



# Designer Resource Guide

COMMERCIAL LANDSCAPE PRODUCTS | EDITION 6.0

PLANNING | DESIGN | INSTALLATION | MAINTENANCE GUIDANCE FOR DESIGN PROFESSIONALS



# We're in this together.

We know that your role as a designer is to bring the vision of your client to reality through your creativity, knowledge and skill. When specifying Oaks Landscape Products, we assure you that they will do more than just look great; your choices will function properly in their intended roles for the life of the project. To this end, this Designer Resource Guide provides a high-level summary of the design tools and resources available from the product experts at Oaks, as well as recommends which Oaks products are suitable for different applications so you can feel confident that your choices will exceed your clients' expectations.



**Paver:** Presidio, Marble Grey and Onyx  
**Wall:** Protterra™ Split, Natural

# We're here to help you by understanding your needs...

As a manufacturer of landscape products, we get the opportunity to talk with many design professionals, be they architects, landscape architects, landscape designers, planners or engineers.

One common theme we're hearing in these conversations is that there are simply too many product choices and too much information circulating for any design pro to be an expert on all things. The common request that filters out of these conversations is: Can we, the manufacturer, provide product specific expertise and guidance on how to properly use the products we make?

Our answer is a resounding "Yes; it's our pleasure to help"! This Designer Resources Guide, as well as our Continuing Education offering, were developed to provide the design community with the most up-to-date and unbiased technical support available. While this guide provides a high-level summary of the design tools and resources available from Oaks, it also identifies which Oaks products are best suited for different applications. Our Continuing Education offering focuses on innovative new topics such as:

- 1) **Finding Balance Between Place and Movement**  
using the *Woonerf Concept*
- 2) **Stabilized Backfill Creates All New Opportunities for Segmental Retaining Walls**

We want to be your **One Trusted Source** of not only a quality, versatile product range but also technical guidance and support. Contact your Oaks Sales Representative to arrange a Lunch and Learn session for your team, and learn more about how Oaks is always here to help.



## We have the resources to help you every step of the way!

### PLANNING

- Oaks Design Resource Guide
- Comprehensive library of supporting documentation
- Examples of existing LID BMP projects
- Environmental Product Declarations

### DESIGN/EVALUATION

- ASCE and CMHA Manuals and Software
- Capital and Life Cycle Costing Software
- ASTM site inspection protocols
- VESPA design software for retaining walls

### SPECIFICATION TENDER

- CSA and ASTM Standards
- Sample Specifications, Patterns, CAD details
- Direct design assistance complete with stamped drawings
- PAT paver pattern files for use in AutoCAD

### CONSTRUCTION

- Oaks Inspection Checklists
- CMHA Contractor Certification Training
- CMHA Inspector Certification Training

### MAINTENANCE

- Oaks Maintenance Guides
- Warranty
- CSA/ASTM Quality Compliance Reports

# Product Technology and Quality

These advanced manufacturing technologies are used in select product lines to create a higher standard of material.

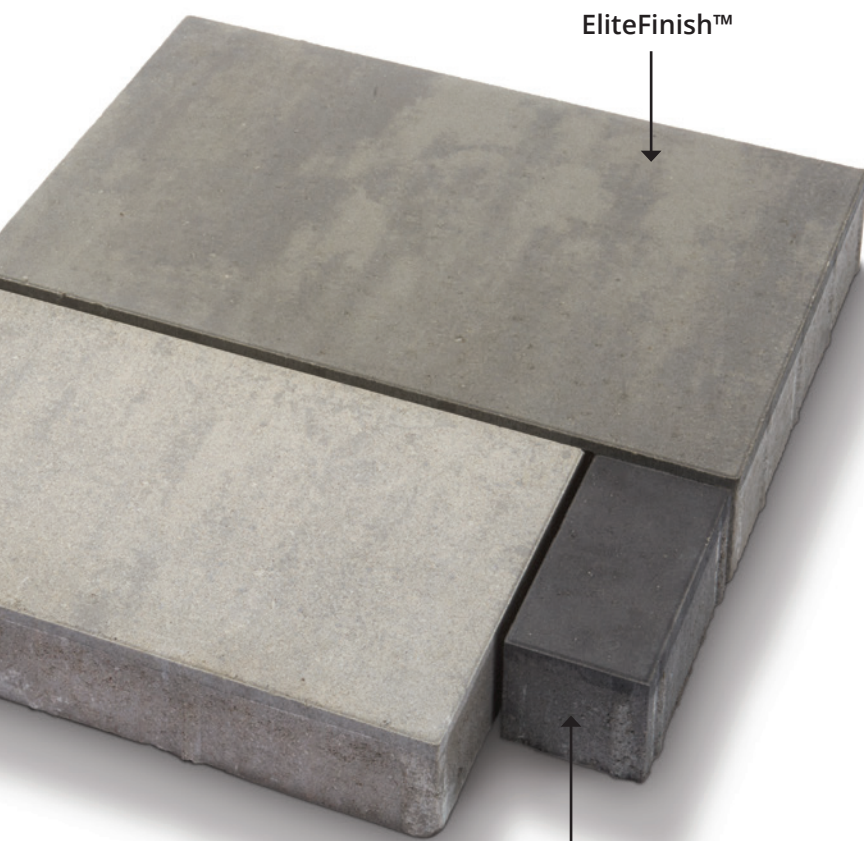
## EliteFinish™

EliteFinish™ is an advanced manufacturing process that delivers richer, more vibrant color and a harder wearing, more durable and smoother textured surface.

The surface of our EliteFinish™ products is a specially engineered layer of finely-ground, durable aggregates combined with rich color and concentrated cement. The paver foundation uses coarser stone to ensure long term performance in application. The resulting product delivers an enhanced finish and greater structural integrity.

### Products with EliteFinish™:

Molina® 60mm, Market Paver, Molina® 80mm, Eterna



Durable, aggregate base for a strong foundation

## ColorBold™

ColorBold™ is an integral treatment employed during manufacturing that provides a new level of color longevity and stain resistance.

ColorBold™ is a proprietary process where supplemental ingredients penetrate the surface of the product to become an integral part of the unit. Enhanced color depth, extended color durability, improved resistance to stains and acidic materials, as well as improved freeze-thaw capability due to decreased moisture absorption are all benefits delivered with products featuring ColorBold™.

Other color enhancement products are sealers applied post production, after the concrete has been thoroughly cured; the chemical can only penetrate whatever surface voids are present, with the balance being left as a film on the paver surface.

### Products with ColorBold™:

Molina® 60mm, Market Paver, Molina® 80mm



With ColorBold™

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## Stay Up-to-Date!



Visit our **interactive online designer resource guide** for additional photo and video content and post-publication updates.  
**Scan to view!**



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Paver: Enviro Midori, Custom Color

# Applications and Solutions

Oaks Segmental Pavement Systems are developed for various degrees of traffic, living street appeal, permeable pavement applications and northern climates, with consideration for pedestrian safety and wheelchair accessibility. Whether your intent is to enhance an entrance way, build a staircase or manage grades, Oaks Wall Products offer you design solutions for a variety of wall classifications. This section will guide you through making the right choices for your project, including detailed installation techniques, design tips, capital/life cycle costing and maintenance considerations.

# Segmental Concrete Pavement Systems

There are several different locations pavers and slabs can be installed. Some of the most common are: at grade on native soil, over an existing concrete or asphalt road, or above grade on a concrete patio or roof deck. The following two pages provide guidance for the majority of these installation practices, while information on Pedestal Set applications is covered on Page 09. CAD details, material specifications and testing requirements, and installation instructions for each option are available online or upon request.

ALL OF THESE DETAILS ARE **AVAILABLE ONLINE!**

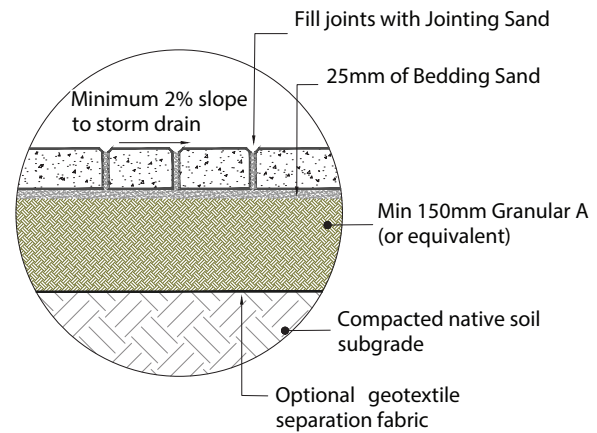
## SAND SET ON SUBGRADE

**SUITABLE APPLICATIONS:** Most pedestrian and vehicular projects.

**BENEFIT:** Economical installation.

**DESIGN NOTES:** See ASCE 58-16 for recommended base thickness subject to traffic conditions and subgrade soil type. Need for separation geotextile subject to subgrade soil type. Underdrains may be needed over tight soils (clays).

**INSTALLATION NOTES:** Ensure subgrade is properly compacted before commencing with Granular A placement. See ICPI (Interlocking Concrete Pavement Institute) for recommended installation practices.



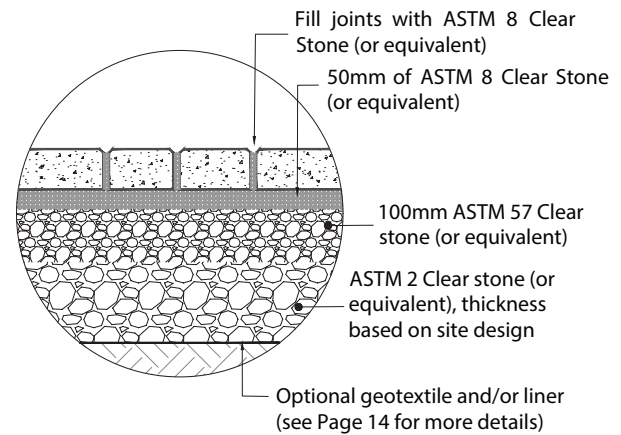
## PERMEABLE STONE SET ON SUBGRADE

**SUITABLE APPLICATIONS:** Most pedestrian and vehicular projects where stormwater management is also an objective.

**BENEFIT:** Utilizes the same area for traffic/parking and storm water management, frees up other space onsite for revenue generating purposes.

**DESIGN NOTES:** See ASCE 68-18 for recommended base thickness subject to stormwater management goals, traffic conditions and subgrade soil type. Need for separation geotextile and/or liner, and underdrains, subject to site conditions. See Page 12 for more information.

**INSTALLATION NOTES:** Consult with Oaks staff on providing contractor training to ensure correct installation practices are being followed.



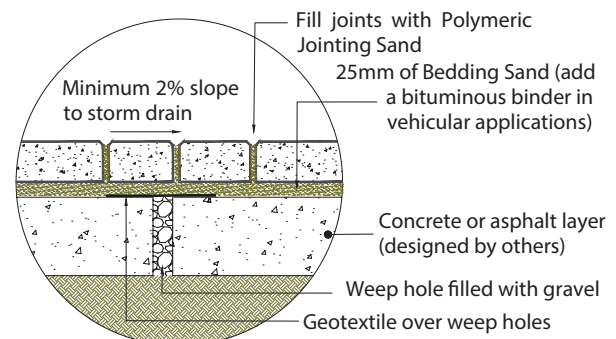
## SAND SET OVERLAY ON CONCRETE OR ASPHALT AT GRADE

**SUITABLE APPLICATIONS:** Recommended over weak native soils. Bituminous set for high traffic areas, crosswalks or intersections

**BENEFIT:** Combines structural benefits of concrete/asphalt with the aesthetics of pavers and slabs.

**DESIGN NOTES:** Drain holes are required throughout the pavement area to allow water in the bedding layer to easily drain.

**INSTALLATION NOTES:** Recommend stabilized jointing sand to minimize water infiltration and tighter height tolerances on the pavers or slabs. For bituminous set, consult with Oaks staff on providing contractor training to ensure correct installation practices are being followed.





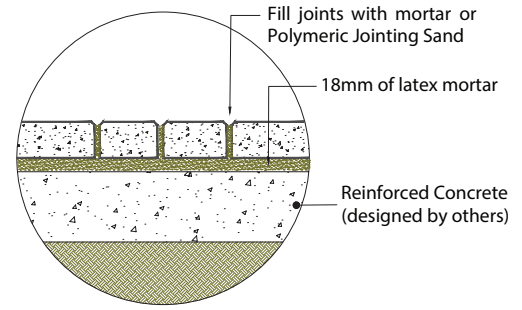
## MORTAR SET ON CONCRETE

**SUITABLE APPLICATIONS:** Interior applications over concrete.

**BENEFIT:** Creates a very rigid surface.

**DESIGN NOTES:** For pavers or slabs with small joints, use polymeric sand in lieu of mortar between the units. Control joints in the reinforced concrete need to extend up through the mortar and pavers/slabs.

**INSTALLATION NOTES:** When using mortar in the joints, be careful to prevent mortar from spilling over the joints, which stains pavers/slabs.



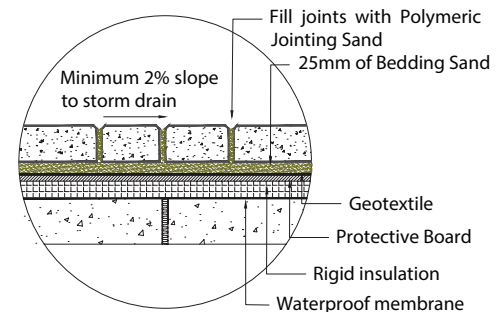
## SAND SET ON CONCRETE PATIO OR ROOFDECK

**SUITABLE APPLICATIONS:** Exterior patios or roofs over concrete decks.

**BENEFIT:** Provides decorative surfacing over concrete that can be lifted/replaced for maintenance or repairs.

**DESIGN NOTES:** Concrete deck needs to be sloped away from building to drains as pavement surface follows same slope. Control joints in the reinforced concrete do not need to extend up through the bedding sand and pavers/slabs. Also, see Note 1 below.

**INSTALLATION NOTES:** Geotextile required above protective board to prevent bedding sand loss.



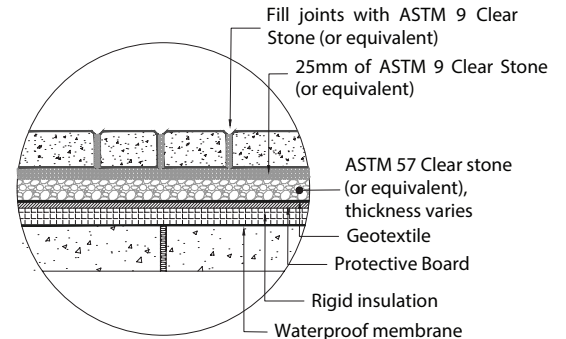
## PERMEABLE STONE SET ON CONCRETE PATIO OR ROOFDECK

**SUITABLE APPLICATIONS:** Exterior patios or roofs over concrete decks where a flat pavement surface is preferred.

**BENEFIT:** Same as previous, plus pavement surface can be at nominal drainage slope (drainage can occur in the aggregate base).

**DESIGN NOTES:** Concrete deck needs to be sloped away from building to drains; thickness of ASTM 57 varies as needed to provide flat pavement surface. Also, see Note 1 below.

**INSTALLATION NOTES:** Size jointing material to accommodate joint width. ASTM 57 stone needs to be manufactured sharp stone (not round river rock) to prevent shifting.



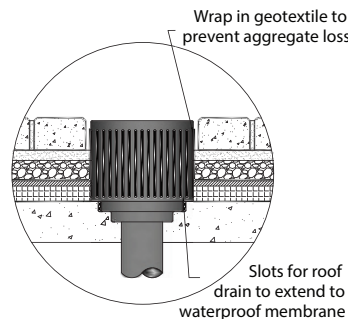
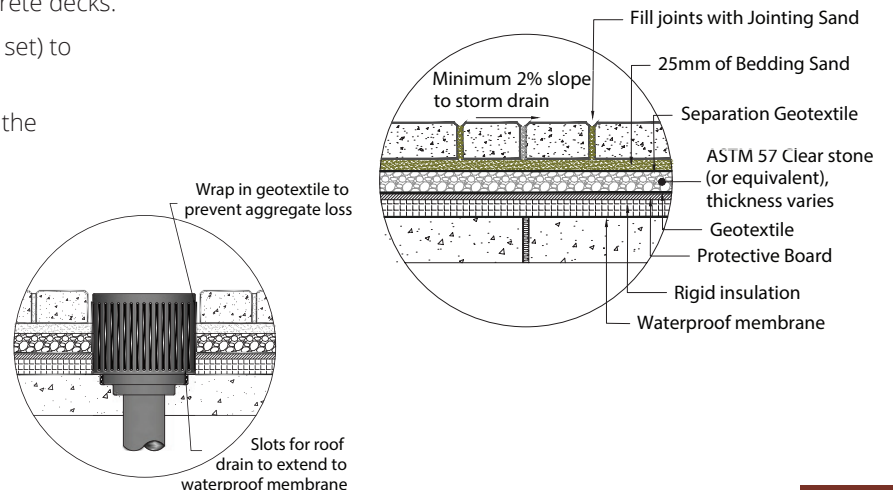
## HYBRID SAND/PERMEABLE STONE SET ON CONCRETE PATIO OR ROOFDECK

**SUITABLE APPLICATIONS:** Exterior patios or roofs over concrete decks.

**BENEFIT:** Provides increased subsurface drainage (over sand set) to better handle moisture that infiltrated through the joints.

**DESIGN NOTES:** A separation geotextile is required between the bedding sand and ASTM 57 stone. Also, see Note 1 below.

**Note 1:** On all concrete patio or roof deck applications, the roof drains need to have side slots that extend down to the waterproof membrane so that any moisture below the pavers can escape. Wrap the outside of the drain with geotextile to prevent bedding material loss.



# Traffic Defines Product Choices

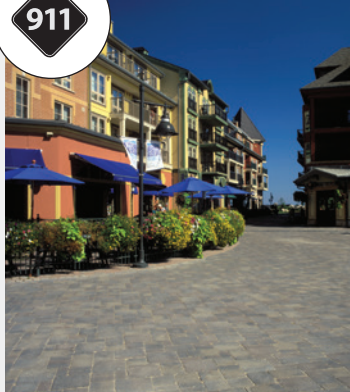
Designers often ask where we recommend each of our pavers and slabs can be used. Given that the answer is dependant on what will be on the pavement, we have identified eight primary commercial *Pavement Classifications* with each representing a different traffic and/or vehicle weight scenario. The suitability of our pavers and slabs relative to each classification was then evaluated based on aspect ratio and/or finite element analysis results assuming a *Sand Set on Subgrade* installation; see *Oaks Tech Note L6 – Structural Design of Vehicular Paver Systems* for more information. In the Products section (starting on Page 38) the icons below are used to identify which Pavement Classifications each of our pavers and slabs are recommended for.

## PAVEMENT CLASSIFICATIONS



### PEDESTRIAN PLAZAS

There will be no vehicular traffic on these areas (rooftop, courtyards, pool decks).



### EMERGENCY AND MAINTENANCE ACCESS ROUTES

Although intended primarily for pedestrian access, there can be the occasional maintenance, snow removal or emergency response vehicle (plazas, sidewalks).



### PASSENGER CARS ONLY

These are areas with restricted access to private passenger vehicles (residential driveways, staff parking lots or restaurant drive thru corridors).



### CARS AND LIGHT TRUCKS

Open parking areas mostly used by private passenger vehicles and occasional light delivery trucks or small shuttle buses (restaurant parking, hotel or business entrances).



### OCCASIONAL HEAVY VEHICLE USE

Open parking areas used by occasional heavy vehicles (garbage collection routes at businesses or townhouses).



### REGULAR HEAVY VEHICLE USE

Open parking areas used by regular heavy vehicles (Mall entrances, bus/delivery routes, or dealership unloading areas).



### MUNICIPAL MIXED USE

Any municipal street or private road where there is a general mix of traffic.



### INDUSTRIAL AREAS

Regular construction, operational equipment, or heavy vehicular traffic (Manufacturing facilities, ports, terminals).

# Pedestal Set Applications

Another question we often get is “what product(s) do you recommend for pedestal set applications”? For those not familiar with pedestal set applications, plastic spacers or pedestals are used to elevate concrete slabs over a built up roof to create an elevated deck. This is generally done to create a horizontal (i.e. easily navigable) surface over a roof deck that is otherwise uneven or sloping, or above ductwork, service pipes or electrical cabling on the rooftop. Unfortunately, prior to 2022 there was no production standard for slabs used in pedestal applications so we refrained from recommending any products. However, in 2021 it was determined that a “2000 lb center load test applied to full size slabs” would be the recommended standard; we then used this to validate the acceptability of our Molina® (60mm) 24 x 24 Stone (see page 42) for use in pedestal applications.



Full-Size Slab, Corner Support Testing

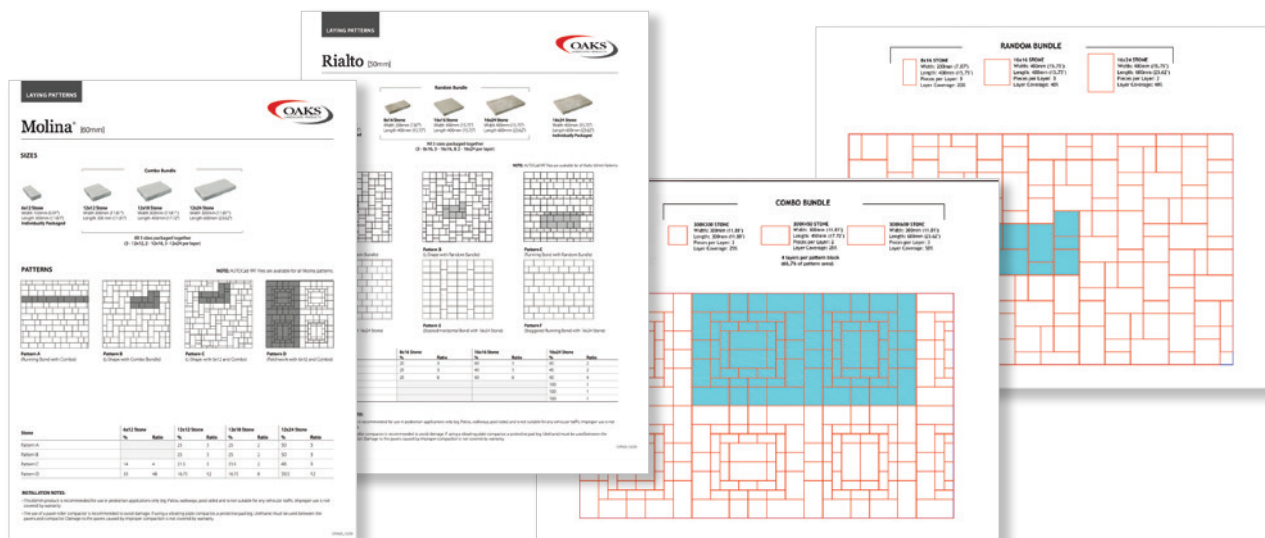
# Creating Patterns and Mosaics

One of the main reasons that Oaks Segmental Pavements are used by design professionals is the variety of colors, sizes and textures available. You can create anything from simple geometric patterns to random layouts to complex mosaics. When reviewing your options, it is important to note that some of our products come pre-blended with multiple-sized pieces in a bundle, while other products have several separately-packaged size, color and/or texture options that can be blended on site based on the design. The Product Summary pages indicate which products come in pre-blended or separately packaged bundles. PAT (pattern image) files are now available for Oaks pavers. We have made it easier for you to auto-fill design areas and rotate and scale patterns as needed. Copy our PAT files into the default AutoCAD support folder for hatch patterns, and Oaks patterns will be listed in your hatch menu.

## PAT FILES FOR ALL OUR PAVER AND SLAB PRODUCTS ARE AVAILABLE ONLINE!

Visit the **RESOURCES** section of our website: [www.bramptonbrick.com/en/resource-search](http://www.bramptonbrick.com/en/resource-search).

There you'll find everything from laying pattern summaries to AutoCAD patterns, drawings and files.



# Safe Pavements - Trips, Slips and Wheelchair Accessibility

Accessibility standards and building codes deal with individual elements of pavement safety. But there is no one regulation that clearly defines a truly safe pavement for all users. To help us develop products that are safe and comfortable for everyone, Oaks reviews and adopts design standards used by other industries.

## HEEL SAFE

ASME: A112.6.3 SECTION 7.12 - HEEL RESISTANT STRAINERS AND GRATES

This guideline limits the maximum grate hole size to 0.31" (8mm) to help prevent heels from entering paver joints, causing injury or falls. We use it to develop our paving products, including permeable pavers. This size is well below Ontario's Accessibility Standard of 20mm and the US ADA Standard of 13mm, which focus on wheelchair tires and cane tips.



## SLIP-RESISTANT

2012 INTERNATIONAL BUILDING CODE - ANSI A137.1 SPECIFICATIONS FOR CERAMIC TILE

We tested various paver and slab textures (from smooth to textured) and finishes (including EliteFinish™ and ColorBold™) to find out how changes affect slip resistance. All of our products exceeded the recommended DCOF (dynamic coefficient of friction) of 0.42 set by ANSI A137.1 for ceramic tile. Details on the DCOF testing can be found in *Oaks Tech Note L2 – Coefficient of Friction Testing for Pavers and Slabs*.



## WHEELCHAIR VIBRATION

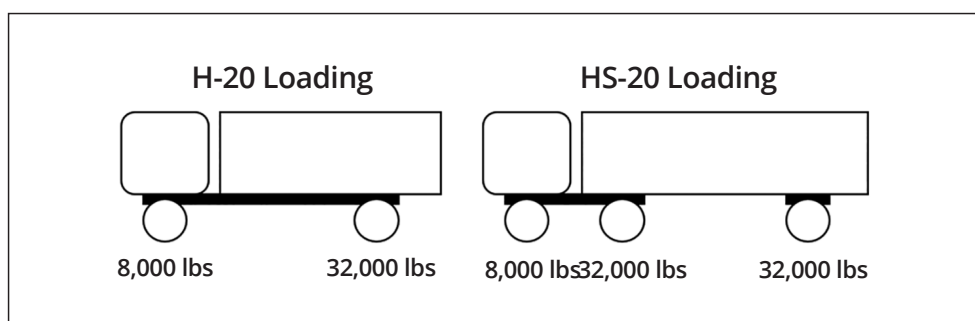
ASTM E3028 Standard Practice for Computing Wheelchair Pathway Roughness Index as Related to Comfort, Passability and Whole Body Vibrations from Longitudinal Profile Measurements

PathMeT's was used to measure the Wheelchair Pathway Roughness Index (WPRI) for a number of pavement surfaces. The results showed that pavers/slabs with 2mm wide chamfers have less of an impact on wheelchair users than even poured concrete surfaces. For this reason, all recently developed Oaks products – Eterna, Molina®, Presidio, Nueva® Paver, Nueva® Slab, and Market Paver – have micro-chamfers (less than 2mm wide).



## H-20 AND HS-20 LOADING

Designers use H-20 or HS-20 from AASHTO to express the extreme load effect created by heavy vehicles (transports, buses and fire trucks) on bridges or other suspended segments such as lids on manholes. Paver systems are installed on a fully supportive base, and are in no way suspended over an opening into which a passing vehicle can collapse; therefore, H-20 or HS-20 loading design principles are not applicable. Refer to Page 08 Pavement Classifications for recommendations on selecting products based on traffic conditions.



# Capital and Life Cycle Costing

## CAPITAL COST

According to an economic analysis report performed by Pavement Technologies Solutions, there are three primary factors that dictate whether a paver installation can be cost competitive to a traditional asphalt pavement, namely:

- the present cost of asphalt, which fluctuates with the price of oil
- the cost of the paver
- the method of paver installation

For our part, Oaks offers several economical machine install products.



**MACHINE INSTALLATION:** Some of our products are manufactured in pre-set patterns for optional machine installation (see the adjacent icon). Mechanical installation can reduce costs significantly for projects over 1,000 square meters (10,000 square feet). Please contact us for product-specific stitching details and more information about mechanical installation.

## What is the expected service life of a sidewalk?

Concrete Pavers Asphalt  
80 years 80 years 40 years

Source: Federation of Canadian Municipalities

## LIFE CYCLE ANALYSIS

It has long been accepted that maintenance and rehabilitation costs - not just initial capital costs - should be considered when conducting an LCCA for pavements. "Life Cycle Cost Management of Interlocking Concrete Block Pavements - Methodology Report and Software" was developed by Applied Research Associated of Toronto to conduct LCCA for different pavement options including asphalt, cast-in-place concrete and segmental pavements. Please contact us for copies of the report and the software.

## UTILITY MAINTENANCE

Segmental pavements offer the advantage of being able to remove and reinstate the wearing course, which can reduce labor, disposal and material replacement costs. There is no need for short-term patching products, and there are no changes to the area's overall appearance when complete. This alone can save significant costs.

### Helpful Maintenance Tools:

- Interlocking Concrete Block Pavement Distress Manual
- Asset Management and Pavement Performance Prediction through Pavement Condition Index (Report and Software)
- ICPI Tech Specs 19 & 23
- Oaks Tech Notes L3 and L4



# What is a Permeable Pavement?

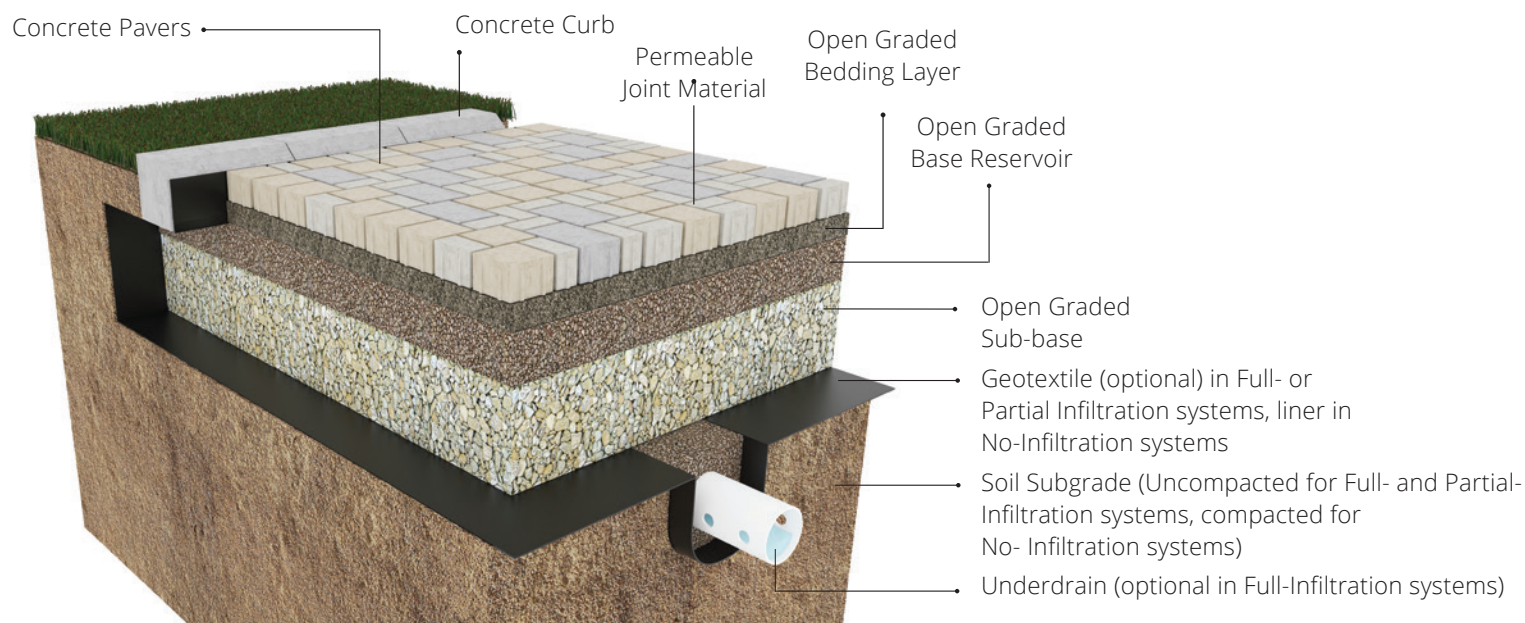
Permeable pavements are pavement systems that allow water to pass through the surface in to an open-graded aggregate base. Widely recognized as a Low Impact Development (LID) strategy, Oaks permeable pavements conform to municipal storm water regulations.

## Associated benefits may include:

1. On-site storm water quantity management
2. Improved water quality
3. Groundwater and tree root zone recharge
4. Reduced hydraulic, erosion and thermal impacts to receiving waters
5. Possible reduction or elimination of traditional storm water management infrastructure

## PERMEABLE PAVEMENT SYSTEM

Below are the main components of a Permeable Interlocking Concrete Pavement (PICP) system.



### ASTM No. 8 Grading Requirements Jointing and Bedding Aggregates

Sieve Size	Percent Passing
12.5 mm (1/2 in.)	100
9.5 mm (3/8 in.)	85 to 100
4.75 mm (No. 4)	10 to 30
2.36 mm (No. 8)	0 to 10
1.16 mm (No. 16)	0 to 5

(commonly referred to as 1/4" clear stone)

### ASTM No. 2 Grading Requirements Subbase Aggregate

Sieve Size	Percent Passing
75 mm (3 in.)	100
63 mm (2 1/2 in.)	90 to 100
50 mm (2 in.)	35 to 70
37.5 mm (1 1/2 in.)	0 to 15
19 mm (3/4 in.)	0 to 5

(commonly referred to as rail ballast)

### ASTM No. 57 Grading Requirements Base Aggregates

Sieve Size	Percent Passing
37.5 mm (1 1/2 in.)	100
25 mm (1 in.)	95 to 100
12.5 mm (1/2 in.)	25 to 60
4.75 mm (No. 4)	0 to 10
2.36 mm (No. 8)	0 to 5

(commonly referred to as 3/4" clear stone)

All aggregate types listed should have less than 2% passing the No. 200 sieve, and should be manufactured sharp stone (not river rock)



This symbol is used in the Products section of this Designer Resource Guide to indicate a permeable paving product. Contact us if you need help sourcing open-graded aggregate materials.

# Selecting Which PICP System To Use

Some jurisdictions offer incentives for storm water quantity reduction or have limits on impervious cover; where this is the case, we recommend that you discuss using PICP with your local municipal and/or regulatory agency before proceeding with your project. If the agency is not familiar with PICP, Oaks staff can provide in-house training and design support.

## Some common misconceptions about PICP:

1. **PICP can not be used in vehicular applications.** Permeable pavers are suitable for a wide range of vehicular applications, provided that speed limits are less than 65 km/hr (40mph).
2. **PICP are not safe in pedestrian areas.** Early versions of permeable pavers were a concern for pedestrians because of their large openings. Oaks more modern permeable pavers are designed to be safe for wheelchairs and pedestrians, and are heel-safe. (Details on Page 10)
3. **PICP cannot be used on clay soils.** Provided that the system is designed accordingly, PICP can be used on any type of soil. (Details below)
4. **PICP systems are too expensive to build and maintain.** Factoring the total cost of pavement, drainage infrastructure, storm water quality management and land, PICP can be a cost-effective option. (Details on page 19)

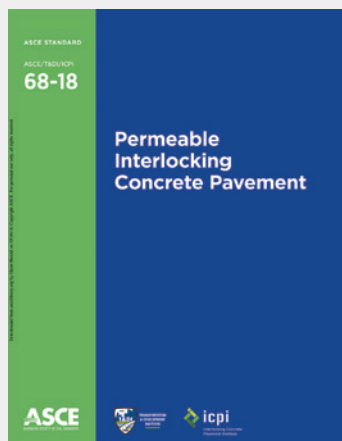
## PERMEABLE PAVEMENT TYPES

### There are three main types of Permeable Pavement designs:

Full-Infiltration, Partial-Infiltration and No-Infiltration, each referring to the amount of water that infiltrates into the native sub-grade.

	SUB-GRADE INFILTRATION FEASIBLE/ PERMITTED	INPUT EXCEEDS INFILTRATION CAPACITY
<b>FULL INFILTRATION:</b> Use Full-Infiltration systems where the infiltration rate of the native soils exceeds the amount of water added to the PICP system. Underdrains and geotextile are optional.	YES	NO
<b>PARTIAL INFILTRATION:</b> Use Partial-Infiltration systems where the amount of water added to the PICP system exceeds the infiltration rate of the native soil and some degree of water storage is required. Include an under-drain and an outlet control device (see Page 16) to control the water storage depth in the sub-base.	YES	YES
<b>NO INFILTRATION:</b> Use No-Infiltration systems over very low permeability, swelling or contaminated soils, or where water harvesting is an objective. Include an under-drain and impermeable liner (on bottom and sides of the system).	NO	-

# PIPC Pavement Design



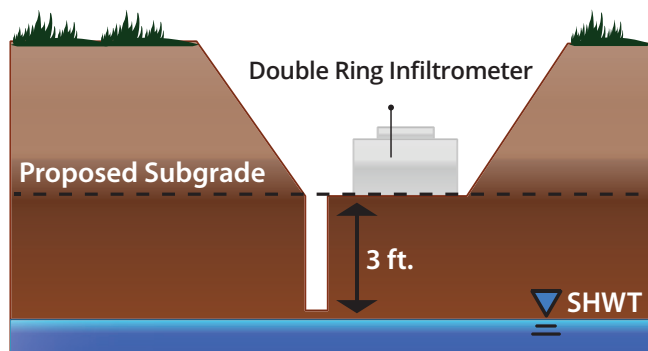
ASCE 68-18 Permeable Interlocking Concrete Pavement was developed to provide design, construction and maintenance guidance for permeable interlocking concrete pavements to achieve storm water management goals while providing a structurally adequate pavement section to accommodate the anticipated vehicular loading in a cost efficient manner.

For copies of the ASCE Manual, or to receive a lunch and learn on the topic **by one of its authors**, contact Oaks staff.

# Hydraulic Design Factors

## MEASURING SITE INFILTRATION

On-site infiltration testing should be done whenever possible to determine site values. Oaks recommends following the protocols laid out in Appendix C of the *TRCA/CVC Low Impact Development Stormwater Management Planning and Design Guide*. Double-ring infiltrometer or Guelph Permeameter testing should be used as the results are more accurate (they estimate the vertical movement of water only). The test should be done at the bottom elevation of the proposed subbase, which is where sub-grade infiltration will take place in the finished pavement. It should also be verified that the depth to the seasonably high water table (SHWT) is not within 1 meter (3 feet) of the subbase.



## ASSESSING INFILTRATION RATES OF SOILS

As part of its Waste Water Flow Management Plan, the City of Toronto summarized the distribution of rainfall events for 16 rainfall stations across the city. The study concluded that 54% of daily storms in Toronto produce less than 5mm of precipitation, and 98% less than 35mm. This table shows sample infiltration rates for different soils. Precipitation of 1.5mm/hour for silty clay may not seem enough to work with a PICP system. But, comparing the daily total (36mm of water infiltration) to the results of the previous study, and it becomes apparent that this infiltration rate exceeds even the 98th percentile of storm events in Toronto.

In other words, even over silty clay storm water will infiltrate into the sub-grade within the same day as the storm event in all but the most severe storms.

SOIL TYPE	INFILTRATION RATE (mm/hour)
SAND	210mm (8.27")
SANDY SILT	26mm (1")
SILT	7mm (0.27")
SILTY CLAY	1.5mm (0.06")
CLAY	0.5mm (0.02")

Source: Porous Pavements



## CONTRIBUTING WATER TO PICP

Many agency regulations allow PICP systems to receive run-on from roofs (see adjacent photo), adjacent impervious pavements, and/or stabilized pervious areas (such as lawns). Although these regulations typically specify a maximum run-on ratio (compared to PICP surface area), Oaks recommends that you perform a water balance analysis to determine if the system can accommodate the additional storm water. Adjust the design details as required.

To quantify the run-on, define the total area of each run-on source and estimate the contributing runoff from each source using the adjusted design storm(s) based on standard run-off practices. Be sure to also consider the potential for increased sediment and contaminant loads associated with the additional run-on. A sediment control chamber may be needed. (See Page 16)

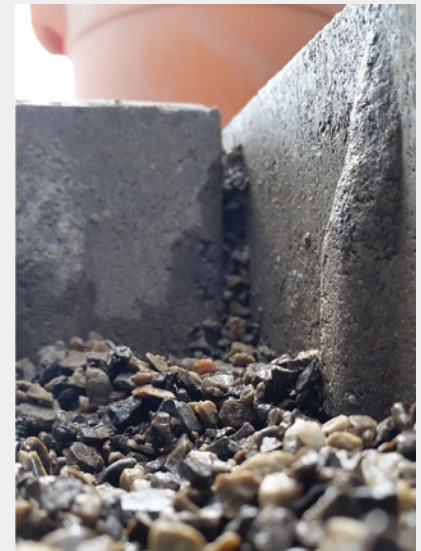


# Storm Water Quality Modelling

Several jurisdictions place restrictions on the amount of Total Suspended Solids (TSS) that can be discharged from a site to the receiving storm water systems. There are two generally recognized methods of TSS management with permeable pavements.

The first is filtration/straining as surface water infiltrates down through the jointing aggregate between the permeable pavers. Research at Florida Gulf Coast University determined that removal efficiency is a function of the size distribution of the particulate and the grain size of the jointing aggregate. Assuming ASTM #8 stone in the joints, the projected removal efficiency of an NJCAT gradation material is between 61 and 74%, while the removal efficiency of an MTO winter sand approaches 100%.

The second method of preventing TSS from being discharged to the storm water system is, like with other infiltration practices, related to the infiltration capacity of the subgrade soils. To quantify the TSS removal resulting from infiltration, a water balance needs to be conducted to define what percentage of water that enters the base/subbase infiltrates into the subgrade (versus overflows/discharges through the drain). Depending on the native soil type and system design, the percentage of infiltration can range from 0 to 100%, with the resulting reduction in the remaining TSS being proportional.



# Storm Water Quantity Modelling

Storm water quantity modelling is performed to calculate and compare the following conditions: pre-development, post-development (uncontrolled), and post-development with BMP practices in place. Since there are no default values for PICP using the Soil Conservation Service (SCS) Curve Numbers (CN) method, it is up to you to determine them.

Start by calculating the expected runoff from the surface of the pavers based on the typical CN for impervious surfaces (CN=98) using the traditional SCS equations below. Remember that a typical 85%-95% solid PICP surface experiences losses similar to traditional pavements due to the cooling/wetting of the paver surface.

$$Q = (P - Ia)^2 / (P - Ia + S)$$

$$S = 1000/CN - 10$$

**Where:**

- Q = Total runoff depth (in.)
- P = Total precipitation depth (in.)
- Ia = Initial abstraction of losses before runoff begins (in.)
- S = Potential maximum retention after runoff begins (in.)

With traditional pavements, excess water collects and sheet flows off the pavement surface. With PICP, excess water infiltrates through the joints between the pavers and into the base/sub-base. Surface overflow occurs only after the infiltration capacity of the sub-grade and/or the storage depth of the reservoir is exceeded. The equations used to calculate adjusted flows (Qadj) and adjusted CN (CNadj) are as follows:

$$Q_{adj} = Q - T_s - T_i$$

$$CN_{adj} = \frac{1000}{10 + 5P + 10Q_{adj} - 10(Q_{adj}^2 + 1.25Q_{adj}P)^{1/2}}$$

**Where:**

- CNadj = Adjusted curve number
- Qadj = Adjusted runoff depth (in.)
- TS = Depth of water storage within aggregate reservoir (in.)
- Ti = Depth of water infiltrating into the subgrade over the duration of the design storm (in.)

**Examples: 100 yr 24 Hr duration precipitation depth (P) = 8 in; for an asphalt pavement with CN = 98, Q = 7.76 in**

**Over clay soil using a No Exfiltration System**

Ts = 4.8 in (using a 12" thick base)  
 Ti = 0 (system is lined)  
 Qadj = 7.76 - 4.8 - 0 = 2.96  
 CNadj = 57  
 (Underdrain discharge would be controlled using an orifice plate or similar)

**Over silty clay soil using a Partial Exfiltration System**

Ts = 4.8 in (using a 12" thick base)  
 Ti = 1.44 in/day (see page 16)  
 Qadj = 7.76 - 4.8 - 1.44 = 1.52  
 CNadj = 43  
 (Underdrain raised to minimize discharge, balance of stored water would infiltrate)

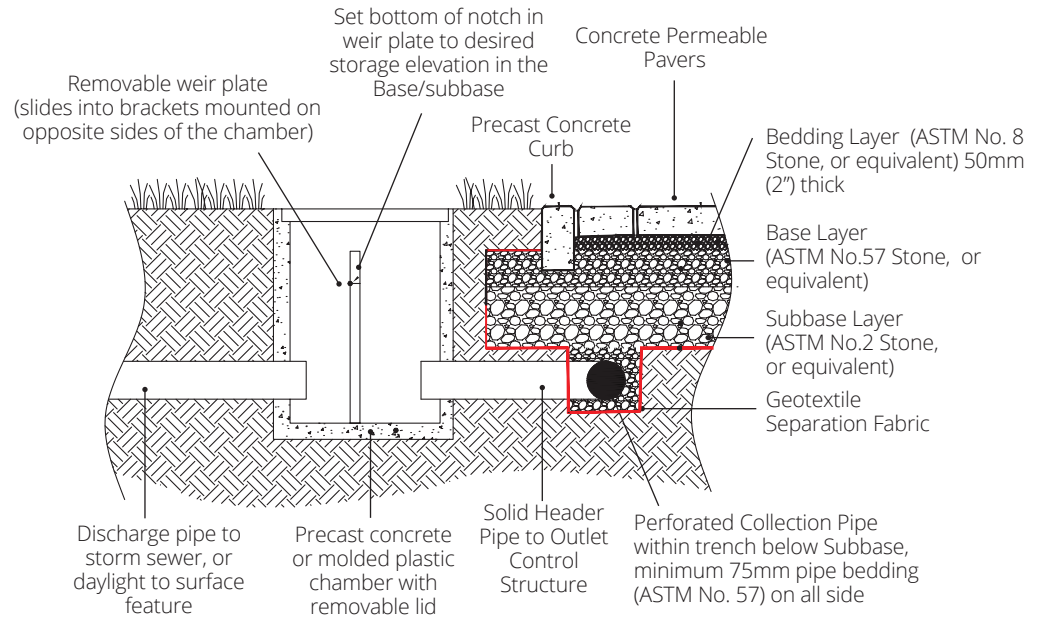
**Over silt using a Full Exfiltration System**

Ts = 4 in (using a 10" thick base)  
 Ti = 6.48 in/day (see page 16)  
 Qadj = 7.76 - 4 - 6.48 < 0  
 CNadj = 0  
 (No underdrain used, balance of stored water would infiltrate)

# Paying Attention To The Details

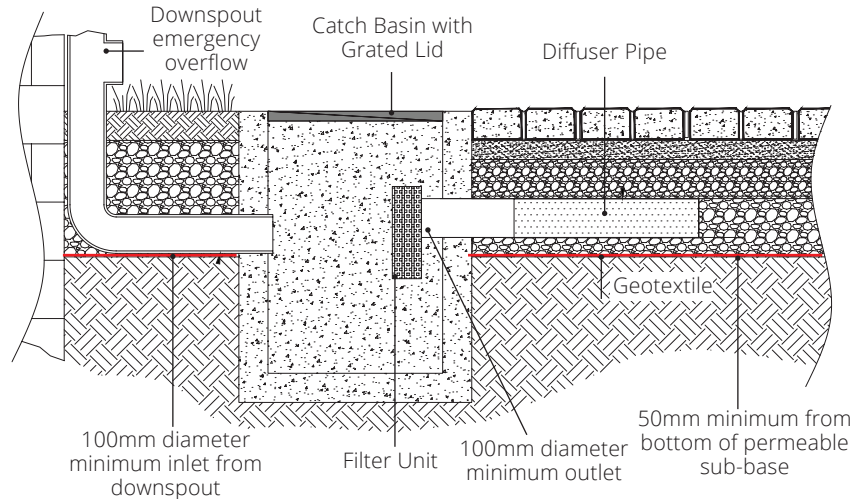
## OUTLET CONTROL DEVICE

This device consists of a concrete or plastic vault with a weir plate through the middle. Use it with Partial-Infiltration systems to set the storage elevation of the base/sub-base (where the water does not discharge until it reaches the weir notch) or with No-Infiltration systems to regulate the outlet discharge rate (drill a flow restricting hole through the weir plate).



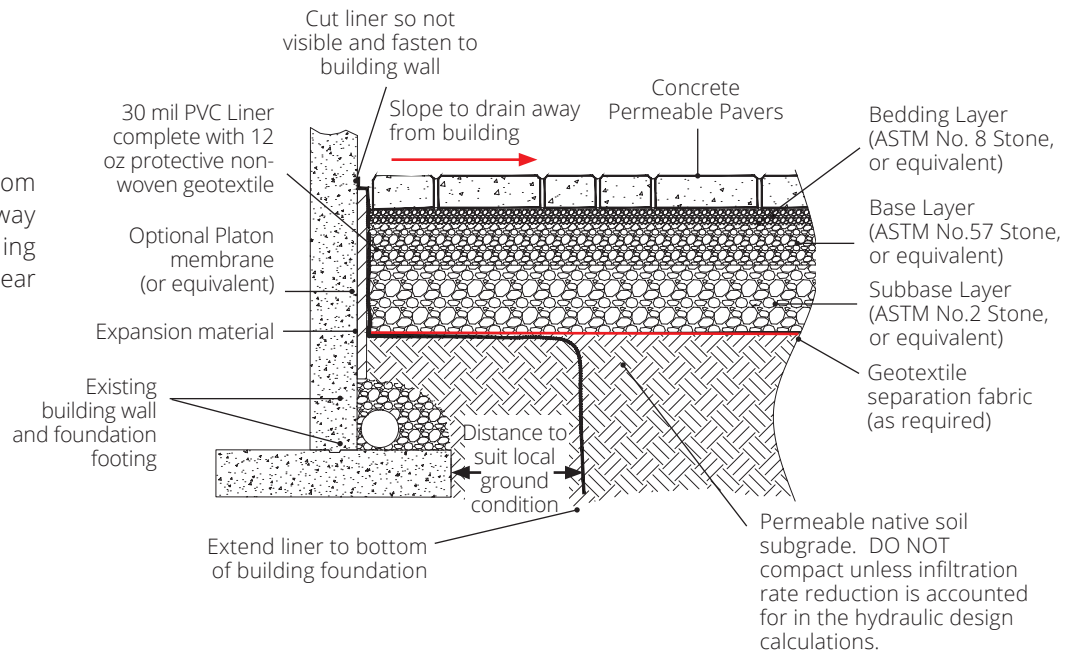
## RUN-ON SEDIMENT CONTROL

When adding roof water and storm water from adjacent impervious surfaces, you may need a receiving structure to handle potential sediment and contaminant loads. This diagram shows a sediment control chamber. Please consult with Oaks staff for more information about available alternatives.



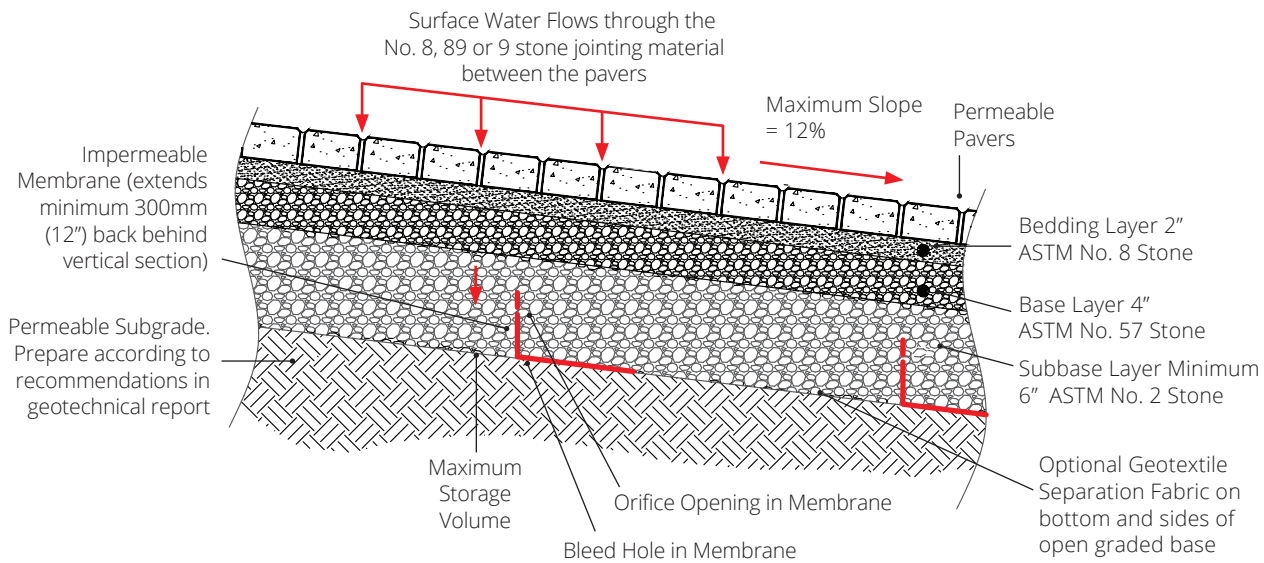
## PICP ADJACENT TO BUILDINGS

Building foundations should be protected from water infiltration by: sloping the PICP away from the building; waterproofing the building foundation; installing an impermeable liner near the foundation wall.



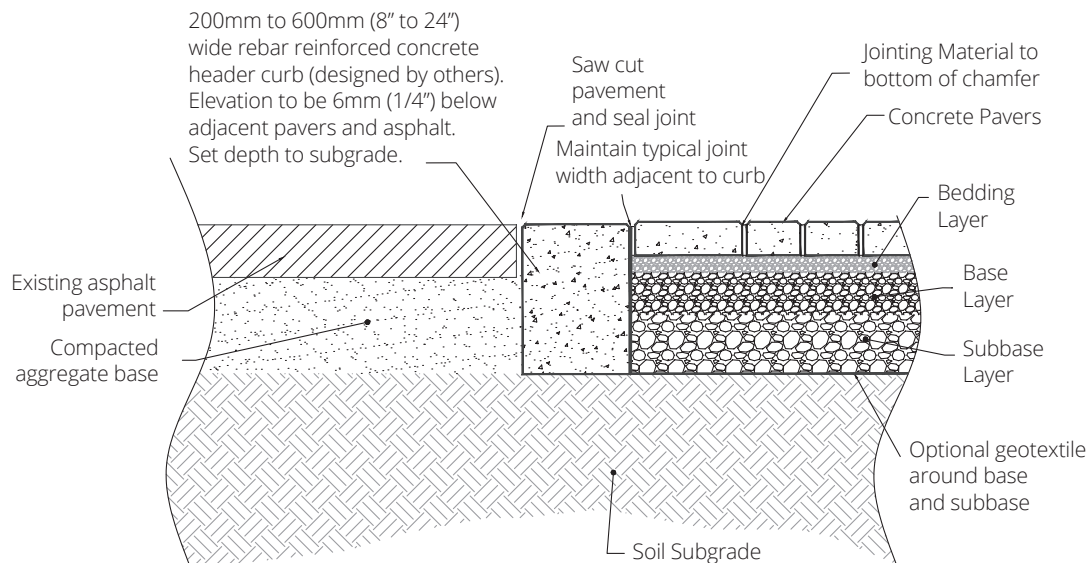
## PICP ON SLOPES

For slopes exceeding 5%, use geomembrane check dams to control down slope flows, distribute infiltration over the entire length of the slope and prevent surges from exiting the pavement system at the bottom of the slope.



## TRANSITIONS TO IMPERVIOUS SURFACES

Because conventional pavement bases and subbases are not designed for saturation, they require protection from water infiltration. Separate the two pavement systems with an impermeable barrier (geomembrane or concrete). Also consider sloping the PICP sub-grade away from the adjacent conventional pavements or installing under-drains at the interface.



# Designing For Northern Climates

Because winter conditions place unique demands on Permeable Pavements, extensive research has been done by the TRCA, the University of New Hampshire and the US EPA among others to evaluate how they perform in cold climates. These are some of the findings.

## SNOW AND ICE COVER

Surface accumulations of snow can occur on Permeable Pavement in the winter. Snow has to melt before it can infiltrate. As with any other paving surface, if the Permeable Pavement is not cleared before traffic drives on the surface, snow packing and ice formation may occur. To prevent ice formation, we recommend traditional snow plowing followed by spreading traction control aggregate as required. Instead of sand, spread the same aggregate used in the Permeable Paver joints.



Applying anti-icing or pre-wetting chemicals to Permeable Pavement is not recommended. Anti-icing agents, which melt snow before it can become compacted into ice, will likely infiltrate into the system before a storm and impact local groundwater systems. And their magnesium or calcium chloride ingredients chemically attack the cement bond, causing the pavers to disintegrate. If the use of de-icing salts is required, as in the case of a zero ice policy, it is important to note an observation from the University of New Hampshire Stormwater Center: the use of permeable pavements resulted in a 75% average reduction in annual salt. Initial melt water was able to drain, leaving no standing water to re-freeze on the surface.

## SURFACE INFILTRATION RATES

Except when packed ice is present on the surface (as noted above), surface infiltration rates of Permeable Pavement are not adversely impacted in cold climates. Although the jointing and reservoir aggregates may become frozen, they still maintain their porosity and permeability.

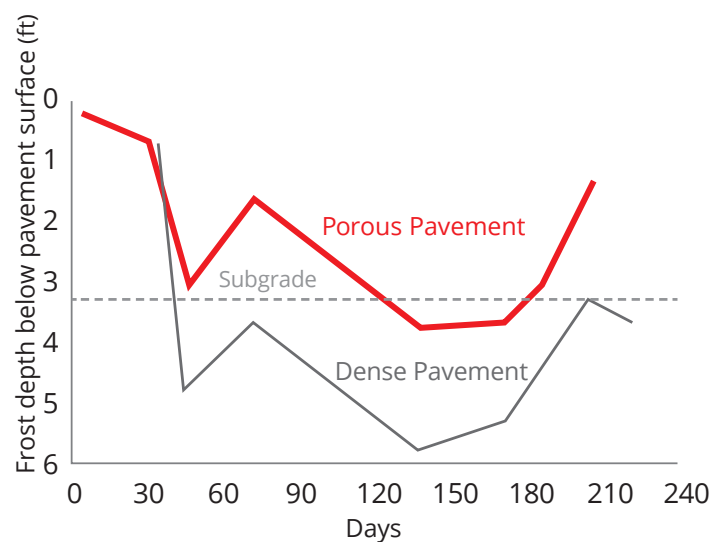
Winter data showed permeable pavement systems function well even during freezing temperatures.

Source: TRCA

## FROST PENETRATION

Road construction protocol calls for a non-frost susceptible material for a percentage of the frost penetration depth. Because Permeable Pavement profiles use non-frost susceptible materials (i.e. open graded aggregates) and are normally deeper than non permeable profiles, most Permeable Pavements in cold climates have not shown any slumping or frost heaving after years of monitoring.

Where water may be detained for an extended period of time or sub-grade soils are prone to differential frost heave (silts), deepening the road profile can be considered. If water freezes in the reservoir, it can expand into the open voids of the base/sub-base without heaving the pavement. Base/sub-base aggregates are also not likely to develop frost lenses (which cause differential frost heave) due to the lack of fines. Permeable Pavement reservoirs tend to thaw more rapidly due to infiltrating melt water.



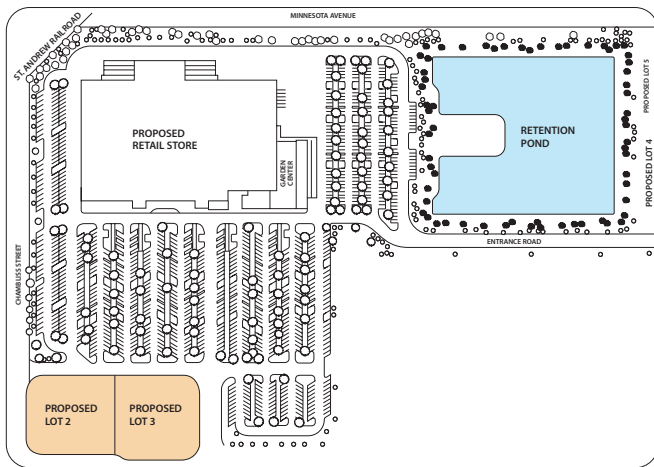
Source: Porous Pavements

# Economics Of PICP

## CAPITAL COST ANALYSIS

To prepare a true capital cost comparison between Permeable Pavements and traditional practices, three areas of the development need to be considered:

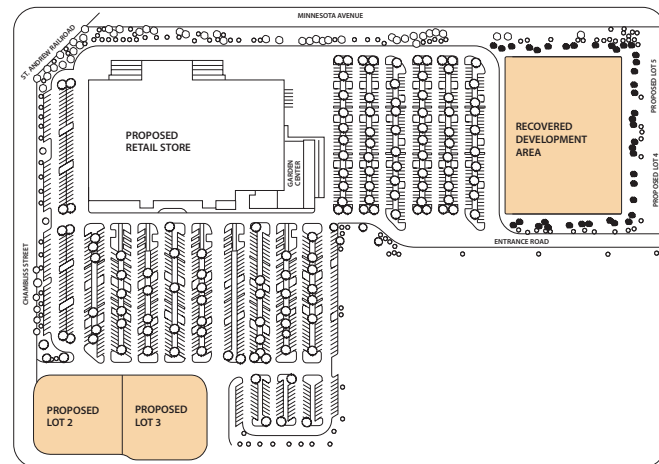
1. **Road Infrastructure** – permeable pavers are installed the same way as standard pavers, with significant cost saving through mechanical installation (see Page 11).
2. **Storm Water Infrastructure** – permeable pavements can reduce and even eliminate the need for traditional storm water infrastructure. The entire pavement surface is one large catch basin/filter, with base/sub-base aggregates providing retention/detention and lateral flow where required.
3. **Income Generating Footprint** – when retention/detention ponds are used, they can take up a lot of property. Consider the profitability of that portion of land if it were available for development, as well as its possible effects on property values. Oaks can provide you with capital cost comparison spreadsheets to help identify the different cost components that should be considered.



< **Option 1** – Traditional storm water management uses a retention pond that consumes 20% of the property footprint.

Using PICP created a **20% increase** in usable (i.e. revenue generating) land

**Option 2** – Using PICP to manage onsite storm water, gains 20% of the property footprint for additional parking and revenue generating buildings. >



## LIFE CYCLE/BENEFIT COST ANALYSIS

We recommend using the TRCA Report *“Assessment of Life Cycle Costs for Low Impact Development Storm Water Management Practices”* and the *“Low Impact Development Costing Tool”* at the site-specific level. These were developed to help assess the design, installation, maintenance and rehabilitation costs over a 50 year period, based on northern conditions. We can help you work through the analysis to determine if Permeable Pavements can save you money.

A number of reports are available for reference at the municipal level. For example, the Philadelphia Water Department determined that Low Impact Development initiatives would provide 20 times the benefits of traditional storm water infrastructure of an equal value.

LID practice life cycle costs were between **35 and 77% less** than conventional

Source: TRCA

# PICP Maintenance

Refer to Oaks Tech Note L3 - Inspection, Maintenance and Repair of Permeable Pavements – for comprehensive PICP maintenance details. This is a brief summary of selected information.

## ROUTINE MAINTENANCE AND INSPECTIONS

PICP Maintenance prolongs the performance of the system and prevents problems from developing. Inspections ensure compliance with applicable regulations. This chart outlines recommended PICP routine maintenance and inspections.

ROUTINE MAINTENANCE	FREQUENCY
Display clearly visible signage identifying the surface as a permeable pavement	Improve visibility or replace as required
Vacuum sweep surface debris	Twice annually
Check depth of joint material	Replenish material when >13mm from surface
Check outlets are clear of debris	Ongoing
Verify surface infiltration rate	Annually
Conduct environmental compliance testing as required by the owner / regulatory agency	As specified

Vacuum sweep the PICP surface using a regenerative air sweeper or similar device with a slight vacuum capable of lifting sediment. Do not use a conventional street sweeper, which can remove jointing material and spread additional smaller sediment over the surface. *ASTM C1781 – Standard Test Method for Surface Infiltration Rate of Permeable Unit Pavement Systems* is an easily reproducible and low-cost method of monitoring the performance of PICP. All you need is a 12" diameter plastic or metal ring, plumber's putty, a 20L pail and a stop watch. Test areas that most frequently encounter sediment or debris.



## REMEDIAL MAINTENANCE

Remedial maintenance involves rectifying a performance problem or safety concern that needs to be corrected.

REMEDIAL MAINTENANCE	FREQUENCY
Repair ruts and deformations	Ruts > 13mm from grade
Reset shifted pavers	Paver > 6mm above or below grade
Re-stripping of lines	As required
Replace broken pavers	As required
Power vacuum surface and replenish jointing material	Infiltration < 250mm/hr or surface ponding observed
Clean out underdrains and inlet/outlet devices	As required

When power vacuuming the surface of the pavers, use a vacuum truck (like an Elgin Whirlwind or equivalent).

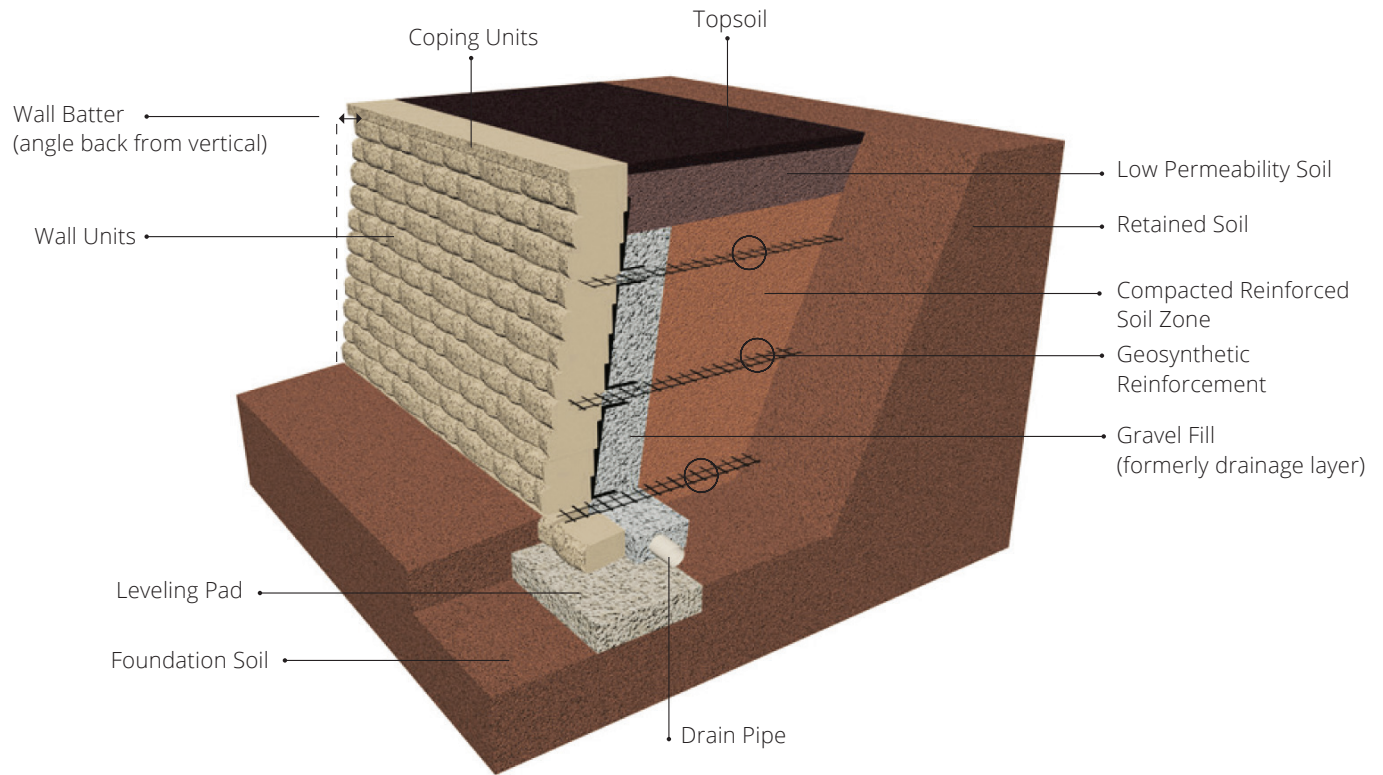


There is an ongoing study through the University of Toronto and NSERC that is investigating maintenance best management practices for PICP. New and innovative maintenance equipment, like the Typhoon PICP Joint Cleaning system are being introduced and evaluated. Contact Oaks for updates and information on the test results.

**Please note:** you do not have to vacuum the entire pavement surface unless needed; focus cleaning on specific areas prone to clogging. Joint material will also be removed, so be prepared to replace it immediately after the area is cleaned.

# Segmental Retaining and Architectural Walls

Segmental block walls and reinforced soil have been used for centuries (the most famous application is the Great Wall of China). Today's Segmental Retaining and Architectural Walls are a modern version of this age-old technology. The diagram below lists the parts of a typical Segmental Retaining Wall, while diagrams on page 22 shows the five primary commercial *Wall Classifications*. Icons identify where each wall product is recommended for use in the *Products* pages.

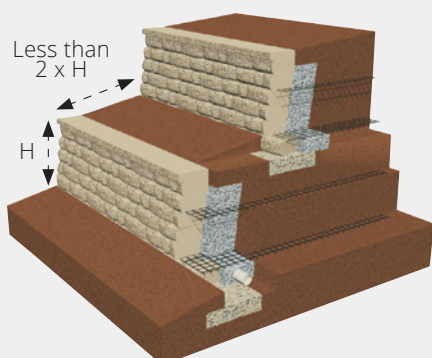


## TIERED WALLS

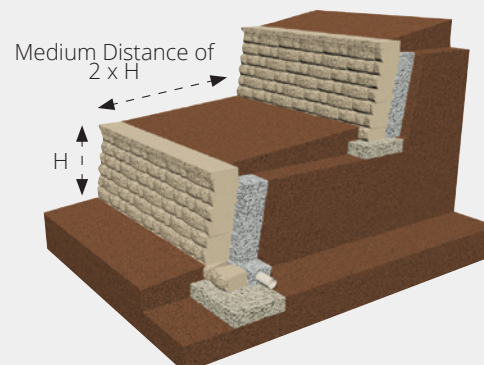
For each wall to be independent of the other, tiered walls need to be built using a 2:1 ratio, with the upper wall built a distance away from the lower wall of at least twice the height of the lower wall. As well, the upper wall must be equal to or less than the height of the lower wall. This is a general rule of thumb and exceptions do exist.

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 into account global stability - the resistance to overall mass movement of the whole segmental retaining wall system in a circular or sliding mode.

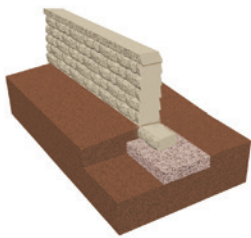
**Dependent Terraced Walls**



**Independent Terraced Walls**

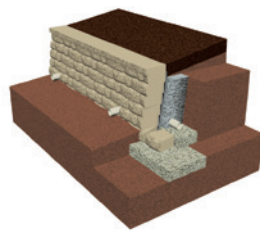


## WALL CLASSIFICATIONS



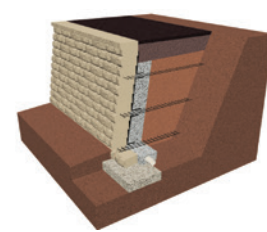
### FREESTANDING

Freestanding walls are vertical architectural features finished on both sides. Typically they are small sitting walls (less than 600mm (2') high), but they have also been used as divider walls (see page 27) and even security features.



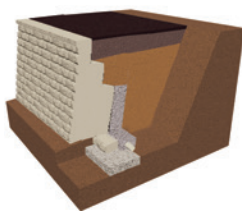
### GRAVITY

Simple (single depth) Gravity walls depend on the mass of the individual wall units dry-stacked on top of one another to hold back the earth behind the wall. Due to the limited mass, these are typically restricted to low retaining walls.



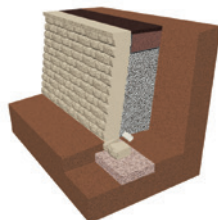
### GEOGRID

Geogrid (soil) Reinforced walls include multiple layers of geogrid reinforcement sandwiched between the wall units and extending back into the compacted reinforced soil zone. They are used when the limitations of a conventional Gravity wall are exceeded.



### MULTI DEPTH GRAVITY

Multi Depth Gravity walls use products of at least two different depths to increase the overall mass of the wall. (Note: there must be a connection between the rows of wall units). See adjacent page for more information.



### STABILIZED BACKFILL

The Stabilized Backfill system is a unique solution commonly used when lot lines, rock outcroppings or other obstructions limit the amount of excavation that can be done, or to provide enhanced stabilization for fences situated close to the back of the wall. See adjacent page for more information.

For batter, alignment and installation options, go to page 52 of the Products section.

## CALL BEFORE YOU BUILD – WHAT ARE THE LOCAL RULES FOR RETAINING WALLS?

Retaining walls are engineered structures that require a site-specific design prepared by a Professional Engineer certified in the jurisdiction where the wall is being constructed. For example:

1. The Ontario Building Code (OBC) requires a site-specific design for retaining walls exposed over 1m (3') that are adjacent to; public property; access to a building; private property allowing public access such as a person's front yard for mail delivery to the front door.
2. Some local municipalities in Ontario have expanded Building Code requirements to include any retaining wall over 1m (3'), including those on private property.
3. The CSLA Canadian Landscape Standards recommends that any wall over 1.2m (4') or one that may be exposed to heavy or dynamic loading should be designed by a structural engineer. An evaluation of soil conditions by a geotechnical engineer may be required.

Check with your local municipality before proceeding with your construction project. Consult with Oaks staff if you require a site-specific design package. (See Page 24 for guidance on how to initiate a site specific design through Oaks)

**GUARDS:** The OBC also requires a guard at the open side of any wall that meets the above requirements, to prevent pedestrians from falling over the edge. Some municipalities have expanded this requirement to include any steps, ramps, exterior landings, porches, balconies, mezzanines, galleries, or raised walkways where:

1. There is a difference in elevation of more than 600mm (2') between the walking surface and the adjacent surface.
2. The adjacent surface within 1.2m (4') of the walking surface has a slope greater than 1:2.

You will need to incorporate additional design loads into the retaining wall design to compensate for pedestrians pushing against the guards. (See Pages 31 to 34 for more information on pedestrian guards and fences)



# Stabilized Backfill Wall

## WHAT IS STABILIZED BACKFILL?

Stabilized backfill is a low strength ready mix concrete consisting primarily of aggregate, cement and limited water (low slump); the sand component is not included. Additives are used as required for local conditions. Mix designs are available.

## WHAT DOES STABILIZED BACKFILL DO?

Stabilized backfill serves two primary functions: it increases the overall mass of the retaining wall structure, and it serves as the drainage layer behind the wall (reason why no sand is included in the material).

## HOW IS STABILIZED BACKFILL PLACED?

Stabilized backfill can be poured directly from a ready mix delivery truck; conveyors and/or pump trucks can also be used where available. The material should be placed in maximum 600mm (2') lifts, and because it has a low slump will need to be worked into place. Do not add water as this could compromise the strength of the end product. Geogrid is placed between the wall blocks and stabilized backfill at every third course to provide a connection between the two materials.

## WHEN TO USE STABILIZED BACKFILL?

This approach is commonly used when lot lines, rock outcroppings or other obstructions limit the amount of excavation that can be done, or to provide enhanced stabilization for fences situated close to the back of the wall.

Please consult with Oaks staff for stabilized backfill supplier contacts.



# Multi Depth Gravity Wall

## WHAT IS A MULTI DEPTH GRAVITY WALL?

Multi depth gravity walls use products of at least two different depths (Proterra™) to increase the overall mass of the wall.

## WHAT DO THE DEEPER UNITS DO?

The deeper units increase the overall mass of the retaining wall structure, eliminating the need for geogrid behind the wall.

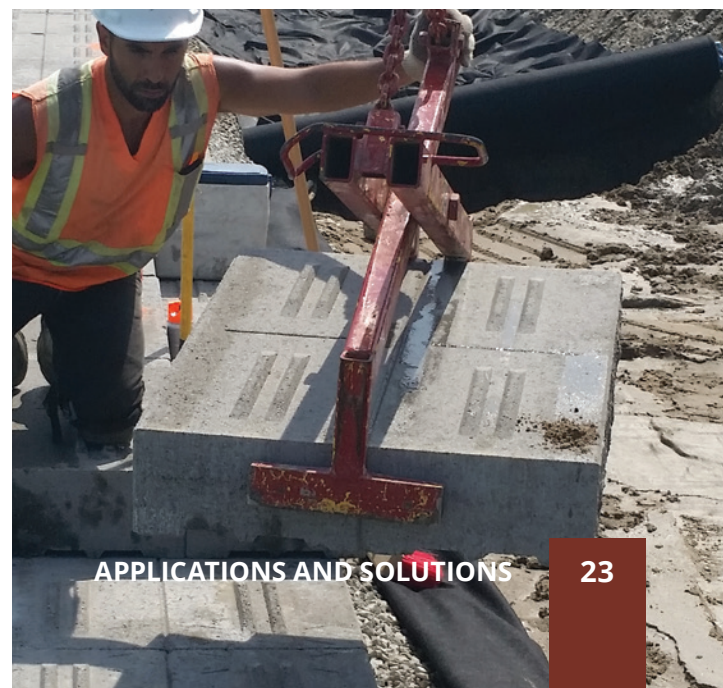
## HOW ARE THE DEEPER UNITS PLACED?

Clamps are required to place Proterra™ units, where double or triples are used, the clamp needs to open to as much as 1125mm wide (see adjacent photo).

## WHEN TO USE MULTI DEPTH GRAVITY WALLS?

This approach is commonly used when lot lines, rock outcroppings or other obstructions limit the amount of excavation that can be done, or where future works behind the wall could potentially compromise the structural integrity of a geogrid reinforced wall. Examples would be future planting of trees or installation of an inground pool. In both cases, any geogrid behind the wall could become damaged during excavation.

Please consult with Oaks staff when ordering for multi depth gravity walls as the specific units needed will differ depending on the desired facial appearance of the wall.



# Wall Design – How Can Oaks Help?



## retaining wall design request form

### GENERAL INFORMATION

Applicant: \_\_\_\_\_ Date: \_\_\_\_\_  
 Contact Name: \_\_\_\_\_ Wall Installer: \_\_\_\_\_  
 Phone #: \_\_\_\_\_ Wall Installer Contact #: \_\_\_\_\_  
 Email: \_\_\_\_\_ Wall Installer Email: \_\_\_\_\_  
 Applicant Type: Architect  Engineer  Landscape Architect  Contractor   
 Home Owner  Developer  Other \_\_\_\_\_

### PROJECT INFORMATION

Project Name: \_\_\_\_\_  
 Project Address: \_\_\_\_\_  
 Contact: \_\_\_\_\_  
 Site Plan Available: Yes  No  Geotechnical Report Available: Yes  No

### DESIGN SERVICE INFORMATION

Date Needed: \_\_\_\_\_ Bid/Start Date: \_\_\_\_\_  
 Service Requested: Wall Design for Quoting  Drawing for Building Permit Application   
 Construction Drawings   
 Product Requested: Proterra  Ortana/Ortana Plus  Nueva\* Wall   
 Wall Type: Single Unit Gravity  Multi Unit Gravity  Stabilized Backfill  Geogrid Reinforced

### BASIC SITE INFORMATION

Number of walls on project: \_\_\_\_\_ Wall batter: (check the appropriate boxes)  
 Maximum height: \_\_\_\_\_  
 Surcharge at top of wall: Landscape/Pedestrian  Vehicular  Slope   
 Building  Pool  Other \_\_\_\_\_  
 Tiered: Yes  No   
 If yes, provide tier information (setback, heights, # of tiers) \_\_\_\_\_  

	0°	3.5°	7°	8°	16°
Ortana	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proterra™ (split)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proterra™ (smooth)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nueva* 150 Wall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nueva* 75 Wall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

 Rail or fence at top of wall? Yes  No  If yes, type of rail or fence: \_\_\_\_\_  
 Site soil description: Clean sands and gravel (ø=36")  Sands, sandy silts (ø=32")  Silts, sandy and silty clays (ø=27")   
 (if geotechnical report not available)  
 Slope below wall: Yes  No  How steep: \_\_\_\_\_ How high: \_\_\_\_\_  
 Site soil used for Infill? Yes  No  Engineered or native? \_\_\_\_\_  
 Water application? Yes  No  Details: \_\_\_\_\_  
 Special site requirements/information: \_\_\_\_\_

REV. 06/20

Each specific retaining wall product, and each Wall Classification, have their own benefits and limitations. Oaks staff are available to help you decide which product/classification combination(s) will work best for your given application.

Oaks created the adjacent check list to ensure we know all the required particulars of your given project. We ask that you submit this completed form, along with a site plan and geotechnical report (where available) so that we can properly evaluate the project. Factors that Oaks staff will consider include:

- Wall purpose
- Wall height and alignment
- Desired aesthetics
- Surcharge conditions
- Proximity to property line or other existing/proposed barriers behind the wall
- Water impacts above, below or behind the wall
- Construction access
- Site soils
- Type of backfill material being used



A digital/fillable version of this form is available on our website in the Resources section.

# General Costing Comparisons

Once we have narrowed down the most suitable product/design option(s), we can use our proprietary estimating tool to generate costing comparisons. Below is an example of a comparison between geogrid reinforced and multi depth gravity designs for a proposed 2m high wall. Costing is broken down into Material and Labor, and Material Only so it is clear where the true costs are.

ECONOMIC COMPARISON	GRID WALL		GRAVITY WALL	
	Mat & Labour	Material Only	Mat & Labour	Material Only
Levelling Pad	\$22.05	\$3.89	\$46.56	\$8.21
Proterra	\$553.99	\$403.99	\$851.39	\$701.39
Gravel Fill & Drainage	\$36.69	\$26.34	\$36.69	\$26.34
Reinforced Zone & Grid	\$450.65	\$138.14	NA	NA
Low Perm Soil & Geotextile	\$14.46	\$3.70	\$14.46	\$3.70
<b>TOTAL PER METRE OF WALL</b>	<b>\$1,077.84</b>	<b>\$576.06</b>	<b>\$949.10</b>	<b>\$739.64</b>
<b>TOTAL PER SQUARE METRE</b>	<b>\$485.51</b>	<b>\$259.49</b>	<b>\$427.52</b>	<b>\$333.17</b>

# Project Specific Quantity Estimates

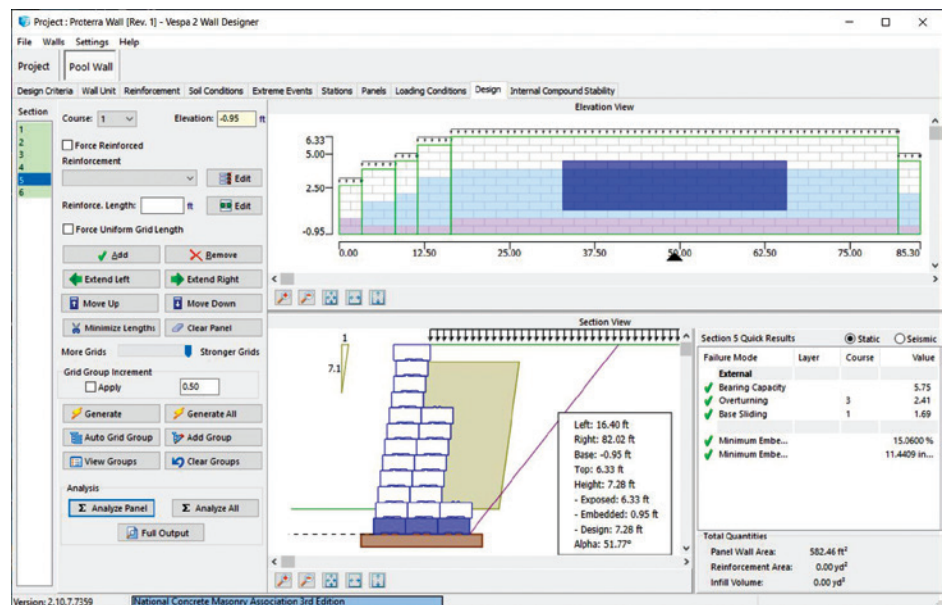
VESPA MSE (Mechanically Stabilized Earth) design software was created by retaining wall design experts to provide accurate quantity estimates and comprehensive reports while simultaneously performing the necessary analysis in accordance with CMHA (Concrete Masonry and Hardscape Association) methodologies.

## WHAT WE NEED FROM YOU?

A scalable site plan complete with TOW (top of wall) and BOW (bottom of wall) elevations is ideal, but hand sketches will work as long as the distances between elevation points are provided.

## WHAT VESPA DOES

Once we input the dimensions of the wall, along with some site specific design details, VESPA generates a wall profile (upper part of screen) and series of cross sections (lower part of screen). The wall profile shows the location of every single unit within the wall. The cross sections show the required lengths of geogrid, depths of stabilized backfill, or number of multi depth units (as applicable), for each panel in the wall.



**VESPA now does multi depth gravity wall design!**

## Quantities

Wall	Facing	Wall/Cap Length [m]	Facing Area [m <sup>2</sup> ]	Total Wall Area [m <sup>2</sup> ]
East Wall	Proterra	64	66	78
West Wall	Proterra	22	8	12
		85	73	89

Wall	Leveling Pad [m <sup>3</sup> ]	Reinforced Fill [m <sup>3</sup> ]	Drainage Fill [m <sup>3</sup> ]	Core Fill [m <sup>3</sup> ]
East Wall	6.6	45.8	16.2	0.0
West Wall	2.2	0.0	1.5	0.0
<b>Totals:</b>	<b>8.8</b>	<b>45.8</b>	<b>17.6</b>	<b>0.0</b>

## Reinforcements

Wall	SG200 [m <sup>2</sup> ]	Geogrid Connectors
East Wall	202.3	0
West Wall	0.0	0
<b>Totals:</b>	<b>202.3</b>	<b>0</b>

## WHAT OAKS GIVES TO YOU

Material quantities (see adjacent) can be exported directly from VESPA that list not only the area and length of the wall (from which we can determine the retaining wall product needs) but also the volume of aggregates needed for the levelling pad, reinforced fill (where applicable), and drainage fill as well as the quantity of geogrid and geotextile needed.

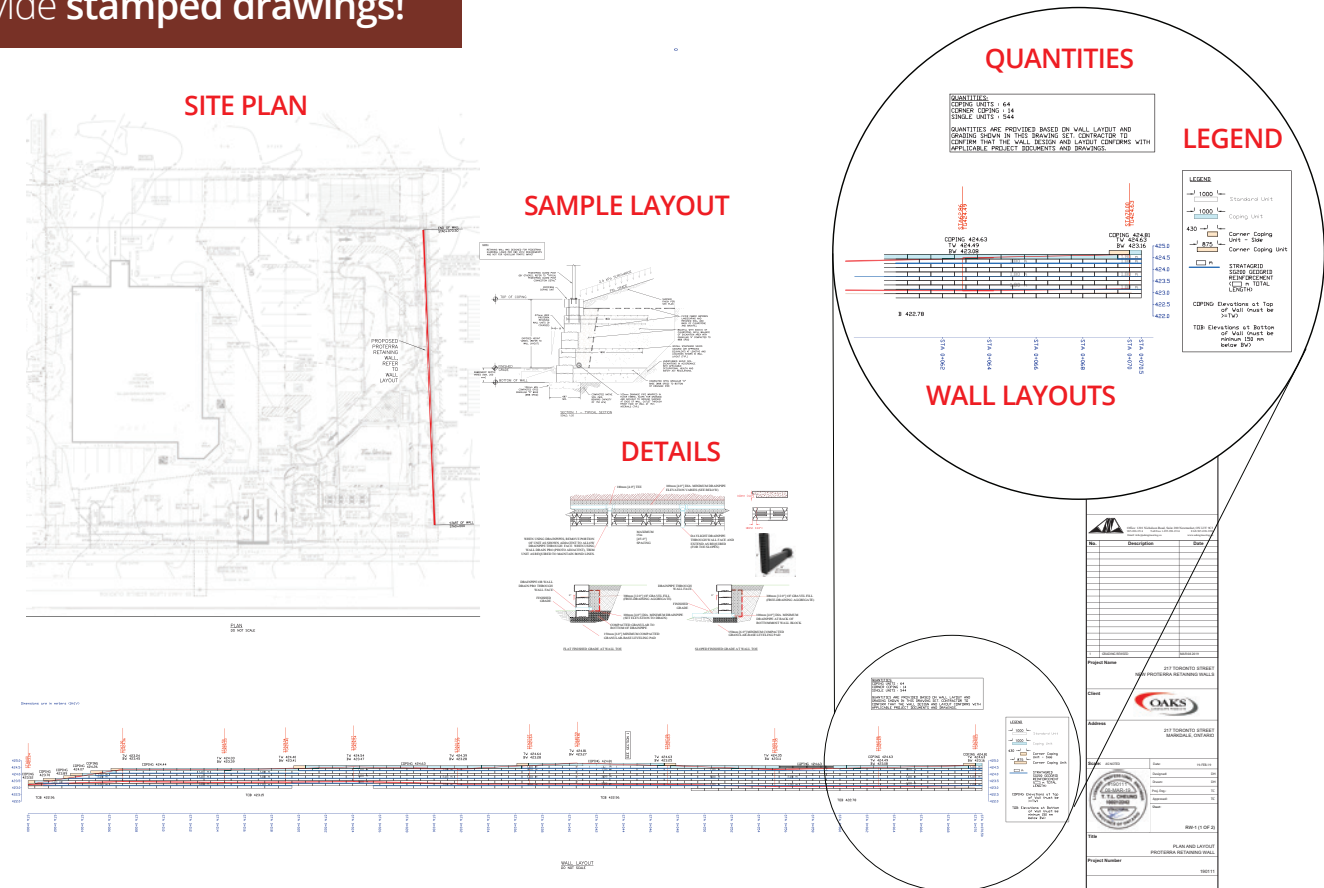
In short, there is more than sufficient information available for local contractors to generate an accurate price estimate.

# Stamped Wall Drawings

As mentioned on Page 22, site specific design drawings may need to be submitted to the local regulatory agency for approval and/or construction drawings are desired for tender purposes. Oaks can assist with that.

Wall cross sections and elevation views generated by VESPA can be imported directly into AutoCAD to make a clear and comprehensive drawing package complete with material quantities, color coding of different units for easy identification during construction, wall layouts complete with grid locations/lengths for the entire wall, and applicable details to ensure a quality installation.

We provide **stamped drawings!**



Below is an example of a mosaic in a wall. This particular wall is adjacent to a wave pool, so the contractor decided to incorporate a wave into the wall itself. Where a mosaic is desired, we can show exactly what the mosaic will look like on the wall layout (see above). Because every unit in the wall is shown on the layout, there is no guess work onsite during construction – in essence, we are providing a large scale Lego kit complete with instructions.



Wall: Proterra™ Split and Smooth, Greyfield

# Creating Outdoor Features Or Spaces

Garden walls are an aesthetic and effective way of separating patios and gardens. The very nature of architectural wall products make them an economical alternative to complex prefab kits or veneered masonry walls. Architectural walls are an easy way to delineate an outdoor patio, create a cozy courtyard in which customers and staff can sit and relax, or simply provide extra seating.



Fire pit: Nueva® 75 Wall, Onyx  
 Seat Wall: Nueva® 150 Wall, Marble Grey with Oasis Bullnose, Onyx Suave coping  
 Steps: Nueva® Step, Cloudburst  
 Tree Surround: Modan, Marble Grey  
 Slabs: Nueva® Slab, Marble Grey with Onyx inset



Wall: Modan, Cloudburst with Twilight accents  
 Pavers: Rialto 60mm, Marble Grey



BBQ Surround: Modan, Cloudburst and Twilight  
 Pavers: Eterna, Cloudburst and Twilight



Wall: Modan, Champagne with Oasis, Onyx caps



Wall: Proterra™ Smooth, Natural

# Getting Back To Nature With Planting Beds



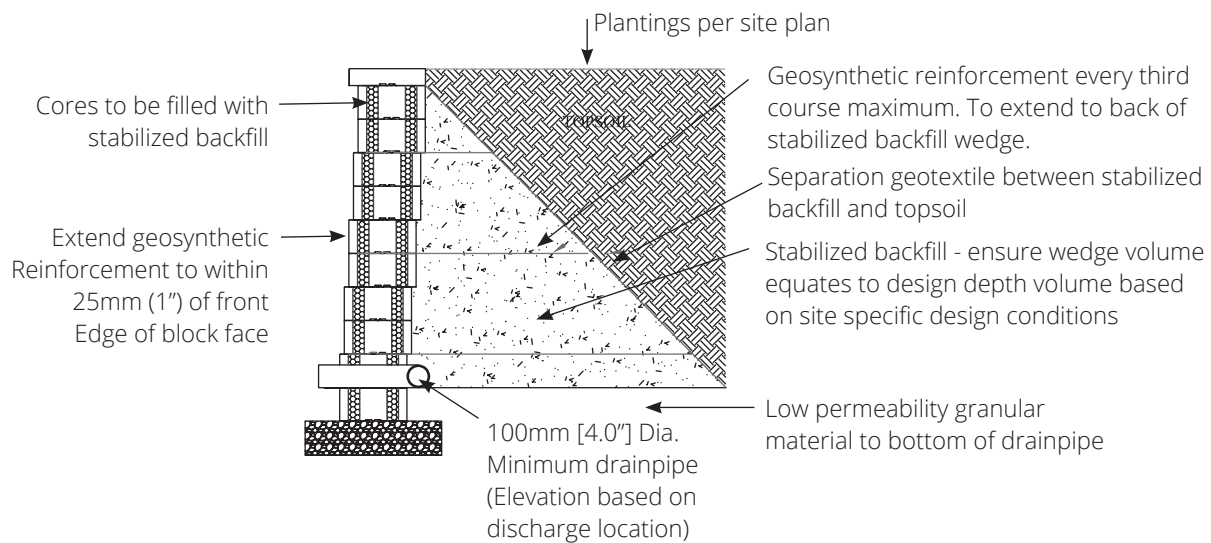
Wall: Ortana, Greyfield  
Pavers: Avenue Series, Greyfield



Wall: Proterra™ Smooth, Natural (Multi Gravity Wall)

Planting beds are an easy way to provide pockets of color and life to a yard, which makes the area more inviting and appealing. Defined planting areas also help protect plantings by discouraging pedestrians from walking in the area, and plants tend to be healthier and more productive as one can control the quality of the soil and water drainage.

For Planting Beds enclosed by taller walls (where geogrid reinforcement would typically be needed), Multi Depth Gravity or Stabilized Backfill walls can be used to prevent any conflicts with tree root balls. The diagram below shows how the stabilized backfill can be installed in a wedge configuration to accommodate plantings, while the photo adjacent is of a Proterra™ Multi Depth Gravity wall installation.



# Segmental Retaining Walls Increase Usable Space



Wall: Proterra™ Split, Natural

Retaining walls are commonly used to create more usable space onsite, particularly where there are dramatic grade changes over short distances. The rear yard in the above photo would have been un-useful by the home owner without the addition of the retaining walls, and accessibility is maintained between levels through built in staircases.



Wall: Proterra™ Split, Natural

In commercial applications, consideration must be given to providing easy access to customers/clients. A retaining wall was used in the adjacent project to “flatten” the parking lot making it easier to push around the available shopping carts.

Just a reminder that the associated retaining wall designs can be quite complex – please remember to ask Oaks about design assistance.

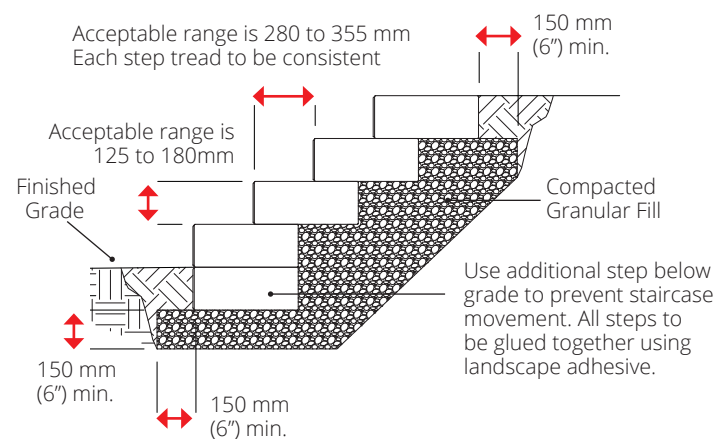
# Constructing Ramps, Staircases and Seating

Ramps are an economical method of providing accessibility compliance to grade changes. Architectural and retaining walls are often used to contour along the outside of a gentle entrance way ramp, or to provide the actual grade change for elevated ramp structures.



Wall: Proterra™ Split, Greyfield

The Integrated Accessibility Standards define an acceptable range of tread rise (vertical change) and run (depth of step tread) that is more stringent than the original OBC criteria – see adjacent. After consultation with contractors and designers, Oaks developed two step systems (to date) to address their aesthetic objectives, provide compliant design options, and improve constructability and in turn long term stability – see Page 56 for product details.



Our Aria and Nueva® Step systems comply with **Design of Public Space criteria**



Steps: Nueva® Step, Twilight  
Pavers: Molina® 60mm, Moraine and Twilight border



# Incorporating Guards, Fences and Barriers



Whenever a guard, fence or barrier is placed at or near the top of a retaining wall, there is a potential for overturning at the post location. People lean against guards. A car can strike the barrier. Snow could be pushed up against the fence. Wind can exert pressure on solid (glass panel or board) fences. For these reasons, minimum setback requirements from 0.3m (11.8") to 1.0m (39.4") are usually applied between the back of the wall and the centerline of the guard, fence or barrier. The greater the setback, the lower the impact on the wall facing. Because property owners prefer not to have large spaces between the fence and the back of the wall (wasted space that is difficult to maintain), Oaks has developed creative ways to incorporate guards, fences and barriers into SRWs.

## MECHANICS OF WALL OVERTURNING

People or objects pushing against a guard or fence can cause overturning around the bottom of the guard/fence post. If the guard/fence post is buried behind the wall, a surcharge at the back of the wall can occur. To avoid this and prevent the whole system from moving, the weight of the wall and soil in front of guard/fence and the resistance of the geogrid, need to be sufficient.

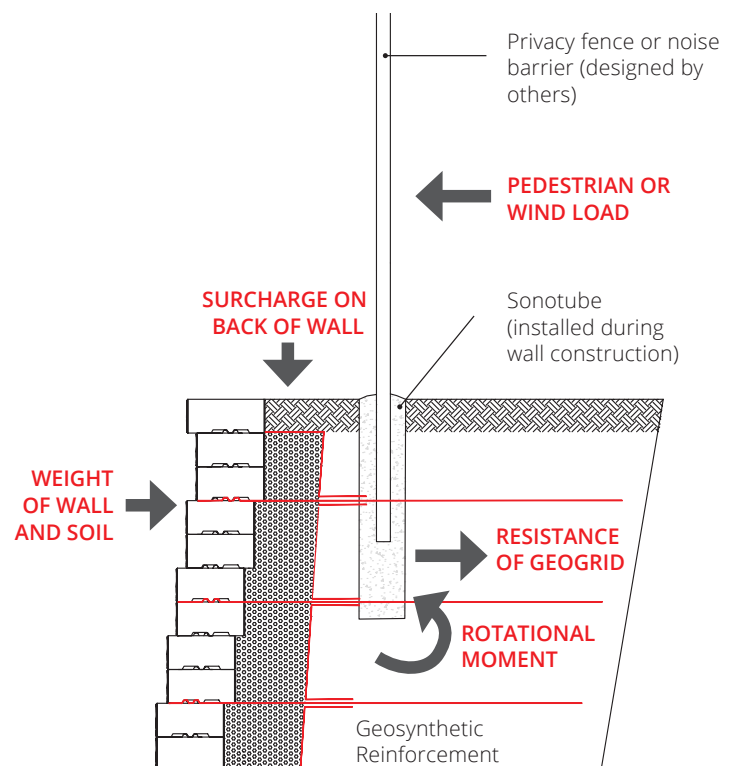
**When designing pedestrian guards you need to analyse the following:**

1. The horizontal load applied inward or outward on any point at the top of the guard (e.g. 200 lbs at each post).
2. An evenly distributed vertical load applied at the top of the guard (e.g. 50 lbs/linear foot of wall).

The load that creates the most critical condition applies.

**For wind loads consider:**

1. The percent of area obstructed by the fence – this can range from 3% for chain link to 100% for solid wood.
2. Wind pressure – available in Canada in the National Building Code, Appendix C. Typically 1/30 hourly is used.

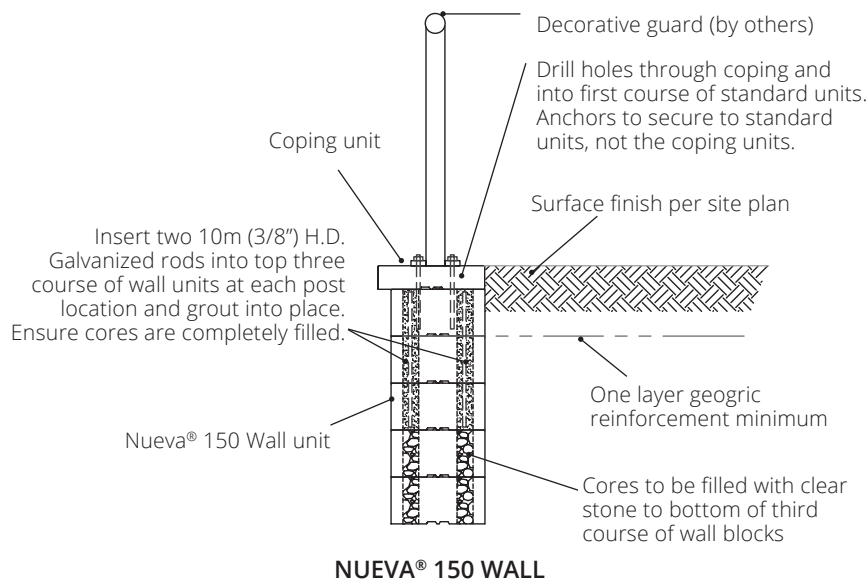


# Incorporating Guards, Fences and Barriers

## PEDESTRIAN GUARD OPTIONS

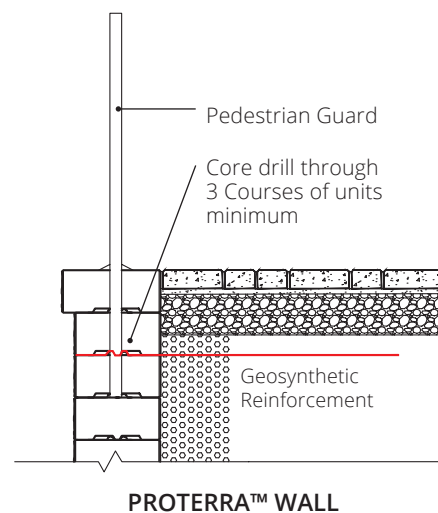
### SURFACE MOUNTED DECORATIVE RAILING

When mounting a decorative railing to the top of our Proterra™, Nueva® or Ortana products, gluing a couple of courses together is not enough. To meet Building Code requirements, a minimum of three courses of wall blocks should be mechanically fastened together using threaded rods epoxied into place. With the Nueva® 150 wall, the built in cores provide a convenient way to insert the threaded rods without extensive drilling.



### TUBULAR STEEL OR ALUMINUM RAILINGS

With round or square tubular railings, standard practice is to core drill through three courses of wall block into which the tubing is extended and grouted into place; be sure to crown the grout at surface to shed water away from the core holes. It is recommended that Proterra™ be used in this type of application as there is a reduced risk of unit cracking due to the core drilling as long as the cores are a minimum of 125mm (5") from any edge of the unit and core holes do not exceed 75mm (3") diameter.



### SONOTUBE PLACEMENT BEHIND THE WALL

For smaller Oaks products, the weight of the wall will not provide the required resistance to overturning. For best results, secure the guard posts in Sonotubes filled with concrete. These are best located behind the wall (per diagram on Page 34). Where space is tight, you can install the Sonotubes under the wall, with the SRW independent of the fence posts.

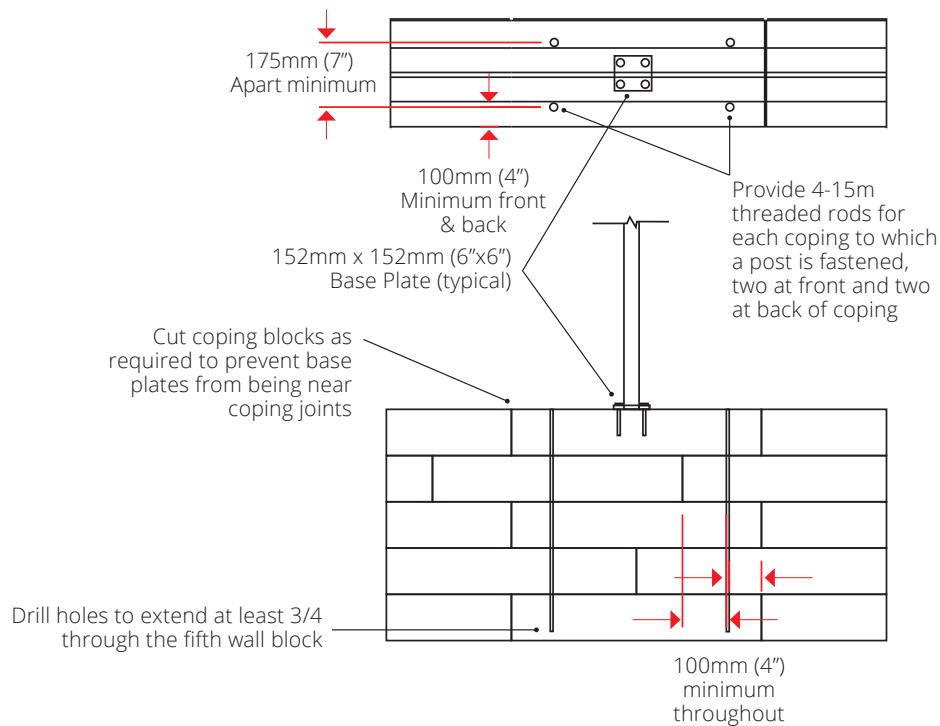
# Incorporating Guards, Fences and Barriers

## FENCE OPTIONS

Design requirements for walls with fences at or near the top depend on the type of fence. With limited wind load, chain link fences are designed the same way as pedestrian guards. Wooden privacy and glass panel guards/fences on walls act as large sails, so the wall must be designed to account for wind loads.

With Oaks Proterra™, you can surface mount some privacy fences or noise barriers to the coping units, as long as the coping is mechanically fastened to at least four additional courses of wall block. Epoxy a rod into a drill hole at each of the four corners of the coping. (See diagram)

### PRIVACY FENCE OR NOISE BARRIER SURFACE MOUNTED ONTO WALL



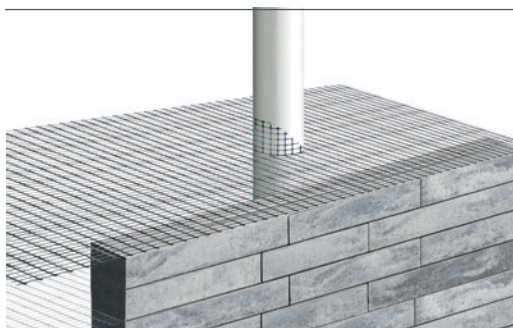
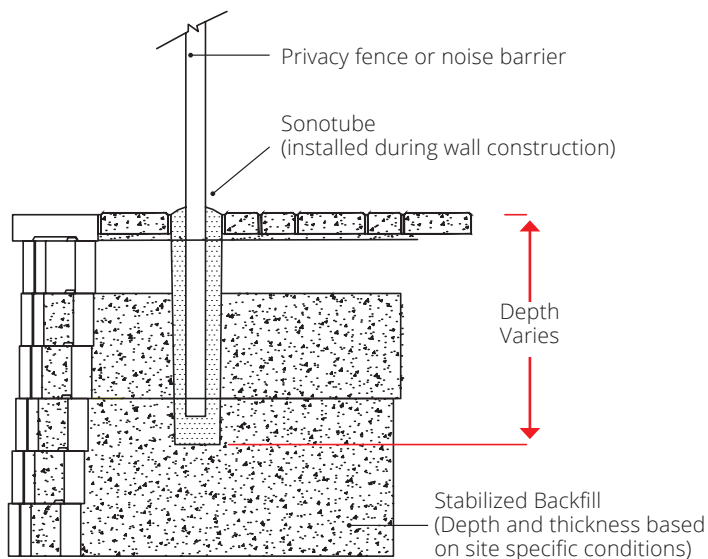
Wall: Proterra™ Split, Natural

# Incorporating Guards, Fences and Barriers

## FENCE OPTIONS

### PRIVACY FENCE, NOISE BARRIERS OR TRAFFIC BARRIERS IN SONO TUBES BEHIND THE WALL

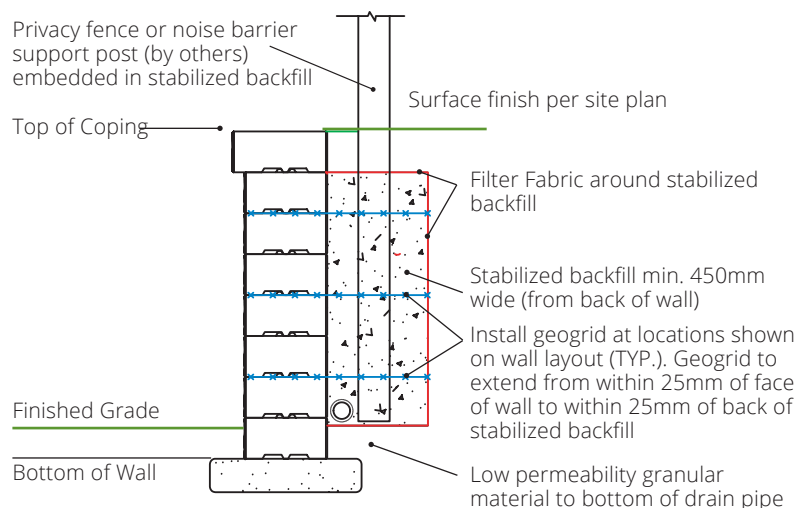
With higher privacy fences or noise barriers, in areas of high wind loads, or where there are traffic barriers, it will be necessary to install the fence/barrier in sono tubes behind the wall, and to adjust the geogrid lengths accordingly. The photo below shows sono tubes (black) being used for a traffic barriers along the roadway, and large diameter HPDE piping (green) being used for a 3m noise wall.



**IMPORTANT** When a fence is within the Reinforce Soil Zone, install Sonotubes during wall construction. This will prevent damage to the grid resulting from sleeves being punched or augured through the reinforced zone. Wrap the geogrid around the Sonotube. Cut only the cross members of the grid, not the strength members. Provide at least 25mm (1") clearance between the inside of the sleeve and the outside of the post to allow for mortar and grout.

### PRIVACY FENCE, NOISE BARRIER OR TRAFFIC BARRIER IN STABILIZED BACKFILL

Where there is limited property behind the wall, or the property owner wants to limit the gap between the back of wall and fence or barrier, stabilized backfill can be used. Stabilized backfill is much more rigid than granular fill, so distributes the overturning action over a greater area, and in turn allows the fence or barrier to be moved closer to the wall face.



# Drainage Design and Water Considerations



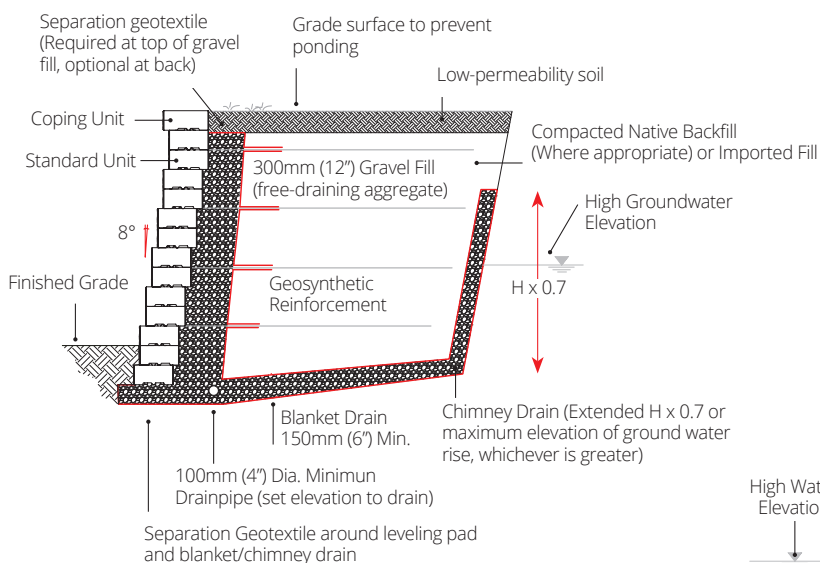
Improper management of surface water can cause erosion. When water infiltrates the Gravel Fill or Reinforced Soil Zone, it can overload a wall. Drainage swales made of low to negligible permeability materials such as clay, plastic liners or concrete can divert water around the back of the wall (see below). Scuppers can provide for controlled flows over the crest of the wall, but they need to include proper erosion control features at the toe of the wall. Drainage inlets can collect water and direct it towards storm water facilities or out the face of the wall.

## WATER CAN INCREASE THE PRESSURE BEHIND A WALL BY 2.5 TIMES!

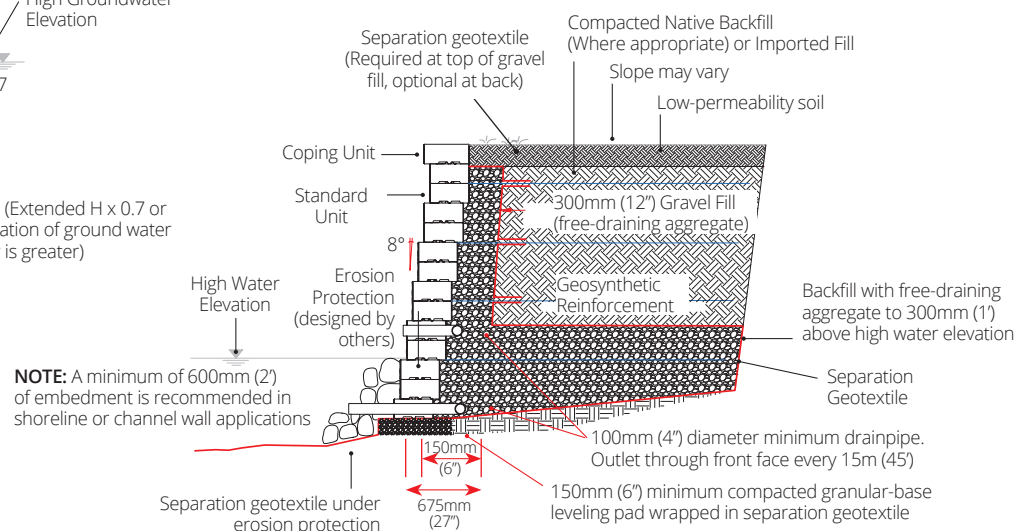
Groundwater can weaken foundation soils supporting the wall, clog drain pipes, and increase external loads on the wall. Blanket or chimney drains may be required to divert groundwater around the wall structure (see below).

When using walls for shoreline stabilization or erosion/sedimentation control along stream banks, some unique considerations need to be addressed in the wall design, such as: erosion at the toe of the wall; potential build up of hydrostatic pressure behind the wall (especially when rapid water level draw down occurs); the forces of waves and ice sheet flows exerted on the face of the wall.


### POTENTIAL GROUND WATER DETAIL



### WATERFRONT APPLICATION







Paver: Eterna, Cloudburst and Twilight

# Products

Owing to the range of colors, sizes, thicknesses, textures and applications available, Oaks Products are the preferred choice of design professionals. This section will guide you through making the right choices for your segmental pavement or wall design application, including product selection, color palettes and applications. With all Oaks Products, we are always available to assist you with any special requirements of your project, such as soil type, barrier construction or water management.









## In this section...

- 38 Slab, Paver, Permeable, Accent and Specialty Products
- 52 Retaining and Garden Wall Products

# SLAB, PAVER, PERMEABLE, ACCENT AND SPECIALTY




## Products

### PAVER TRAFFIC LOAD

 PEDESTRIAN PLAZA	 OCCASIONAL HEAVY VEHICLE
 EMERGENCY & MAINTENANCE ACCESS ROUTES	 REGULAR HEAVY VEHICLE
 PASSENGER CARS ONLY	 MUNICIPAL MIXED USE
 CARS & LIGHT TRUCKS	 INDUSTRIAL AREAS

See page 8 for details on each of these Pavement Classifications.



### ENVIRONMENTAL COMPLIANCE

-  CAN APPLY FOR LEED CREDITS
-  PERMEABLE PAVER
-  SOLAR REFLECTANCE INDEX (SRI)

### INSTALLATION METHODS

-  DESIGNED FOR MACHINE INSTALL (SEE PAGE 11)

### TECHNOLOGY

-  **EliteFinish™**  
Product produced with enhanced finish technology
-  **ColorBold™**  
Product produced with enhanced color technology

See page 2 for details on each of these Technologies.

### SUMMARY CHART

Width(s) in millimeters    Length(s) in millimeters    Thickness in millimeters           

#### SLABS AND COPINGS

##### TERRACE TILE **NEW!** - PAGE 40

12x12 Stone (NON-STOCK)	300	300	45	✓
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##### RIALTO 60mm - PAGE 40

8x16 Stone	200	400	60	✓
16x24 Stone (NON-STOCK)	400	600	60	✓
Random Bundle	200, 400	400, 600	60	✓

##### NUEVA® SLAB - PAGE 41

8x16 Small Rectangle	200	400	60	✓
12x24 Rectangle <b>NEW!</b>	300	600	60	✓
Random Bundle	200, 400	400, 600	60	✓

##### NUEVA® XL SLAB - PAGE 41

24x36 Stone	600	900	60	✓
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##### MOLINA® 60mm - PAGE 42

6x12 Stone (NON-STOCK)	150	300	60	✓	✓	✓
12x24 Stone <b>NEW!</b> (NON-STOCK)	300	600	60	✓		
24x24 Stone <b>NEW!</b> (NON-STOCK)	600	600	60	✓		
Combo Bundle	300	300, 450, 600	60	✓		

##### MOLINA® FERRO FINISH 60mm **NEW!** - PAGE 42

6x12 Stone (NON-STOCK)	150	300	60	✓	✓	✓
12x24 Stone (NON-STOCK)	300	600	60	✓		
24x24 Stone (NON-STOCK)	600	600	60	✓		

##### OASIS COPING - PAGE 43

Coping Stone (NON-STOCK)	610	360	60	✓
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##### OASIS BULLNOSE COPING - PAGE 43

Bullnose Coping Stone (NON-STOCK)	610	360	60	✓
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##### CASSINA - PAGE 43

8x12 Coping Stone (WHILE QUANTITIES LAST)	203	305	70	✓
12x12 Coping Stone <b>COMING SOON!</b>	305	305	70	✓



SUMMARY CHART

Width(s) in millimeters   Length(s) in millimeters   Thickness in millimeters



<b>PAVERS</b>												
<b>TACTILE DOME PAVERS - PAGE 43</b>												
12x12 Stone (NON-STOCK)	305	305	50	✓								
<b>CLASSIC PAVER - PAGE 44</b>												
4x8 Standard Bundle	100	100, 200	60	✓	✓	✓						
<b>MARKET PAVER - PAGE 44</b>												
4x8 Stone (NON-STOCK)	100	200	80	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>TURF-SLAB - PAGE 44</b>												
400x600 Stone (NON-STOCK)	400	600	80		✓	✓						
<b>BEAUMONT <b>NEW!</b> - PAGE 45</b>												
4x8 Standard Bundle (NON-STOCK)	100	100, 200	80	✓	✓	✓	✓	✓	✓	✓	✓	✓
8x8 Stone (NON-STOCK)	200	200	80	✓	✓	✓	✓	✓	✓	✓	✓	✓
8x12 Stone (NON-STOCK)	200	300	80	✓	✓	✓	✓	✓				
<b>HYDR'EAU PAVE - PAGE 45</b>												
Combo Bundle (NON-STOCK)	100, 200	100, 200, 300	80	✓	✓	✓	✓	✓				
<b>ENVIRO MIDORI - PAGE 46</b>												
Random Bundle (NON-STOCK)	120, 240	240, 360	80	✓	✓	✓	✓					
Herringbone Bundle (NON-STOCK)	120	120, 240	80	✓	✓	✓	✓	✓	✓	✓	✓	✓
<b>NUEVA® PAVER - PAGE 46</b>												
8x16 Small Rectangle (NON-STOCK)	200	400	80	✓	✓	✓						
16x32 Large Rectangle <b>NEW!</b> (NON-STOCK)	400	800	80	✓	✓							
Random Bundle (NON-STOCK)	200, 400	400, 600	80	✓	✓	✓						
<b>RIALTO 80mm - PAGE 47</b>												
8x16 Stone (NON-STOCK)	200	400	80	✓	✓	✓						
16x24 Stone (NON-STOCK)	400	600	80	✓	✓	✓						
Random Bundle (NON-STOCK)	200, 400	400, 600	80	✓	✓	✓						
<b>PRESIDIO - PAGE 47</b>												
Rectangle Stone (NON-STOCK)	168	336	80	✓	✓	✓	✓					
Combo Bundle (NON-STOCK)	126, 168	301, 401, 501	80	✓	✓	✓						
<b>MOLINA® 80mm - PAGE 48</b>												
6x12 Stone (NON-STOCK)	150	300	80	✓	✓	✓	✓	✓				
12x12 Stone <b>NEW!</b> (NON-STOCK)	300	300	80	✓	✓	✓	✓	✓				
12x24 Stone (NON-STOCK)	300	600	80	✓	✓	✓						
Combo Bundle (NON-STOCK)	300	300, 450, 600	80	✓	✓	✓						
<b>MOLINA® FERRO FINISH 80mm <b>NEW!</b> - PAGE 48</b>												
6x12 Stone (NON-STOCK)	150	300	80	✓	✓	✓	✓	✓				
12x12 Stone (NON-STOCK)	300	300	80	✓	✓	✓	✓	✓				
12x24 Stone (NON-STOCK)	300	600	80	✓	✓	✓						
<b>ETERNA - PAGE 49</b>												
100x300 Stone (NON-STOCK)	100	300	100	✓	✓	✓	✓	✓	✓	✓	✓	✓
100x400 Stone (NON-STOCK)	100	400	100	✓	✓	✓	✓	✓				
200x600 Stone (NON-STOCK)	200	600	100	✓	✓	✓	✓					
400x600 Stone (NON-STOCK)	400	600	100	✓	✓	✓	✓					
<b>STEPS AND CURBS</b>												
<b>ARIA STEP - PAGE 50</b>												
Step Unit (NON-STOCK)	1200	400	165	✓								
<b>NUEVA® STEP - PAGE 50</b>												
1200mm Step Unit	1200	400	150	✓								
<b>NUEVA® CURB <b>NEW!</b> - PAGE 51</b>												
Curb Unit	600	100	125	✓								

# Products

## Terrace Tile 45mm **NEW!**



**CHAMPAGNE**  
Nueva® Slab Shown



**CLOUDBURST**  
Nueva® Slab Shown



**MARBLE GREY**  
Nueva® Slab Shown



**MILANO**  
Nueva® Slab Shown

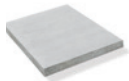


**ONYX**  
Nueva® Slab Shown



**UMBER**  
Nueva® Slab Shown

### TERRACE TILE (NON-STOCK)



**12x12 Stone**  
11.81 x 11.81"  
(300 x 300mm)  
Pieces/layer: 12  
Coverage/layer: 100%

**Individually Packaged**

Also available in 80mm thickness!

See page 47

## Rialto 60mm



**CHAMPAGNE**



**MACKINAW**



**MARBLE GREY**



**MILANO**



**CHESTNUT**



**ONYX**

Chestnut and Onyx are available in 8x16 Stone size only. Ideal for soldier coursing or banding.

### SMALL RECTANGLE



**8x16 Stone**  
7.87 x 15.75"  
(200 x 400mm)  
Pieces/layer: 15  
Coverage/layer: 100%

**Individually Packaged**

### LARGE RECTANGLE



**16x24 Stone**  
15.75 x 23.62"  
(400 x 600mm)  
Pieces/layer: 5  
Coverage/layer: 100%

**Individually Packaged**

### RANDOM BUNDLE



**8x16 Stone**  
7.87 x 15.75"  
(200 x 400mm)  
Pieces/layer: 3  
Coverage/layer: 20%



**16x16 Stone**  
15.75 x 15.75"  
(400 x 400mm)  
Pieces/layer: 3  
Coverage/layer: 40%



**16x24 Stone**  
15.75 x 23.62"  
(400 x 600mm)  
Pieces/layer: 2  
Coverage/layer: 40%

**NON-STOCK PRODUCTS:** Please be aware that these products are made to order as required. Minimum quantities and advance lead times must be considered to ensure your products arrive on time. Contact your Oaks Sales Representative to discuss your project requirements prior to specifying.

# SLAB, PAVER, PERMEABLE, ACCENT AND SPECIALTY Products

## Nueva® Slab 60mm **NEW SIZE!**

Also available in 80mm thickness!  
See page 46



Chestnut and Onyx available in 8x16 Small Rectangle size only. Ideal for soldier coursing or banding.

### RECTANGLE BUNDLE



**8x16 Small Rectangle**  
7.87 x 15.75"  
(200 x 400mm)  
Pieces/layer: 15  
Coverage/layer: 100%  
**Individually Packaged**

### 12X24 RECTANGLE **NEW!**

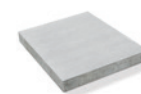


**12x24 Rectangle**  
11.81 x 23.62"  
(300 x 600mm)  
Pieces/layer: 6  
Coverage/layer: 100%  
**Individually Packaged**

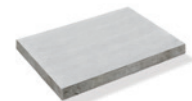
### RANDOM BUNDLE



**8x16 Small Rectangle**  
7.87 x 15.75"  
(200 x 400mm)  
Pieces/layer: 3  
Coverage/layer: 20%



**16x16 Stone**  
15.75 x 15.75"  
(400 x 400mm)  
Pieces/layer: 3  
Coverage/layer: 40%



**16x24 Stone**  
15.75 x 23.62"  
(400 x 600mm)  
Pieces/layer: 2  
Coverage/layer: 40%

## Nueva® XL Slab 60mm



**NOTE:** When using Nueva® Slab with Nueva® XL, please understand that colors and tonal consistency between these products may not be exact matches.

### 24X36 STONE



**24x36 Stone**  
23.62 x 35.43"  
(600 x 900mm)  
Pieces/layer: 2  
Coverage/layer: 100%  
**Individually Packaged**

# SLAB, PAVER, PERMEABLE, ACCENT AND SPECIALTY Products

Also available in 80mm thickness!  
See page 48

## Molina® 60mm **NEW COLOR & SIZES!**



**6X12 STONE**  
(NON-STOCK\*)



**6x12 Stone**  
5.91 x 11.81"  
(150 x 300mm)  
Pieces/layer: 24  
Coverage/layer: 100%

**Individually Packaged**

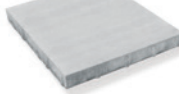
**12X24 STONE**  
**NEW!** (NON-STOCK)



**12x24 Stone**  
11.81 x 23.62"  
(300 x 600mm)  
Pieces/layer: 6  
Coverage/layer: 100%

**Individually Packaged**

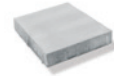
**24X24 STONE**  
**NEW!** (NON-STOCK)



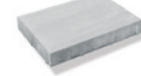
**24x24 Stone**  
23.62 x 23.62"  
(600 x 600mm)  
Pieces/layer: 2  
Coverage/layer: 100%

**Individually Packaged**

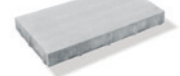
**COMBO BUNDLE**



**12x12 Stone**  
11.81 x 11.81"  
(300 x 300mm)  
Pieces/layer: 3  
Coverage/layer: 25%



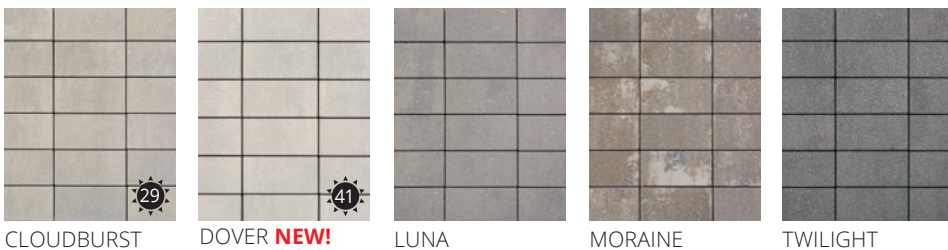
**12x18 Stone**  
11.81 x 17.72"  
(300 x 450mm)  
Pieces/layer: 2  
Coverage/layer: 25%



**12x24 Stone**  
11.81 x 23.62"  
(300 x 600mm)  
Pieces/layer: 3  
Coverage/layer: 50%

\*6x12 Stone is STOCK in Twilight,  
NON-STOCK all other colors

## Molina® Ferro Finish 60mm **NEW!**



Also available in 80mm thickness!  
See page 48

**6X12 STONE**  
(NON-STOCK)



**6x12 Stone**  
5.91 x 11.81"  
(150 x 300mm)  
Pieces/layer: 24  
Coverage/layer: 100%

**Individually Packaged**

**12X24 STONE**  
(NON-STOCK)



**12x24 Stone**  
11.81 x 23.62"  
(300 x 600mm)  
Pieces/layer: 6  
Coverage/layer: 100%

**Individually Packaged**

**24X24 STONE**  
(NON-STOCK)



**24x24 Stone**  
23.62 x 23.62"  
(600 x 600mm)  
Pieces/layer: 2  
Coverage/layer: 100%

**Individually Packaged**



See the difference Molina®  
Ferro Finish can make!  
**Scan to view!**

**NON-STOCK PRODUCTS:** Please be aware that these products are made to order as required. Minimum quantities and advance lead times must be considered to ensure your products arrive on time. Contact your Oaks Sales Representative to discuss your project requirements prior to specifying.

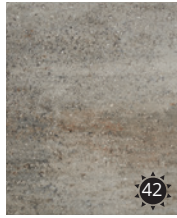
# Products

## Oasis 60mm

**NEW COLORS!**



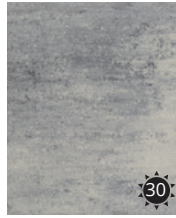
DOVER



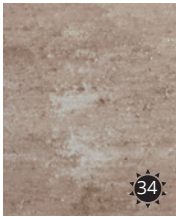
CHAMPAGNE  
**NEW!**



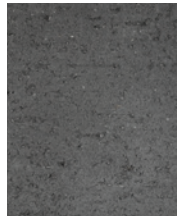
CLOUDBURST  
**NEW!**



MARBLE GREY  
**NEW!**

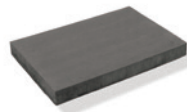


MILANO  
**NEW!**



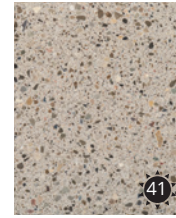
ONYX

**COPING STONE**   
(NON-STOCK)

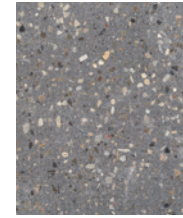


**Oasis Coping Stone**  
24 x 14.125"  
(610 x 360mm)  
Pieces/layer: 4  
Coverage/layer: 100%  
**Individually Packaged**

## Oasis Bullnose 60mm



DOVER, SUAVE



ONYX, SUAVE

Suave finish only available on Bullnose Coping Stones.

**BULLNOSE COPING STONE**   
(NON-STOCK)

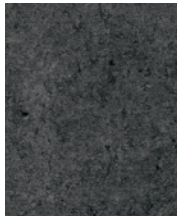


**Bullnose Coping Stone**  
24 x 14.125"  
(610 x 360mm)  
Pieces/layer: 3  
Coverage/layer: 100%  
**Individually Packaged**

## Cassina 70mm



DOVER




ONYX

**8X12 COPING STONE**   
(WHILE QUANTITIES LAST)



**Coping Stone**  
8 x 12"  
(203 x 305mm)  
Pieces/layer: 39  
Coverage/layer: 100%

**12X12 COPING STONE**   
**COMING SOON!**



**Coping Stone**  
12 x 12"  
(305 x 305mm)  
Pieces/layer: 30  
Coverage/layer: 100%

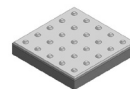
## Tactile Dome Pavers 50mm



CHARCOAL



**12X12 STONE**   
(NON-STOCK)



**12x12 Stone**  
12 x 12"  
(305 x 305mm)  
Pieces/Bundle: 76  
**Individually Packaged**

Stock in 12x12 Charcoal color only. Contact us for further details on other available colors and sizes. Minimum quantities and lead times apply.

**NON-STOCK PRODUCTS:** Please be aware that these products are made to order as required. Minimum quantities and advance lead times must be considered to ensure your products arrive on time. Contact your Oaks Sales Representative to discuss your project requirements prior to specifying.

# SLAB, PAVER, PERMEABLE, ACCENT AND SPECIALTY Products

## Classic Paver 60mm



CHAMPAGNE  
**NEW!**

MARBLE GREY  
**NEW!**

CHESTNUT

ONYX

### 4X8 STANDARD BUNDLE



**4x4 Stone**  
3.94 x 3.94"  
(100 x 100mm)  
Pieces/layer: 2  
Coverage/layer: 1.9%



**4x8 Stone**  
3.94 x 7.87"  
(100 x 200mm)  
Pieces/layer: 53  
Coverage/layer: 98.1%

## Market Paver 80mm



ONYX

SANGRIA

SERENGETI

### RECTANGLE (NON-STOCK)



**4x8 Stone**  
3.94 x 7.87"  
(100 x 200mm)  
Pieces/layer: 54  
Coverage/layer: 100%

**Individually Packaged**

## Turf-Slab 80mm

### 400X600 STONE (NON-STOCK)



**400x600 Stone**  
15.75 x 23.62"  
(400 x 600mm)  
Pieces/layer: 5  
Coverage/layer: 100%

**Individually Packaged**

AVAILABLE IN NATURAL  
COLOR ONLY.

### TYPICAL USES:

- Cottage Parking
- Emergency & Service Vehicle Access Routes
- Slope Erosion Protection
- Retention Pond Linings and Vehicular Access Roads
- Ditch & Channel Linings
- Low Use Turf Areas for Overflow Parking
- Environmentally Sensitive Area Erosion Protection
- Small Lake Boat Launching Ramps

**NON-STOCK PRODUCTS:** Please be aware that these products are made to order as required. Minimum quantities and advance lead times must be considered to ensure your products arrive on time. Contact your Oaks Sales Representative to discuss your project requirements prior to specifying.

# SLAB, PAVER, PERMEABLE, ACCENT AND SPECIALTY Products

## Beaumont 80mm **NEW!**



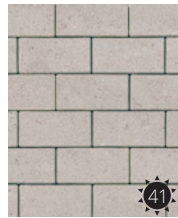
CHARCOAL /  
CITY OF TORONTO  
DARK GREY



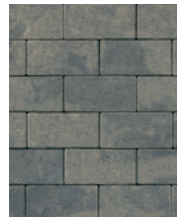
CITY OF TORONTO  
DARK RED  
**NEW!**



CITY OF TORONTO  
LIGHT RED  
**NEW!**



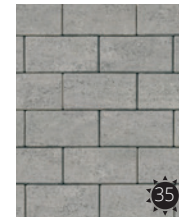
DOVER / CITY OF  
TORONTO LIGHT  
GREY **NEW!**



EXECUTIVE



GREYFIELD



NATURAL / CITY OF  
TORONTO MEDIUM  
GREY **NEW!**



TIMBERWOOD

### 4X8 STANDARD BUNDLE (NON-STOCK)



**4x4 Stone**  
3.94 x 3.94"  
(100 x 100mm)  
Pieces/layer: 2  
Coverage/layer: 1.9%



**4x8 Stone**  
3.94 x 7.87"  
(100 x 200mm)  
Pieces/layer: 53  
Coverage/layer: 98.1%

### 8X8 STONE (NON-STOCK)



**8x8 Stone**  
7.87 x 7.87"  
(200 x 200mm)  
Pieces/layer: 30  
Coverage/layer: 100%

**Individually Packaged**

### 8X12 STONE (NON-STOCK)



**8x12 Stone**  
7.87 x 11.81"  
(200 x 300mm)  
Pieces/layer: 20  
Coverage/layer: 100%

**Individually Packaged**

## Hydr'eau Pave 80mm



CHAMPAGNE  
(Rialto Shown)



MACKINAW  
(Rialto Shown)



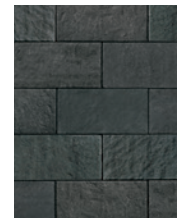
MARBLE GREY  
(Rialto Shown)



MILANO  
(Rialto Shown)



CHESTNUT  
(Rialto Shown)



ONYX  
(Rialto Shown)

### COMBO BUNDLE (NON-STOCK)



**4x4 Stone**  
3.94 x 3.94"  
(100 x 100mm)  
Pieces/layer: 1  
Coverage/layer: 1%



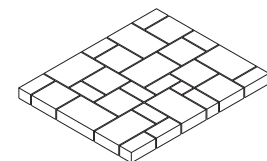
**4x8 Stone**  
3.94 x 7.87"  
(100 x 200mm)  
Pieces/layer: 12  
Coverage/layer: 24.2%



**8x8 Stone**  
7.87 x 7.87"  
(200 x 200mm)  
Pieces/layer: 8  
Coverage/layer: 32.3%



**8x12 Stone**  
7.87 x 11.81"  
(200 x 300mm)  
Pieces/layer: 7  
Coverage/layer: 42.4%



**Combo Bundle  
Layout by Layer**

**NON-STOCK PRODUCTS:** Please be aware that these products are made to order as required. Minimum quantities and advance lead times must be considered to ensure your products arrive on time. Contact your Oaks Sales Representative to discuss your project requirements prior to specifying.

# Products

## Enviro Midori 80mm **NEW COLOR!**

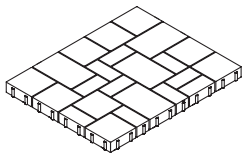


### RANDOM BUNDLE (NON-STOCK)

- 5x10 Stone**  
4.72 x 9.45"  
(120 x 240mm)  
Pieces/layer: 10  
Coverage/layer: 25%
- 10x10 Stone**  
9.45 x 9.45"  
(240 x 240mm)  
Pieces/layer: 9  
Coverage/layer: 45%
- 10x15 Stone**  
9.45 x 14.17"  
(240 x 360mm)  
Pieces/layer: 4  
Coverage/layer: 30%

### HERRINGBONE BUNDLE (NON-STOCK)

- 5x5 Stone**  
4.72 x 4.72"  
(120 x 120mm)  
Pieces/layer: 7  
Coverage/layer: 11.1%
- 5x10 Stone**  
4.72 x 9.45"  
(120 x 240mm)  
Pieces/layer: 28  
Coverage/layer: 88.9%



Random Bundle Layout by Layer

**NON-STOCK PRODUCTS:** Please be aware that these products are made to order as required. Minimum quantities and advance lead times must be considered to ensure your products arrive on time. Contact your Oaks Sales Representative to discuss your project requirements prior to specifying.

## Nueva® Paver 80mm **NEW SIZE!**

Also available in 60mm thickness!  
See page 41



Chestnut and Onyx available in 8x16 Small Rectangle size only. Ideal for soldier coursing or banding.

### RECTANGLE BUNDLE (NON-STOCK)

- 8x16 Small Rectangle**  
7.87 x 15.75"  
(200 x 400mm)  
Pieces/layer: 15  
Coverage/layer: 100%

Individually Packaged

### 16x32 LARGE RECTANGLE **NEW!** (NON-STOCK)

- 16x32 Large Rectangle**  
15.75 x 31.50"  
(400 x 800mm)  
Pieces/layer: 3  
Coverage/layer: 100%

Individually Packaged

### RANDOM BUNDLE (NON-STOCK)

- 8x16 Small Rectangle**  
7.87 x 15.75"  
(200 x 400mm)  
Pieces/layer: 3  
Coverage/layer: 20%
- 16x16 Stone**  
15.75 x 15.75"  
(400 x 400mm)  
Pieces/layer: 3  
Coverage/layer: 40%
- 16x24 Stone**  
15.75 x 23.62"  
(400 x 600mm)  
Pieces/layer: 2  
Coverage/layer: 40%



# SLAB, PAVER, PERMEABLE, ACCENT AND SPECIALTY Products

## Rialto 80mm

Also available in 60mm thickness!  
See page 40



CHAMPAGNE

MACKINAW

MARBLE GREY

MILANO

CHESTNUT

ONYX

Chestnut and Onyx are available in 8x16 Stone size only. Ideal for soldier coursing or banding.

**SMALL RECTANGLE**  
(NON-STOCK)



**8x16 Stone**  
7.87 x 15.75"  
(200 x 400mm)  
Pieces/layer: 15  
Coverage/layer: 100%  
**Individually Packaged**

**LARGE RECTANGLE**  
(NON-STOCK)



**16x24 Stone**  
15.75 x 23.62"  
(400 x 600mm)  
Pieces/layer: 5  
Coverage/layer: 100%  
**Individually Packaged**

**RANDOM BUNDLE**  
(NON-STOCK)



**8x16 Stone**  
7.87 x 15.75"  
(200 x 400mm)  
Pieces/layer: 3  
Coverage/layer: 20%

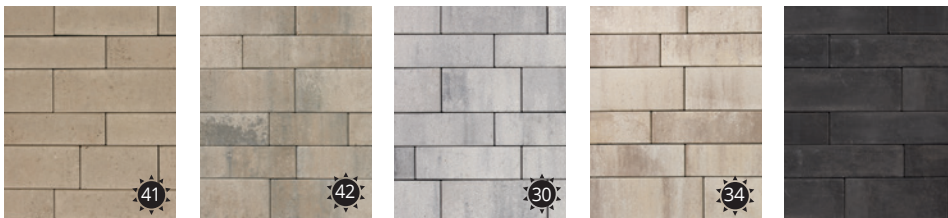


**16x16 Stone**  
15.75 x 15.75"  
(400 x 400mm)  
Pieces/layer: 3  
Coverage/layer: 40%



**16x24 Stone**  
15.75 x 23.62"  
(400 x 600mm)  
Pieces/layer: 2  
Coverage/layer: 40%

## Presidio 80mm



BUFF

CHAMPAGNE

MARBLE GREY

MILANO

ONYX

**NON-STOCK PRODUCTS:** Please be aware that these products are made to order as required. Minimum quantities and advance lead times must be considered to ensure your products arrive on time. Contact your Oaks Sales Representative to discuss your project requirements prior to specifying.

**RECTANGLE STONE**  
(NON-STOCK)



**Rectangle Stone**  
6.61 x 13.23"  
(168 x 336mm)  
Pieces/layer: 15  
Coverage/layer: 100%  
**Individually Packaged**

**COMBO BUNDLE**  
(NON-STOCK)



**Stone 1**  
4.96 x 11.85"  
(126 x 301mm)  
Pieces/layer: 4  
Coverage/layer: 15%



**Stone 2**  
4.96 x 15.79"  
(126 x 401mm)  
Pieces/layer: 4  
Coverage/layer: 20%



**Stone 3**  
4.96 x 19.72"  
(126 x 501mm)  
Pieces/layer: 4  
Coverage/layer: 25%



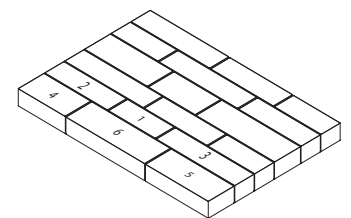
**Stone 4**  
6.61 x 11.85"  
(168 x 301mm)  
Pieces/layer: 2  
Coverage/layer: 10%



**Stone 5**  
6.61 x 15.79"  
(168 x 401mm)  
Pieces/layer: 2  
Coverage/layer: 13.3%



**Stone 6**  
6.61 x 19.72"  
(168 x 501mm)  
Pieces/layer: 2  
Coverage/layer: 16.7%



**Combo Bundle  
Layout by Layer**

# Products

## Molina® 80mm **NEW SIZE!**



Also available in 60mm thickness!  
See page 42

### 6X12 STONE (NON-STOCK)



**6x12 Stone**  
5.91 x 11.81"  
(150 x 300mm)  
Pieces/layer: 24  
Coverage/layer: 100%

**Individually Packaged**

### 12X12 STONE **NEW!** (NON-STOCK)



**12x12 Stone**  
11.81 x 11.81"  
(300 x 300mm)  
Pieces/layer: 12  
Coverage/layer: 100%

**Individually Packaged**

### 12X24 STONE (NON-STOCK)



**12x24 Stone**  
11.81 x 23.62"  
(300 x 600mm)  
Pieces/layer: 6  
Coverage/layer: 100%

**Individually Packaged**

### COMBO BUNDLE (NON-STOCK)



**12x12 Stone**  
11.81 x 11.81"  
(300 x 300mm)  
Pieces/layer: 3  
Coverage/layer: 25%

**12x18 Stone**  
11.81 x 17.72"  
(300 x 450mm)  
Pieces/layer: 2  
Coverage/layer: 25%

**12x24 Stone**  
11.81 x 23.62"  
(300 x 600mm)  
Pieces/layer: 3  
Coverage/layer: 50%

## Molina® Ferro Finish 80mm **NEW!**



Also available in 60mm thickness!  
See page 42

### 6X12 STONE (NON-STOCK)



**6x12 Stone**  
5.91 x 11.81"  
(150 x 300mm)  
Pieces/layer: 24  
Coverage/layer: 100%

**Individually Packaged**

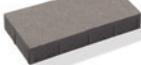
### 12X12 STONE (NON-STOCK)



**12x12 Stone**  
11.81 x 11.81"  
(300 x 300mm)  
Pieces/layer: 12  
Coverage/layer: 100%

**Individually Packaged**

### 12X24 STONE (NON-STOCK)



**12x24 Stone**  
11.81 x 23.62"  
(300 x 600mm)  
Pieces/layer: 6  
Coverage/layer: 100%

**Individually Packaged**



See the difference Molina®  
Ferro Finish can make!  
**Scan to view!**

**NON-STOCK PRODUCTS:** Please be aware that these products are made to order as required. Minimum quantities and advance lead times must be considered to ensure your products arrive on time. Contact your Oaks Sales Representative to discuss your project requirements prior to specifying.

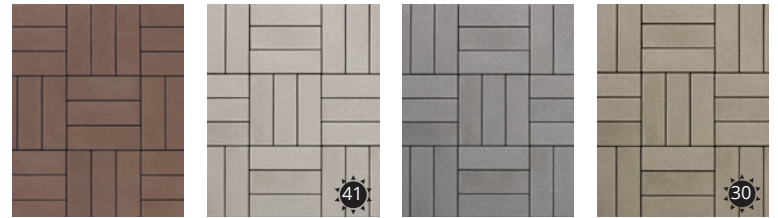
# SLAB, PAVER, PERMEABLE, ACCENT AND SPECIALTY Products

## Eterna 100mm



CLOUDBURST    LUNA    TWILIGHT

**NOTE:** When ordering Eterna, try to secure product from a single batch lot to reduce the risk of variability. Color and tonal consistency between different sizes and batch lots cannot be guaranteed.



DARK OAK    DOVER    NICKEL    OLIVE



ONYX    PLUM    TERRA COTTA

### 100X300 STONE (NON-STOCK)



**100x300 Stone**  
3.94 x 11.81"  
(100 x 300mm)  
Pieces/layer: 33  
Coverage/layer: 100%

**Individually Packaged**



### 100X400 STONE (NON-STOCK)



**100x400 Stone**  
3.94 x 15.75"  
(100 x 400mm)  
Pieces/layer: 22  
Coverage/layer: 100%

**Individually Packaged**



### 200X600 STONE (NON-STOCK)



**200x600 Stone**  
7.87 x 23.62"  
(200 x 600mm)  
Pieces/layer: 8  
Coverage/layer: 100%

**Individually Packaged**



### 400X600 STONE (NON-STOCK)



**400x600 Stone**  
15.75 x 23.62"  
(400 x 600mm)  
Pieces/layer: 5  
Coverage/layer: 100%

**Individually Packaged**

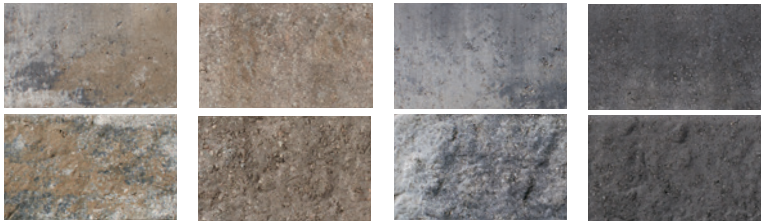


**NON-STOCK PRODUCTS:** Please be aware that these products are made to order as required. Minimum quantities and advance lead times must be considered to ensure your products arrive on time. Contact your Oaks Sales Representative to discuss your project requirements prior to specifying.

# Products

## Aria Step

**NEW COLORS!**



SMOOTH  
TOP, BACK & ENDS

**NOTE:** Colored step units also available as custom order. Minimum quantities apply.

EMBOSSED  
FRONT FACE

CHAMPAGNE

MACKINAW  
**NEW!**

MARBLE GREY  
**NEW!**

ONYX  
**NEW!**

**STEP UNIT**  
(NON-STOCK)

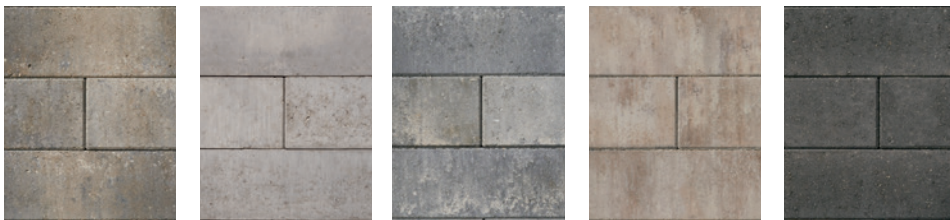


**Step Unit**  
47.24 x 6.5 x 15.75"  
(1200 x 165 x 400mm)  
Smooth top, back and ends  
Embossed front face

**Individually Packaged**

## Nueva<sup>®</sup> Step

**NEW COLOR!**



CHAMPAGNE

CLOUDBURST

MARBLE GREY

MILANO **NEW!**

ONYX

**STEP UNIT**

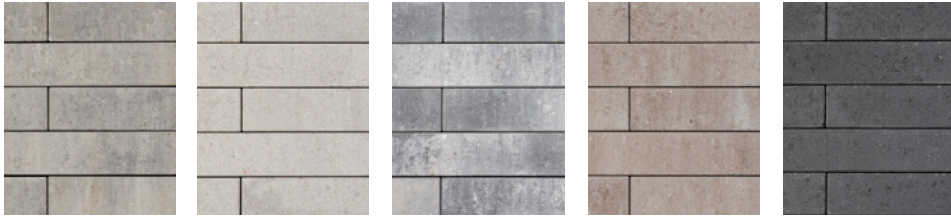


**1200mm Step Unit**  
47.24 x 5.91 x 15.75"  
(1200 x 150 x 400mm)  
Smooth on all faces  
and ends

**Individually Packaged**

# SLAB, PAVER, PERMEABLE, ACCENT AND SPECIALTY Products

## Nueva® Curb **NEW!**



CHAMPAGNE

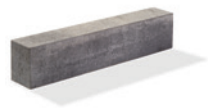
CLOUDBURST

MARBLE GREY

MILANO

ONYX

### CURB UNIT



#### **Curb Unit**

23.6 x 4.9 x 3.9"









(600 x 125 x 100mm)

Smooth on all faces and ends

**Individually Packaged**

# Products









## ICON LEGEND

WALL TYPE			ALIGNMENT		INSTALLATION OPTIONS
 FREESTANDING	 GEOGRID REINFORCED	 MULTI DEPTH GRAVITY	 STRAIGHT WALL		 MACHINE INSTALLED
 SINGLE-DEPTH GRAVITY	 STABILIZED BACKFILL		 CURVED WALL		See page 22 for more details on each of these wall types.

## CHOOSING THE RIGHT WALL FOR YOUR PROJECT

In this section, we have included batter, alignment and installation options to further assist in selecting the correct wall for your given application. Please note for 0 degree (vertical) batter walls, we recommend placing a slight back slope to the leveling pad to accommodate forward rotation of the wall during installation; contact Oaks for more details.

### SUMMARY CHART

	Connector Type	Batter Options								
<b>WALLS</b>										
<b>NUEVA® 150 WALL - PAGE 53</b>										
Combo Bundle	Split tongue	0°, 3.5°, 7°	√	√		√	√	√		
<b>NUEVA® 75 WALL - PAGE 54</b>										
Combo Bundle	Split tongue	0°, 3.5°, 7°	√	√		√	√	√		
<b>ORTANA - PAGE 54</b>										
Standard/Tapered	Split tongue	0°, 7°	√	√		√	√	√	√	
<b>PROTERRA™ SMOOTH - PAGE 55</b>										
	Split tongue	0°, 8°, 16°	√	√	√	√	√	√	√	√
<b>PROTERRA™ SPLIT - PAGE 56</b>										
	Split tongue	0°, 8°, 16°	√	√	√	√	√	√	√	√
<b>MODAN - PAGE 57</b>										
Combo Bundle	Glue	0°		√				√		
Linear Unit	Glue	0°		√				√		
<b>GARDENIA LINEAR - PAGE 57</b>										
	Rear lip	5°		√				√		

# Products

## Nueva® 150 Wall **NEW COLORS!**



CHAMPAGNE    CLOUDBURST **NEW!**    MARBLE GREY    MILANO **NEW!**    ONYX

Onyx is available in Coping Bundle only.



For design, please reference the Nueva® Wall Estimating Guide, available our website. **Scan to view!**

### COMBO BUNDLE



<p><b>16" Unit</b> 15.75 x 5.91 x 11.81" (400 x 150 x 300mm) Connector Type: Split tongue Setback: 0°, 3.5°, 7° Smooth on both faces Pieces/layer: 2 Coverage/layer: 20%</p>	<p><b>20" Unit</b> 19.69 x 5.91 x 11.81" (500 x 150 x 300mm) Connector Type: Split tongue Setback: 0°, 3.5°, 7° Smooth on both faces Pieces/layer: 2 Coverage/layer: 25%</p>	<p><b>20" Corner/End Unit</b> 19.69 x 5.91 x 11.81" (500 x 150 x 300mm) Connector Type: Split tongue Setback: 0°, 3.5°, 7° Smooth on both faces and one end Pieces/layer: 2 Coverage/layer: 25%</p>	<p><b>24" Unit</b> 23.62 x 5.91 x 11.81" (600 x 150 x 300mm) Connector Type: Split tongue Setback: 0°, 3.5°, 7° Smooth on both faces Pieces/layer: 2 Coverage/layer: 30%</p>
--	--	---	--

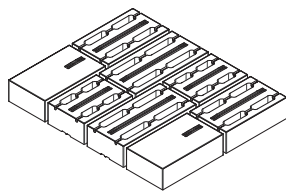
### COPING BUNDLE



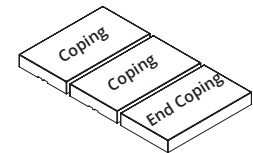
<p><b>Coping Unit</b> 23.62 x 2.95 x 13.38" (600 x 75 x 340mm) Smooth on both faces Pieces/layer: 2 Coverage/layer: 67%</p>	<p><b>End Coping Unit</b> 23.62 x 2.95 x 13.38" (600 x 75 x 340mm) Smooth on both faces and one end Pieces/layer: 1 Coverage/layer: 33%</p>
---	---

**Packaged with End Coping Unit**      **Packaged with Coping Units**

### Combo Bundle Layout by Layer



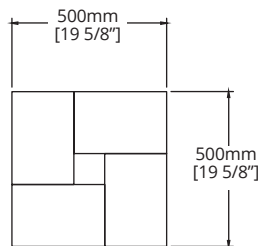
### Coping/End Coping Combo Bundle by Layer



### CORNER/COLUMN BUNDLE



**Corner/Column Unit**  
7.87 x 5.91 x 11.81"  
(200 x 150 x 300mm)  
No Connector, glue required  
Smooth on both faces and on both ends  
Pieces/layer: 15  
Coverage per layer: 100%



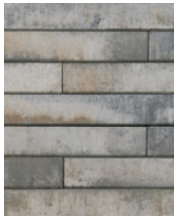
Makes a 500x500mm (19.69x19.69") square column

**Individually Packaged**

# Products

## Nueva® 75 Wall

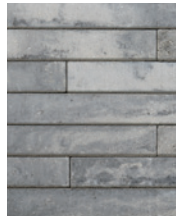
**NEW COLORS!**



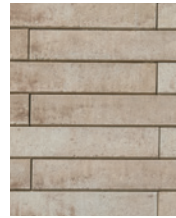
CHAMPAGNE



CLOUDBURST  
**NEW!**



MARBLE GREY

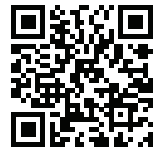


MILANO  
**NEW!**



ONYX

Onyx available  
in Combo Bundle  
and Coping Bundle!



For design, please reference the  
Nueva® Wall Estimating Guide,  
available on our website.

**Scan to view!**

### COMBO BUNDLE



**16" Unit**  
15.75 x 2.95 x 11.81"  
(400 x 75 x 300mm)  
Connector Type:  
Split tongue  
Setback: 0°, 3.5°, 7°  
Smooth on both faces  
Pieces/layer: 2  
Coverage/layer: 20%



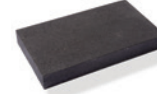
**20" Unit**  
19.69 x 2.95 x 11.81"  
(500 x 75 x 300mm)  
Connector Type:  
Split tongue  
Setback: 0°, 3.5°, 7°  
Smooth on both faces  
Pieces/layer: 2  
Coverage/layer: 25%



**20" Corner/End Unit**  
19.69 x 2.95 x 11.81"  
(500 x 75 x 300mm)  
Connector Type:  
Split tongue  
Setback: 0°, 3.5°, 7°  
Smooth on both faces  
and one end  
Pieces/layer: 2  
Coverage/layer: 25%



**24" Unit**  
23.62 x 2.95 x 11.81"  
(600 x 75 x 300mm)  
Connector Type:  
Split tongue  
Setback: 0°, 3.5°, 7°  
Smooth on both faces  
Pieces/layer: 2  
Coverage/layer: 30%



**Coping Unit**  
23.62 x 2.95 x 13.38"  
(600 x 75 x 340mm)  
Smooth on both faces  
Pieces/layer: 2  
Coverage/layer: 67%

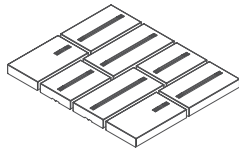


**End Coping Unit**  
23.62 x 2.95 x 13.38"  
(600 x 75 x 340mm)  
Smooth on both faces  
and one end  
Pieces/layer: 1  
Coverage/layer: 33%

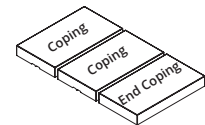
**Packaged with End Coping Unit**

**Packaged with Coping Units**

### Combo Bundle Layout by Layer



### Coping/End Coping Combo Bundle by Layer



## Ortana



CHAMPAGNE  
**NEW!**



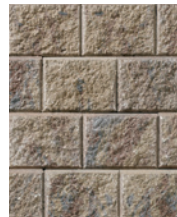
DESERT



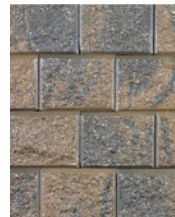
MARBLE GREY  
**NEW!**



ONYX



SANDALWOOD



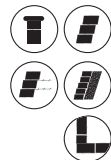
TIMBERWOOD



For right and left corner info,  
consult the Ortana product sheet  
available on our website.

**Scan to view!**

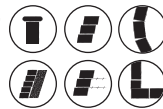
### STANDARD UNIT



**Standard Unit**  
7.87 x 5.91 x 11.81"  
(200 x 150 x 300mm)  
Connector Type:  
Split tongue  
Setback: 0°, 7°  
Split on front face

**Individually Packaged**

### TAPERED UNIT



**Tapered Unit**  
Front Width 7.87 x  
Back Width 5.91 x 5.91 x 11.81"  
(Front Width 200 x  
Back Width 150 x 150 x 300mm)  
Connector Type:  
Split tongue  
Setback: 0°, 7°  
Split on front face

**Individually Packaged**

### ACCESSORY UNITS



**90° Corner Unit**  
11.81 x 5.91 x 7.87"  
(300 x 150 x 200mm)  
Split on front face  
and one end

**Individually Packaged**



**2' Split-Face Coping Unit**  
24.02 x 2.95 x 11.81"  
(610 x 75 x 300mm)  
Split on front face

**Individually Packaged**



**1' Split-Face Coping Unit**  
12 x 2.95 x 11.81"  
(302 x 75 x 300mm)  
Split on front face

**Individually Packaged  
Not available in Onyx**



# Products

## Proterra™ Smooth



GREYFIELD  
Smooth



NATURAL  
Smooth

**Note:** Colored wall units also available as custom order. Minimum quantities apply.



For design, please reference the Proterra™ Wall Estimating Guide, available on our website.

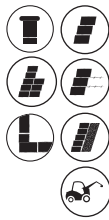
**Scan to view!**

### STANDARD UNIT (NON-STOCK)



**Standard Unit**  
39.37 x 7.28 x 14.76"  
(1000 x 185 x 375mm)  
Connector Type:  
Split tongue  
Setback: 0°, 8°, 16°  
Smooth on both faces

**Individually Packaged**

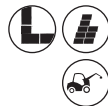


### DOUBLE UNIT (NON-STOCK)



**Double Unit**  
39.37 x 7.28 x 29.52"  
(1000 x 185 x 750mm)  
Connector Type:  
Split tongue  
Setback: 0°, 8°, 16°  
Smooth on one face,  
Split on one face

**Comes with one  
split-face Standard Unit**



### TRIPLE UNIT (NON-STOCK)



**Triple Unit**  
39.37 x 7.28 x 44.29"  
(1000 x 185 x 1125mm)  
Connector Type:  
Split tongue  
Setback: 0°, 8°, 16°  
Smooth on both faces

**Individually Packaged**



### ACCESSORY UNITS (NON-STOCK)



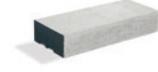
**Standard Corner Unit**  
39.37 x 7.28 x 14.76"  
(1000 x 185 x 375mm)  
Smooth on both faces  
and closed end

**Individually Packaged**



**Coping Corner/End Unit**  
39.37 x 7.28 x 16.92"  
(1000 x 185 x 430mm)  
Smooth on both faces  
and closed end

**Individually Packaged**



**Coping-Step Unit**  
39.37 x 7.28 x 16.92"  
(1000 x 185 x 430mm)  
Smooth on both faces

**Individually Packaged**

### Proterra™ Coping



Smooth Coping and Wall  
(Coping centers over wall)

# Products

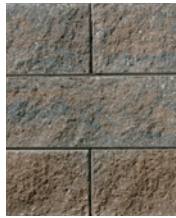
## Proterra™ Split



GREYFIELD  
Split

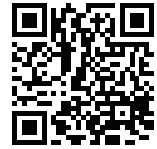


NATURAL  
Split



TIMBERWOOD  
Split

**Note:** Colored wall units also available as custom order. Minimum quantities apply.



For design, please reference the Proterra™ Wall Estimating Guide, available our website.

**Scan to view!**

### STANDARD UNIT (NON-STOCK)



#### Standard Unit

39.37 x 7.28 x 14.76"  
(1000 x 185 x 375mm)

Connector Type:

Split tongue

Setback: 0°, 8°, 16°

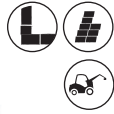
Two units Split on one face,

Smooth on one face

One unit Split on both faces

**Individually Packaged**

### DOUBLE UNIT (NON-STOCK)



#### Double Unit

39.37 x 7.28 x 29.52"  
(1000 x 185 x 750mm)

Connector Type:

Split tongue

Setback: 0°, 8°, 16°

Split on one face,

Smooth on one face

**Packaged with similar  
Standard Unit**

### ACCESSORY UNITS (NON-STOCK)



#### Standard Corner Unit

34.44 x 7.28 x 14.76"  
(875 x 185 x 375mm)

Split on front face and  
closed end

**Individually Packaged**



#### Coping Corner/End Unit

34.44 x 7.28 x 16.92"  
(875 x 185 x 430mm)

Split on front face and  
closed end

**Individually Packaged**



#### Coping-Step Unit

39.37 x 7.28 x 16.92"  
(1000 x 185 x 430mm)

Split on one face,  
Smooth on one face

**Individually Packaged**

### Proterra™ Coping

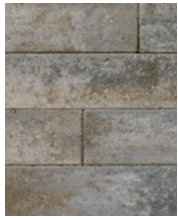


Split Coping and Wall  
(Coping overhangs one side)

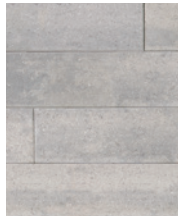
# Products

## Modan

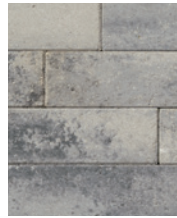
**NEW COLOR!**



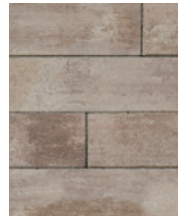
CHAMPAGNE



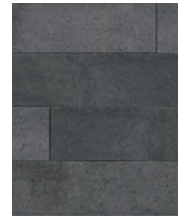
CLOUDBURST



MARBLE GREY



MILANO  
**NEW!**



TWILIGHT

### COMBO BUNDLE



**330 Unit**  
12.99 x 4.33 x 8.66"  
(330 x 110 x 220mm)  
Pieces/layer: 4  
Coverage/layer: 16.7%  
No Connector,  
glue required  
Setback: 0°  
Smooth on front face



**440 Unit**  
17.32 x 4.33 x 8.66"  
(440 x 110 x 220mm)  
Pieces/layer: 4  
Coverage/layer: 22.2%  
No Connector,  
glue required  
Setback: 0°  
Smooth on front face



**550 Unit**  
21.65 x 4.33 x 8.66"  
(550 x 110 x 220mm)  
Pieces/layer: 4  
Coverage/layer: 27.8%  
No Connector,  
glue required  
Setback: 0°  
Smooth on front face



**660 Unit**  
25.98 x 4.33 x 8.66"  
(660 x 110 x 220mm)  
Pieces/layer: 4  
Coverage/layer: 33.3%  
No Connector,  
glue required  
Setback: 0°  
Smooth on front face

### LINEAR UNIT



**Linear Unit**  
17.32 x 4.33 x 8.66"  
(440 x 110 x 220mm)  
No Connector,  
glue required  
Setback: 0°  
Smooth on front face  
**Individually Packaged**

\*Concrete adhesive is required between rows for optimum stability.

## Gardenia Linear



CHARTAN



GREYSTONE



SANDSTONE



For right and left corner info, consult the Gardenia product sheet available on our website.

**Scan to view!**

### LINEAR UNIT



**Linear Unit**  
23.62 x 5.91 x 7.87"  
(600 x 150 x 200mm)  
Connector Type: Rear lip  
Setback: 5°  
Split on front face

**Individually Packaged**

### 90° CORNER UNIT



**90° Corner Unit**  
11.81 x 5.91 x 7.87"  
(300 x 150 x 200mm)  
Connector Type: Rear lip  
Setback: 5°  
Split on front face and one end

**Individually Packaged**

STRENGTH & INTEGRITY

# Our guarantee.



Oaks Landscape Products are manufactured to the highest quality standards in a tightly controlled, fully monitored production environment. Oaks Landscape Products warrants the original property owner that the concrete product is free from material defects. Material found to be defective will be replaced without cost. Color matching cannot be guaranteed and replacement labor is not included. This assurance of quality is applicable where concrete products produced by Oaks Landscape Products are installed on the site and is subject to use under normal conditions.



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Scan to view limitations & exclusions.

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## Need additional product information?

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Architectural Masonry  
Product Guide





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BRAMPTON, ON L7A 1E9

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4200, MARCEL-LACASSE  
BOISBRIAND, QC J7H 1N3

**BROCKVILLE**

3007 COUNTY RD. #29, PO BOX 141  
BROCKVILLE, ON K6V 5V2

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1038 RIFE ROAD  
CAMBRIDGE, ON N1R 5S3

**HILLSDALE**

2108 FLOS ROAD FOUR EAST  
HILLSDALE, ON L0L 1V0

**MARKHAM**

455 RODICK ROAD  
MARKHAM, ON L6G 1B2



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updated throughout the year.  
**Scan for the latest version.**



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