

## Planning & Design

When planning a hardscape project, taking the time to do a little research and planning will ensure your project is successful. Consider the unlimited design potential of Hanson's shapes, sizes, colors, patterns and textures. With so many possible combinations, the design possibilities are endless.

**Design Ideas** Collecting pictures and sketching your ideas on paper are your best planning tools. Whether you are considering doing the work yourself or hiring a professional, photos and sketches will help you to develop and communicate your ideas.

**Evaluate Space** Once you have a design in mind, measure out the space to help you visualize the area. This can be done with wooden stakes and a string line or by marking the ground with spray paint. If you are planning a patio, place some furniture or a BBQ in the area to help you evaluate the space. Measure distances to significant objects, such as buildings, trees, fences and steps as they can affect the layout of your project.

**Select Product** There are many products and designs to choose from with Hanson's comprehensive selection of shapes, sizes, colors, patterns and textures. To help narrow down your selection, determine what is most important to you. Is it color, shape, laying pattern or texture? Once you have identified your priorities, browse through our catalogue or our website to find the products that suit your tastes.

**Professional Contractors** If you are planning a project that is more than 300 ft<sup>2</sup> (30 m<sup>2</sup>), it is recommended that you hire a professional hardscapes contractor. A contractor has the experience and equipment to complete your project faster and with professional results. Here are a few tips to consider when choosing a contractor:

- Visit the Interlocking Concrete Pavement Institute's website at [www.ICPI.org](http://www.ICPI.org) to review their Consumer Guide brochure.
- Ask your local Hanson Dealer for contractor referrals.
- Meet in person with the contractor at your home to explain the project before obtaining proposals.
- Get written proposals from at least three contractors.

**Required Tools** Doing the job well and safely means having the proper tools. If you do not have these items readily available, they may be available for loan or rent from your local Hanson Dealer or tool rental store. In addition to the tools listed below, be sure to wear appropriate personal protective equipment (e.g. steel toed boots, gloves, eye protection) to prevent injury.

- |                                      |  |                |
|--------------------------------------|--|----------------|
| ■ Hard toothed rake                  | ■ Pointed shovel                           | ■ Hammer       |
| ■ Chalk or string line and stakes    | ■ Chalk Marker                             | ■ Tape Measure |
| ■ 4' hand level or transit level     | ■ 4" wide chisel (wall installations only) | ■ Wheelbarrow  |
| ■ Vibrating compactor or hand tamper | ■ Push broom (paving installations only)   |                |
| ■ 1" screed rails (e.g. pipe)        | ■ Paver cutter or masonry saw              |                |

## Estimating & Ordering

Accurately measure and draft a plan of your project. An exact plan will enable you to accurately calculate the material quantities you will need to complete your project. In addition to the Hanson products you have chosen, you will need the following materials to ensure a quality installation. Use the calculation tables on page 47 for assistance in determining your material quantities or use our online estimator tool at [www.hansonhardscapes.com](http://www.hansonhardscapes.com).

**Base Material:** Proper base material is 25 mm (1 in) sized, crushed, angular, free-draining gravel material. The depth of base material required varies by application. Visit us online or consult your local Hanson dealer for more detailed base requirements.

- 100 - 200 mm (4 - 8 in) compacted base for patios, walkways and most retaining walls
- 200 - 300 mm (8 - 12 in) compacted base for driveways and parking areas.

**Wall Backfill Material:** Proper wall backfill material is a compactable, free-draining sand and gravel mix. For simplicity, the base material specified above can also be used for backfill. Pea stone, clear stone (No. 57), existing site soil and topsoil are not suitable backfill materials. The depth of the backfill material will vary, depending on the application of your wall. Consult your local Hanson Dealer for specific advice regarding your project.

**Setting Bed Material (paving only):** Use 2 mm (1 in) of clean, sharp sand (i.e. concrete sand).

**Professional Accessories** Hanson Dealers carry a complete line of professional accessory products needed to complete your project.

**Landscape Adhesive (walls only):** An adhesive should be used at corners and to glue the coping (top) course of the wall in place.

**Edge Restraint (paving only):** To prevent shifting, an edge restraint is recommended along all edges not abutting a building or wall.

**Jointing Material (paving only):** You will need approximately one bag of jointing material for the following:

- every 60 - 75 ft<sup>2</sup> (6 - 7 m<sup>2</sup>) of paving stones laid with narrow joints
- every 25 - 40 ft<sup>2</sup> (2.3 - 4 m<sup>2</sup>) of paving stones laid with wide joints
- every 100 - 125 ft<sup>2</sup> (9 - 12 m<sup>2</sup>) of architectural tiles or paver slabs.

When selecting a jointing material, remember that regular joint sand needs to be reapplied annually while more durable polymeric sand requires less maintenance. See the section on Jointing Material on page for assistance in choosing the right jointing material for your project.

## Installation Guidelines - Paving

These installation guidelines apply to all Hanson interlocking paving stones, architectural tiles and paver slabs. There are some differences between installing paving stones and installing tiles or slabs, as noted in these guidelines. If your project includes both paving and walls, install the walls first.

**Excavation & Base Preparation** Determine the depth of the excavation by adding together the recommended depth of the base material and setting bed and the thickness of the product you have chosen. For paving stone installations and vehicular applications, the surface of the installed product should be 5 mm (0.25 in) above grade. During compaction, the product will settle into the setting bed, creating a strong interlock.

Be sure that your plan includes grading the area for proper drainage. A minimum grade of 1 cm per meter (1/8" per foot) is required to carry water away from house foundations and to prevent water from standing on the surface.

After excavation, spread the base material uniformly throughout the excavated area with a hard toothed rake in layers of no more than 100 mm (4 in). Use a tamper to compact the entire area evenly. Continue spreading and compacting base material until the desired depth is achieved and the surface has no high or low areas. Level the base to the desired grades, remembering to grade it so water is directed away from structures.

**Constructing the Setting Bed** A simple and accurate way to establish final grading and a good setting bed is to use a process known as screeding. Obtain screeding rails of approximately 25 mm (1 in) diameter or thickness (pipe is ideal). Set the screeding rails on the compacted base and use a transit or 4' hand level to check that the grades are accurate. Allow for a 20-25% rate of compaction for the uncompacted setting bed when setting rails. Carefully shovel the bedding sand around and between the rails. Run a screeding board, such as a straight 2x4 timber along the top of the rails to level the sand evenly. Reset the rails as needed to screed the entire project. Screed only the area you are able to cover with product that same day.

**Installing the Edge Restraint** Edge restraint prevents paving installations from shifting and spreading and is recommended on all edges of any installation not abutting a structure such as a building or a wall. The edge restraint must be installed on the compacted granular base material (not the setting bed). Although it can be installed after the product is laid, it is often placed first to serve as a starting edge.

**Laying the Product** Begin placing the stones on the setting bed in the desired pattern, starting at an edge or 90° corner. This will provide a straight line and reduce the need for cutting. Snap a chalk line or set a string line to follow when laying to ensure lines remain straight. Do not walk or kneel on the edges of tiles or near the edges of the paving installation as this may cause them to sink unevenly.

Some Hanson products are manufactured with spacer bars on the side to ensure accurate spacing of the joints. If the style you are using does not have spacer bars, leave a 1.5 - 3 mm (1/16 - 1/8") space around the product to act as a joint. In non-vehicular applications, architectural tiles and paver slabs can be laid butted tight together, without joints.

To ensure proper color distribution, take pieces from several bundles at a time. Remove paving stones in stacks rather than layers. Frequently look at the overall area and ensure good color distribution is being achieved throughout the project.

Cut the units as needed to finish edges. Do not install a cut piece that is less than 1/3 of its original size as pieces this small are likely to break. Instead, cut two larger pieces.

Walk around the project to ensure proper color distribution and that none of the units rock back and forth or are significantly lower than the others. Units are easily removed and replaced prior to compacting.

**Compacting** All interlocking paver installations must be compacted to ensure a strong interlock. Sweep the surface to remove any debris that could mar the surface of the product. Next, run the vibrating compactor up and down, then side to side over the entire installation. Any small irregularities in paver height caused during the laying process will be leveled out during compaction.

Compact the pavers at the end of each workday to within 1 m (3') of all unrestrained edges. The compactor should pass over all pavers a minimum of 2 times.

Paver slab installations and most architectural tile installations should not be compacted. Instead, tap the tiles with a rubber mallet after laying to settle them into the setting bed. However, architectural tiles used in a vehicular application [60 mm (2.36") modules only] must be compacted as above. In order to avoid marring the surface of the StoneTile modules during compaction, we recommend laying Mirafi 140 non-woven geotextile (available from your local landscape supply store) over the tiles prior to compaction.

**Jointing Materials** Jointing sands perform a critical role in the performance of interlocking systems by solidifying installations and are vital to ensuring effective interlock, particularly with paving stones. They maintain strength and integrity while also offering flexibility to expand and contract through all climactic conditions. In addition, proper maintenance of joints assists in the formation of an effective barrier that prevents weed or insect penetration within the joints.

There are a variety of jointing materials available:

- **Jointing Sand** - an inexpensive, manufactured, dry bagged sand that requires yearly maintenance to ensure optimum performance.
- **Polymeric Sand RG / Stabilizing Sand** - a polymer and sand based compound that is ideal to stabilize horizontal or sloping installations with joints of up to 13 mm (1/2"). Polymeric sand hardens once wet and requires little to no maintenance.
- **Polymeric Sand HP** - Similar to polymeric sand but in a high performance formula, this material is ideal for poolside paving, sloped installations, public areas with excessive traffic and any other paving installations with joints in excess of 25 mm (1").

Once all of the product has been installed and compacted (where necessary), install the preferred jointing material as follows:

**Jointing Sand** - Spread jointing sand liberally over the entire installation. Sweep jointing sand in all directions over the paving surface, making sure to fill in all the joints. Due to settling, repeat this process in successive days to ensure joints are packed and full of sand. Usually 2-3 applications are required. To speed up the settling process, vibrate the entire paving surface with a plate tamper or rubber mallet and then reapply sand, repeating this process until joints are full and firm.

**Polymeric Sand / Stabilizing Sand** - Sweep polymeric sand into the joints of the installation taking care not to sweep over long distances. Using a plate tamper or rubber mallet, vibrate the entire paving surface to compact the sand in the joints. Continue sweeping and compacting until joints are full and firm and the surface of the pavers is free of sand. In sections of 500 ft<sup>2</sup> (46 m<sup>2</sup>), moisten the sand lightly and continuously with a fine mist from a garden hose only until joints are moistened to their full depth. Do not flood or over water the surface. Let dry for at least 24 hours.

**Mortar Bed Installation** For information about installing our paving products using mortar and grout, refer to the Handbook for Ceramic Tile Installation, published by the Tile Council of America ([www.tileusa.com](http://www.tileusa.com)). Your local building supply store can advise you about what type of mortar to use and how to install properly in this fashion.

## Care & Maintenance of Paving Installations

**Efflorescence** Efflorescence is a chalky white residue that may appear on the surface of any concrete product. Salts that naturally occur in concrete are carried to the product's surface by water. When the water evaporates, the salts are left on the surface of the product as a white haze. The process will stop when no more salts are available to move to the surface. The length of time this takes can vary greatly, depending on granular materials used, climate and other factors. It is strongly recommended that you wait a minimum of 12 weeks after installation before sealing a project to ensure this process is complete. Sealing too early can trap efflorescence underneath the sealer, making it extremely difficult to clean.

Efflorescence does not affect the structural integrity of the product and is not considered a defect. With proper maintenance, efflorescence can be removed and the original color restored. The condition will usually correct itself with time and exposure to the elements or it can be removed quickly using an efflorescence cleaner.

Efflorescence cleaner is not recommended for use with NaturalCast architectural tiles and accent products due to their highly detailed surface textures. If it is absolutely necessary to use an efflorescence cleaner with these products, the following precautions should be taken:

- Add 50% more water than recommended by the cleaner manufacturer (e.g. if cleaner requires a standard 4:1 dilution, use a 6:1 dilution).
- Test on an extra stone or in an inconspicuous area first to ensure that the result is acceptable.
- Apply to small areas at a time to prevent the cleaner from drying on the stones.
- Rinse, rinse and rinse again. The area should be rinsed thoroughly for several hours. Volume of water is the key, not speed. Pressure washers are not recommended.

**Cleaning & Sealing** Using a sealer on a paving installation is a matter of personal preference. A sealer does not affect the overall durability or performance of the paver or tile but may enhance the color of the product and offer some protection against stains.

Before sealing an installation for the first time, any stains should be removed and the entire surface cleaned with an efflorescence cleaner. Use only cleaners and sealers specifically formulated for use on concrete pavers and follow the manufacturer's instructions. Always test the cleaning product on a small, inconspicuous area first.

Sealers can be either solvent or water based. Solvent based sealers are available in either a flat or a gloss finish. Water based sealers typically leave less gloss on the surface and are an environmentally friendly choice. Be sure the sealer you choose meets local environmental laws prior to use.

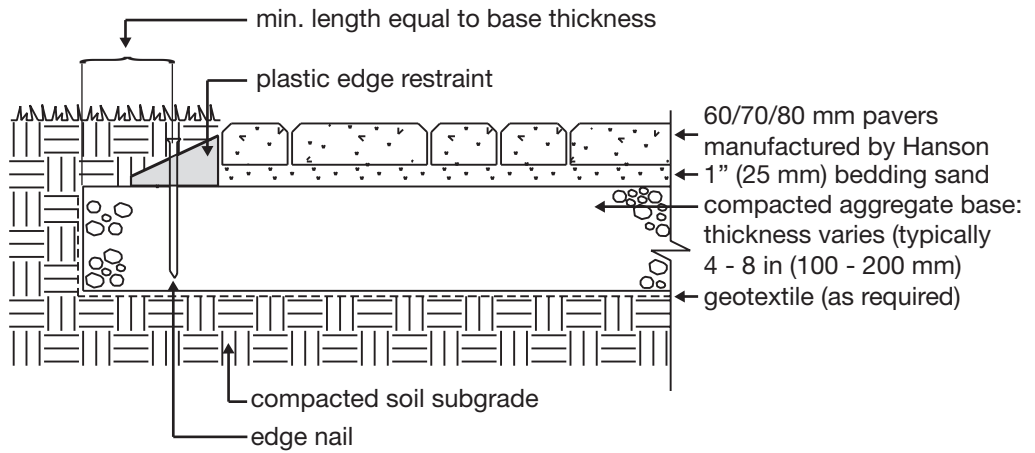
We recommend cleaning paved surfaces yearly to remove impurities and maintain the overall appearance of the paving stones. Spills should be treated immediately to prevent staining. For stubborn stains that just won't come clean, individual pavers can easily be removed and replaced with new ones. It is recommended that you reserve a small quantity of paving stones or tiles at the time of installation for this purpose.

**Winter Maintenance** Hanson products are regularly tested for durability resistance to de-icing salts, in accordance with current Canadian and US standards. However, excessive salting can result in the deterioration of any concrete product. We recommend using a salt/sand mixture on icy walkways and driveways. In the spring, the residual sand can be swept into the joints.

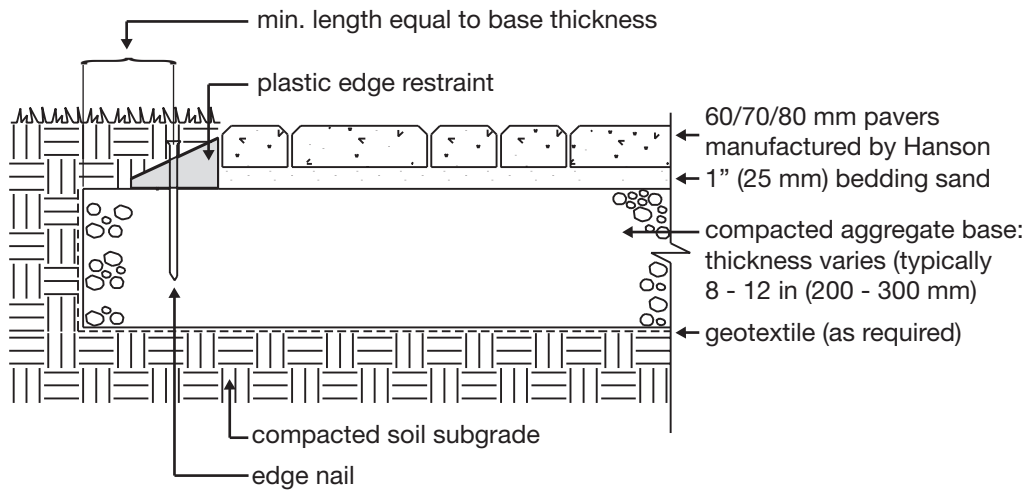
Not all nonsalt ice melter products are suitable for use with precast concrete. Consult the ice melter manufacturer for recommendations.

Typical Cross-sections - Paving

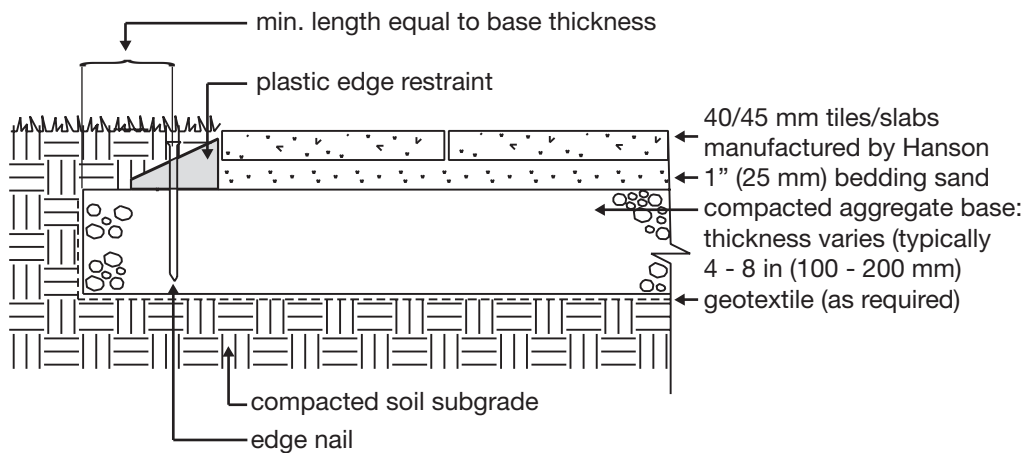
Interlocking Paver Patio / Walkway



Interlocking Paver Driveway



Architectural Tile Patio / Walkway



## Installation Guidelines - Walls

These installation guidelines apply to garden and decorative walls built with any Hanson retaining wall system. For large structural or retaining walls, walls that exceed the maximum recommended height or walls in areas of poor drainage or soil conditions, please contact us for more specific installation requirements.

**Design Considerations** When planning a garden or retaining wall, you should ask yourself several questions to ensure your finished installation will look good and last a lifetime.

How high will the wall be? Height of the wall should always include a minimum of one buried base course in addition to the height above ground. Different wall systems have different height capabilities. Be sure not to exceed the maximum recommended height for the wall product you choose.

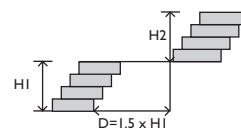
Will the wall be straight, curved or both? Hanson walls can create circles, soft flowing curves, straight linear designs or any of these in combination. Measure the curved and straight sections of the wall separately to make estimating easier.

What is the purpose of the wall? Some wall products are suitable for large retaining wall projects while others are ideal for small garden walls or planters.

Will the height of the wall vary? If the property has a slope, the wall height may vary accordingly. To make estimating easier, break the wall up into sections of equal height, always maintaining one buried base course.

Will the wall be terraced? If so, the front of the upper wall must be at least 1.5 times the height of the lower wall behind the back of the base course of the lower wall.

What setback do you need? Some Hanson wall products are capable of achieving vertical walls and other products have an automatic setback. Vertical walls typically can't go as high as setback walls without geogrid reinforcement. In addition, setback walls may require less product. When planning and measuring, keep in mind that a single setback moves the top of the wall back 25 mm (1") per course from the front of the base course.



**Terraced Walls**

Walls that exceed the maximum recommended height, walls in areas of poor drainage and walls with extra loading at the top may require special engineering. Please contact Hanson for more information if your wall falls into one of these categories.

**Excavation & Base Preparation** Set an excavation line using a chalk or string line. To create an accurate radius, drive a stake into the ground at the desired center of your project. Attach a string to the stake equal in length to the desired inside radius. Rotate the string to indicate the location of the back of the first course. Once laid out, excavate a trench equal to the depth of gravel material plus the height of one unit, or to firm soil. The trench should be approximately 100 - 150 mm (4 - 6") wider than the wall block you have chosen.

After excavation, spread the base material uniformly throughout the trench with a hard toothed rake in layers of no more than 100 mm (4"). Use the vibrating or hand tamper to compact the entire area evenly. Continue spreading and compacting base material until the desired depth is achieved and the surface has no low or high areas.

Place screed rails at the desired grade of the underside of the first course of wall. Level the screed rails with a 4 foot level or transit level. Place granular base material between the rails and screed level with a straight edge, such as a 2x4 timber. Compact this area with a hand tamper. After compacting, place more granular base material between the rails and screed level. This is the level surface for laying the wall base pieces.

**Base Course & Wall Construction** Start placing the base course on top of the compacted base, beginning at the lowest point of the wall. Check alignment and leveling as you proceed. Continue with additional courses, adding and compacting backfill material behind the wall after every second course. To ensure adequate interlock between courses, we recommend a minimum joint overlap of 1/4 bond.

To ensure proper color distribution, take pieces from several bundles at a time, removing them in stacks rather than by layer. Tip: Check the levelness of the wall every 2-3 courses by putting a string line along the length of the wall. Shim or adjust the blocks as necessary to keep the wall lines straight.

**Corner Construction** Building corners with Hanson retaining walls is easy, whether they are curved, square or at any angle. Create curved corners using any of our wedge or taper blocks by simply laying the pieces in their natural curve. For gentler curves, gap the back of the pieces to fit the desired radius. Keep in mind that gaps in the wall layout will mean gaps in the coping (top) course unless coping units are cut to fit.

Building square corners is equally simple with Hanson retaining walls (see corner construction details on page 38). We strongly recommend building a finger jointed corner as it is the strongest corner that can be built. In addition, it is recommended that you use a landscape adhesive between all courses at the corner for increased strength.

**Coping Installation** The coping course adds the finishing touch to your wall project. Because of the tongue and groove features of many Hanson walls, the coping course offers multiple placement options - set it forward or in line with the rest of the wall, or use a wider coping piece and center it over the rest of the wall. Whatever placement option you choose, the coping pieces are simply set on top of the rest of the wall.

An adhesive should be applied in two continuous beads along the outer edge of each top rib of the course below the coping. This will secure the coping to the rest of the wall.

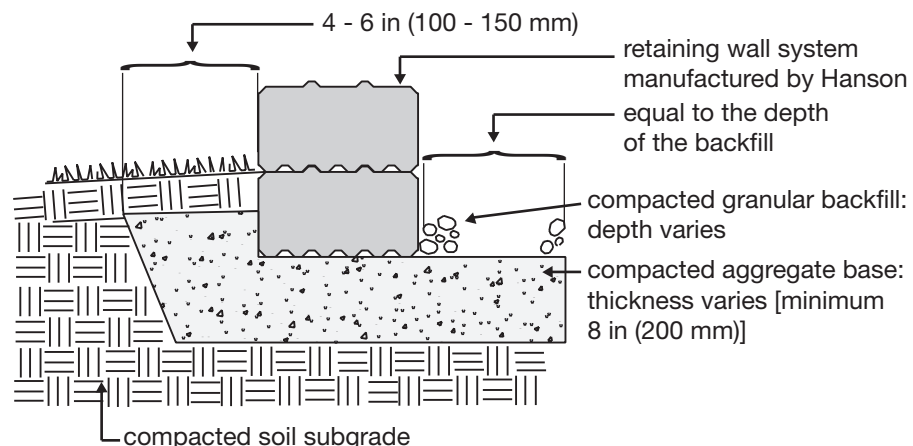
**Step Construction** Steps can be built using any Hanson wall products (see page 38 for detailed step construction drawings). The base underneath and behind a step remains the same as the base underneath and behind a wall. Tread width can be customized by installing Hanson pavers. When including steps as part of a larger wall, build the main wall and the returns first, then construct the steps.

**Using Wall Systems in Combination** Many of our wall systems include both straight and wedge or tapered blocks that can be used alone or in combination for maximum flexibility. The RB, XL Pro, Wallstone and GRANDE systems can easily accommodate straight, curved or combination walls.

There are a few tricks that can assist you with combining standard and wedge or tapered units in the same wall:

- You may have to gap blocks at the back of the wall every second course to make the blocks sit properly. A gap of 75 mm (3") is acceptable for Wedgestone Wall and XL Pro Wall and 130 mm (5") is acceptable for GRANDE Wedge.
- The second course may not have exactly the same configuration as the course below it. Once again, gapping the blocks may be necessary. In a vertical wall, the first course will match the third course, the second course will match the fourth course and so on.
- You may need to remove or modify some of the ribs on the bottom of the block to make the next course sit flat. Removal of ribs is acceptable but should be kept to a minimum, as this is the primary connection mode between courses.

### Typical Cross-section - Walls



The charts below will assist you in calculating the material requirements for your project. Quantities given include approximately 5% overage for cutting. For additional assistance, use our online estimating tool at [www.hansonhardscapes.com](http://www.hansonhardscapes.com).

**Typical Project Material Requirements**

Material	3 x 20 ft (0.9 x 6.1 m) Walkway	12 x 12 ft (3.7 x 3.7 m) Patio	20 x 30 ft (6.1 x 9.1 m) Driveway
Hanson pavers, architectural tiles or paver slabs	63 ft <sup>2</sup>	150 ft <sup>2</sup>	630 ft <sup>2</sup>
Granular base material	1 yd <sup>3</sup>	3 yd <sup>3</sup>	23 yd <sup>3</sup>
Setting bed material	0.2 yd <sup>3</sup>	0.5 yd <sup>3</sup>	2 yd <sup>3</sup>
Edge restraint	40 ft (2 edges)	48 ft (4 edges)	60 ft (2 edges)
Jointing material	1 bag	3 bags	10 bags

**Your Project Material Calculator**

Material			Your Project		Total Required
Hanson pavers, architectural tiles or paver slabs	1.05	x	ft <sup>2</sup>	=	ft <sup>2</sup>
Granular base material (walkway/patio - 4" deep)	0.0123	x	ft <sup>2</sup>	=	yd <sup>3</sup>
Granular base material (walkway/patio - 6" deep)	0.0185	x	ft <sup>2</sup>	=	yd <sup>3</sup>
Granular base material (driveway - 12" deep)	0.037	x	ft <sup>2</sup>	=	yd <sup>3</sup>
Setting bed material (1" deep)	0.0031	x	ft <sup>2</sup>	=	yd <sup>3</sup>
Edge restraint (along any edges not abutting a wall, building or other permanent structure)	1	x	ft (perimeter)	=	ft
Jointing material (pavers - narrow joints)	0.0167	x	ft <sup>2</sup>	=	bags
Jointing material (pavers - wide joints)	0.04	x	ft <sup>2</sup>	=	bags
Jointing material (architectural tiles / paver slabs)	0.01	x	ft <sup>2</sup>	=	bags

**Base Depth Chart (yd<sup>3</sup>)**

	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"
100 ft <sup>2</sup>	0.3	0.6	0.9	1.2	1.5	1.9	2.2	2.5	2.8	3.1	3.4	3.7
200 ft <sup>2</sup>	0.6	1.2	1.9	2.5	3.1	3.7	4.3	4.9	5.6	6.2	6.8	7.4
300 ft <sup>2</sup>	0.9	1.9	2.8	3.7	4.6	5.6	6.5	7.4	8.3	9.2	10.2	11.1
400 ft <sup>2</sup>	1.2	2.5	3.7	4.9	6.2	7.4	8.6	9.9	11.1	12.3	13.6	14.8
500 ft <sup>2</sup>	1.5	3.1	4.7	6.2	7.7	9.3	10.8	12.4	13.9	15.4	17.0	18.5
600 ft <sup>2</sup>	1.8	3.7	5.6	7.4	9.2	11.1	13.0	14.8	16.7	18.5	20.3	22.2

**Metric Conversion Chart**

When you know:	Multiply by:	To find:
Inches (in)	25.4	Millimeters (mm)
Inches (in)	2.54	Centimeters (cm)
Feet (ft)	30.48	Centimeters (cm)
Feet (ft)	0.3048	Meters (m)
Square Feet (ft <sup>2</sup> )	0.0929	Square Meters (m <sup>2</sup> )
Cubic Feet (ft <sup>3</sup> )	0.037	Cubic Yards (yd <sup>3</sup> )

**Helpful Formulas**

**Soldier Course**

$$\frac{\text{Length of soldier course (in)}}{\text{Width of paver (in)}} = \text{\# of pcs required}$$

$$\frac{\text{\# of pcs required}}{\text{Pcs/ft}^2} = \text{\# of ft}^2 \text{ required}$$

**Area**

Circle =  $\pi r^2$   
= 3.14 x radius x radius

Rectangle = length x width

Triangle = 1/2 base x height

**Perimeter**

Circle =  $\pi d$   
= 3.14 x diameter

Rectangle = 2 x (length + width)