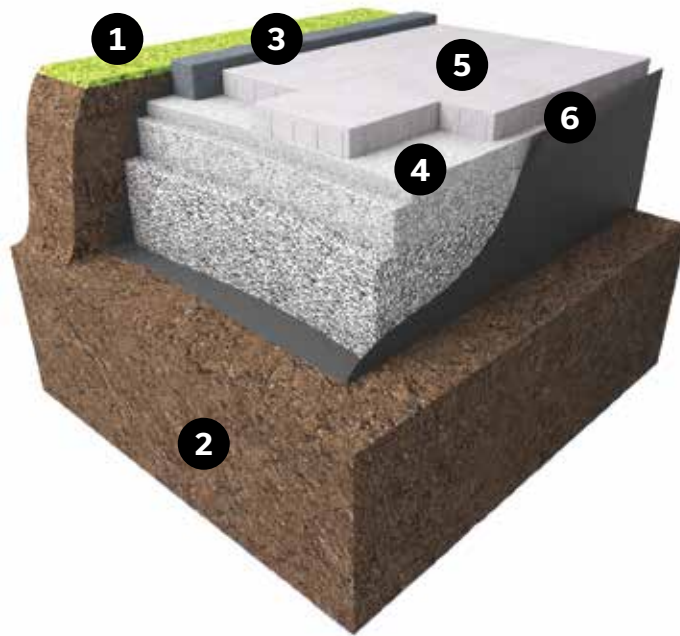


Pavers

PAVER INSTALLATION (GENERIC)



TOOLS REQUIRED

- > 1 wheelbarrow
- > A few pegs
- > 2 rigid pipes with a diameter of 25 mm - 1 in x 3 m - 10 ft
- > 1 plank: 25 mm x 150 mm x 2.4 m - 1 in x 6 in x 8 ft.
- > 1 plumb line
- > 1 level
- > 1 bricklayer's line: 15 m long - 50 ft
- > 1 shovel
- > 1 chalk line
- > 1 measuring tape
- > 1 broom
- > 1 rake
- > 1 guillotine or concrete saw (available from rental stores)
- > 1 vibrating plate (compacting tool available from tool rental stores)

OPTIONAL TOOLS

- > Jumping jack

The jumping jack should not be used to compact pavers. It should only be used for the foundation.

1 EXCAVATION

If pipes or wires are located in the area to be excavated, contact the representatives of the company concerned before the work is started.

To ensure adequate drainage, excavate the soil to obtain a minimum 2% slope (20 mm per metre or 1/4 inch per foot). The slope can be reduced to 1% if the drainage of all the landscaping is well controlled. In case of doubt, obtain an expert's assistance for a detailed analysis of everything concerning drainage (slopes of the ground, soil type, landscaping, etc.).

The excavation contour should extend beyond the surface to be paved by at least 300 mm - 12 in. Ideally, this distance should be 1 to 1 1/2 times the thickness of the foundation. The stability of the project depends on this measurement, which ensures that the paving stones at the edge will be as well supported as those in the centre.

Level the bottom of the excavation with a rake and if the soil is sandy, compact it with a vibrating plate or roller. It is preferable not to pack clay soil at this stage. In this case, the use of a geotextile membrane placed between the natural soil and the foundation is recommended to prevent foundation contamination by clay and ensure greater stability. Refer to the chart EXCAVATION DEPTH AND MINIMUM FOUNDATION to get the minimum excavation required (ref: photo #1).

2 FOUNDATION

Spread and compact the 0 to 20 mm - 0 to 3/4 in. stone in 100 mm - 4 in. layers. Lightly water the 0 to 20 mm - 0 to 3/4 in. stone to make tamping easier. To ensure an adequate foundation, compact the stone several times with a vibrating plate, roller, or a jumping jack (ref: photo #2). Once this stage is completed, you will be able to see what the final result will look like. You can verify the final level of the pavers by placing a paver on a guide (ref: photo #3). Refer to the typical installation drawings (see page 6).

3 CURB

If you install a Novo curb type, proceed with installation of the curbs immediately before completing the foundation. Start by laying the first side of the curb. Before installing the other side of the curb, temporarily place a row of pavers on the ground to determine the ideal distance and the position of the other curb, and thus minimize the size of the pavers. If you install a Melville curb, a Lafitt curb, a Celtik curb or even a plastic curb, refer to LAYING PAVERS.

4 INSTALLATION BED

Spread between 15 mm - 5/8 in. and 25 mm - 1 in. of concrete sand or screening (ref: photo #4). Bear in mind that a 25 mm - 1 in. bed will be reduced down to 15 mm - 5/8 in. in thickness once compacting is completed and after the paving stones are installed.

Level the concrete sand using two (2) 25 mm - 1 in. diameter pipes and a straight plank (ref: photo #5). Any significant variation in bed thickness may cause irregularities in the paved surface.

Make sure you do not compact the screenings or the sand before laying the pavers on the installation bed. Fill the holes left by the pipes.

5 LAYING THE PAVERS

Arrange the paving stones according to the pattern chosen with a 90° angle if possible. Proceed by walking on the paving stones (ref: photo #6).

Paving stones are manufactured with side spacers that will set a space of 3 mm - 1/8 in. between each paver. A space of 2 mm must be allowed for paving stones without spacers.

To obtain an even distribution of colour and texture, it is recommended that you choose paving stones from more than one cube at a time. Moreover, working across each cube always gives the best results.

Check the alignment of the pavers (after every five rows installed) and adjust them, if necessary, using a screwdriver.

Install paving stones up to the last row. To avoid having to cut paving stones later, determine the position of the curbs to finish with a complete paving stone.

If necessary, you can cut the paving stones using a cold chisel or specialized tool such as guillotine or a concrete saw (ref: photo #7). It is recommended that you use a chalk line to mark the paving stones to be cut. If you have to use a guillotine to cut the stones, make sure that the cut is at a slight angle as pavers cut this way are much easier to install. If you use a concrete saw, keep away from the paving stones already installed, since the dust and dirt from the sawing will permanently stain them. Wear safety glasses when cutting concrete products.

Proceed immediately with installation of Melville curbs, Lafitt curbs, Celtik curbs or plastic curbs on the perimeter of the paved surface (ref. photo # 8). The curbs are laid directly on the densified granular foundation.

6 FILLING THE JOINTS

Once you have finished laying the paving stones, stabilize them using a vibrating plate (ref: photo #9). This operation will settle the stones into the bed while levelling the surface. Begin by brushing a thin uniform layer of joint-filling sand over the paving stones and into the joints (ref: photo #10), and then use a vibrating plate. For best results, run the plate two or three times in each direction. This operation will allow the sand to penetrate suitably into the joints and the paving stones to settle approximately 10 mm - 3/8 in. into the bed. (For improved performance, use Techniseal polymeric sand in accordance with the instructions provided on the bag).

The installation of a detachable neoprene sole (or layer) has been proven to be an additional protection against the risk of concrete spalls when filling the joints of paving stones.

Repeat the sand-spreading and vibrating procedures until all of the paving-stone joints have been filled. Remove the excess sand with a brush. The final level of the sand in the joints should be about 3 mm - 1/8 in. lower than the level of the paving stones.

If, after a few days, some joints are not properly filled, repeat the procedure. It is recommended to perform an annual maintenance of the joints between the paving stones.

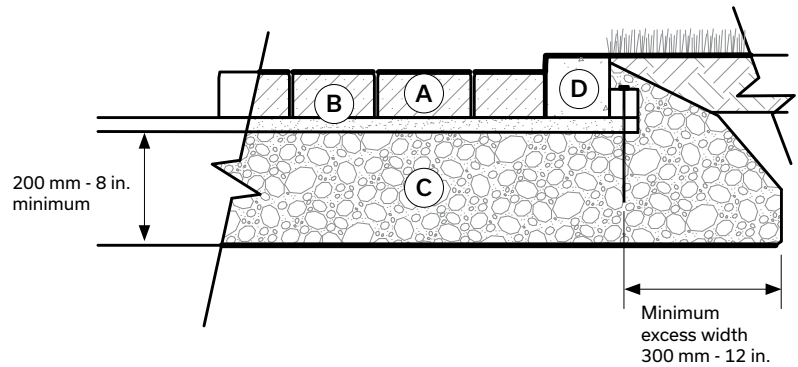
WE SUGGEST SETTING ASIDE A NUMBER OF PAVING STONES FOR REPLACEMENT.



TYPICAL CROSS-SECTION - PAVERS

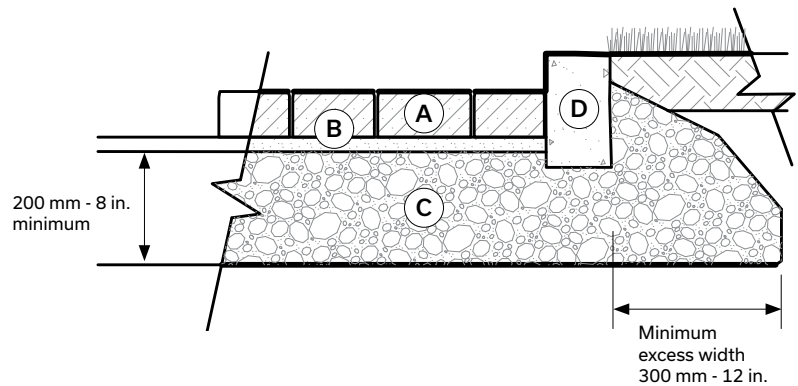
TYPICAL PAVER INSTALLATION WITH MELVILLE, LAFITT OR CELTIK CURB

- (A) Paving stones
- (B) Laying bed 25 mm - 1 in. (concrete sand)
- (C) Compacted granular foundation 0 to 20 mm - 0 to 3/4 in.
- (D) Melville, Lafitt or Celtik curb



TYPICAL PAVER INSTALLATION WITH NOVO CURB

- (A) Paving stones
- (B) Laying bed 25 mm - 1 in. (concrete sand)
- (C) Compacted granular foundation 0 to 20 mm - 0 to 3/4 in.
- (D) Novo curb



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	400 mm 16 in.	300 mm 12 in.	350 mm 14 in.	250 mm 10 in.
MINIMUM FOUNDATION THICKNESS 0 TO 20 MM - 0 TO 3/4 IN. CRUSHED STONE	300 mm 12 in.	200 mm 8 in.	250 mm 10 in.	150 mm 6 in.
MINIMUM/MAXIMUM UNCOMPACTED INSTALLATION ⁽¹⁾ BED	15 mm to 25 mm 5/8 in. to 1 in.	15 mm to 25 mm 5/8 in. to 1 in.	15 mm to 25 mm 5/8 in. to 1 in.	15 mm to 25 mm 5/8 in. to 1 in.
THICKNESS OF PAVING STONE	60 mm or 80 mm 2 3/8 in. or 3 1/8 in.	60 mm or 80 mm 2 3/8 in. or 3 1/8 in.	60 mm or 80 mm 2 3/8 in. or 3 1/8 in.	60 mm or 80 mm 2 3/8 in. or 3 1/8 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 25 mm - 1 in. bed will be reduced down to 15 mm - 5/8 in.

⁽²⁾ For certain areas where clay soil is unstable, the minimum excavation required is 600 mm - 24 in. and the minimum foundation is 525 mm - 21 in.

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

Paver Index

Pavers

Ecological Pavers:

Cassara Verde Paver	8
Boulevard Verde Paver	8
Turfstone Paver	8
Virage Paver	8
Zen Paver	8

Virage Paver - Laying Patterns	13
--------------------------------	----

Permeable Pavement:

Mondrian Plus	31
Trafalgar 60	31
Vendome	31

PACKAGING

For product packaging information, please refer to our Product Data Guide on our website.



English
Quebec



English
Ontario

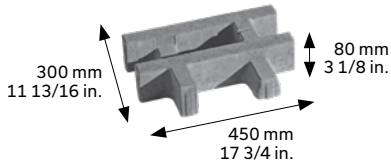
NOTE: Please note that only pavers with specific notes are included in the guide. For information on our entire product line, please see our product guide.

The information contained in these technical documents is supplied for information purposes only. Any application of the information is the sole responsibility of the installer. The installer must ensure that the installation and use of permeable installation projects comply with local regulations and code requirements. A qualified engineer must be consulted for final design for construction purposes. Oldcastle Building Products Canada, Inc. and its affiliates cannot be held responsible for the improper use of information contained in these technical documents.

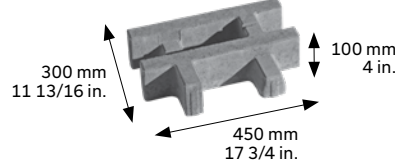
Ecological Pavers

SPECIFIC DETAILS

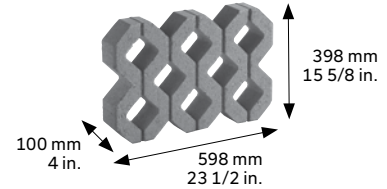
CASSARA VERDE



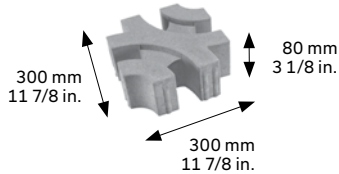
BOULEVARD VERDE



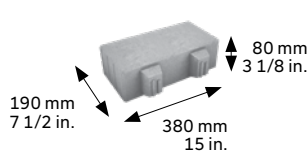
TURFSTONE



VIRAGE



ZEN



RESIDENTIAL VEHICULAR VEGETATED PAVEMENTS INCORPORATING PAVERS WITH MULTI-CAVITY

Whether they are filled with clean aggregates to improve water infiltration into the soil or vegetated to reduce urban heat islands and capture harmful CO₂ from the air, permeable pavers allow you to create an environment-friendly space tailored to your taste.

ADVANTAGES

- > Significantly reduces heat island effects
- > Better management of rainwater: slow-down of runoff water
- > Improves air quality
- > Create more natural and soothing spaces for the population

APPLICATIONS

- > Residential parking, driveways, picnic areas and pedestrian walkways

IMPLEMENTATION

Filling paver cells: Soil mix for grassing, sodding and tree planting. Professional blend composed of mineral soil, sand, fibrous black earth and compost. Available at bulk landscape suppliers, specialized garden centres and soil mix manufacturers. Fill the cells. Pass vibrating plate. Water the surface. Spread the grass seeds.

GRASS SEED : two recommended brands

Minimum maintenance blend (2-week germination):

63% Fescue, 20% Perennial Ryegrass, 17% Kentucky Bluegrass

Sports field blend - high traffic resistance (3-week germination): 65% Kentucky Bluegrass, 20% Fescue, 15% Perennial Ryegrass

SEED BED

Cover the grass seeds with a maximum of 10 mm of soil mix for grassing, sodding and tree planting, then water slightly.

FERTILIZERS: NITROGEN (N), PHOSPHORUS (P), POTASSIUM (K)

Application of fertilizers is recommended for the first year. An organic-based fertilizer is adequate. The following ratios (N-P-K) may be used: 4-1-2, 3-1-1, 2-1-1 (formulation example: 19-6-4)

GERMINATION COVER FOR SEED BED PROTECTION

A woven fabric designed to protect the seed bed allows moisture retention and prevents soil erosion during heavy rains.

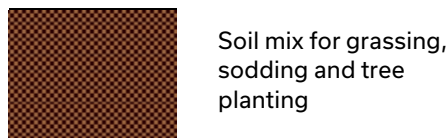
IRRIGATION

During the first year of implementation, you must provide an irrigation system for 7 to 8 weeks.

Then irrigate as needed in the morning such that the soil throughout the depth of the cells is moistened.

Product	Void Opening	Infiltration Rate
Cassara Verde Paver	50%	N/A
Boulevard Verde Paver	50%	N/A
Turfstone Paver	40%	2544 in./hour
Virage Paver	47%	N/A
Zen Paver	27%	N/A

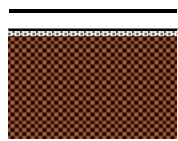
PLANTING DIAGRAM OF LAWN GRASSES IN ECOLOGICAL PAVERS



COMPACT



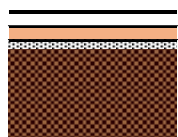
WATER



Fertilizers and seeds



Seed bed



WATER

STAGES OF FILLING AND ESTABLISHMENT OF GRASS

- > Fill the cells with soil mix for grassing, sodding and tree planting
- > Spread without compacting
- > Level with the paver surface
- > Apply (vibrating plate with rubberized protection)
- > Compact the pavers (vibrating plate with rubberized protection)
- > Water to obtain soil packing enabling the addition of the seed bed
- > Ensure 5-10 mm of clearance under the paver surface and adjust (if required)
- > Spread out fertilizers and seeds
- > Spread the seed bed and level
- > Water lightly to moisten the seed bed

NOTE: The seed bed is the soil mix for grassing, sodding and tree planting. Shown here on the left are the grass filling and planting steps. The succession of steps should prevent the seeds from being more than 10 mm below the seed bed so that they do not rot.

MAIN INTERVENTION TO MAINTAIN THE INITIAL VEGETATION IN PLACE

EXTENSIVE APPROACH WITH MINIMAL MAINTENANCE REQUIRED:

- > A traditional vegetation planting approach: selection of undemanding plants
- > One fertilization per year: from irrigation process to planting
- > Minimal interventions for natural growth of the vegetation in the cells

INTENSIVE APPROACH WITH MULTIPLE INTERVENTIONS (GREATER CHANCE OF SUCCESS):

- > A traditional approach of planting vegetation (grass)
- > Regular irrigations in season (mandatory in drought period)
- > Periodic manual weeding (preferred)
- > Replacement of vegetation as needed (reseeding)
- > Addition of soil mix annually
- > Regular fertilization in season

USE OF HERBACEOUS PERENNIALS TO REPLACE LAWN GRASSES

It is important to note that the turf installed in the ecological pavers is demanding in terms of water and fertilizer and is not very resistant to dryness. Intensive maintenance interventions approach increase the chances of success. In addition, hardy ground cover crops that are very drought-resistant and low in fertilizer may provide a better alternative.

In this sense, several plants were selected and tested to establish their drought resistance and their demand for water and fertilizer. Overall, the plants that we propose here exceed the potential of the more demanding lawn. The use of these plants should be considered when an extensive approach (minimal maintenance interventions) is recommended.

- > Veronica Repens
- > Pilosella aurantiacum (hawkweed)
- > Sedum album *Coral Carpet*
- > Thymus serpyllium *Magic Carpet*
- > Sedum acre

TIPS

- > Use plants produced in multi-cell at the rate of 2 per single alveolus
- > Cutting implantation (for SEDUM) is possible and takes root more quickly
- > Plants exposed to full sun will have smaller leaves than normal because they adapt
- > Plants are available in specialized horticultural centers (Aux Aubepines for example)
- > The substrate (potting soil) to be considered must not contain an excessive mineral component

MAINTENANCE RECOMMENDATION

SEASONAL IRRIGATION

Irrigation is necessary during the first year of planting

MOWING

Mowing to 8-10 cm - 3 and 4 in. is recommended for the entire growing season. Avoid mowing during drought periods.

WEEDING CONTROL

Extensive approach: leave what nature provides

Intensive approach: manual weeding can be performed in season

FERTILIZATION PROGRAM (N-P-K)

Proceed with at least one fertilization per year (extensive approach). For optimal results, three fertilizations per year are required.

ADDING SOIL MIX

Addition of soil mix is performed from the end of August to mid-September as well as in the spring. It maintains fertility and restores the filling level (if packing is observed) for optimum clearance (6 to 10 mm) below the paver surface.

RESEEDING

Increases grass density. The dense presence of vegetation associated with a strong root system avoids compaction. Reseeding is performed at the same time as the addition of soil mix, between mid-August and mid-September and in the spring.

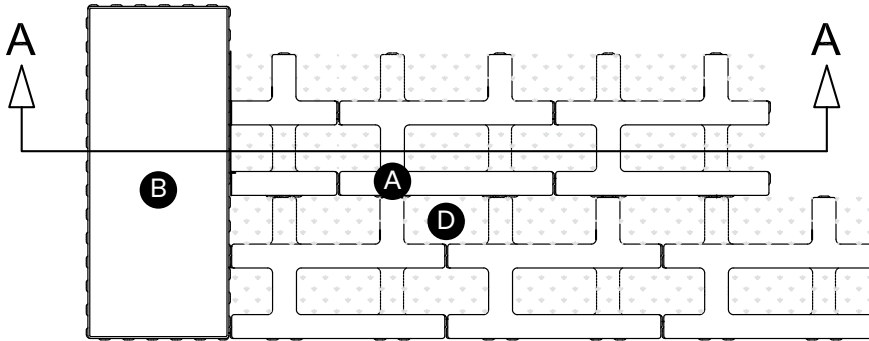
WINTER

De-icing salts application is prohibited. Ice clumps under vehicles are also a threat to the plants. Snow removal height must be adapted to leave a tamped snow cover of 2 to 4 cm, which will protect the plants from cold spells and prevent their uprooting during snow removal.

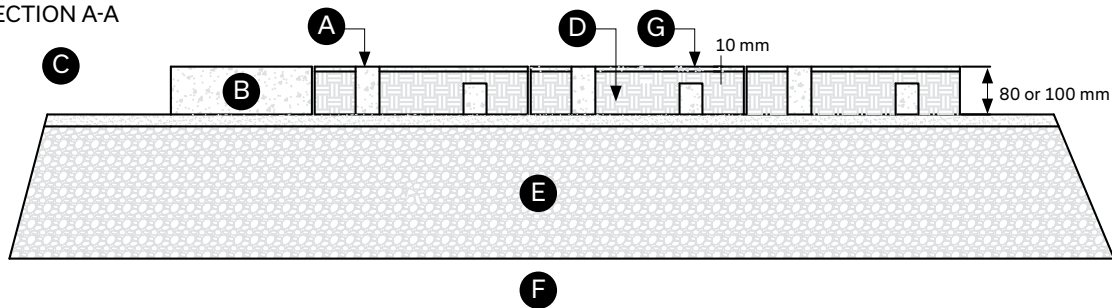
Ecological Pavers

CASSARA VERDE AND BOULEVARD VERDE PAVERS CROSS-SECTION - DRIVEWAY

PLAN VIEW



CROSS-SECTION A-A

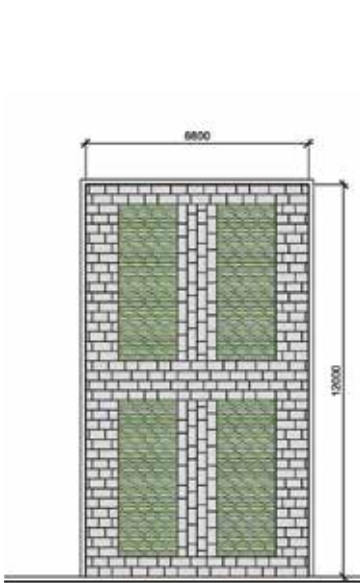


- Ⓐ Cassara Verde paver (80 x 300 x 450 mm) or Boulevard Verde paver (100 x 300 x 450 mm)
- Ⓑ Cassara Large Rectangle paver or Boulevard paver
- Ⓒ Installation bed 12 to 25 mm: clean stone, 9.5 mm - 3/8 in.
- Ⓓ Soil mix for grassing, sodding and tree planting (inside the multi-cavity).
The soil mix is also used as seed bed (for grass).
- Ⓔ 20 mm - 3/4 in. clean stone compacted to 95% modified Proctor
- Ⓕ Existing soil with adequate bearing capacity (minimum of 150 kN/m²)
- Ⓖ Maximum clearance of 10 mm under the paver surface

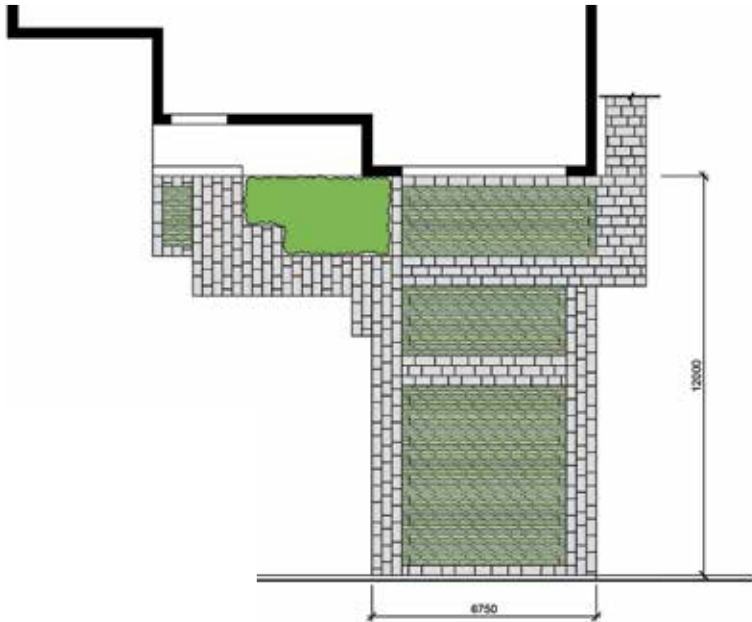
NOTE: The Cassara Verde paver can be used in combination with Cassara Large Rectangle, Esbelto, Melville, Mondrian, Trafalgar and Vendome pavers. The Boulevard Verde paver can be used with Agora, Boulevard and Vertex pavers.

EXAMPLE OF INSTALLATION

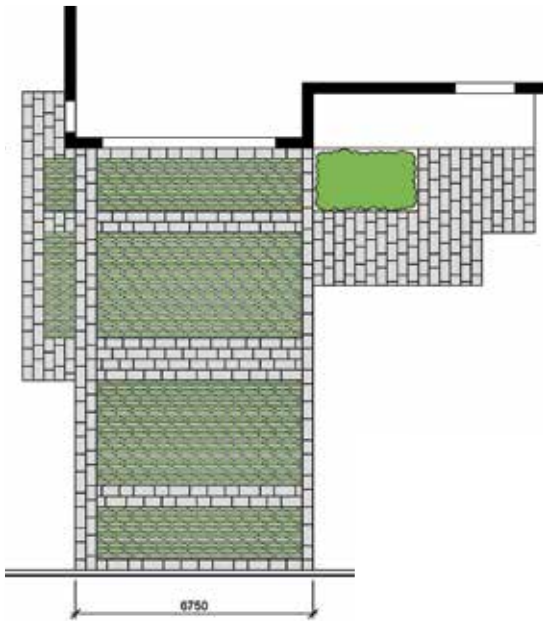
Driveway: Cassara Verde or Boulevard Verde paver



OPTION ①



OPTION ②



OPTION ③