynthetic reinforcement material (if required).
- The trench for the leveling pad should be at least 2 feet wide and a minimum of 1 foot (minimum) deep, enough to bury the first course below grade, plus 6 inches for the leveling pad.

Ensure that a minimum of 8 inches or 10 percent of the total wall height (whichever is greater) is below grade. See Diagram 1.

DIAGRAM 1 – EXCAVATION

LEVELING PAD

- An aggregate leveling pad is made of compactible base material of 3/4-inch minus with fines.
- If the planned grade along the wall front will change elevation, the leveling pad may be stepped up by the height of the block (typically 8-inch increments) to match the grade change. Always start at the lowest level and work upward.
- Compact the 6 inch (minimum thickness) aggregate leveling pad, using ordinary compaction methods, to provide a level, hard surface on which to place the base course. Mist lightly with water before compaction, if needed. See Diagram 2.
- For walls with step-ups in the base course, extra care should be given to properly compact the aggregate leveling pad at the step-up locations.

DIAGRAM 2 - LEVELING PAD

BASE COURSE

This is the most important step in the installation process.

- Begin laying block at the lowest elevation of the wall, whenever possible.
- Use string along back edge of the block to check for proper alignment. See Diagram 3.
- Place the blocks side by side, flush against each other, and make sure the blocks are in full contact with the leveling pad. Level front to back and side to side.
  See Diagram 4.
- If the wall is on an incline, don't slope the blocks. Step them up so they remain consistently level.
- Place soil in front of the base course and compact. Continue to fill the rest of the trench, including cores, with gravel. Compact after each course is laid.

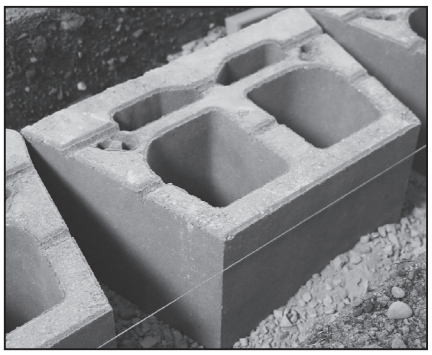


DIAGRAM 3 - PROPER ALIGNMENT

DIAGRAM 4 - LEVELING BASE COURSE

PIN PLACEMENT

- Each unit has two sets of pin cores. The pin cores closest to the face of the block will create a near vertical system. The pin cores closest to the back of the block will create a 1-inch setback with a 7.1° system batter. Additional system batters can be created by alternating pin placement on each course of wall.
- Install pins prior to filling the cores and voids between the blocks. See Diagram 5.

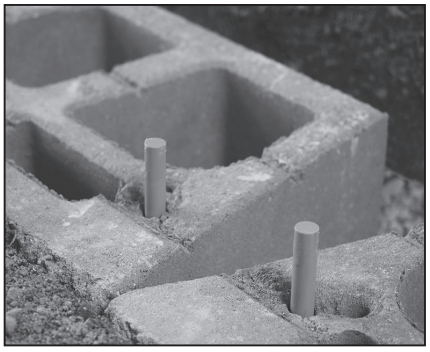


DIAGRAM 5 - PIN PLACEMENT

CONSTRUCTION OF THE NEXT COURSE

- Place 12 inches (minimum) of drainage aggregate between, and directly behind the wall units. Fill voids in wall units with free draining aggregate. Place backfill soil and compact. Only lightweight hand operated compaction equipment is allowed within 3 feet from the back of the wall. See Diagram 6.
- Remove excess fill from top of units before placement of the next course.
- Place the next course of blocks over the pins using the pin alignment cores. Align pins into the core of the unit. Pull each block forward as far as possible to engage the pins. Maintain running bond with row below.
- On curves, use partial units to stay on bond. A circular saw with a masonry blade is recommended for cutting partial units. Use safety glasses and other protective equipment when cutting.

DIAGRAM 6 - CORE FILL

DRAINAGE DESIGN (PER DESIGN)

- Each project is unique. The grades on the site will determine at what level to install the drainpipe. Place the drainpipe (4-inch perforated piping) so water drains down and away from the wall into a storm drain, or daylight just above grade.
- Fill in the area behind the blocks with clean drainage aggregate, at least 1 foot from the wall. You may need to place and backfill several courses to achieve the proper drainage level.
- The outlet pipes should be spaced not more than every 50 feet and at low points of the wall. In order for the drainage aggregate to function properly, it must keep clear of regular soil fill.

DIAGRAM 7 - REINFORCEMENT

REINFORCED BACKFILL PLACEMENT AND COMPACTION (PER PLAN)

- Place reinforced backfill in 6 to 8 inch loose lifts and compact to the densities specified on the approved wall construction plans.
- Only hand operated compaction equipment is allowed within 3 feet from the back of the wall.
- If the compaction equipment is too small to achieve the required compaction, thinner lifts should be used.
- Install each subsequent course in a similar manner. Repeat procedure to the extent of wall height.

DIAGRAM 7 - REINFORCEMENT

REINFORCEMENT PLACEMENT (PER PLAN)

- Refer to the approved wall construction plans for the reinforcement type, strength, and placement location. Measure and cut the reinforcement to the lengths shown on the plans.
- Ensure the reinforced backfill is placed and compacted flush with the top of the units and is graded reasonably flat prior to reinforcement placement. Clean any debris off the top layer of blocks prior to reinforcement placement.
- The reinforcement has a primary strength direction, which must be laid perpendicular to the wall face.
- Place the reinforcement within 1 inch of the front of the units and connect with the pins of the units. *See Diagram 7.*
- Place the next course of units. Pull the reinforcement hand taut and place staples, stakes, or fill at the back of the reinforcement to maintain reinforcement tension during placement of drainage aggregate and reinforced backfill.
- Place a minimum of 6 inches of reinforced backfill prior to operating equipment above the reinforcement. Avoid sudden braking or turning on fill placed over the reinforcement.

CAPPING A WALL

- Always start capping from the lowest elevation. If the wall elevation changes, caps can be stacked where the wall steps up.
- Lay caps at the elevation change and work back toward the previous step up. Cut caps with a diamond-blade saw to fit, as needed.
- Carefully glue with a high-strength concrete adhesive.

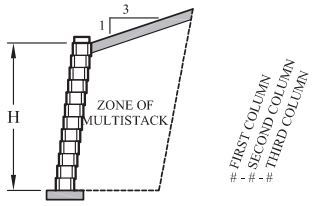
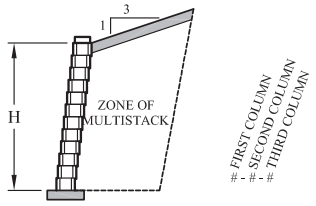
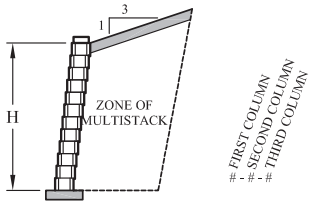
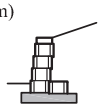
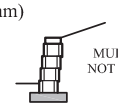
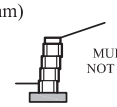
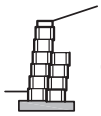
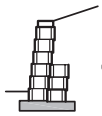
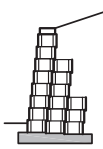
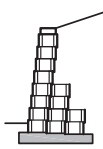
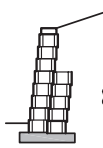
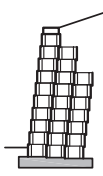
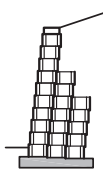
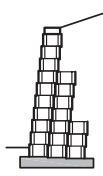
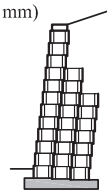
FINISH GRADE AND SURFACE DRAINAGE

- Protect the wall with a finished grade at the top and bottom. To ensure proper water drainage away from the wall, use 6 inches of soil with low permeability and seed or plant to stabilize the surface.
- Consult the wall design engineer if water may be directed behind the wall. If needed, create a swale to divert water away from the wall. This will minimize water seeping into the soil and drainage aggregate behind the wall.

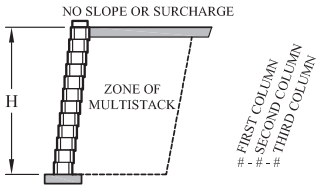
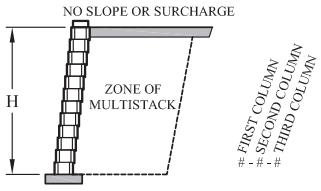
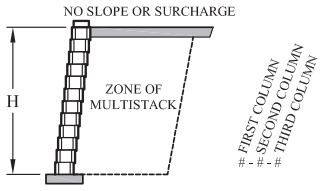
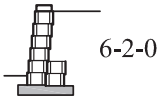
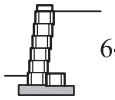
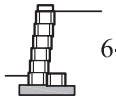
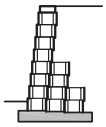
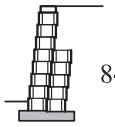
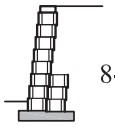
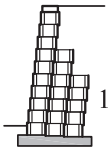
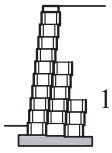
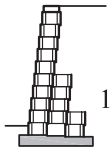
SITE CLEANING AND RESTORATION

- Brush off the wall and pick up any debris left from the construction process. Notify the job superintendent in writing of the completion and that it is ready for final inspection and acceptance.
- Planting vegetation in front and on top of the wall will help reduce the chance of erosion.
- Following these best practices for construction will ensure the success of your retaining wall. These instructions are meant as general guidelines. Site-specific conditions may warrant additional installation requirements.
- It's recommended that you consult a professional engineer to design walls over 4 feet high, and have compaction tested by a qualified Geotechnical Engineer.

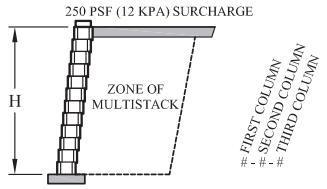
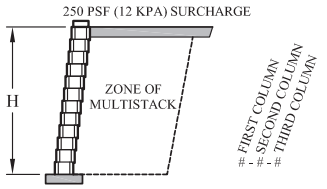
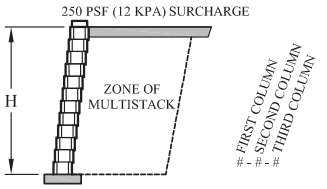
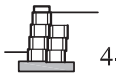
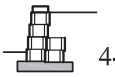
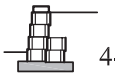
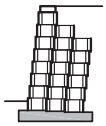
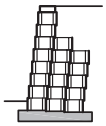
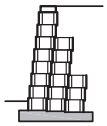
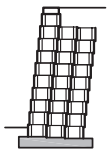
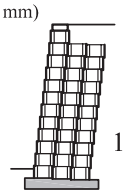
Estimating Chart for Multi-Stack Walls
Diamond Pro® Retaining Walls
3:1 Crest Slope

CLAY AND SILT SOIL	SILTY/CLAYEY SAND SOIL	CLEAN SAND AND GRAVEL SOIL
H φ = 26° γ = 120 pcf (19 kN/m^3) 	H φ = 30° γ = 120 pcf (19 kN/m^3) 	H φ = 34° γ = 120 pcf (19 kN/m^3) 
4 Courses 2'-8" (800 mm)  4-1-0	4 Courses 2'-8" (800 mm)  MULTISTACK NOT REQUIRED	4 Courses 2'-8" (800 mm)  MULTISTACK NOT REQUIRED
6 Courses 4'-0" (1200 mm)  6-4-0	6 Courses 4'-0" (1200 mm)  6-3-0	6 Courses 4'-0" (1200 mm)  6-2-0
8 Courses 5'-4" (1600 mm)  8-6-3	8 Courses 5'-4" (1600 mm)  8-4-2	8 Courses 5'-4" (1600 mm)  8-5-0
10 Courses 6'-8" (2000 mm)  10-9-7	10 Courses 6'-8" (2000 mm)  10-7-5	10 Courses 6'-8" (2000 mm)  10-7-3
12 Courses 8'-0" (2400 mm) N/A	12 Courses 8'-0" (2400 mm)  12-11-9	12 Courses 8'-0" (2400 mm)  12-9-7

Estimating Chart for Multi-Stack Walls
Diamond Pro® Retaining Walls
No Slope / No Surcharges

CLAY AND SILT SOIL	SILTY/CLAYEY SAND SOIL	CLEAN SAND AND GRAVEL SOIL
H φ = 26° γ = 120 pcf (19 kN/m^3) 	H φ = 30° γ = 120 pcf (19 kN/m^3) 	H φ = 34° γ = 120 pcf (19 kN/m^3) 
4 Courses 2'-8" (800 mm) 	4 Courses 2'-8" (800 mm) 	4 Courses 2'-8" (800 mm) 
6 Courses 4'-0" (1200 mm) 	6 Courses 4'-0" (1200 mm) 	6 Courses 4'-0" (1200 mm) 
8 Courses 5'-4" (1600 mm) 	8 Courses 5'-4" (1600 mm) 	8 Courses 5'-4" (1600 mm) 
10 Courses 6'-8" (2000 mm) 	10 Courses 6'-8" (2000 mm) 	10 Courses 6'-8" (2000 mm) 
12 Courses 8'-0" (2400 mm) 	12 Courses 8'-0" (2400 mm) 	12 Courses 8'-0" (2400 mm) 

Estimating Chart for Multi-Stack Walls
Diamond Pro® Retaining Walls
250 PSF Surcharge

CLAY AND SILT SOIL	SILTY/CLAYEY SAND SOIL	CLEAN SAND AND GRAVEL SOIL
H φ = 26° γ = 120 pcf (19 kN/m^3) 	H φ = 30° γ = 120 pcf (19 kN/m^3) 	H φ = 34° γ = 120 pcf (19 kN/m^3) 
4 Courses 2'-8" (800 mm)  4-3-0	4 Courses 2'-8" (800 mm)  4-2-0	4 Courses 2'-8" (800 mm)  4-2-0
6 Courses 4'-0" (1200 mm)  6-5-3	6 Courses 4'-0" (1200 mm)  6-4-2	6 Courses 4'-0" (1200 mm)  6-4-2
8 Courses 5'-4" (1600 mm)  8-7-6	8 Courses 5'-4" (1600 mm)  8-6-5	8 Courses 5'-4" (1600 mm)  8-6-3
10 Courses 6'-8" (2000 mm) N/A	10 Courses 6'-8" (2000 mm)  10-9-9	10 Courses 6'-8" (2000 mm)  10-9-8
12 Courses 8'-0" (2400 mm) N/A	12 Courses 8'-0" (2400 mm) N/A	12 Courses 8'-0" (2400 mm)  12-11-11

HIGHLAND STONE®

LEGACY COLLECTION

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓	✓	✓	✓	✓	✓	✓	✓

SHAPES & SIZES

6" Retaining

6 x 6 x 12

6 x 12 x 12

6 x 18 x 12

6" Freestanding

6 x 6 / 4 x 9

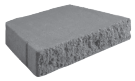
6 x 12 / 10 x 9

6 x 18 / 16 x 9

Corner

6 x 18 x 9

XL Cap



13 x 18 / 12 x 3

ENGINEERED SOLUTIONS BY ANCHOR™ WALL SYSTEMS

HIGHLAND STONE®

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
							
✓	✓	✓	✓	✓	✓	✓	✓

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ UNIT	WEIGHT/ PALLET
6" RETAINING								
6 X 6 X 12	4	.8	5	16	3.2	4.00	–	–
6 X 12 X 12	8	1.6	5	16	3.2	2.00	–	–
6 X 18 X 12	12	2.4	5	16	3.2	1.33	–	–
TOTAL	24	6	4	48	12	–	–	2808
6" FREESTANDING								
6 X 6 / 4 X 9	4	0.8	5	20	4	5	–	–
6 X 12 / 10 X 9	9	1.8	5	20	4	2.22	–	–
6 X 18 / 16 X 9	14	2.8	5	20	4	1.43	–	–
TOTAL	27	5.4	5	60	12	–	–	2808
CORNER								
6 X 18 X 9	30	7.5	4	40	10	1.33	–	2060
XL CAP								
13 X 18 / 12 X 3	22.32	2.79	8	72	9	3.23	–	3312

ENGINEERED SOLUTIONS BY ANCHOR WALL SYSTEMS

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓	✓				✓		

SHAPES & SIZES

Veneer

Available Sizes (Inches)
Heights: 2, 3, 4 & 6
Lengths: 6, 8, 10, 12, 14, 16 & 20
Thicknesses: 15/8, 11/8

MELVILLE WALL™

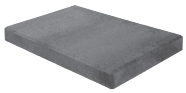
RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓	✓	✓				✓	✓

SHAPES & SIZES

Wall Unit

4 x 20 x 10

Cap



2 x 20 x 13

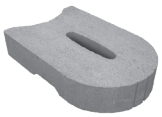
UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ SQFT	WEIGHT/ UNIT	WEIGHT/ PALLET
WALL UNIT							
4 X 20 X 10	26.6	4.44	6	48	–	–	3060
CAP							
2 X 20 X 13	16.8	1.68	10	60	–	–	2500

U START BASE BLOCK®

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓	✓	✓	✓	✓		✓	✓

SHAPES & SIZES

Block



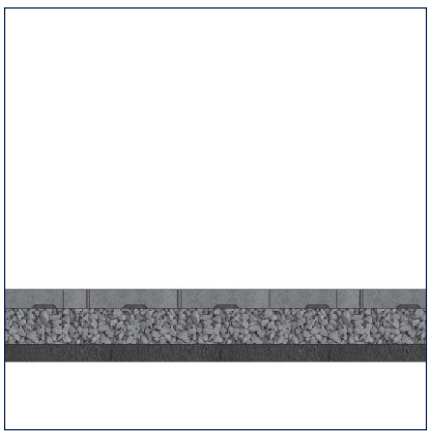
18 7/16 x 12 x 3½

Base Block with Tandem Wall

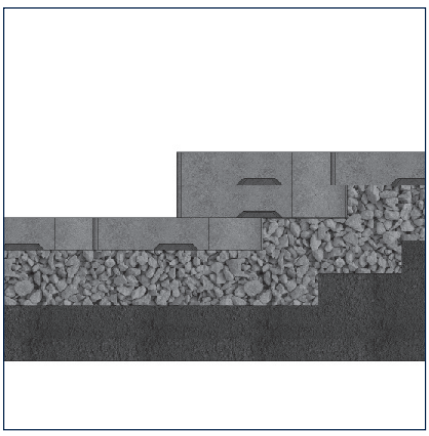
*Note: U Start Base Block actual coverage length is 16 11/16

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ SQFT	WEIGHT/ UNIT	WEIGHT/ PALLET
U START BASE BLOCK							
18 7/16 X 12 X 3½	–	–	7	56	–	54	3080

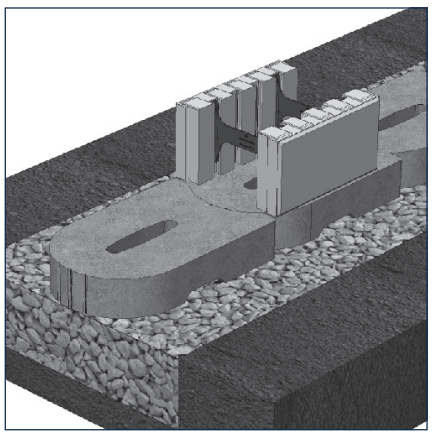
INSTALLATION INSTRUCTIONS



Prep Site



Install Base Course



Install the Wall

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓	✓	✓	✓	✓	✓	✓	✓

SHAPES & SIZES

Universal

4 x 12 x 8

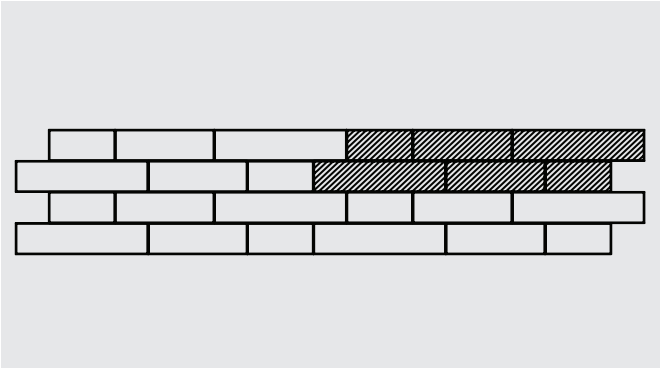
UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ SQFT	WEIGHT/ UNIT	WEIGHT/ PALLET
UNIVERSAL							
4 X 12 X 8	39.96	6.66	6	120	3.003	28	3360

WESTON STONE™ INSTALLATION INSTRUCTIONS

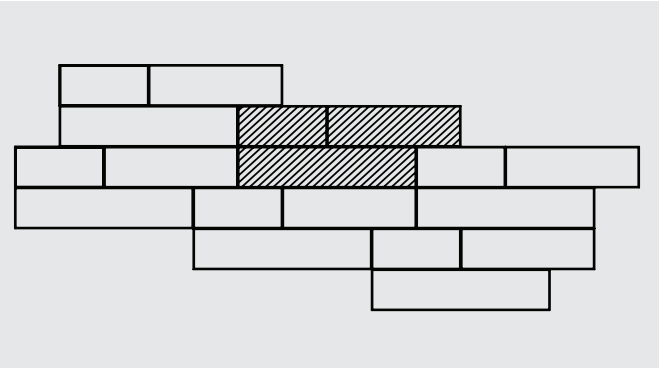
This is a pinless system. Maximum wall height is 2½ feet. Walls exceeding 2½ feet in height may require geogrid reinforcing and the consultation of a qualified engineer. Contact your Belgard sales representative or dealer for assistance.

Weston Stone wall units must be glued with a quality construction adhesive to develop the necessary mechanical bond. All measurements herein are approximate. Natural materials are used in the manufacturing of this product.

WESTON STONE™ WALL PATTERNS

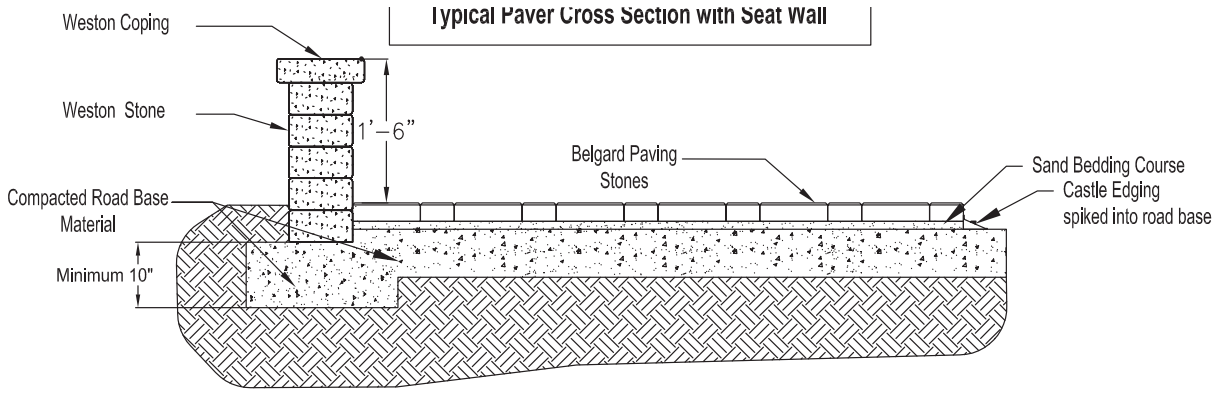


1-PIECE

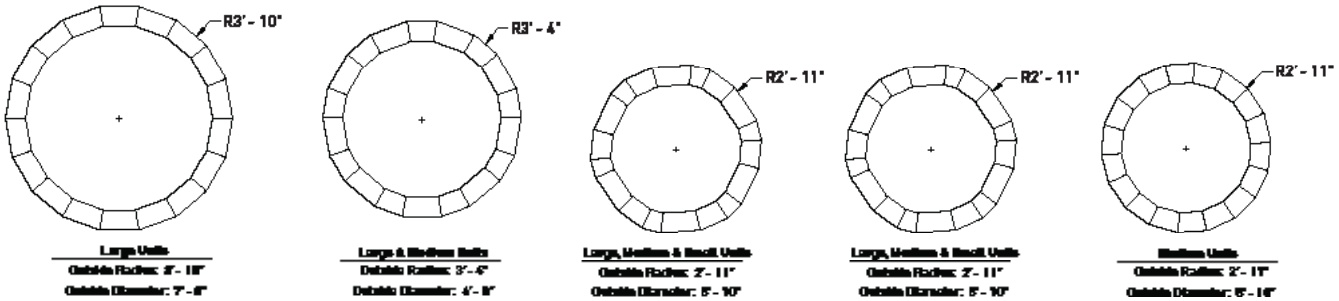


2-PIECE

TYPICAL CROSS SECTION WITH WESTON STONE SEAT WALL



TREE RINGS WITH WESTON STONE



VERSATILE LANDSCAPING

INSTALLATION INSTRUCTIONS

VERSATILE LANDSCAPING

TANDEM WALL SYSTEM INSTALLATION INSTRUCTIONS

STEP 1

Remove all surface vegetation and debris. Select the length of the wall and excavate a trench the length of the wall and approximately 12" from top of final grade. Then place a minimum of 6" of dense graded aggregate and compact to 95% standard density or modified. It's not recommended to use a pea rock or a rounded type of material on the base.

STEP 2

Place the Base Block (shown here) on the compacted gravel. Level the base block units front to back as well as side to side. Making sure the units are fully level.

STEP 3

Assemble the Tandem Wall units by inserting the Tandem Wall connectors into the dove tails. Make sure the front and rear panels are the same length.

STEP 4

Place the assembled Tandem Wall unit on the top of the U Start Base Block or Torpedo Base Block, making sure that the first course is centered on the base block. Check to make sure units are kept level.

STEP 5

Once the Tandem Wall units have been placed. Run a string line along the back of the front or rear panel to assure you are keeping the wall units straight in line.

STEP 6

Place 3/4" crushed rock in between the panels to provide frictional connection and proper internal drainage.

STEP 7

Lightly hand compact the gravel in between the panels for proper compaction.

STEP 8

Place 12" of 3/4" drainage rock behind the rear panel of the wall. This will provide for proper drainage behind retaining walls.

STEP 9

Set additional courses of the Tandem Wall. Making sure that you are keeping the wall in proper alignment. Backfill and compact each additional course.

STEP 10

When placing the cap on top of Tandem Wall, use a construction adhesive to secure the cap to the top of the wall.

TANDEM MODULAR BLOCK RETAINING WALL INSTALLATION BEST PRACTICES

STAKE OUT THE WALL

- A surveyor shall locate the proposed base of wall location. Verify the wall location with the project supervisor.

LEVELING PAD

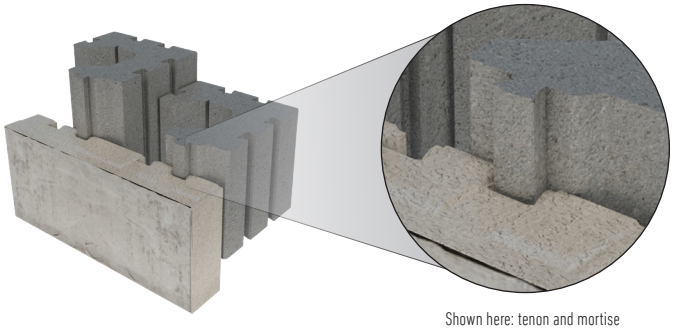
- Excavate for the leveling pad to the lines and grades shown on the approved plans and excavate enough soil behind the wall for geosynthetic reinforcement material, if needed.
- The trench should be approximately 24 inches wide. See Diagram 1.
- Create a leveling pad of compacted base materials that extends a minimum of 6 inches in front of and 6 inches behind the base units. This leveling pad should be at least 6 inches deep after compaction. See Diagram 2.

BASE COURSE

- Install the U Start Base Block with the hand holds down. Place the blocks so the outside curve of one block fits into the curve of the block next to is. Blocks should touch.
- Level blocks front to back and side to side with a dead-blow hammer. See Diagram 3.
- The base course and 2 inches of the wall will be buried.

SYSTEM ASSEMBLY

- Assemble a retaining wall unit by applying the veneer unit to the modular blocks.
- Each modular block has a vertical tenon and each veneer has multiple mortises. The veneer units are joined to the modular blocks by simply sliding the tenon into the mortise to form a retaining wall block.
- Assembly of the retaining wall units always requires the use of two modular blocks for every veneer unit. See Diagram 4.



Shown here: tenon and mortise

Diagram 1—Excavation

Diagram 2—Leveling Pad

Diagram 3—Lay and level base block

Diagram 4— Assembled units on top of U Start block

CONSTRUCTION OF 1ST WALL COURSE

- Clean any debris off the top of the U Start base course unit.
- Place the assembled retaining wall unit on top of the U Start Base Block making sure that the first course of wall is centered on the base block.
- For best results, refer to the laying patterns on page 5.
- Check to make sure units are level front to back and side to side on each course.
- Fill cores and voids with ¾-inch free draining aggregate prior to laying the next course of block. See Diagram 5.
- After filling the cores of the units add additional free draining aggregate behind the units extending at least 12 inches behind the blocks. Compact aggregate after each course of block is laid.

Diagram 5—Fill cores with free draining aggregate

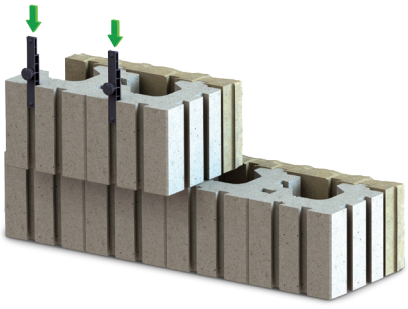
CONSTRUCTION OF SUBSEQURENT COURSES AND UNIVERSAL CLIP PLACEMENT

- Clean any debris off the top of the 1st course of wall units.
- Assemble and place the next course of wall units, maintaining a running bond.
- Insert a universal connector in each modular unit with the knuckle towards the soil. Push the connector down until it extends below the bottom of the block to create a 3/8" setback. You need one connector per modular unit.
- Push the retaining unit forward until it locks in place. See Diagram 6.
- Level unit front to back and side to side with a dead-blow hammer.
- Fill cores and voids with ¾-inch free draining aggregate prior to laying the next course of block.
- Backfill with ¾-inch free draining aggregate directly behind the block, adding 6 inches at a time followed by proper compaction. Only lightweight hand operated compaction equipment is allowed within 3 feet from the back of the wall.
- Continue each course until the project is complete.

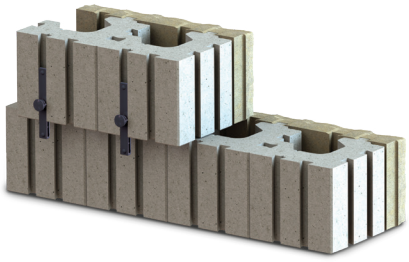
Diagram 6—Lock connector to the block in front

Tandem Universal Connector

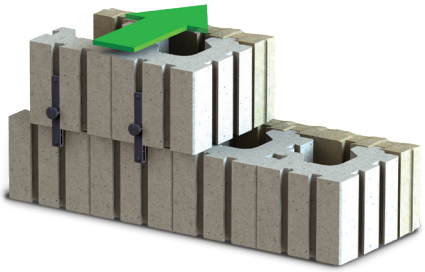
STEP 1



STEP 2



STEP 3



RETAINING WALL INSTALLATION BEST PRACTICES

STEPPING UP THE BASE

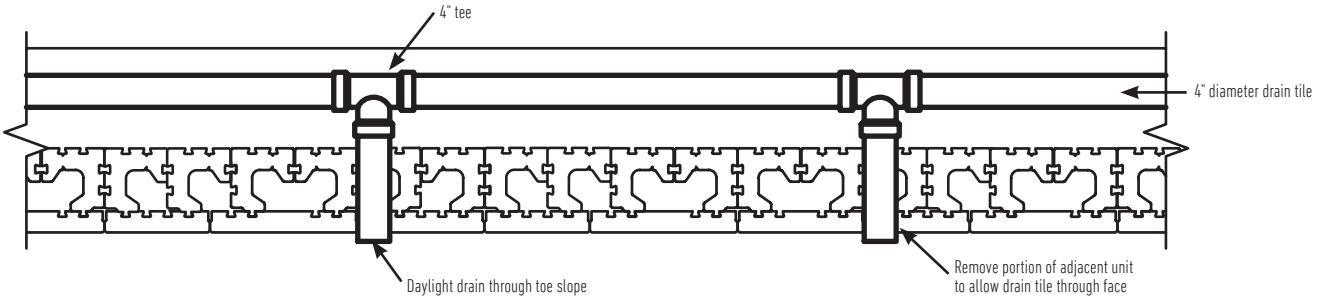
- Walls built on a sloping grade require a stepped base.
- Begin excavation at the lowest point and dig a level trench into the slope until it is deep enough to accommodate the base material and one entire block.
- At this point, step up the height of one block and begin a new section of base trench. Continue to step-up as needed to top of slope. Always bury at least one full unit at each step. See Diagram 7.

Diagram 7—Stepping up the base

DRAINAGE (PER PLAN)

- Each project is unique. The grades on the site will determine at what level to install the drainpipe. Place the drainpipe (4-inch perforated piping) so water drains down and away from the wall into a storm drain, or daylight just above grade. See Diagram 8.
- Fill in the area behind the blocks with clean drainage aggregate, at least 1 foot from the wall. You may need to place and backfill several courses to achieve the proper drainage level.
- The outlet pipes should be spaced not more than every 50 feet and at low points of the wall. In order for the drainage aggregate to function properly, it must keep clear of regular soil fill.

Diagram 8—Daylight



REINFORCED BACKFILL PLACEMENT AND COMPACTION (PER PLAN)

- Place reinforced backfill in 6 to 8 inch loose lifts and compact to the densities specified on the approved wall constructions plans. See Diagram 9.
- Only hand operated compaction equipment is allowed within 3 feet of the back of the wall.
- If the compaction equipment is too small to achieve the required compaction, thinner lifts should be used.
- Install each subsequent course in a similar manner. Repeat procedure to the extent of the wall height.

Diagram 9—Compaction

GEOSYNTHETIC REINFORCEMENT PLACEMENT (PER PLAN) BATTERED WALL INSTALLATION ONLY

- Refer to the approved wall construction plans for the reinforcement type, strength, and placement location. Measure and cut the reinforcement to the lengths shown on the plans.
- Ensure the reinforced backfill is placed and compacted flush with the top of the units and is graded reasonably flat prior to reinforcement placement. Clean any debris off the top layer of blocks prior to reinforcement placement.
- The reinforcement has a primary strength direction, which must be laid perpendicular to the wall face.
- Place the reinforcement within 1 inch of the front of the units. See Diagram 9.
- Apply the next course of blocks to secure the reinforcement in place. Insert Universal Connector into one of the mortise on the back of the modular block to create the proper setback. Pull the reinforcement hand taut and place staples, stakes, or fill at the back of the reinforcement to keep tension during placement of drainage aggregate and reinforced backfill.
- Place a minimum of 6 inches of reinforced backfill prior to operating equipment above the reinforcement. Avoid sudden braking or turning on fill placed over the reinforcement.

Diagram 9—Action

Diagram 10—Low permeable soil

FINISH GRADE AND SURFACE DRAINAGE

- Protect the wall with a finished grade at the top and bottom. To ensure proper water drainage away from the wall, use 6 inches of soil with low permeability and seed or plant to stabilize the surface. See Diagram 10.
- Consult the wall design engineer if water may be directed behind the wall. If needed, create a swale to divert water away from the wall. This will minimize water seeping into the soil and drainage aggregate behind the wall.

SITE CLEANING AND RESTORATION

- Brush off the wall and pick up any debris left from the construction process. Notify the job superintendent in writing of the completion and that it is ready for final inspection and acceptance.
- Planting vegetation in front and on top of the wall will help reduce the chance of erosion.
- Following these best practices for construction will ensure the success of your retaining wall system. These instructions are meant as general guidelines.
  Site-specific conditions may warrant additional installation requirements.
- Oldcastle® recommends you consult a professional engineer to design walls over 4 feet high, and have compaction tested by a qualified geotechnical engineer.

TANDEM MODULAR BLOCK
FREESTANDING WALL INSTALLATION BEST PRACTICES

STAKE OUT THE WALL

- A surveyor shall locate the proposed base of wall location. Verify the wall location with the project supervisor.

LEVELING PAD

- Excavate for the leveling pad to the lines and grades shown on the approved plans and excavate enough soil behind the wall for geosynthetic reinforcement material, if needed.
- The trench should be approximately 24 inches wide. See Diagram 17.
- Create a leveling pad of compacted base materials that extends a minimum of 6 inches in front of and 6 inches behind the base units. This leveling pad should be at least 6 inches deep after compaction. See Diagram 18.

Diagram 17—Excavation

BASE COURSE

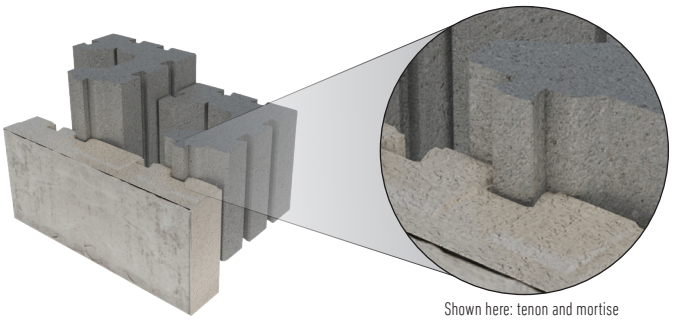
- Install the U Start Base Block with the hand holds down. Place the blocks so the outside curve of one block fits into the curve of the block next to is. Blocks should touch.
- Level blocks front to back and side to side with a dead-blow hammer. See Diagram 19.
- The base course and 2 inches of the wall will be buried.

Diagram 18—Leveling Pad

SYSTEM ASSEMBLY

- Assemble a freestanding wall unit by applying the veneer units to both sides of the modular blocks. See Diagram 20.
- Each modular block has a vertical tenon and each veneer has multiple mortises. The veneer units are joined to the modular blocks by simply sliding the tenon into the mortise to form a retaining wall block.
- Assembly of the freestanding wall units always requires the use of two modular blocks for every veneer unit.

Diagram 19—Lay and level base block



Shown here: tenon and mortise

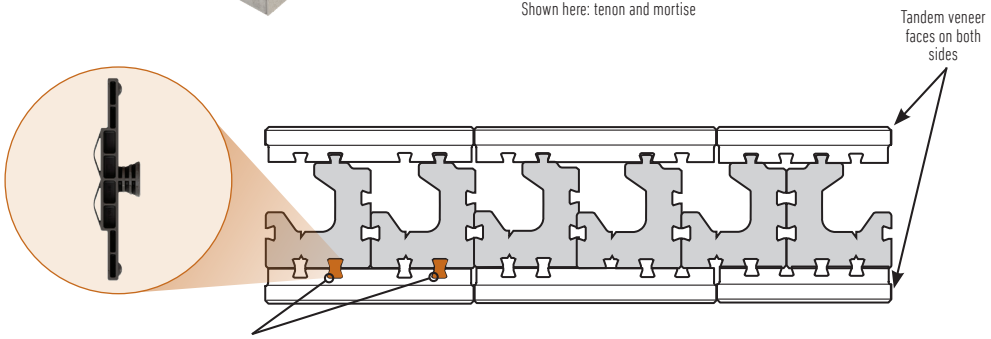


Diagram 20—Placing veneers onto modular block

TANDEM MODULAR BLOCK
COURSE CONSTRUCTION & ENDING A WALL WITH & WITHOUT A COLUMN

CONSTRUCTION OF WALL COURSES

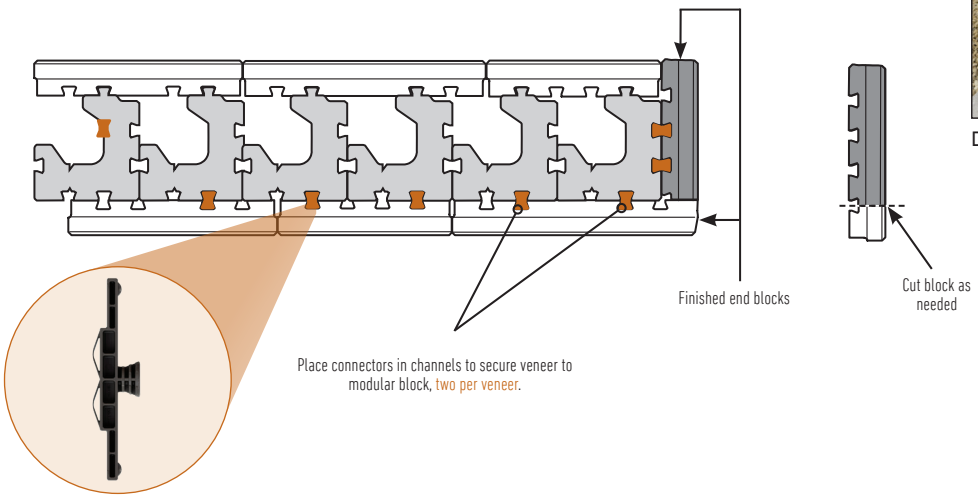
To continue with additional courses, assemble units in the same manner as the previous step. Place the assembled units on the course below ensuring that the veneer units are staggered over the bond below. Glue each modular unit to the course below. See Diagram 21.

Diagram 21—Second course construction

ENDING A WALL WITHOUT A COLUMN

When finishing a wall end without a column build the wall to the desired length. Install the veneers on one side of the modular units flush to the end. Install the veneer on the other side extending past the modular unit by the thickness of one veneer. Make sure the exposed end of the veneer is the natural edge and not the manufactured edge. Line up and mark a unit to be cut to finish the end of the wall. See illustration below. Make sure to cut off the manufactured edge leaving the natural edge exposed. Install this cut unit inserting two universal connectors into the grooves in both the modular unit and the veneer. See Diagram 22.

Diagram 22—Wall end example



ENDING A WALL WITH A COLUMN

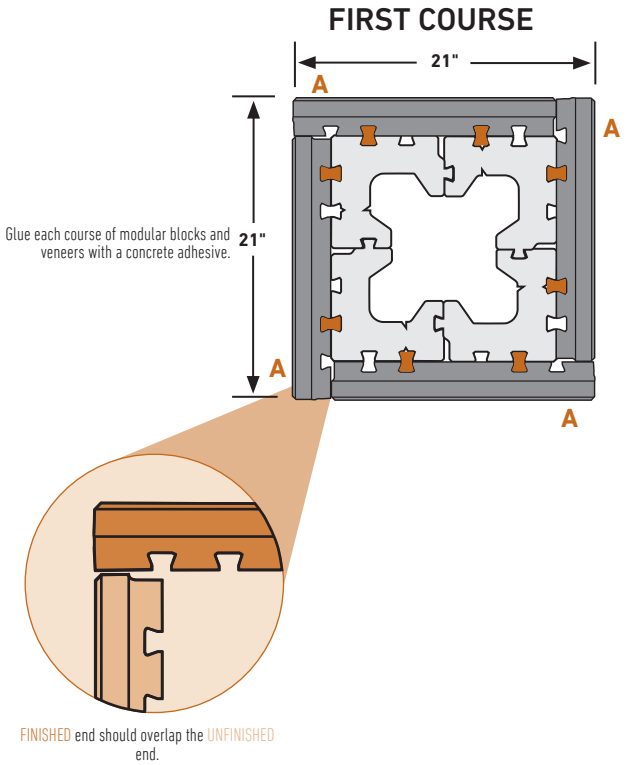
To end a free-standing wall with a column, start by constructing the first course of the column. Using four Modular units, interlock them with the tongue and groove See Diagram 24 on the next page. Add four large veneer units to this assembly utilizing to universal connectors for each veneer. Start building the wall flush to, and centered on the assembled column units. Add the veneer units to the wall and build to length. See Diagram 25. Add the second course of column in a similar fashion rotating the bond at the corners. Continue with the second course of wall. Continue in this fashion until you reach the desired height of column and wall.

Finished End (Corner Unit)

Diagram 23—Ending a wall at a column example

TANDEM MODULAR BLOCK - COLUMNS

To build a column you start by excavating 12 inches below grade and installing an aggregate leveling pad 6 inches thick after compaction and extends at least 6 inches on each side beyond the column dimension. Install 4 U-Start base blocks on the aggregate pad leveling front to back and side to side. Using four Modular units, create your first course of column by interlocking the tongue and groove system together forming an approximate 16-inch by 16-inch square formation. See Diagram 24. Attach a large veneer to each side of your column using 2 universal connectors on each veneer. Make sure the one end of the veneer that protrudes beyond the edge has the natural edge exposed and not the manufactured edge. Using 4 more Modular units build the second course in the same manner using Structurebond between the course to secure them in place. Attach 4 veneers to this course making sure to stagger the bonds at the corners and ensure that all exposed ends are the natural ends and not the manufactured ends. See Diagram 25. Continue to build your column to the desired height.



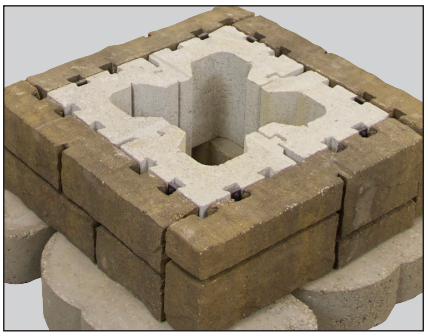


Diagram 24—Connector locations

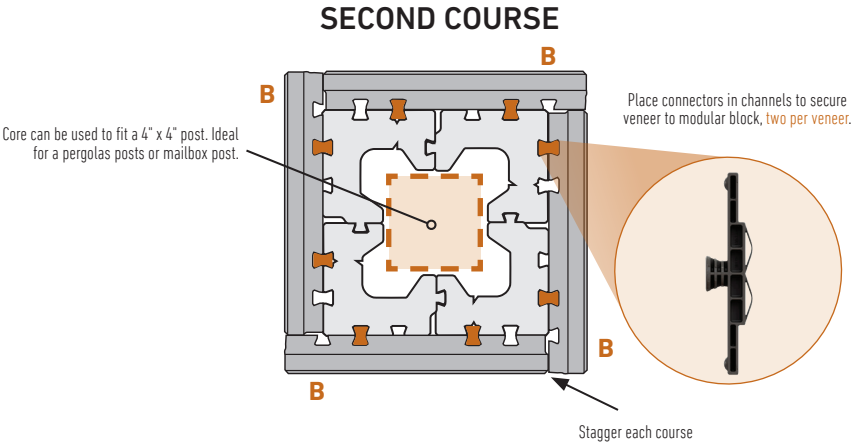
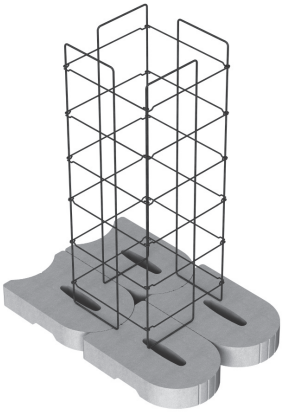


Diagram 25—Stager veneers to break up lines

TANDEM COLUMN INSTALLATION GUIDE

TANDEM® COLUMN COMPONENTS

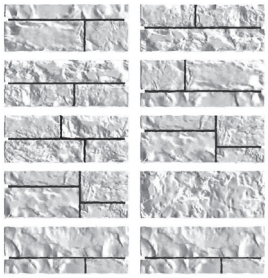


1 Column grid

Final height: 42"
(Shown with
U Start Base Block®)

Connectors:

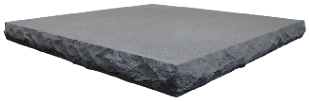
50 connectors per bag
(Enough for 1-42" column)



Pallet of panels

21.8 square feet needed per column.
Use modules G only (Lg Unit 18.5"w)

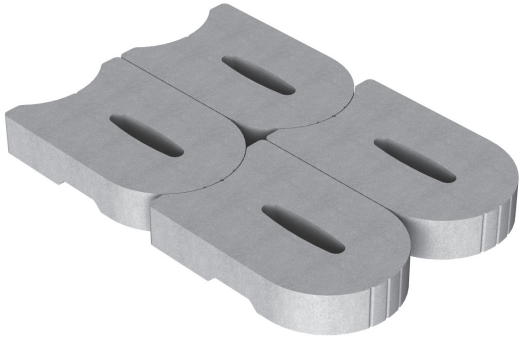
24 of the long pieces are needed (21.6 sf)



24" x 24"

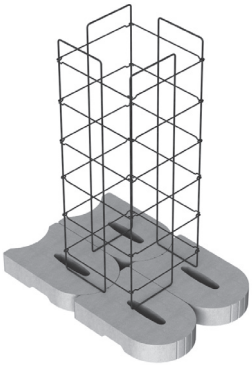
Tandem Wall Cap
(Sold Separately)

STEP 1



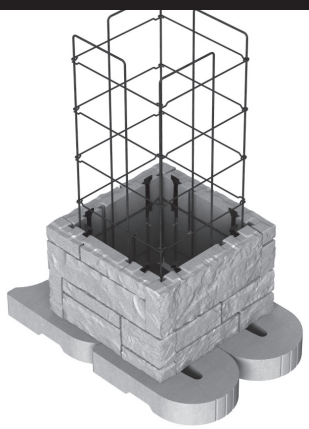
Install Base Block

STEP 2



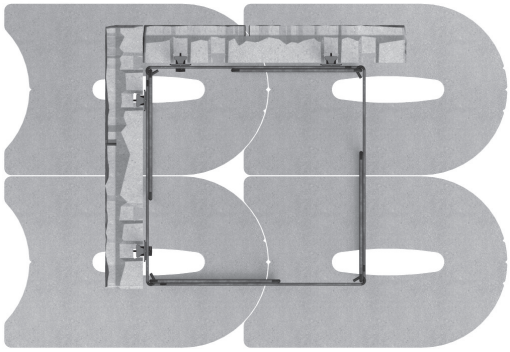
Place the grid on a prepared surface. Make sure the outside perimeter of the grid is clear

STEP 3



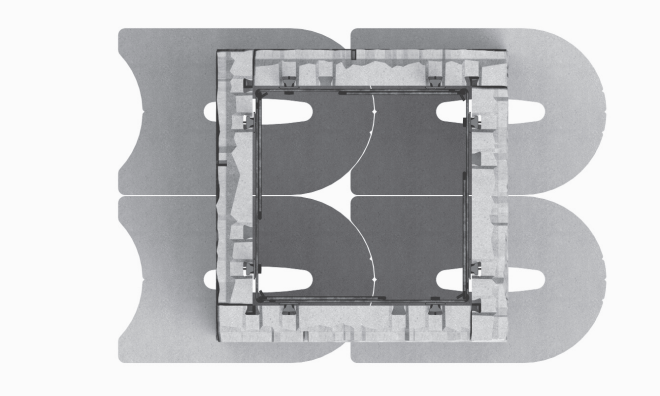
Take a panel and slide the supplied connectors into the dovetails until they snap onto the horizontal rod of the grid.

STEP 4



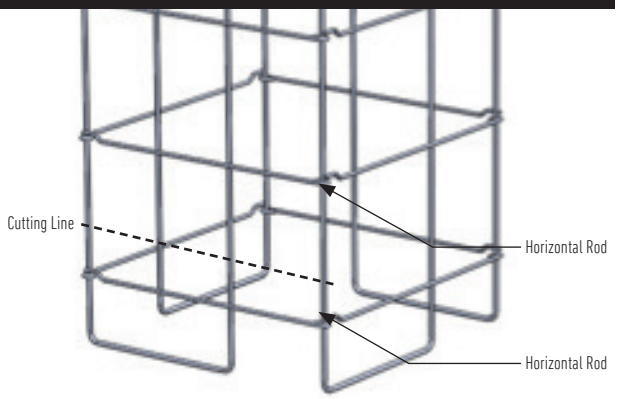
Take another stone and repeat the same process. Make sure you have a corner stone to finish the corner. Once installed, slide the stone along the horizontal axis to adjust the corner.

STEP 5



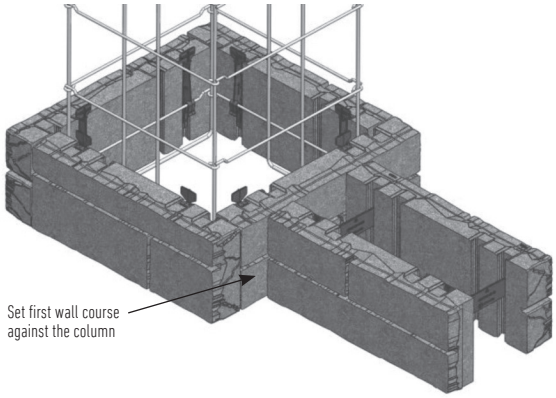
Once you have completed the first two rows, use a square to make sure the column is square and then fill the space with 3/4" clear aggregate. Fill the empty space with aggregates at every row.

OPTIONAL



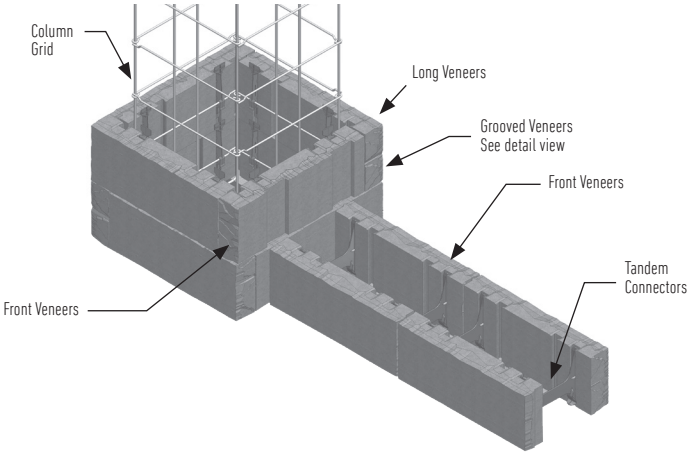
If you have to cut the grid before installation on the base, you must cut the vertical rod at mid distance between two horizontal rods as shown below.

STEP 6



To integrate a wall into the column set the first course up against the column.

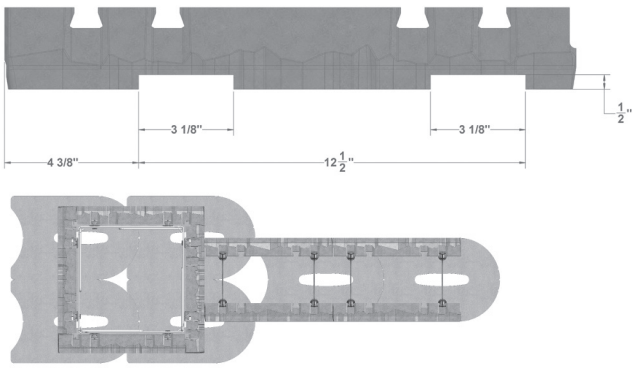
STEP 7



At the second row the long veneer on the column needs to be grooved. Set wall block into grooved veneer.

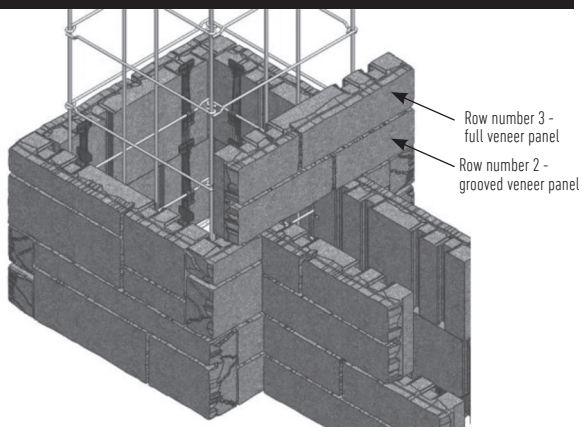
Note: You must groove a panel every other row.

STEP 7: GROOVED VENEER DETAIL



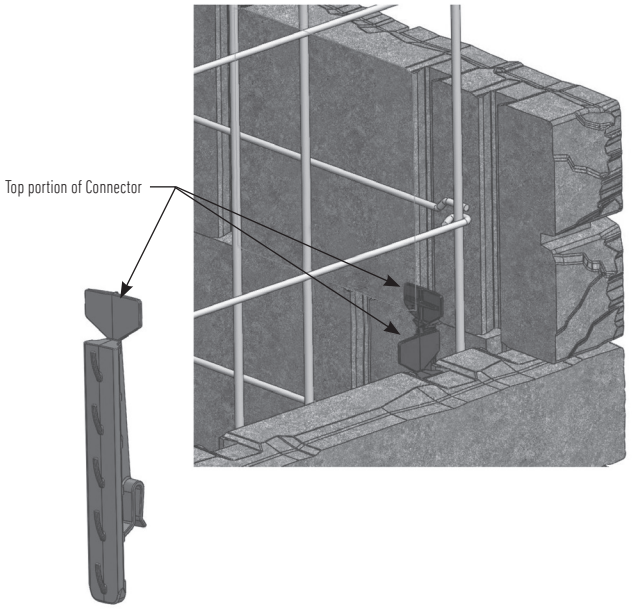
Every other row will require a grooved veneer.

STEP 8



When starting row 3 place full veneer panel across the top of grooved panel. The wall block in row 3 will butt up against column similar to row 1.

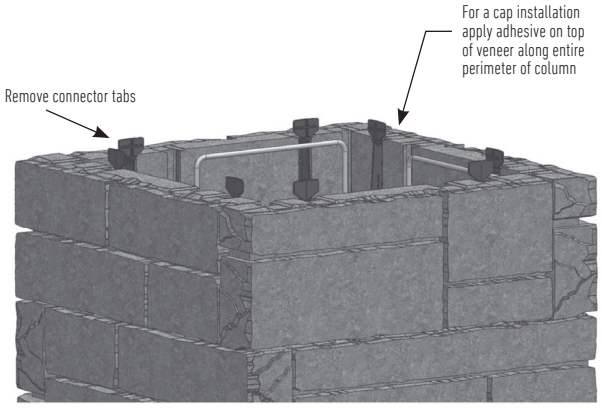
STEP 9



IMPORTANT

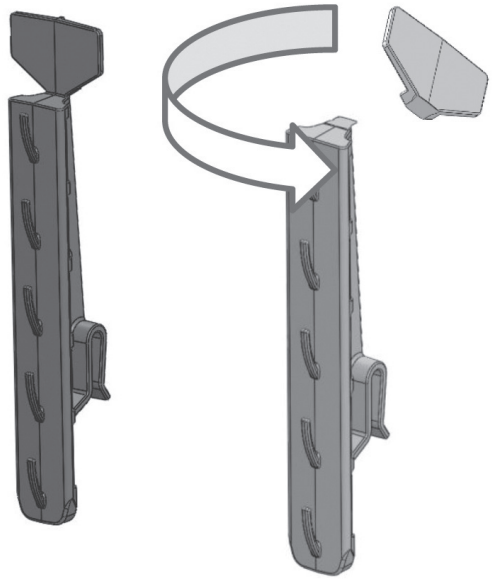
When you are starting the second row, make sure the base of the top panel hits the top portion of the connector.

STEP 10



When you have reached the last row, cut the top portion of the connectors with pliers snippers or just by twisting the top portion with your hands.

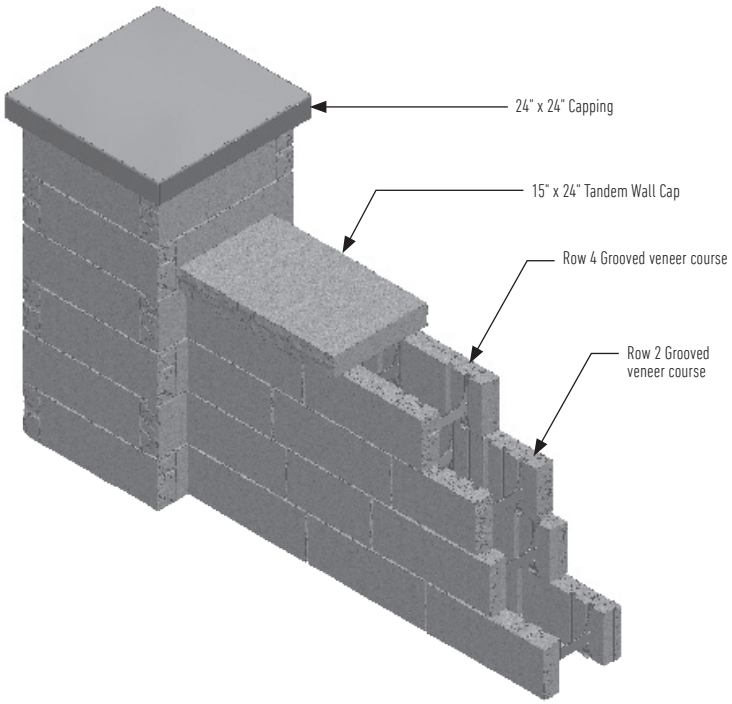
STEP 11



Apply glue on the top of the panels before putting on the capping.

IMPORTANT: The capping must lay on the panels , not on the grid.

FINISHED WALL DETAIL

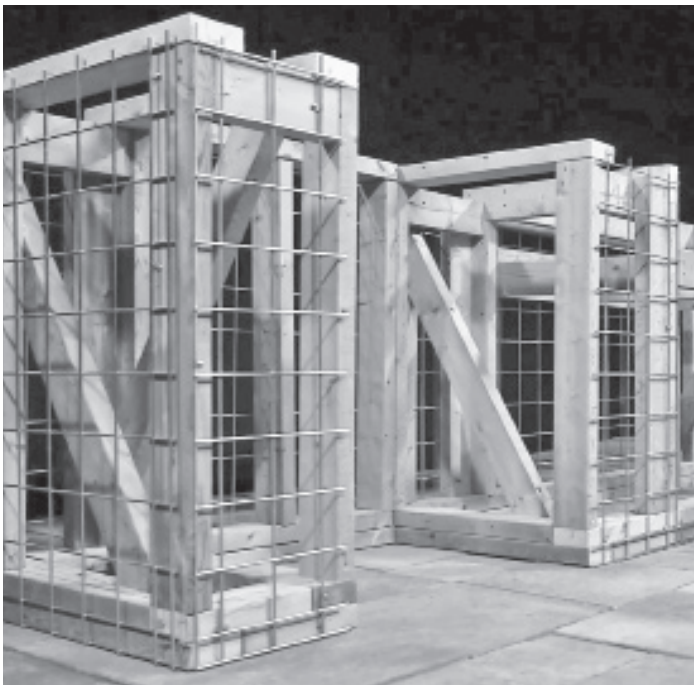


TANDEM MODULAR GRID INSTALLATION GUIDE

STEP 1

Build your wooden frame

STEP 2



Attach your Modular Grid

STEP 3

Attach Lafitt Tandem Veneer with Connector

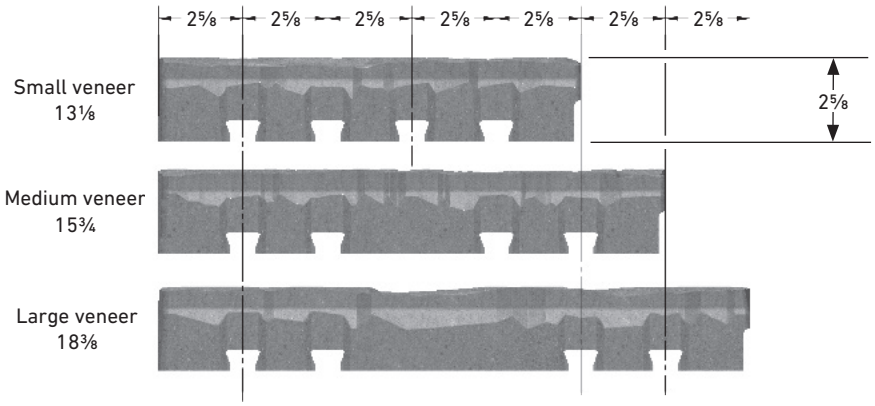
STEP 4

Finish with Lafitt Tandem Cap Unit

TANDEM MODULAR GRID INSTALLATION GUIDE

The Tandem® system allows you to install different outdoor living components such as outdoor kitchens (barbecue, fridge, bar), patio furniture (bench and table), flower box, outdoor gas fireplace, privacy wall, fencing and deck skirting.

You can easily build all these features if you use the new Tandem Modular Grid.

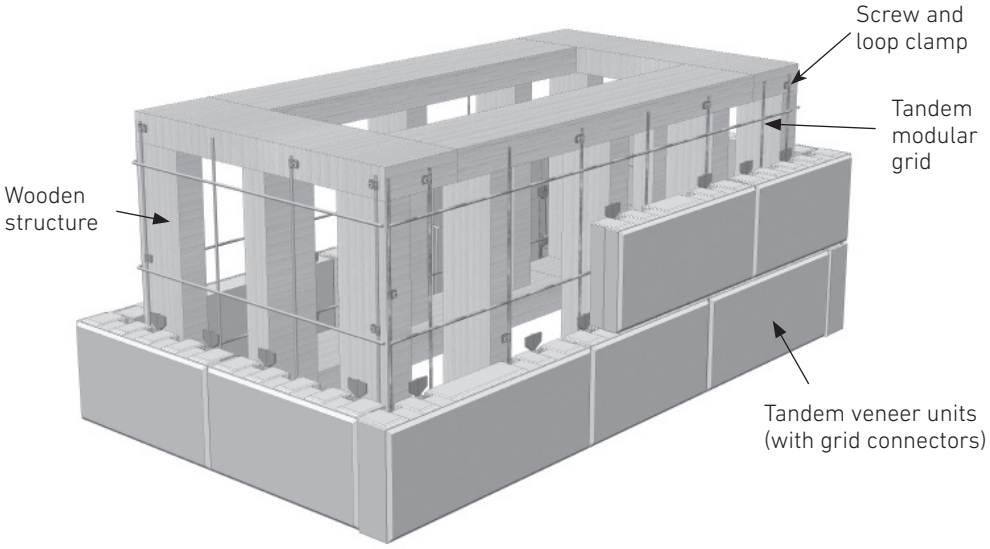


OUR SYSTEM HAS MULTIPLE BENEFITS:

- Provides a unified look for all the features of the landscaping design.
- Provides a durable, economical and maintenance-free solution.
- Offers great flexibility and unrestricted creativity regarding the configuration and size of components to be constructed.
- Offers a solution to difficult issues (e.g. deck skirting).

BASIC PRINCIPLES

A set of Tandem Modular Grids is attached to a treated wood structure. Tandem veneers are then attached to the grids. Since veneer units are manufactured in multiples of 2 ⅝, the overall dimensions of outdoor units should always be a multiple of
2 ⅝ in order to avoid cuts. The wooden structure should be built taking into account the modular design of Tandem veneers. The same applies to the height, which must be a multiple of 7 1⁄16. The item is finished off with an appropriate capping module. You can construct a range of outdoor units of various dimensions.



MAIN COMPONENTS OF THE SYSTEM

- Tandem Modular Grid, 28" × 42 ½, including stainless steel screws and loop clamps for fastening. A modular grid covers a facing surface of 8.40 sqft. Each modular grid includes a kit of 25 connectors, 10 × 1 ¼ screws and 10 loop clamps.
- Tandem veneer units.
- Galvanized shelf angle (for deck skirting, privacy walls and fences) 2 ½ × 2 ½ × 8' (min 10 gauge, Z275 G90 galvanized steel, ASTM A653 Grade 33).
- Concrete capping module (Sold Separately)

OTHER COMPONENTS (SOLD SEPARATELY)

- Treated Wood: 2x4, 2x6 and 2x8 boards, 4x4 or 6x6 posts, 4x8 plywood sheets (all wood should be treated against rot and must be category S-P-F #1 or better). Refer to the various suppliers' specific application sheets for details.
- Fiber cement panels 48" × 96" × ½.
- #10 screws of varying lengths, nuts, bolts and washers where required, all in stainless steel. It is not recommended to use treated wood screws (green ceramic) or metal plated screws (zinc, copper or other).
- Hilti Kwik Bolt®-type anchors (for concrete deck skirting).
- Simpson Strong-Tie-type hardware for construction of wood frame for deck.
- Custom countertops made of granite, quartz, marble and natural stone as alternatives to concrete tops.
- Cementitious adhesive for between each layer of veneers.
- Eliminates the use of cementitious products (mortar).

You must always take the modular design of Tandem® veneers into account when constructing wood framing. The overall dimensions of outdoor units must always be a multiple of 2 5⁄8 in length and width and 7 1⁄16 in height. When installing the framing, remember that grids need a 5⁄8 space between the veneer and
the frame.

Bearing this in mind, the following tables show detailed measurements for the framing of units. These tables are very useful for quickly calculating the actual dimensions of the wood framing and the unit to be constructed to build the component without any veneers cut.

NOTE: When using a Dim A less than 15 13⁄16 cuts will be needed.

TYPICAL COMPONENT – PLAN VIEW

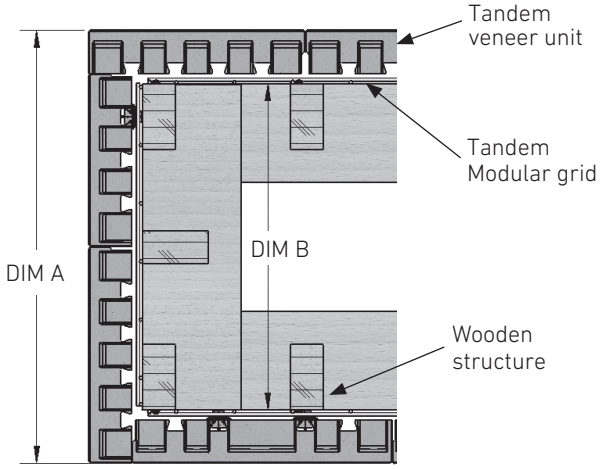


Table of component and its wood frame dimensions based on the modular format of veneers

DIM A (IN)	DIM A (MM)	DIM B (IN)	DIM B (MM)
7 15⁄16	201	1 3⁄8	35
10 9⁄16	268	4	102
13 3⁄16	335	6 5⁄8	169
15 13⁄16	402	9 5⁄16	236
18 7⁄16	469	11 15⁄16	303
21 1⁄8	536	14 9⁄16	370
23 3⁄4	603	17 3⁄16	437
26 3⁄8	670	19 13⁄16	504
29	737	22 1⁄2	571
31 5⁄8	804	25 1⁄8	638
34 5⁄16	871	27 3⁄4	705
36 15⁄16	938	30 3⁄8	772
39 9⁄16	1005	33 1⁄16	839
42 3⁄16	1072	35 11⁄16	906
44 13⁄16	1139	38 1⁄4	973
47 1⁄2	1206	40 15⁄16	1040
50 1⁄8	1273	43 9⁄16	1107
52 3⁄4	1340	46 1⁄4	1174
55 3⁄8	1407	48 7⁄8	1241
58 1⁄16	1474	51 1⁄2	1308
60 11⁄16	1541	54 1⁄8	1375
63 5⁄16	1608	56 3⁄4	1442
65 15⁄16	1675	59 3⁄8	1509
68 9⁄16	1742	62 1⁄16	1576
71 1⁄4	1809	64 5⁄8	1643
73 7⁄8	1876	67 5⁄16	1710
76 1⁄2	1943	69 15⁄16	1777
79 1⁄8	2010	72 5⁄8	1844
81 3⁄4	2077	75 1⁄4	1911
84 7⁄16	2144	77 7⁄8	1978
87 1⁄16	2211	80 1⁄2	2045
89 11⁄16	2278	83 1⁄8	2112
92 5⁄16	2345	85 3⁄4	2179
94 15⁄16	2412	88 7⁄16	2246
97 5⁄8	2479	91 1⁄16	2313
100 1⁄4	2546	93 11⁄16	2380
102 7⁄8	2613	96 5⁄16	2447
105 1⁄2	2680	99	2514

MEGA-TANDEM™ INSTALLATION INSTRUCTIONS

STEP 1

Place the 6" crushed stone (3/4" rock) to create the leveling pad for Mega-Tandem.

STEP 2

Compact the placed crushed stone to reach 95% standard proctor density.

STEP 3

Forming up to pour a 2" unreinforced concrete overlay for setting the first course of Mega-Tandem.

A 6" crushed stone leveling pad is an option as well.

STEP 4

Pouring the leveling pad with a low psi concrete.

STEP 5

Start the Mega-Tandem at the lowest elevation. Start by setting the panels in place with the use of the wall jigs to help support the panels during the wall installation.

STEP 6

Insert the Mega-Tandem (connecting members into the center dovetails to provide the structural support in the wall system.

STEP 7

Run a string line from the back side of the front wall veneer to assure proper horizontal wall alignment.

STEP 8

Place the #57 stone inside the Mega-Tandem panels to provide the internal gravel interlock. This will also provide for internal drainage to relieve hydrostatic pressure in the wall.

STEP 9

Place the drain tile directly behind the rear wall panel to provide for positive drainage through the wall to daylight.

STEP 10

Laying out the radi. Insert plastic connecting members into the veneer dovetails to keep the connectors as straight as possible. Make sure that each veneer has at least two connecting members for proper panel support.

STEP 11

Start the corner with the side textured fitting up against a Mega-Tandem wall panel facing the outer side of the wall. Then place additional panels to create a corner column. Insert the first two connectors upside down for the panel supports (break off the setback tab for this step). Then place two connectors in the opposite direction right side up to support the additional panels. Mega-Tandem Wall requires four connecting members per course.

STEP 12

Place a concrete paver directly behind the wall panel and level from front to back. Then take the construction adhesive and place the glue on the paver and top of wall panel. Then secure the cap units to create the bond.

STEP 13

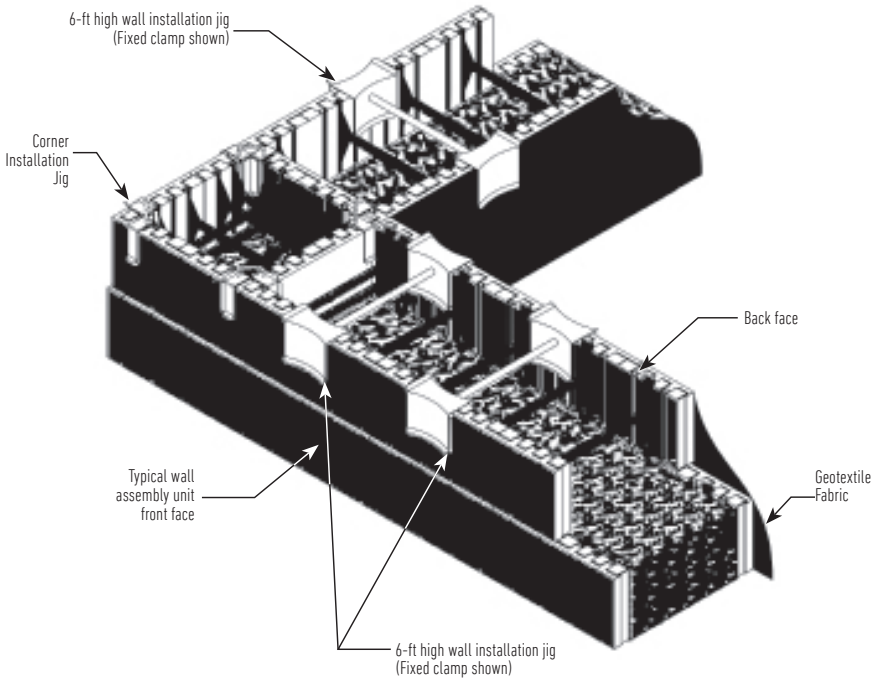
Run a string line for accurate wall alignment when setting the caps.

STEP 14

Place a low permeable soil for fill placement for the top of wall.

JIGS

1. Installation jigs are required to hold the front face, back face and corners inplace during the construction and infill of the wall units. This is typical for the 6 and 10 foot high wall installations as shown below.
2. Connectors required 1 per square face foot.
3. Geotextile fabric as specified by designing engineer is shown on the back face of the walls, it is recommended to be used to prevent native soils from infiltrating into the infill material.



ARTFORMS™

METROPOLITAN COLLECTION

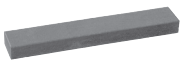
RESIDENTIAL	COMMERCIAL	STEPS	CAPS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓	✓	✓	✓	✓	✓	✓	✓

SHAPES & SIZES

18 x 36*

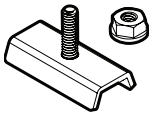
3 × 18 × 36

6 x 36*

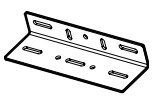


3 × 6 × 36

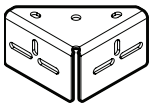
Installaton Hardware



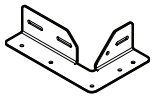
Anchor Slide & Nut



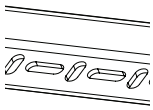
Joining Plate



Outer Corner



Inner Corner



Stretcher

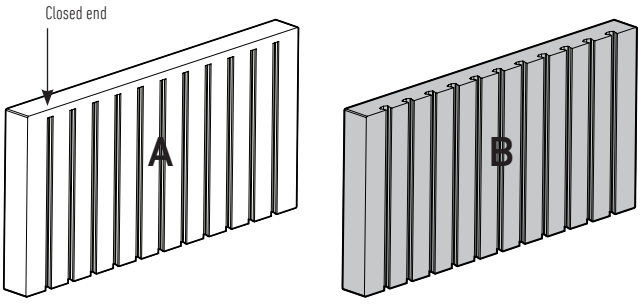
*Pallets contain both open and closed ended units

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
ARTFORMS							
3 X 18 X 36	81	9	9	18*	2	4.5	2682**
3 X 6 X 36	31.5	10.5	3	21*	7	1.5	1029

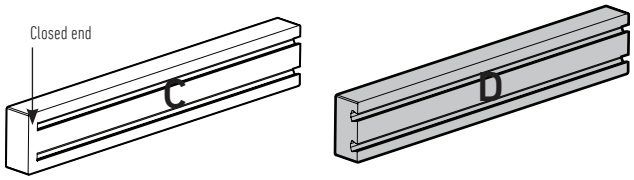
*Total number of both open and closed end panels. 18 x 36 pallets contain 9 of each. 6 x 36 pallets contain 3 open end panels and 18 closed end panels

**150lbs is the weight for the closed units, 148lbs is the weight for the open units.

18 X 36 X 3



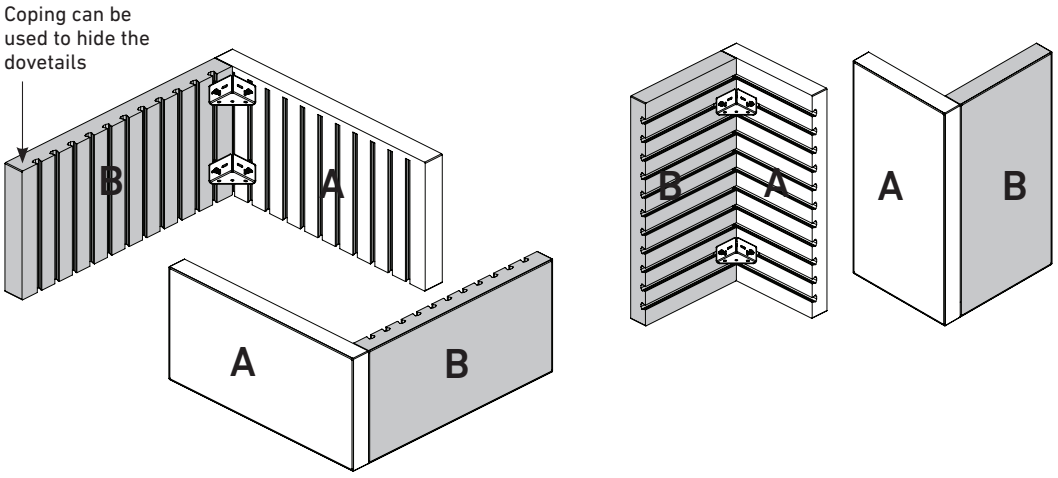
6 X 36 X 3



PANEL CONFIGURATIONS

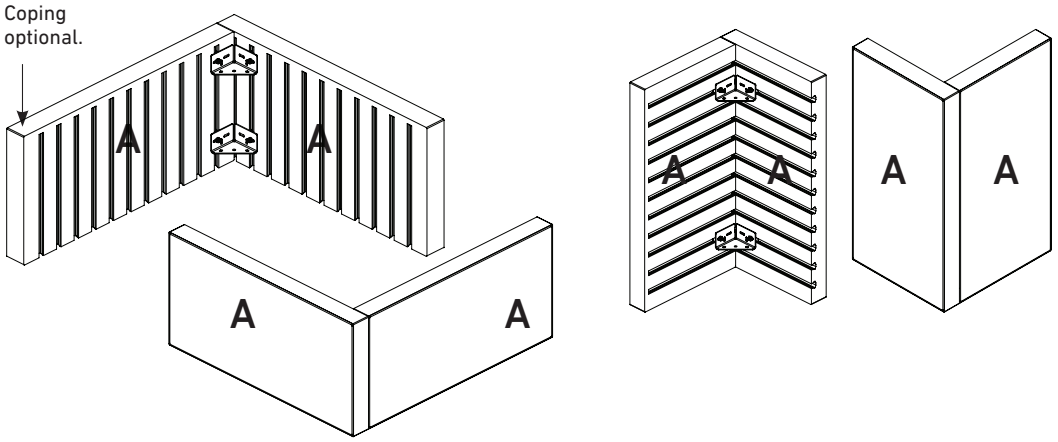
IDEAL:

This configuration uses equal number of panel A and panel B.



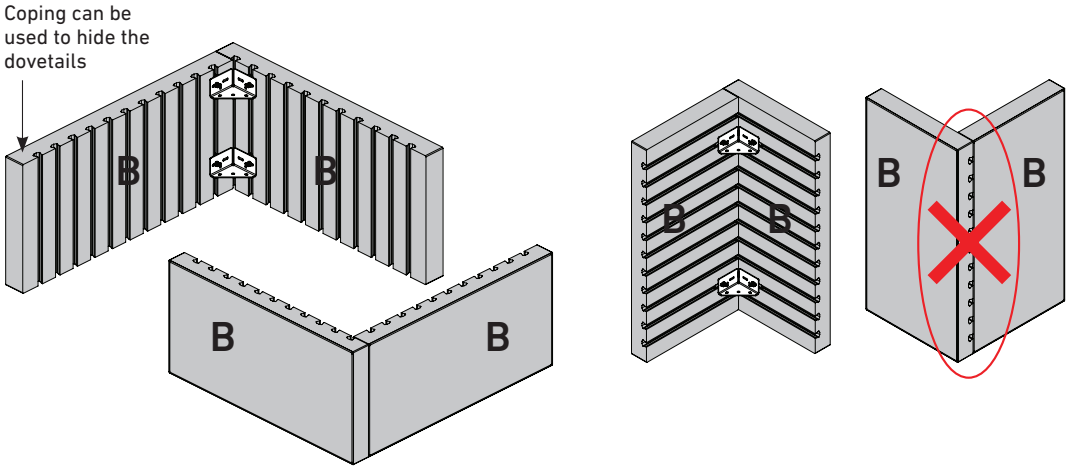
NOT OPTIMAL:

This configuration uses panel A only.



NOT RECOMMENDED:

This configuration uses panel B only and the dovetails are exposed. Use ideal configuration as shown above.



*IMPORTANT: When planning configurations, consider the amount of panel A and panel B on a pallet. 18 x 36' panels are sold in pair/layer or in full pallet only. 6 x 36 panels are sold in layer or in full pallet only.

ASHLAR TANDEM™

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓		✓	✓	✓	✓	✓	✓

SHAPES & SIZES

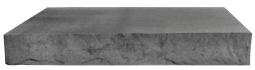
Tandem Units

7 x 13⅔ x 2⅝
7 x 15⅔ x 2⅝
7 x 18 x 2⅝

Tandem Solid Units

7 x 13⅔ x 2⅝
7 x 15⅔ x 2⅝
7 x 18 x 2⅝

Tandem Cap

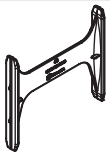


15 x 24 x 3¼

Tandem Modular Block

7 1/16 x 7⅞ x 7⅞

8" Connecting Member



3 x 1⅛ x 12

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ SQFT	WEIGHT/ UNIT	WEIGHT/ PALLET
TANDEM UNIT							
7 X 13 3/16 X 2⅝	–	–	–	30	–	–	–
7 X 15 13/16 X 2⅝	–	–	–	30	–	–	–
7 X 18 7/16 X 2⅝	–	–	–	30	–	–	–
TOTAL	70.09 / 35.045 DOUBLE-SIDED	–	6	90	–	–	1916
TANDEM CAP							
15 X 24 X 3¼	25	6.25	4	32	–	–	2912
TANDEM MODULAR BLOCK							
7 1/16 X 7⅞ X 7⅞	49.2	–	4	128	–	–	2688
8" CONNECTING MEMBER							
3 X 1⅛ X 12	–	–	–	30*	–	–	–

**30 units per bag.*

TANDEM® COLUMN KITS

NATURAL COLLECTION

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓			✓				

SHAPES & SIZES

Tandem Units:

Ashlar Tandem™
7 x 18 7/16 x 2 5/8

Tandem Veneer Units available in three sizes. Units only available in 7" height.

Column Grid

HEIGHT: 42"

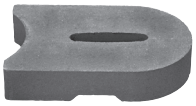
Column/Modular Grid Connector

12 x 24 x 3

Tandem Column Cap

24 x 24 x 3 1/4
SOLD SEPARATELY

U Start Base Block®



*Note: U Start Base Block actual coverage length is 16 11/16

12 x 18 7/16 x 3 1/2
SOLD SEPARATELY

*Tandem Column Kit includes 1 Column Grid & 1 Bag of Tandem Connectors

See the installation video at Belgard.com/Tandem

TANDEM® MODULAR GRID

LEGACY COLLECTION

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓	✓		✓	✓	✓		

SHAPES & SIZES

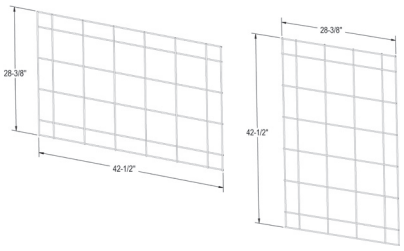
Ashlar Tandem™ Unit 1

Ashlar Tandem™ Unit 2

Ashlar Tandem™ Unit 3

*Tandem Veneer Units available in three sizes. Units only available in 7" height.

Modular Grid

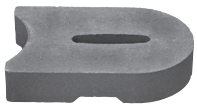


Vertical or Horizontal Application

Column/Modular Grid Connector

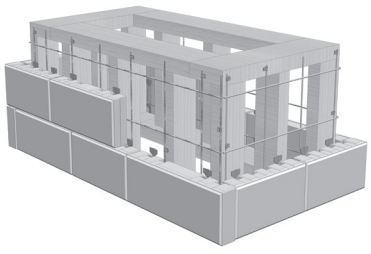
12 x 24 x 3

U Start Base Block®



12 x 18 7/16 x 3½
SOLD SEPARATELY

Modular Kit includes: 1 Modular Grid & 1 Bag of Tandem Connectors



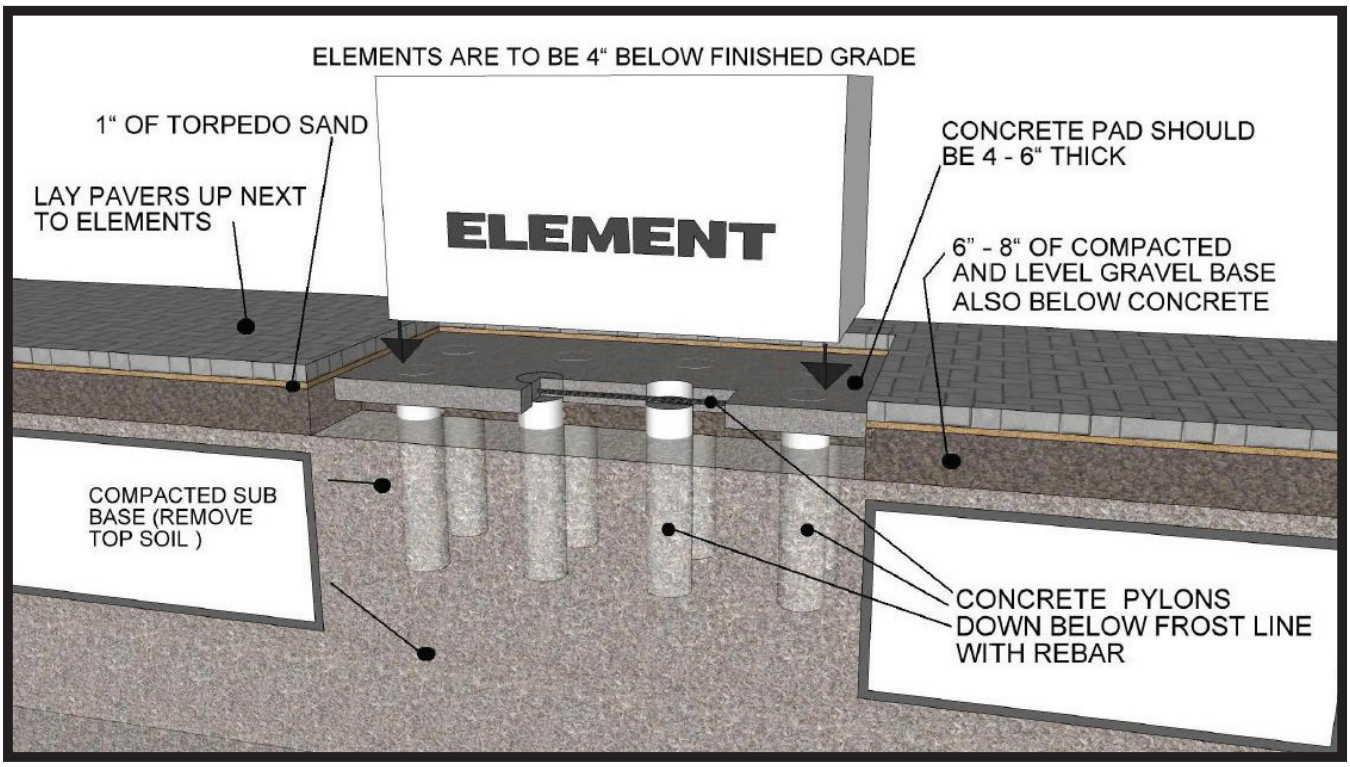
See the installation video at Belgard.com/Tandem

FIRE FEATURES

FIRE FEATURES INSTALLATION GUIDE

FIRE FEATURES

INSTALLATION INSTRUCTIONS



Make sure you check with your local municipality for their requirements when installing fire features.

A FEW KEY POINTS TO REMEMBER:

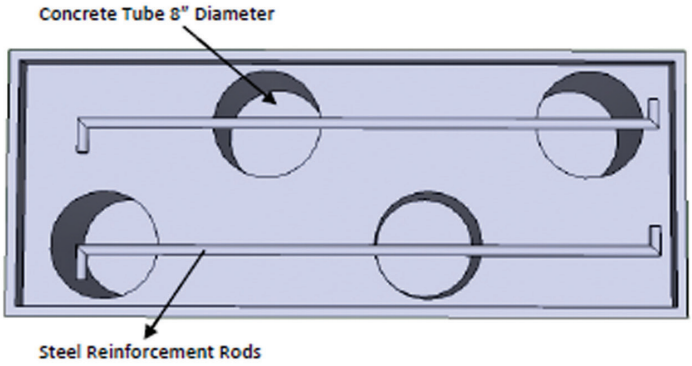
- Always place a piece of material (plywood or carpet work well) between your forks and the Fire features to prevent chipping.
- Always transport the Fire feature on the pallet it comes with until you are ready to place on the permanent location.
- Make sure to use a ratchet strap to secure the Fire feature to the loader when transporting and placing.
- Handle Fire features with care - they are concrete, but not indestructible.
- Make sure to size the machine to the Fire features weight.
- All Fire features are designed to be buried 4" below finish grade.

INSTALLATION INSTRUCTIONS

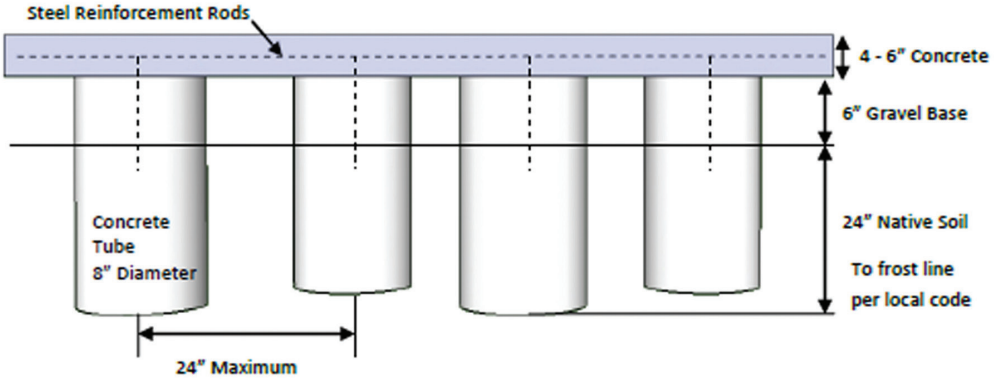
Typical Cross Section for Concrete Pad Installation

***The following measurements are a suggestion. Always check your local building codes first.*

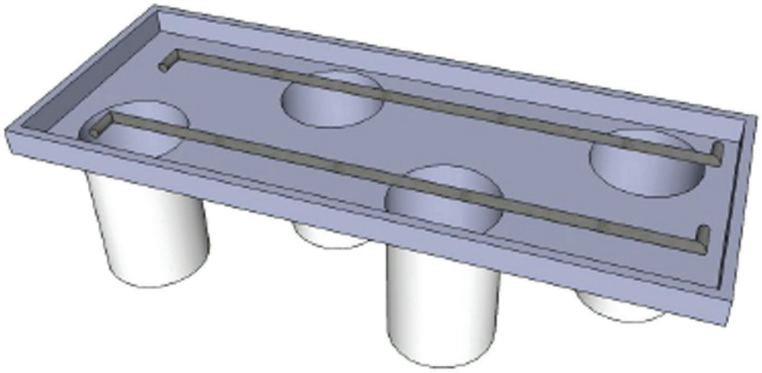
Top View



Side View



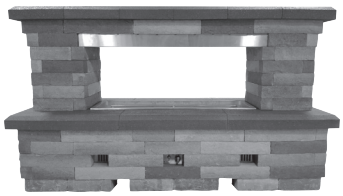
3D View



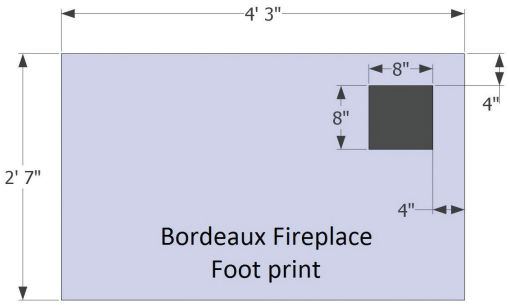
For areas not affected by freeze-thaw conditions please contact your local Belgard sales representative for further installation information.

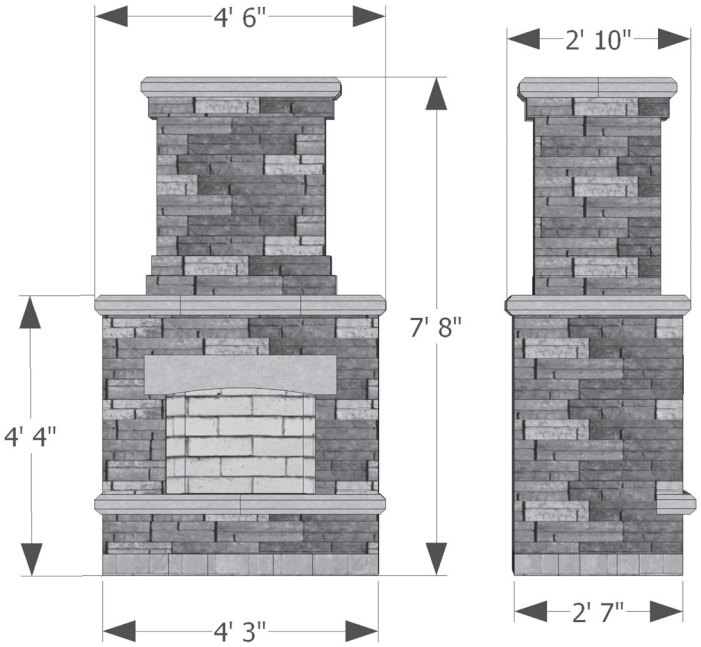
SPECIAL ORDER
BORDEAUX SERIES™

NATURAL COLLECTION



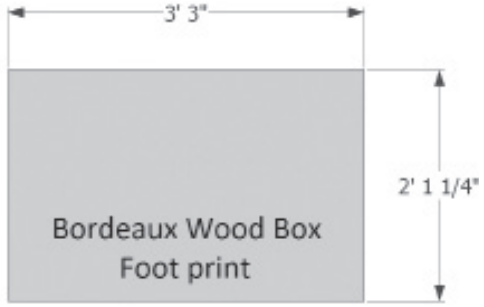
SPECIAL ORDER
BORDEAUX SERIES™

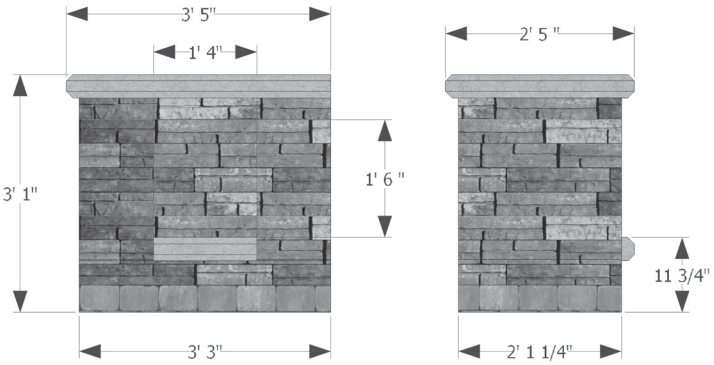




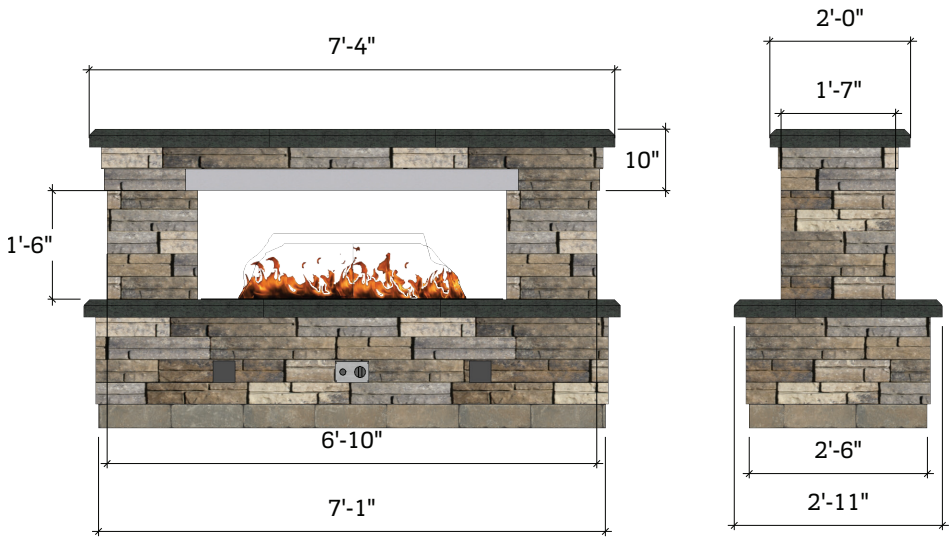
FIREPLACE
Rough Dimensions:
2' 7"D x 4' 3"W x 7' 8"H

WOOD BOXES
Rough Dimensions:
2' 1 1/4"D x 3' 3"W x 3' 1"H

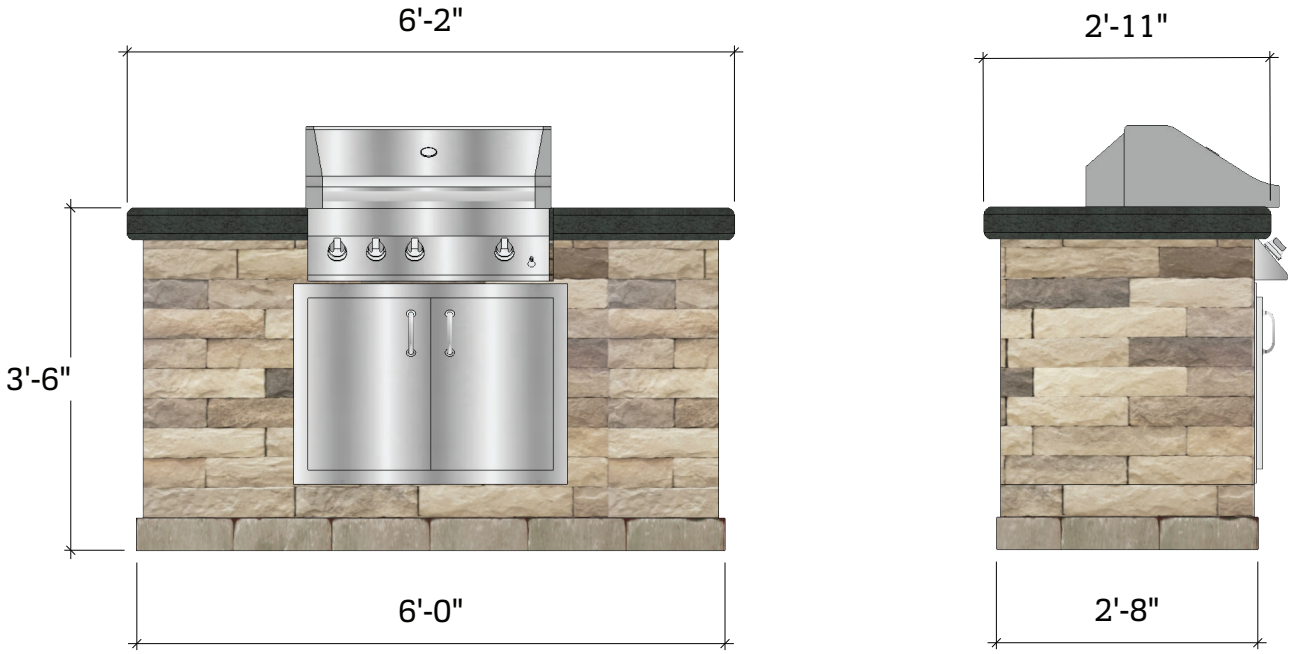




LINEAR FIREPIT
Rough Dimensions:
2' 11"D x 7' 4"W x 5' 4"H



SPECIAL ORDER
BORDEAUX SERIES™



GRILL ISLAND
Rough Dimensions:
2’ 6”D x 5’ 11”W x 3’ 5”H

FIREPLACE
70300791
Bordeaux Builder Wood Fireplace
Colors: Lamina Sienna/
Cordova Stone Buff Base + Top
13070014
Bordeaux Builder Wood Fireplace
Colors: Lamina Solid Shelby Blend/
Cordova Midnight
Base + Top
13070014
Bordeaux Builder Wood Fireplace
Colors: Lamina Sienna/
Cordova Stone Midnight
Base + Top
Approximate Weight:
Bottom Unit-2850 lbs.
Top Unit-1320 lbs.
Rough Dimensions:
2’ 7”D x 4’ 3”W x 8’H

36” wood burning fireplace can be converted to a vented gas unit on-site.

WOOD BOXES
13140001
Bordeaux Wood Boxes (Pair)
Colors: Lamina Sienna/
Cordova Stone Buff
13140020
Bordeaux Wood Boxes (Pair)
Colors: Lamina Sienna/
Cordova Stone Midnight
13140505
Bordeaux Wood Boxes (Pair)
Colors: Lamina Solid Shelby Blend/
Cordova Stone Midnight
Approximate Weight:
3070 lbs.
Rough Dimensions:
2’ 1 ¼”D x 3’ 3”W x 3’ 1”H

GRILL ISLAND
Bordeaux Grill Island
Colors: Lamina Sienna/
Cordova Stone Buff
+ Stainless
Bordeaux Grill Island
Colors: Lamina Sienna/
Cordova Stone Midnight
+ Stainless
Bordeaux Grill Island
Colors: Lamina Solid Shelby Blend/
Cordova Stone Midnight
+ Stainless
Approximate Weight:
3055 lbs.
Rough Dimensions:
2’ 6”D x 5’ 11”W x 3’ 5”H

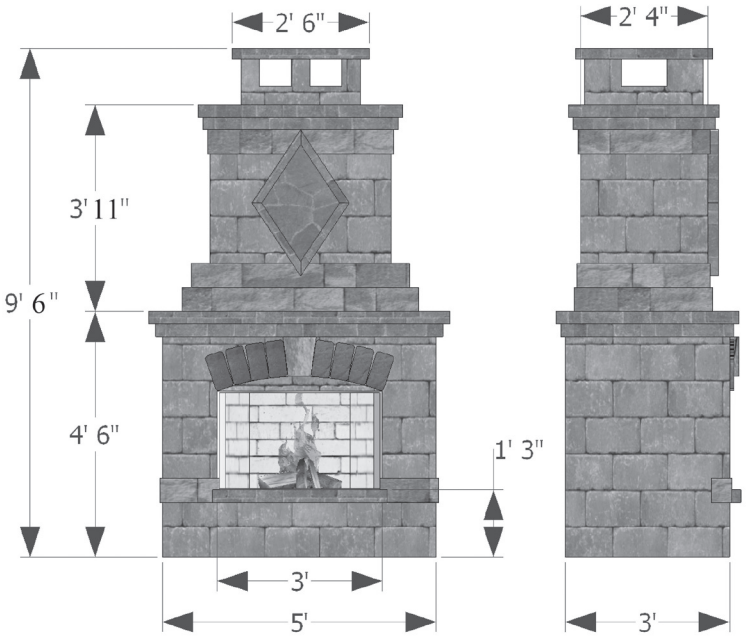
SPECIAL ORDER
BRISTOL SERIES™

NATURAL COLLECTION

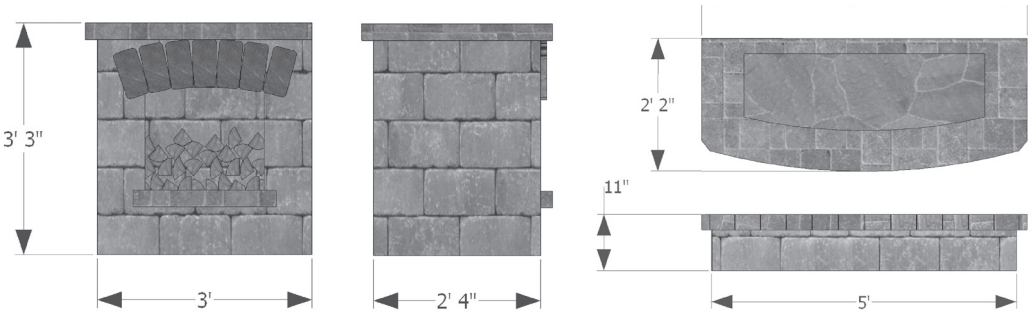
SPECIAL ORDER
BRISTOL SERIES™

FIREPLACE
70580261
Colors: Weston Gascony Tan/
Arbel Ashbury Haze Base + Top
70580312
Colors: Weston Cotswold Mist/
Arbel Brookstone Slate Base + Top
Approximate Weight:
Bottom Unit-4095 lbs.
Top Unit-3200 lbs.
Rough Dimensions:
3'D x 5'W x 9' 6"H

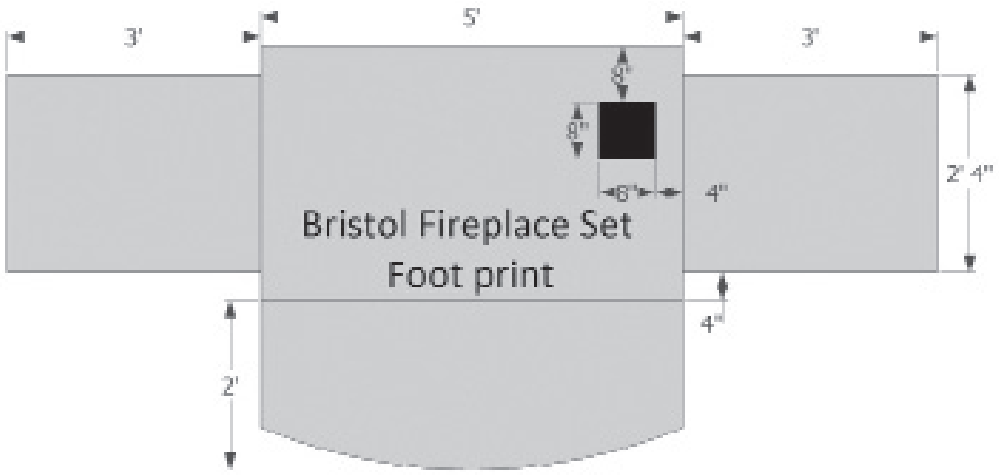
36" wood burning fireplace can be converted to a vented gas unit on-site.



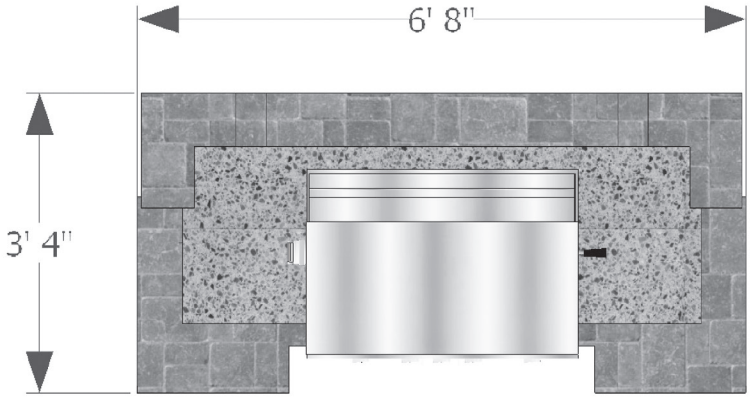
WOOD BOXES (PAIR)
70580334
Colors: Weston Gascony Tan/
Urbana Ashbury Haze
70580534
Colors: Weston Cotswold
Mist/Urbana
Brookstone Slate
Approximate Weight Per Pair:
3950 lbs.
Rough Dimensions:
2' 4"D x 3'W x 3' 3"H



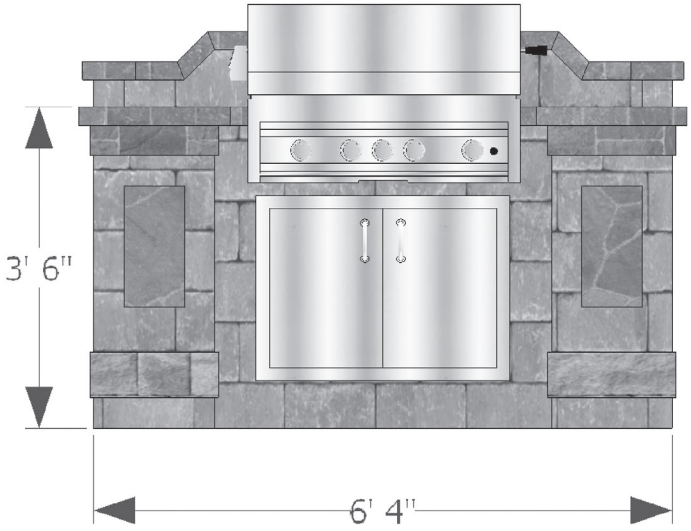
ARCHED HEARTH
70580262
Colors: Weston Gascony Tan/
Arbel Ashbury Haze
70580309
Colors: Weston Cotswold Mist/
Arbel Brookstone Slate
Approximate Weight:
1180 lbs.
Rough Dimensions:
2'D x 5'W x 11"H

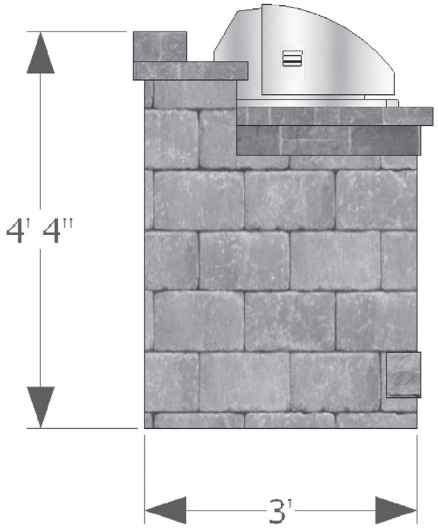


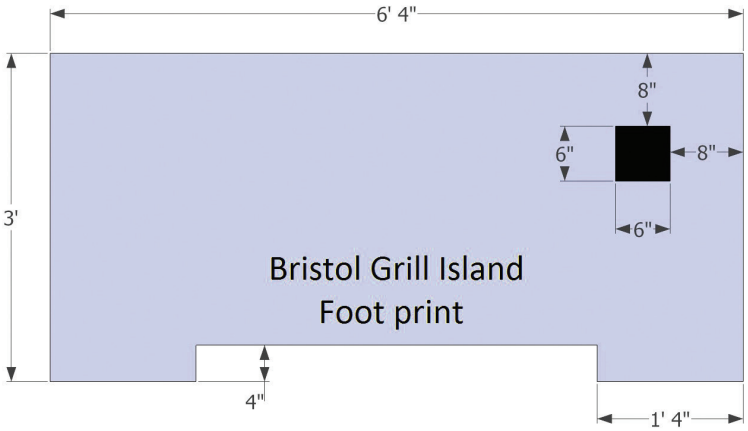
SPECIAL ORDER
BRISTOL SERIES™



GRILL ISLAND
Colors: Weston Gascony Tan/
Arbel Ashbury Haze + Stainless
Bristol Grill Island
Colors: Weston Cotswold Mist/
Arbel Brookstone Slate +
Stainless
Approximate Weight:
3945 lbs.
Rough Dimensions:
3'D x 6' 4"W x 4' 4"H







GRILL ISLAND INCLUDES
- Grillhead
- Stainless Steel Cooking Grids
- Control Knobs
- Rear Infrared Rotisserie Burner
- 760 sq. in. of cooking surface
- Up to 66,000 BTU
- Requires 110v outlet
- Stainless Steel Double Doors

* Hoses not included, recommended hard-piped installation.

DUBLIN FIREPLACE KIT

BEFORE YOU GET STARTED:

- Have a tape measure handy at all times.
- Lay block left-to-right or back-to-front instead of outside-to-in. Laying block outside to in will make it difficult to place the inner blocks.
- When unloading the pallet, place the removed block at two to three feet from the pallet, leaving a clear path on all sides of the pallet. This will ensure easy access to the pallet at all times. And if you want to make it extra easy on yourself, group alike blocks together for quick reference — A's together, B's together, etc.
- Be gentle with the CopingStone. It's delicate and may break if handled too roughly.
- Make sure the letters on each block face a connecting block so they are hidden.• Once each course has been placed, make sure you tighten it up by using a rubber mallet on the edges.

INCLUDED IN YOUR FIREPLACE OR WOODBOX

- All Block, Coping, Lintel, Firebrick and Caps that are needed for completion
- Detailed, easy to follow, step-by-step manual with diagrams
- Two tubes of adhesive for Coping and Firebrick

This fireplace is designed to burn solid wood, plumbed propane or natural gas only. Gas log appliances must be approved for outdoor use. Please obtain the proper permits in your local jurisdiction and make sure to comply with all building codes. This fireplace is not designed to be used indoors or in any framed wooden structure. It should not be placed next to or on any combustible materials. Do not fill voids with insulation or any other materials. This fireplace is not intended to be used for cooking food. Eagle Bay recommends using a grate centered in Burning Box for optimum burning performance. Do not stack wood against block walls while burning. Be aware that sparks can escape and ignite combustible surroundings. Do not over pack with wood.

FIREPLACE KIT
Rough Dimensions:
4' 3"D x 5'W x 8' 6"H

WOOD BOX
Rough Dimensions:
3' 3"D x 3' 6"W x 3' 5"H

WESTON STONE™ TRADITIONAL FIREPLACE

HERITAGE COLLECTION

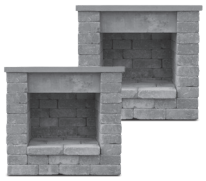
RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓	✓			✓			

SHAPES & SIZES

Fireplace Unit

4'4"D x 5'W x 8'8"H

Fireplace Wood Boxes



2'4"D x 2'8"W x 2'11"H

PLEASE NOTE: All of our fireplaces, brick ovens and fire pits come standard as wood-burning units. However, our fireplaces and fire pits can be retro-fitted for gas burning log sets and burners. Our brick ovens are wood-burning units only. Please contact us for more details at 877-235-4273.

UNIT	UNITS/PALLET	WEIGHT/PALLET
FIREPLACE UNIT		
61 X 52 X 104	1	10,920
FIREPLACE WOOD BOXES		
44 X 40 X 43	1	4,100

***Weston Stone Kit does not come pre-built. Assembly is required.*

WESTON STONE™ FIRE PIT

HERITAGE COLLECTION

RESIDENTIAL	COMMERCIAL	STEPS	COLUMNS	FIRE PITS	KITCHEN	FREESTANDING WALL	RETAINING WALL
✓				✓			

SHAPES & SIZES

Fire Pit Kit

4 x 8 x 8

4 x 8 x 12

Metal Ring

Metal Grate

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ SQFT	WEIGHT/ UNIT	WEIGHT/ PALLET
WESTON FIRE PIT UNIT							
4 X 8 X 12	–	–	–	–	–	27.1	1568
4 X 8 X 8	16	–	–	–	–	16.9	1968
TOTAL	–	–	–	–	–	–	1532

Completed kit yields: 55" Outside Diameter,16" tall

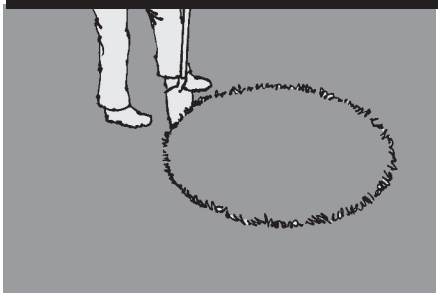
FIRE PIT KITS INSTALLATION INSTRUCTIONS

- Always use in accordance with all applicable local and state fire codes
- Failure to follow these instructions could result in a hazardous fire causing property damage or physical injury
- Caution: For outdoor use only
- Use the fire ring on stone, dirt or sand surfaces
- For adult use only — do not allow children to use the fire ring
- Do not use on lawns, wooden decks, concrete or asphalt
- Do not use fire ring indoors or under a patio roof
- Do not use in windy conditions
- Do not leave fire unattended at any time
- Do not use under tree branches, trellis, or overhangs of any kind, including covered porches
- Do not use flammable liquids such as gasoline, alcohol, diesel fuel, kerosene, or charcoal lighter fluid to light or relight fires as this may also cause paint to flake off fire ring
- Care should be taken to make sure all combustible material is far enough away from the fire ring not to ignite it
- Avoid using softwoods such as pine or cedar because they are likely to throw sparks — hardwoods are recommended
- Keep children and pets away from the fire ring while it is in use
- Exercise the same precautions you would with any open fire
- Do not wear flammable or loose clothing when tending an open fire
- Avoid touching surfaces as they will be extremely hot
- Assure the fire is completely extinguished before leaving fire ring
- Any modifications to this appliance may be dangerous and are not permitted

ADDITIONAL MATERIALS NEEDED

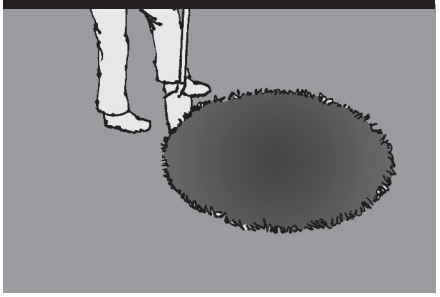
- Tamper
- Level
- 2 Bags of Leveling Sand
- 2 Tubes of Concrete Adhesive
- Caulk Gun
- 3 Bags of Gravel or Lava Rock
- Shovel
- Optional Marking Paint or Chalk

STEP 1



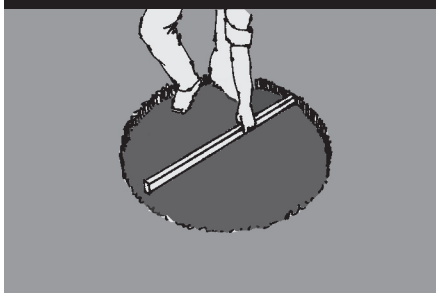
For a lawn, mark a 58" diameter circle with marking paint then go to step 2. For a patio, use chalk instead of paint then skip to step 5.

STEP 2



Remove all sod, roots and dirt to a depth of 2 inches inside the circle.

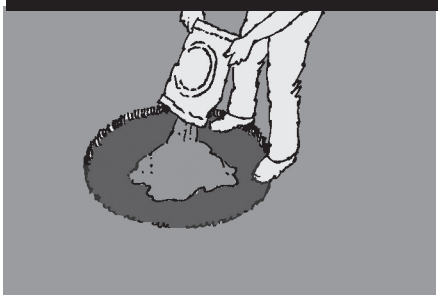
STEP 3



Level the soil with a tamper and remove high spots as best possible.

Tip: Use a level to check.

STEP 4



Add 1½"-2" of paver base (sand) and level. Moisten with water to aid compaction then use a tamper to pack the entire area firm. Add 1/2"-1" more of paver base and level again.

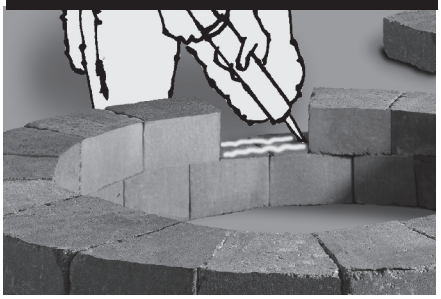
STEP 5

Place wall blocks on top of paver base, firmly touching each block creating a circle. Make sure each block is leveled front to back and side to side and even with adjacent blocks.

STEP 6

For the second layer of blocks, center the middle of each block over the joint made between the sides of the two blocks underneath it. Place blocks firmly together and level as before.

STEP 7



Attach the two layers of blocks together using concrete adhesive. Remove one top block and lay two liberal beads of adhesive near the center of the block. Place block back and press down firmly. Repeat for all 2nd layer blocks.

STEP 8

Lay the third layer the same way you laid the second. The third layer joints should line up with the first layer joints. Adhere the blocks with concrete adhesive as you did in step 7.

STEP 9

After all blocks are set, install the fire pit insert. The insert's top lip should rest on the inside edge of the fire pit blocks.

ACCESSORIES

ACCESSORIES

ANGLIA EDGER®

RESIDENTIAL	COMMERCIAL	STEPS	CAPS	COPING
✓	✓			

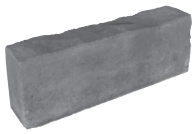
SHAPES & SIZES

4-Piece


8 x 7⅞ x 4½

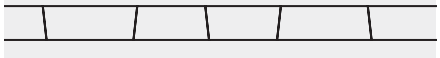

8 x 10½ x 4½


8 x 15½ x 4½

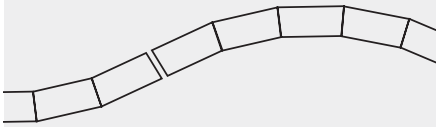

8 x 17⅞ x 4½

UNIT	LF/ PALLET	LF/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
ANGLIA EDGER®							
8 X 7⅞ X 4½	–	–	–	12	4	–	–
8 X 10½ X 4½	–	–	–	12	4	–	–
8 X 15½ X 4½	–	–	–	12	4	–	–
8 X 17⅞ X 4½	–	–	–	24	8	–	–
TOTAL	69.75	23.25	3	–	20	–	2678

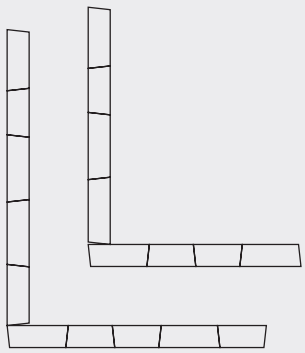
STRAIGHT



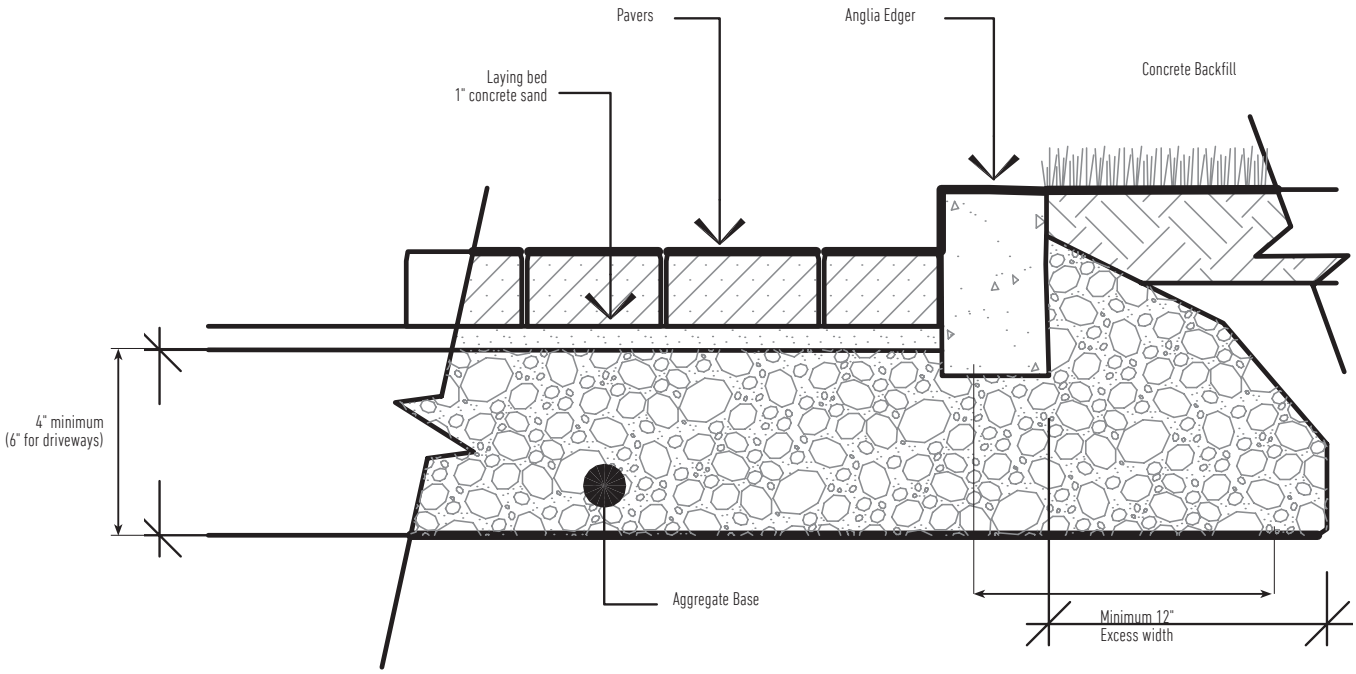
CONCAVE



90° CORNER



ANGLIA EDGER INSTALLATION INSTRUCTIONS



EXCAVATION DEPTH AND MINIMUM FOUNDATION(3)				
NATURE OF PROJECT	GARAGE ENTRANCE		PATIO OR SIDEWALK	
NATURE OF SOIL	CLAY(2)	SANDY	CLAY	SANDY
MINIMUM EXCAVATION REQUIRED	16-IN	12-IN	14-IN	10-IN
MINIMUM FOUNDATION THICKNESS 0-¾" CRUSHED STONE	12-IN	8-IN	10-IN	6-IN
MINIMUM/MAXIMUM UNCOMPACTED INSTALLATION(1) BED	⅝-IN TO 1-IN	⅝-IN TO 1-IN	⅝-IN TO 1-IN	⅝-IN TO 1-IN
THICKNESS OF THE PAVING STONE	2⅜-IN OR 3⅛-IN	2⅜-IN OR 3⅛-IN	2⅜-IN OR 3⅛-IN	2⅜-IN OR 3⅛-IN

The information in this table shows the minimum required for a job well done. Anything above this level means improved stability for the whole.

(1) Once compacted, a 1" bed will be reduced down to 5/8".

(2) For certain areas where clay soil is unstable, the minimum excavation required is 24" and the minimum foundation is 525" 21".

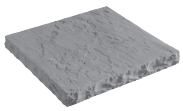
(3) Conforms to the recommended ICPI standards (Interlocking Concrete Pavement Institute).

HENELY COLLECTION™

RESIDENTIAL	COMMERCIAL	STEPS	CAPS	COPING
✓	✓			

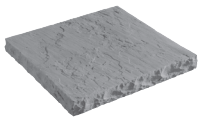
SHAPES & SIZES

26x26



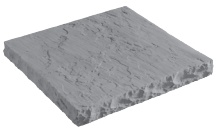
26 x 26 x 2½

28x28



28 x 28 x 2½

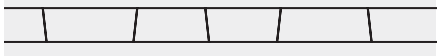
30x30



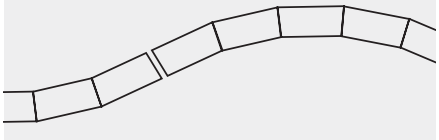
30 x 30 x 2½

UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
HENELY COLLECTION™							
26 X 26 X 2½	–	–	–	–	–	–	–
28 X 28 X 2½	–	–	–	–	–	–	–
30 X 30 X 2½	–	–	–	–	–	–	–

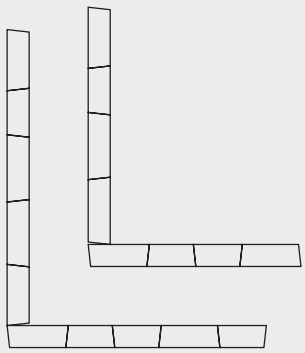
STRAIGHT



CONCAVE



90° CORNER



LANDINGS™ STEP UNIT

NATURAL COLLECTION

RESIDENTIAL	COMMERCIAL	STEPS	CAPS	COPING
✓		✓		

SHAPES & SIZES

Step Unit

6 x 48 x 18

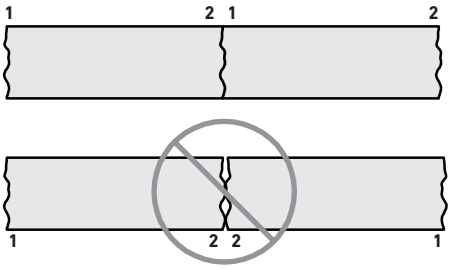
UNIT	LNFT/ PALLET	LNFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ SQFT	WEIGHT/ UNIT	WEIGHT/ PALLET
STEP UNIT							
6 X 48 X 18	–	–	1	2	–	460	870

ENGINEERED SOLUTIONS BY ANCHOR WALL SYSTEMS

LANDINGS™ STEP UNIT INSTALLATION

Each Landings™ Step Unit is manufactured with two unique face patterns. The step units are palletized and packaged for easy skid-steer loader removal. Care needs to be taken in handling these units. If a blemish occurs on one side of unit, rotate 180° before setting unit into place.

The Textures on Sides 1 and 2 are Designed to Nest with Minimal Gapping Between the Units.



Place Units so They Nest Tightly Together.

BASE COURSE

Excavate an area 6 inches deep by 1 foot longer by 1 foot wider than the installed step(s) size. Add a minimum of 6 inches of compactable base material, 3⁄4-inch minus (with fines) aggregate. Compact and level. Set unit and, if desired, add a slight pitch of no more than 1⁄4 inch toward the front of the step to shed moisture. If installing step units next to a retaining wall, keep units level from front to back.

Two unique faces on each step

STAIR TREAD

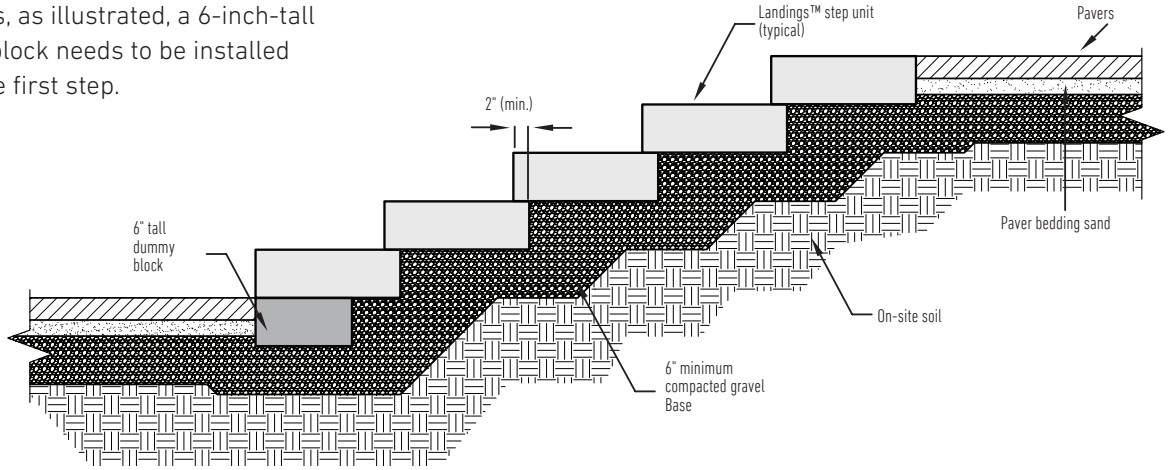
For each consecutive step, follow base course instructions, making sure the top of the base is even with the top of the previously installed unit. Recommended tread depth is a minimum of 10 inches, but no more than 16 inches. When installing steps adjacent to a finished surface such as pavers, as illustrated, a 6-inch-tall dummy block needs to be installed below the first step.

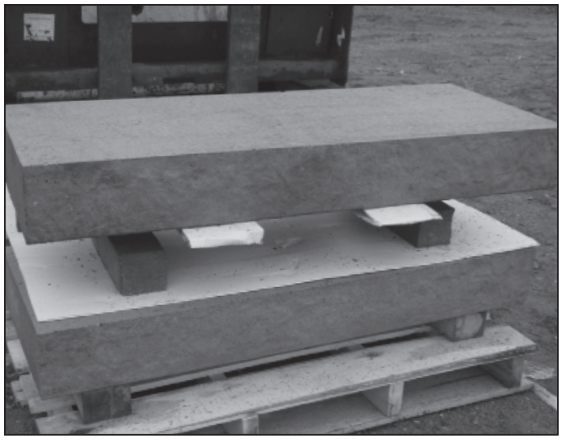
LANDING

For landing(s) follow base course instructions. Each step unit is manufactured with two unique face patterns. The face patterns are manufactured to nest together, which will create a narrower joint, providing pleasing aesthetics.

STEPS IN A 90-DEGREE WALL

When building into a retaining wall, construct the steps first and build the walls adjacent to the steps.

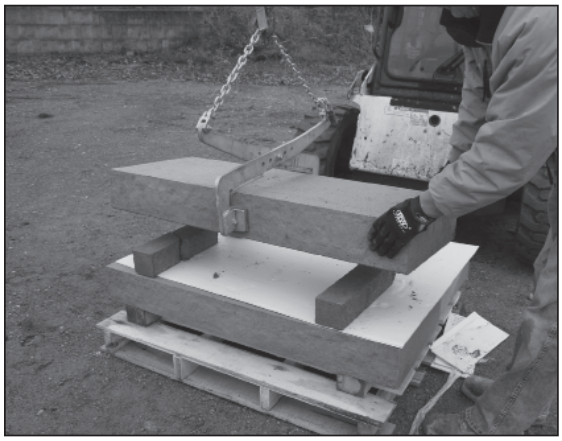




SKID-STEER LOADER

Slide forks underneath the first step unit and lift off pallet. Set the step unit onto its desired location, using a spacer to ease in fork removal.

A helpful tip to protect the step unit is to wrap the fork of the skid-steer with corrugated plastic packaging from the pallet or other protective materials. Secure to the forks.



CLAMP

Using a materials clamp, center the clamp on the step unit. Attach clamp to skid-steer or mini-excavator and slowly lift the step unit off of the pallet and move it into place. Be sure to have a second person to help guide the unit into place as the machine sets the step unit down.

STRAPS

When using a heavy duty strap(s), start by wrapping the strap(s) around the center if using one or close to step unit ends if two straps are being used. Cinch the strap(s) tight and attach the looped ends of the strap(s) to skid-steer or mini-excavator. Slowly lift the step unit from the pallet and move it into place. Be sure to have a second person to help guide the unit into place as the machine sets the step unit down. Using a spacer will help to ease in the strap removal.

CART

When using a cart, place provided corrugated plastic from pallet or other protective material onto the cart to help protect the step unit. With help from a second person, slowly slide the step unit from the pallet onto the cart. Maneuver the unit carefully into place.

Videos can be found on our YouTube channel:
www.youtube.com/anchorblockmn

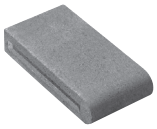
MARINA™ COPING

LEGACY COLLECTION

RESIDENTIAL	COMMERCIAL	STEPS	CAPS	COPING
✓		✓	✓	✓

SHAPES & SIZES

Coping Unit



5 15/16 x 11 13/16 x 2 3/8

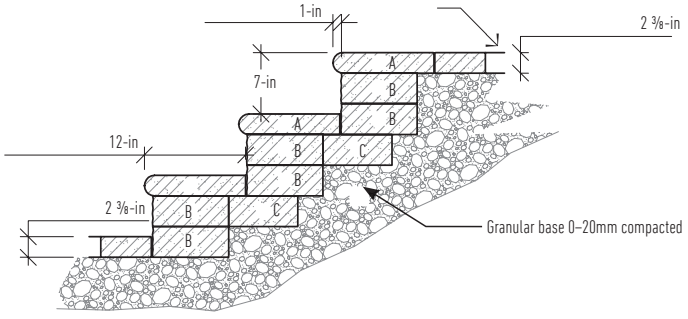
UNIT	SQFT/ PALLET	SQFT/ LAYER	LAYER/ PALLET	UNITS/ PALLET	UNITS/ LAYER	UNITS/ SQFT	WEIGHT/ PALLET
COPING UNIT							
5 15/16 X 11 13/16 X 2 3/8	81	27	3	108	–	–	2106

INSTALLATION GUIDE - STEPS

OPTION 1

A. Marina Coping
B. Wall Block
C. Grey Block (4 in x 8 in x 16 in) or Wall Block

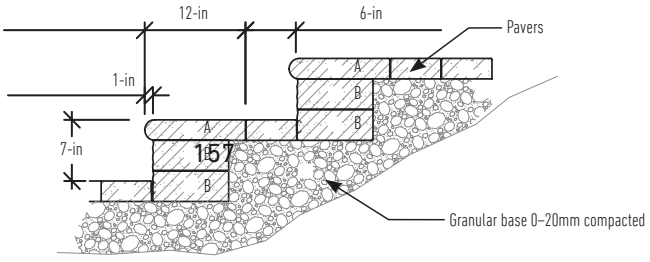
Note: All elements must be glued together with the concrete adhesive



OPTION 2

A. Marina Coping
B. Wall Block

Note: A & B elements must be glued together with the concrete adhesive.



THE ULTIMATE PROTECTION SYSTEM

Techniseal's 3-step treatment system guarantees the best results. Remove stains with a specially formulated Stain Remover, prepare the surface with Paver Prep, then apply a Protector that delivers the look you want.

1 PREP

STAIN REMOVERS

Contact your Belgard Representative for information on stocked Techniseal Stain Removers.

2 CLEAN

CLEANERS

- Dislodges efflorescence and ground-in dirt
- Prepares pavers prior to protector application
- Brightens paver color

3 PROTECT

SPECIAL ORDER

SAME FINISHES, HIGHER STANDARDS

Our versatile, new sealers have been formulated for easier product selection and application.

SPECIAL ORDER

NULOOK®

TINTED PROTECTOR

- Colors pavers
- Translucent
- Water-based stain guard

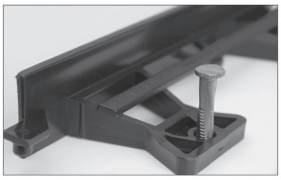
1 PREP

EZ BASE®
PANEL BASE SYSTEM

SPECIAL ORDER

- Saves up to 8 inches of excavation
- Each panel replaces up to 250 lbs of base aggregates
- Ideal for porcelain tile installation

PAVER EDGING
PREVENTS MOVEMENT & DAMAGE TO PRODUCT



RIGID
8-FT PANELS

2 SET

STRUCTURE BOND™
FOAM ADHESIVE

STRUCTURE BOND™
GUN & CLEANER

3 SAND

HP NEXTGEL™
JOINTING SAND

- Heavy-sloped and high-traffic areas
- False or wide joints from 1/16" to 4"
- Haze and dust free

NEW

SMARTSAND
POLYMERIC SAND

- Designed for optimal jointing of interlocking paver installations
- For paver joints from 1/16" to 1"
- Deters insects and weed growth
- Eliminates joint erosion

SPECIAL ORDER

NOCO
POLYMERIC SAND

- No compaction necessary
- Stays flexible to prevent breakage

STRUCTUREBOND™ IS AN INNOVATIVE SUPER-STRENGTH FOAM ADHESIVE THAT BONDS A WIDE RANGE OF CONSTRUCTION MATERIALS.

Made from high-quality modified polyurethanes, StructureBond's adhesive strength is unmatched among all types of polyurethane adhesives. StructureBond's Gun allows for a precise adhesive delivery with a single pull of the trigger. No pumping, cutting or puncturing of cartridge nozzles.

VISIT TECHNISEAL.COM FOR MORE DETAILS.

STRUCTURE FOAM ADHESIVE BOND

BELGARD® | PAVES THE WAY™

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