UNILOCK®

COMMERCIAL CATALOG

Together, let's embark on a journey to transform our built environment and leave a legacy of thriving outdoor spaces. At Unilock, we embrace the power of partnership – a collaboration that extends through every phase of your project, from inception to installation.

It's through this true collaboration that we see the boundless potential to transform our world through design. Potential to protect our neighborhoods from flooding, enhance economic activity with complete streets, or turn underutilized space into rooftop amenities that bring people together.

With over 50 years of innovation and a robust collection of distinctive and sustainable hardscape solutions, Unilock enables you to unleash your creative spirit and craft outdoor spaces that inspire.

The places that **connect us.**

The places that **move us.**

The places that **enrich our lives and our world.**

UNILOCK® TRANSFORMING **HARDSCAPES**

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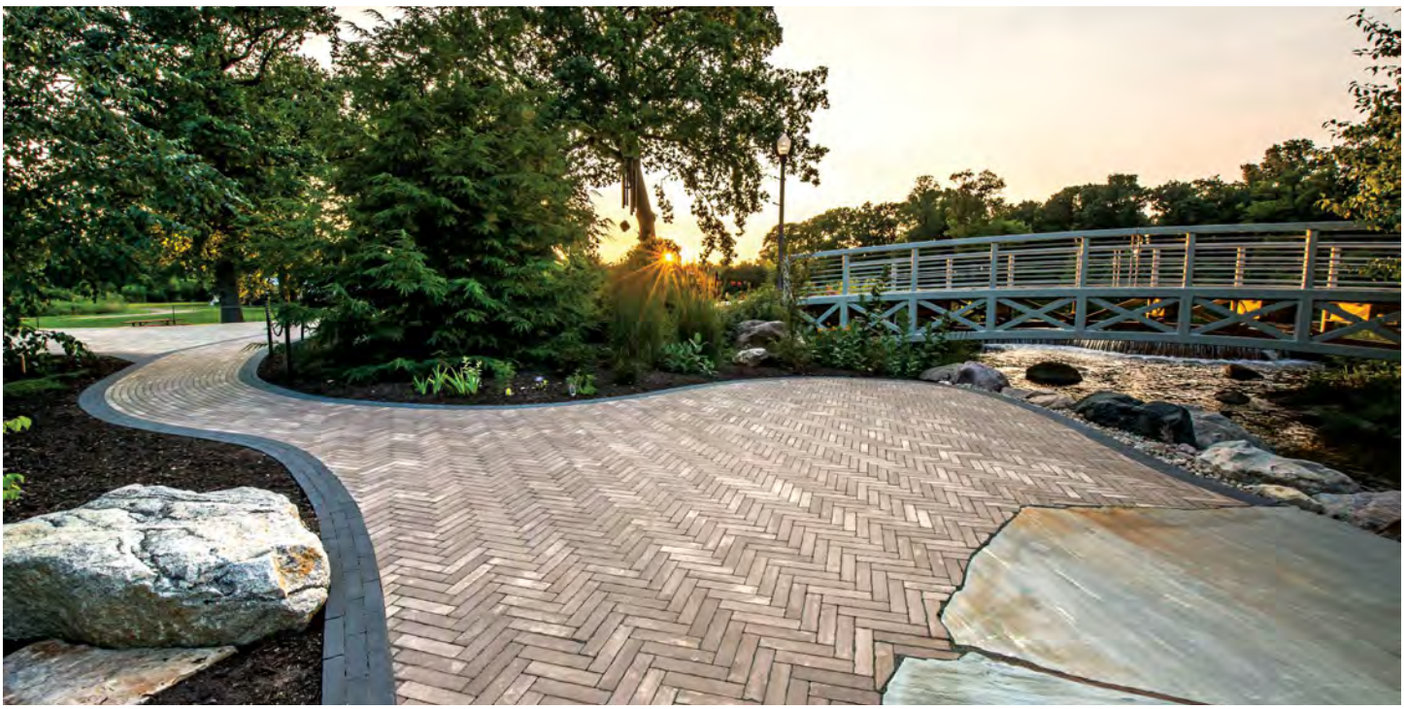
PROJECT: 465 N Park Roof Deck, Chicago, IL. **DESIGN:** Hitchcock Design Group. **PRODUCT:** Arcana™ (23⅞ x 23⅞") in Modena and Vivanto.

BE INSPIRED

PROJECT: The Dot, Ferndale, MI. **DESIGN:** Hagenbuch Weikal Landscape Arcitecture. **PRODUCT:** Promenade™ (4 x 16") with Smooth Premier finsh in Steel Blend and Opal Blend and Series™ finish in Black Granite.

BEAUTIFUL OUTDOOR SPACES designed by Landscape Architects, Architects and Engineers are brought to life with Unilock pavers and walls. Through creative reimagining of the built and natural environment, attractive, functional and sustainable outdoor spaces are created for communities all across North America.

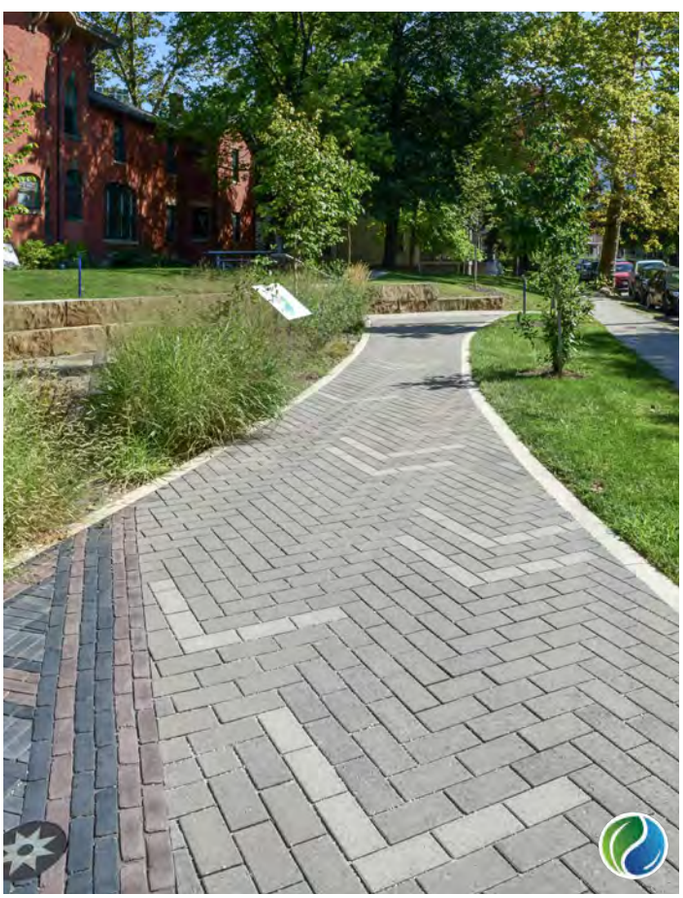


PROJECT: Wellfield Botanical Gardens, Elkhart, IN. **DESIGN:** Rustic Rocks. **PRODUCT:** Mattoni™ (2⅜ x 9½") in Sable Blend.

PROJECT: Western Michigan University, Kalamazoo, MI. **DESIGN:** Smith Group Ann Arbor. **PRODUCT:** Hex™ (7⅞ x 7⅞") with Umbriano® finish in French Grey and Winter Marvel.

PROJECT: 1036 W Fulton Roof Deck, Chicago, IL. **DESIGN:** Hartshorne Plunkard Architecture | Summit Design + Build. **PRODUCT:** Arcana™ (23⅞ x 23⅞") in Modena.

PROJECT: Village of Cassopolis Streetscape, Cassopolis, MI. **DESIGN:** Wightman and Associates. **PRODUCT:** Artline™ (7 Unit Random Bundle) with II Campo® finish in Granite and Smooth Premier finish in Opal, Steel Grey and Granite.



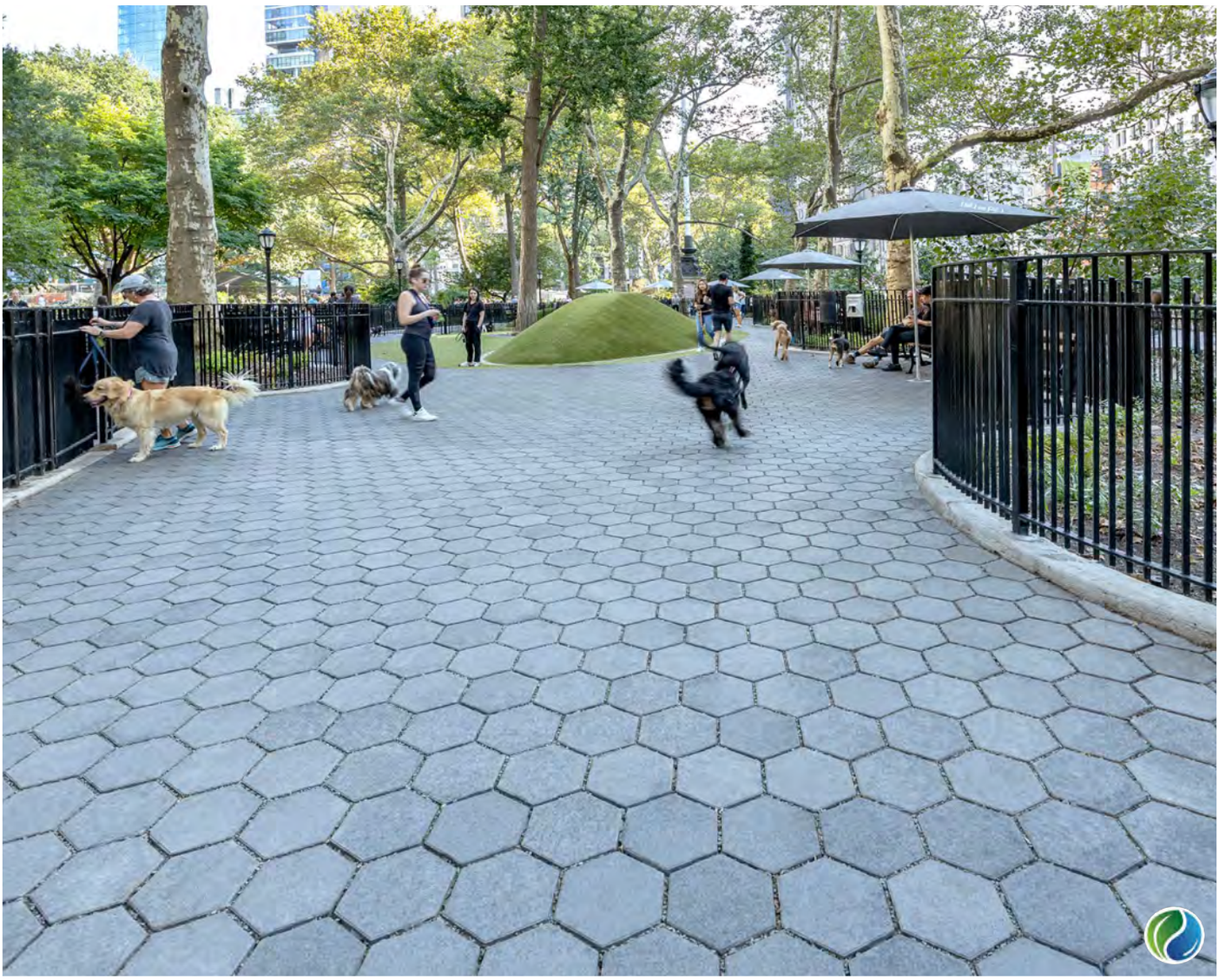
PROJECT: Cozad Bates House, Cleveland, OH. **DESIGN:** DERU Landscape Architecture. **PRODUCT:** Eco-Priora™ (5 x 10") in River Blend and Natural. Copthorne® (2⅝ x 7⅞") in Basalt, Burnt Clay and Steel Blue .

PROJECT: Frederik Meijer Gardens & Sculpture Park, Grand Rapids, MI. **DESIGN:** Todd Williams Billie Tsien & Progressive AE. **PRODUCT:** Promenade™ (4 x 16", 4 x 12" and 8 x 24") with Series™ finish in a custom color and Umbriano® finish in French Grey.

GEOMETRIC

PROJECT: Attleboro High School, Attleboro, MA. **DESIGN:** Kaestle Boos Associates. **PRODUCT:** Promenade™ (6 x 12") with Umbriano® finish in French Grey, Winter Marvel and Midnight Sky.

GEOMETRIC DESIGN has roots in prehistoric and early modern art and is currently on-trend. Patterning used with standard shapes such as squares, hexagons and rectangles can deliver strong geometric execution, achieving a truly unique design.



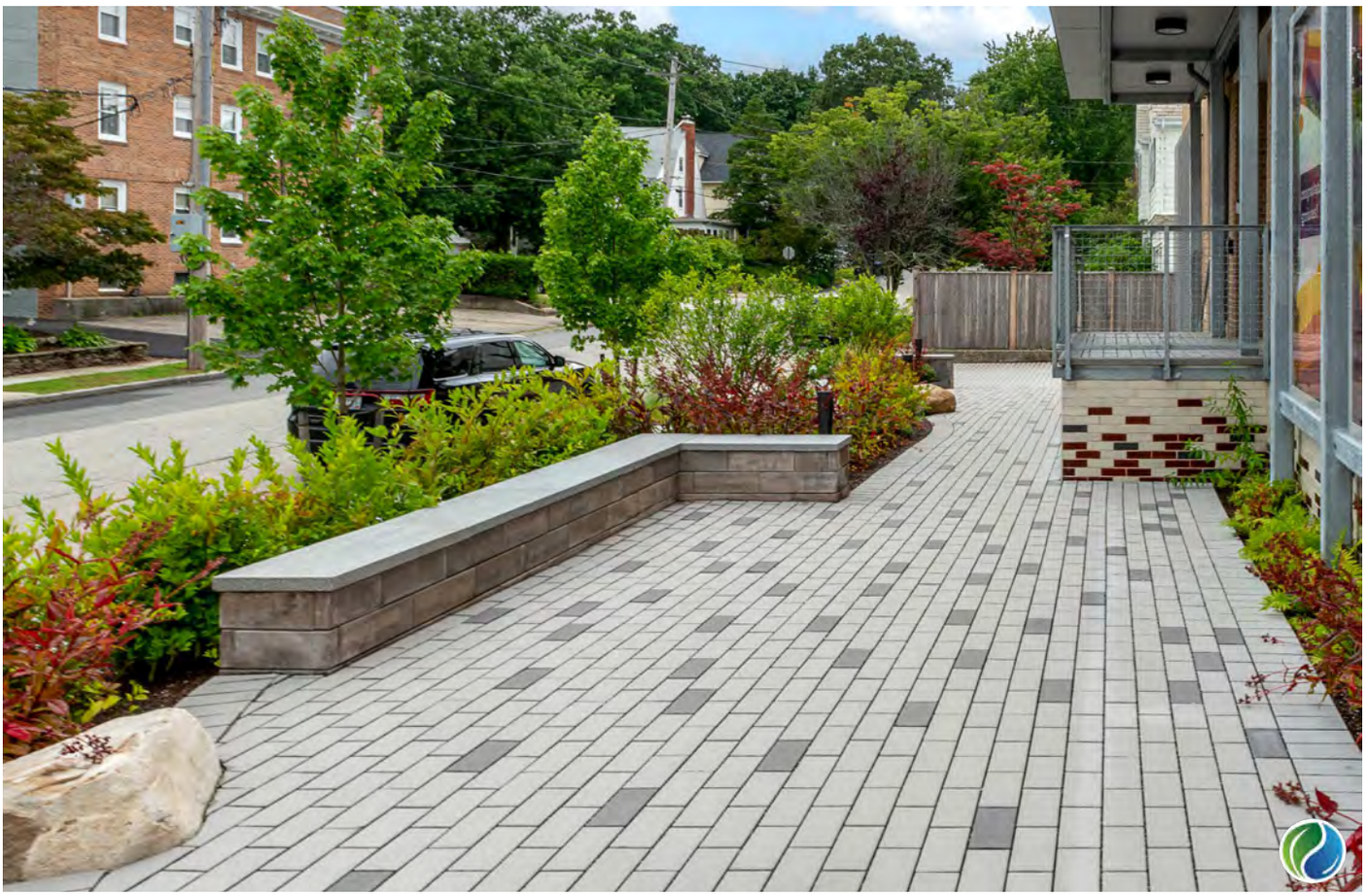
PROJECT: Jemmy's Dog Run - Madison Square Park, New York, NY. **DESIGN:** SWA / Balsley - New York. **PRODUCT:** Eco-Hex™ (7⅞ x 7⅞") with Umbriano® finish in Midnight Sky.

PROJECT: Bagley Mobility Hub, Detroit, MI. **DESIGN:** Giffels Webster Engineers. **PRODUCT:** Eco-Promenade® (3 x 12") with Smooth Premier finish in Opal Blend and Steel Grey and II Campo® finish in Granite.

PROJECT: Stone Lake Beach, Cassopolis, MI. **DESIGN**: Wightman and Associates. **PRODUCT:** Promenade™ (4 x 12", 4 x 16" and 8 x 24") with Il Campo®, Smooth Premier and Series™ finishes.

PROJECT: Bower Condos, Oakville, ON. **DESIGN:** NAK Design Strategies. **PRODUCT:** Hex™ (7⅞ x 7⅞") with Series™ finish in Black Granite and Glacier. **PHOTO CREDIT:** Adrian Stiles Photography.

PROJECT: Edge on Hudson, Westchester, NY. **DESIGN:** Nelson Byrd Woltz. **PRODUCT:** Hex™ (7⅞ x 7⅞") with Revela™ finish in Natural.



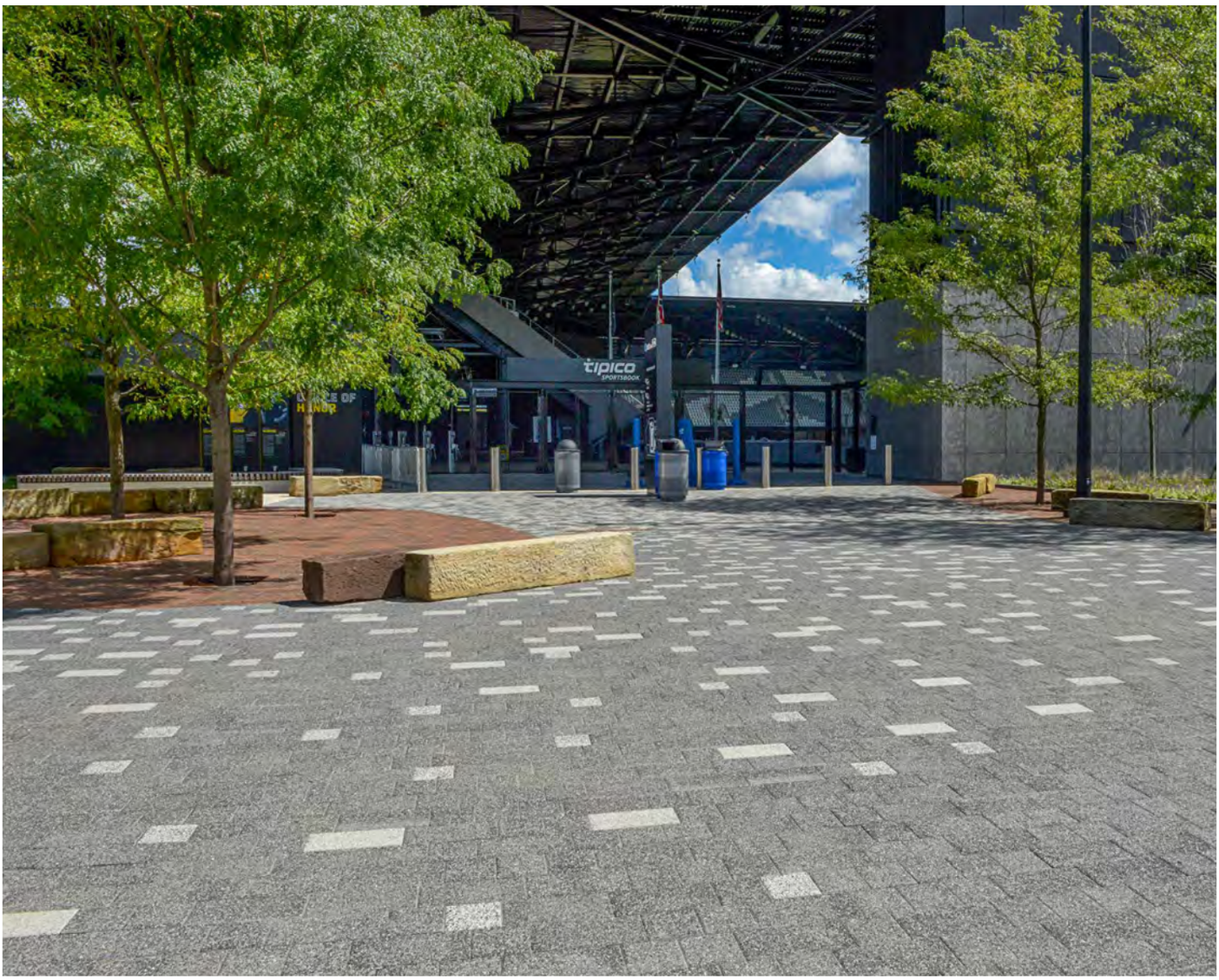
PROJECT: School One, Providence, RI. **DESIGN:** Anjali Joshi Landscape Architect. **PRODUCT:** Eco-Priora® (5 x 10") with Smooth Premier finish in Opal and Steel Grey.

PROJECT: Boynton Yards, Somerville, MA. **DESIGN:** Copley Wolff Design Group.
PRODUCT: Promenade™ (8 x 24") with Umbriano® finish in French Grey, Grenada White and Winter Marvel.

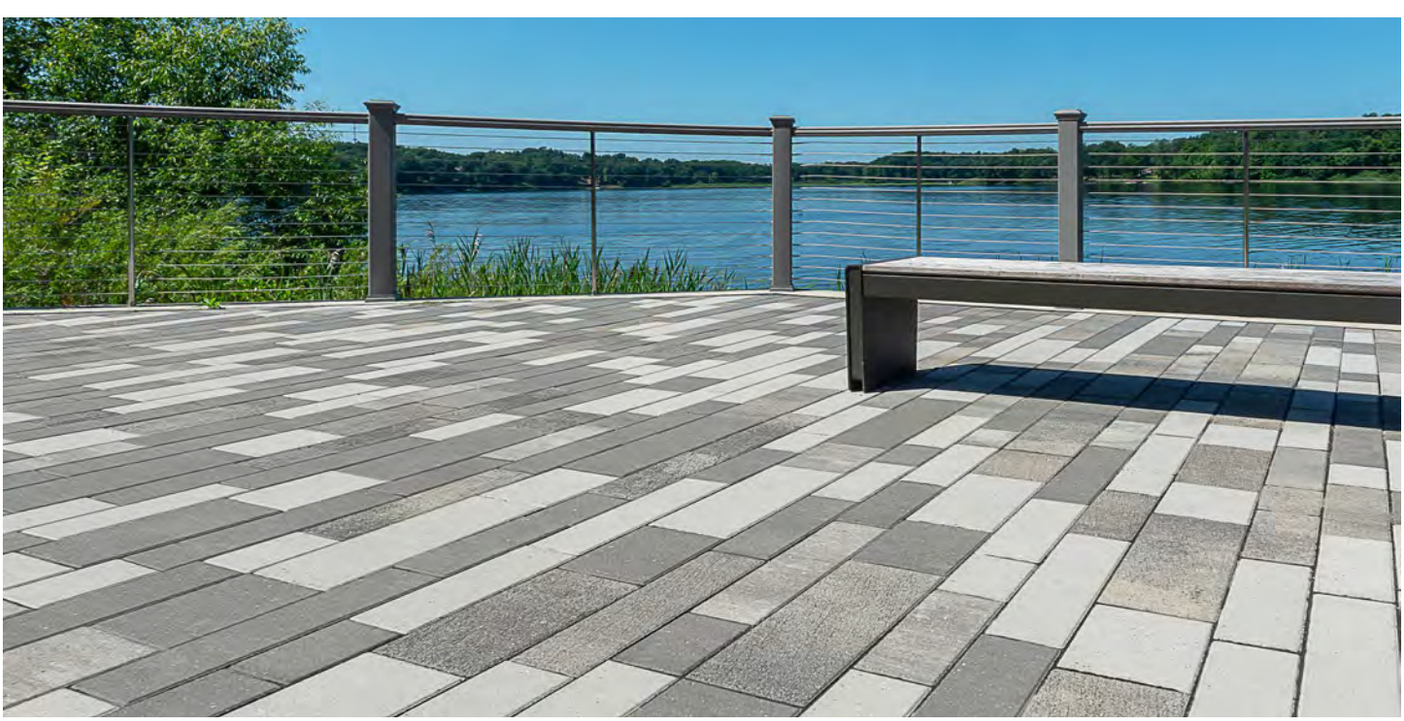
PROJECT: Boston Arts Academy, Boston, MA. **DESIGN:** Warner Larson Landscape Architect.
PRODUCT: Promenade™ (4 x 16") with Smooth Premier finish and (4 x 12") with Il Campo® and Series™ finishes.

PROJECT: Blossom Heath Park, St.Clair Shores, MI. **DESIGN:** Environmental Consulting & Technologies. **PRODUCT:** Hex™ (7⅞ x 7⅞") in Granite and Promenade™ (8 x 24") with II Campo® finish in Granite.

PROJECT: Bagley Mobility Hub, Detroit, MI. **DESIGN:** Giffels Webster Engineers. **PRODUCT:** Eco-Promenade® (3 x 12") with II Campo® finish in Granite and Smooth Premier finish in Opal Blend and Steel Grey.

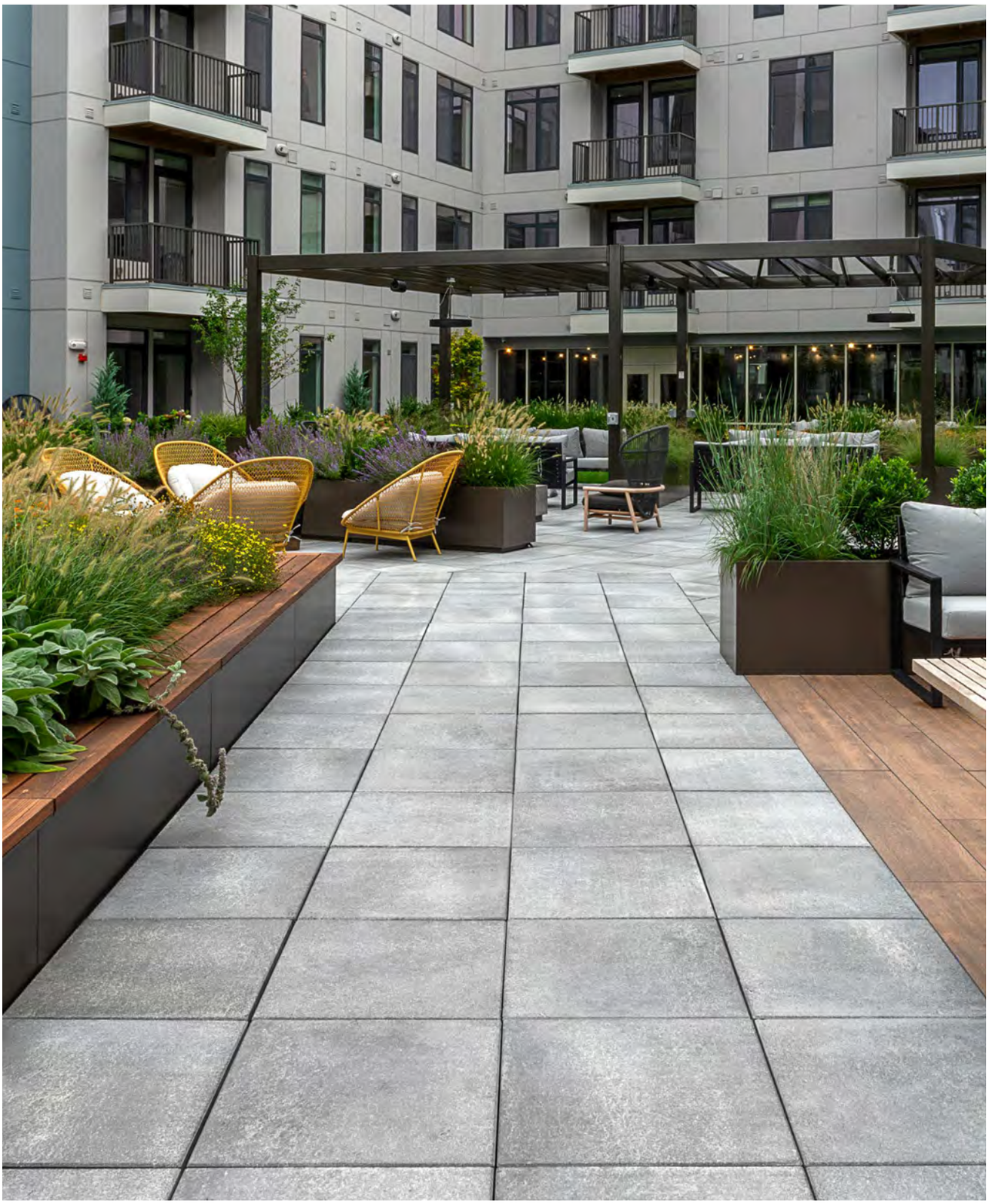


PROJECT: Lower.com Field, Columbus, OH. **DESIGN:** MKSK Columbus. **PRODUCT:** Series™ (6 x 12") in Arctic Grey, Mineral Ice and Nordic Star and (6x6" and 6x24") in Arctic Grey.



PROJECT: Village of Cassopolis Streetscape, Cassopolis, MI. **DESIGN:** Wightman and Associates. **PRODUCT:** Artline™ (7 Unit Random Bundle) with II Campo® finish in Granite and Smooth Premier finish in Opal, Steel Grey and Granite.

CONTEMPORARY

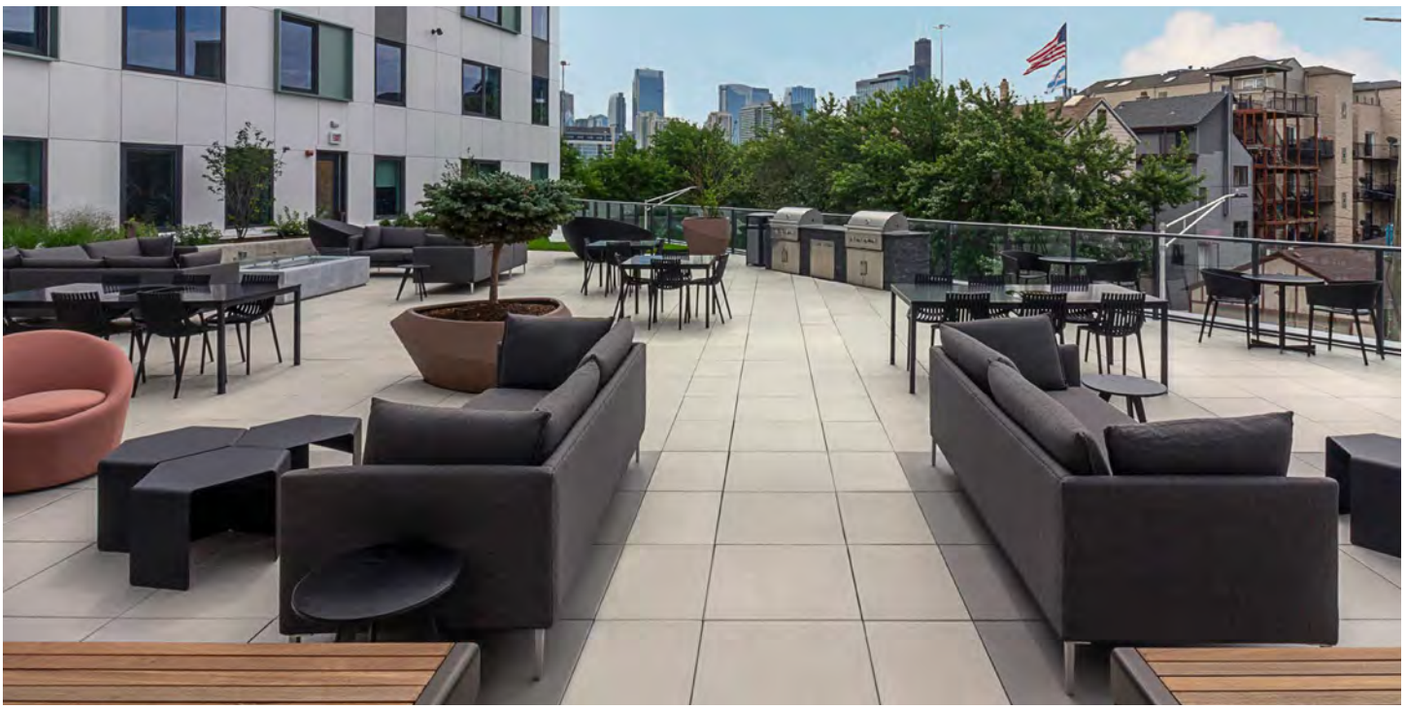


PROJECT: 57 Alexander Yonkers Roof Deck, Yonkers, NY. **DESIGN:** Perkins Eastman. **PRODUCT:** Skyline™ (23⅝ x 23⅝") with Umbriano® finish in French Grey.

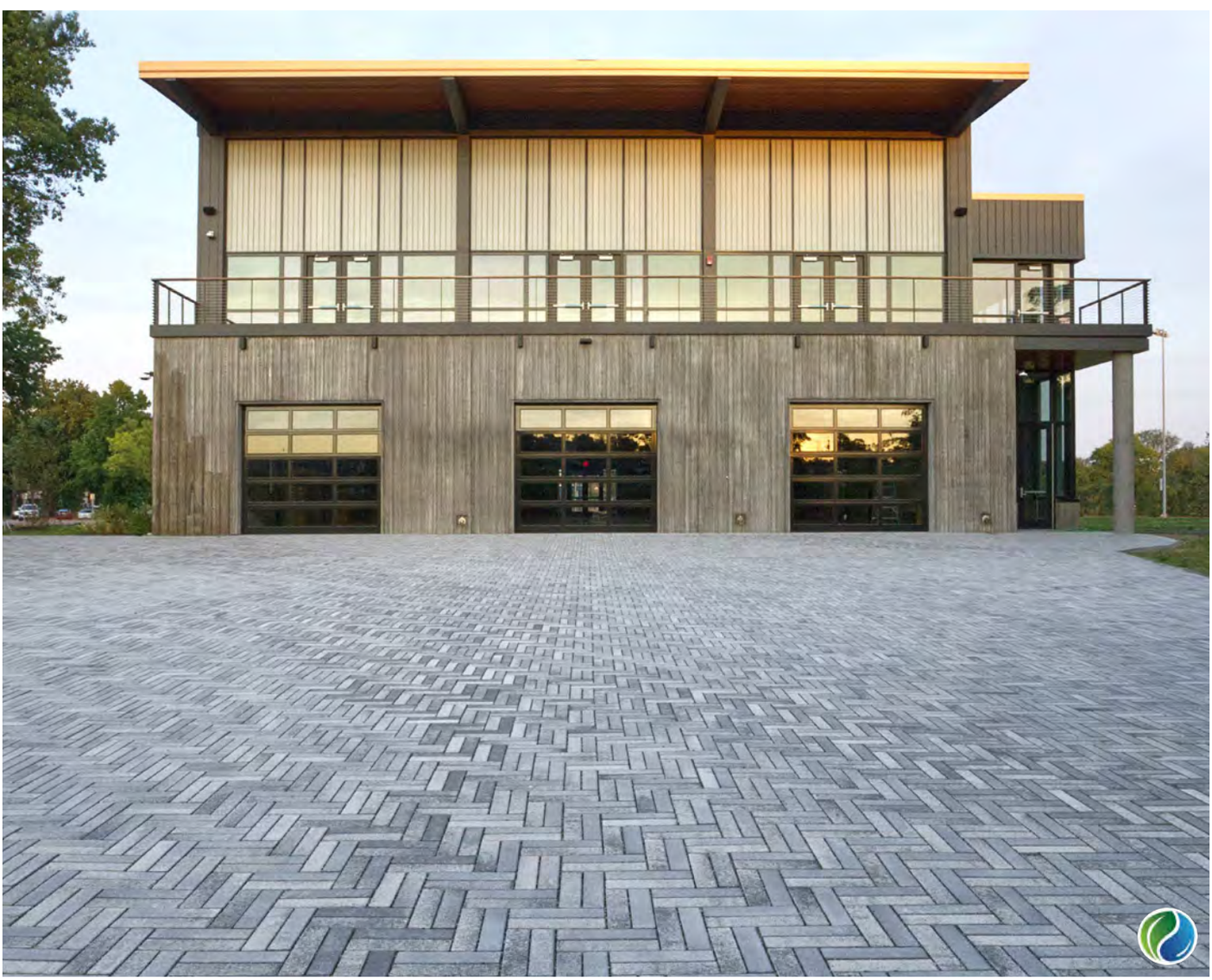
CLEAN, UNCLUTTERED LINES are the foundation for a contemporary project. Often achieved with large format slabs and pavers, the unique and modern finishes of Unilock products allow smaller format pavers to create distinctive, modern landscapes.

PROJECT: MLK Justice Plaza, Newark, NJ. **DESIGN:** Barreto/Dowd Landscape Arcitecture | Comito Associates. **PRODUCT:** Umbriano® (12 x 24") in Winter Marvel and French Grey.

PROJECT: Park Avenue Place Condos, Vaughan, ON. **DESIGN:** Graziani + Corazza Architects, Solmar Development Corp and STUDIO TLA. **PRODUCT:** Richcliff® (8⅞ x 11⅞") in Smoke Shale.
PHOTO CREDIT: Adrian Stiles Photography.



PROJECT: Inspire West Town, Chicago, IL. **DESIGN:** Juli Ordower Landscape Architecture. **PRODUCT:** Arcana™ (23⅞ x 23⅞") in Modena and Corvara.

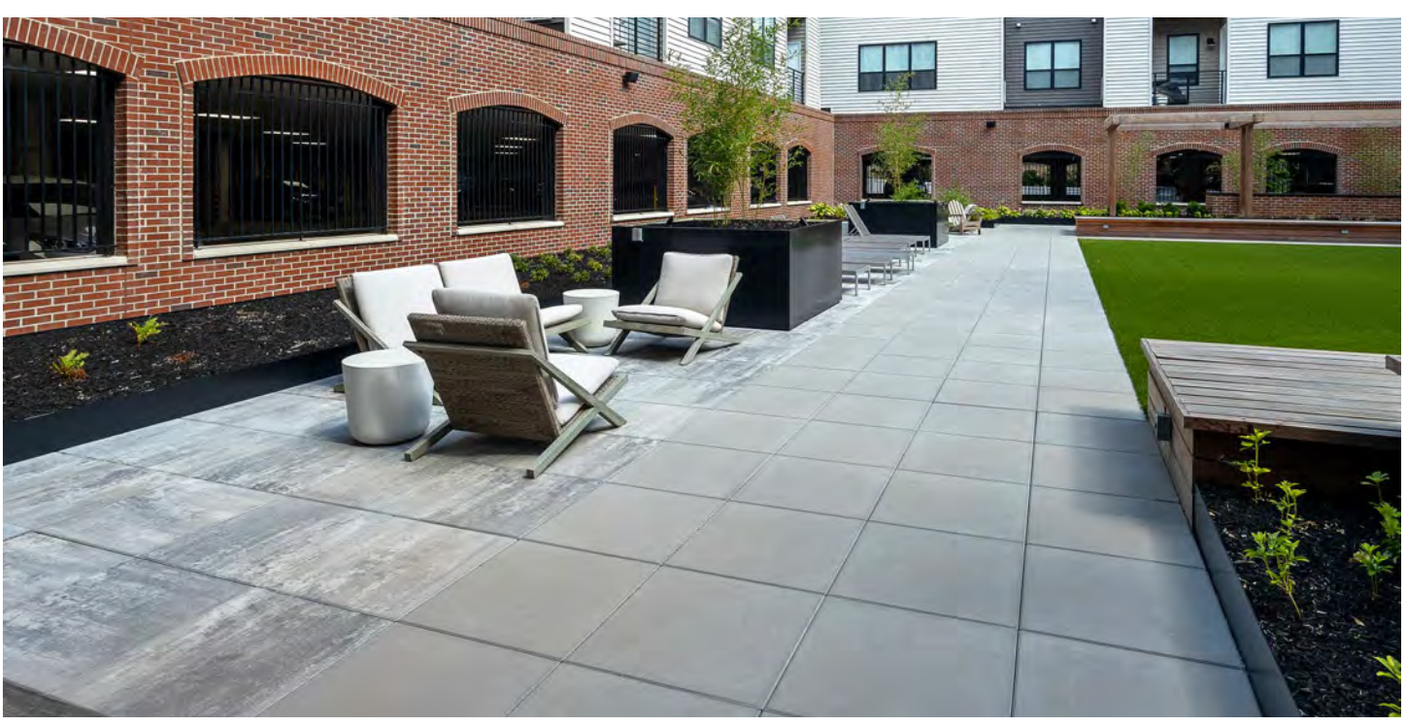


PROJECT: Bergen County Rowing Center, North Arlington, NJ. **DESIGN:** Clarke Caton Hintz. **PRODUCT:** Eco-Promenade® (3 x 12") with Umbriano® finish in French Grey and Winter Marvel.

PROJECT: Onni Fulton Market, Chicago, IL. **DESIGN:** Daniel Weinbach & Partners, LTD. **PRODUCT:** Beacon Hill™ Smooth XL (22½ x 37½") in Opal.

PROJECT: JR Green Lofts, Covington, KY. **DESIGN:** Bayer Becker. **PRODUCT:** Skyline™ (23⅝ x 23⅝") with Smooth Premier finish in Silver Grey and U-Cara® with Umbriano® finish fascia panels in Midnight Sky.

PROJECT: MLK Justice Plaza, Newark, NJ. **DESIGN:** Barreto/Dowd Lardscape Architecture | Comito Associates. **PRODUCT:** Umbriano® (12 x 24") in Winter Marvel.



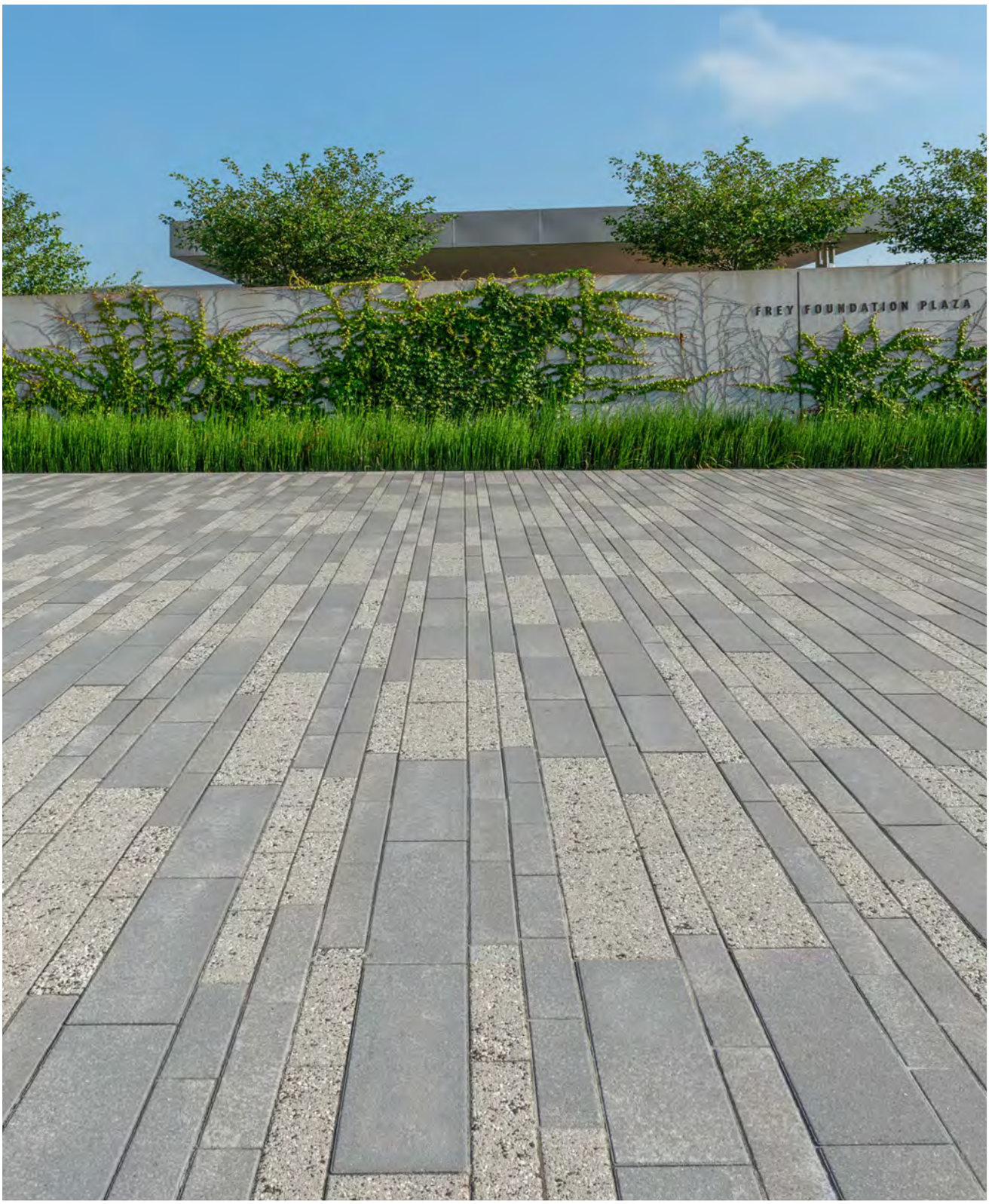
PROJECT: Citizen Linden, Linden, NJ. **DESIGN:** Bowman Consulting. **PRODUCT:** Skyline™ (23⅝ x 23⅝") with Smooth Premier finish in Steel Mountain and Natural.

PROJECT: Private Office Complex, Johnston, RI. **DESIGN:** IBI Placemaking. **PRODUCT:** Umbriano® (21 x 35") in Summer Wheat.

PROJECT: Suburban Square, Arcmore, PA. **DESIGN:** Mahan Rykiel Associates. **PRODUCT:** Umbriano® (12 x 24") in Winter Marvel.

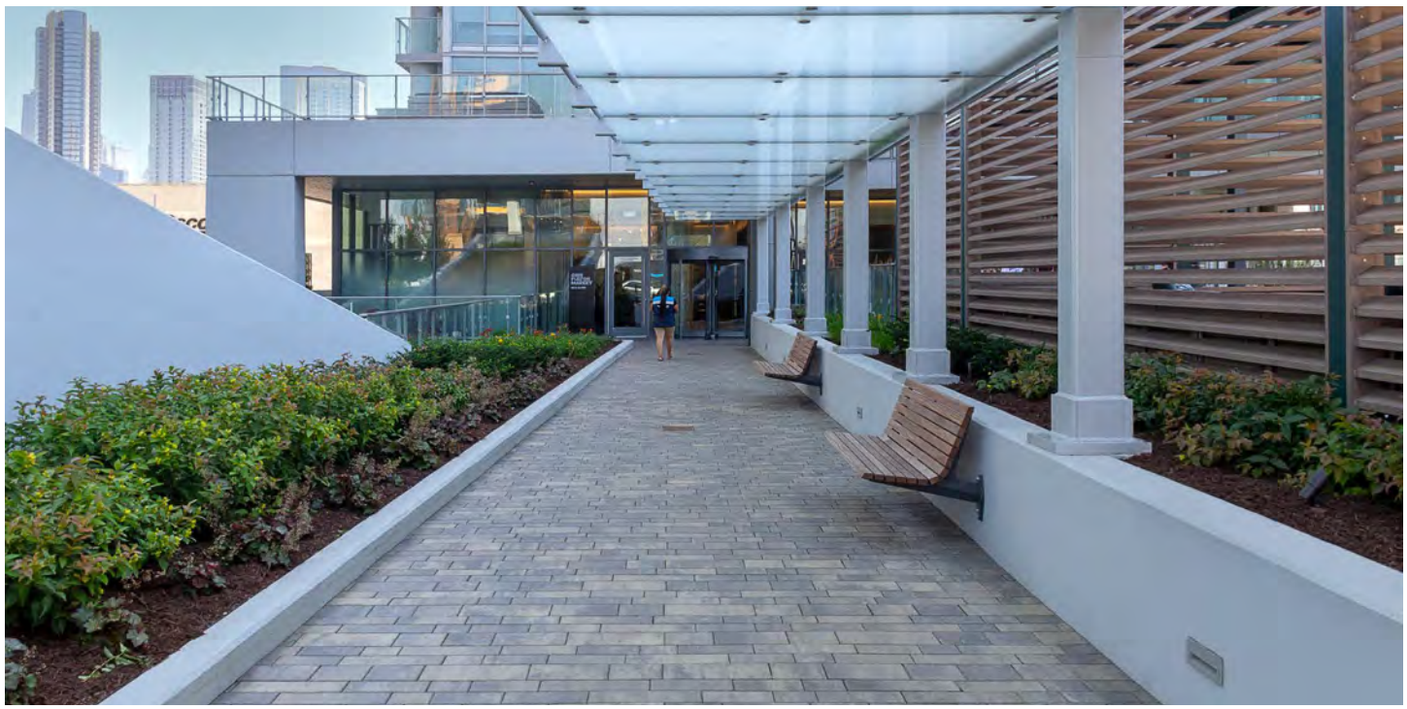
PROJECT: Avani 2 Condo, Scarborough, ON. **DESIGN:** Studio TLA. **PRODUCT:** Series™ (8 x 16") in Ice Grey and Mountain Mist, Series™ (8 x 8") in Ice Grey and Il Campo® (4 x 8") in Dark Charcoal.

LINEAR



PROJECT: Frederik Meijer Gardens & Sculpture Park, Grand Rapids, MI. **DESIGN:** Todd Williams Billie Tsien & Progressive AE. **PRODUCT:** Promenade™ (4 x 16", 4 x 12" and 8 x 24") with Series™ finish in a custom color and Umbriano® finish in French Grey.

LINEAR, PLANK PAVING DESIGN provides creative and unique design opportunities. Whether directing the flow of traffic or creating a dramatic destination, Unilock offers an extensive range of sizes along with unique finishes to ensure your design vision is achieved.



PROJECT: Onni Fulton Market, Chicago, IL. **DESIGN:** Daniel Weinbach & Partners, LTD. **PRODUCT:** Artline™ (7 Unit Random Bundle) with Smooth Premier finish in Steel Mountain.

PROJECT: Islington Golf Club - Club House Patio, Toronto, ON. **DESIGN:** Schollen & Company Inc. **PRODUCT:** Umbriano® (Random Bundle) in French Grey, Promenade™ (4 x 16") with Smooth Premier finish in Opal Blend, (4 x 12") in Steel Grey Blend and (8 x 24") with Series™ finish in Black Granite. **PHOTO CREDIT:** Adrian Stiles Photography.

PROJECT: Plage urbaine de Verdun, Montréal, QC. **DESIGN:** WAA Montréal. **PRODUCT:** Promenade™ (4 x 12" and 8 x 24") with Series™, Smooth Premier and II Campo® finishes.

PROJECT: University of Pittsburgh, Pittsburgh, PA. **DESIGN:** LaQuatra Bonci Associates. **PRODUCT:** Promenade™ (3 x 12") with Series™ finish in Mocha and Smooth Premier finish in custom colors.

PROJECT: Brush Park, Detroit, MI. **DESIGN:** Hamilton Anderson Associates. **PRODUCT:** Promenade™ (4 x 16") with Umbriano® finish in Winter Marvel.

PROJECT: DAV National Headquarters, Erlanger, KY. **DESIGN**: Bayer Becker. **PRODUCT:** Promenade™ (4 x 12") with Smooth Premier finish in Dark Charcoal.

PROJECT: West Eau Claire Park, Calgary, AB. **DESIGN:** 02 Planning + Design Inc. **PRODUCT:** Promenade™ (12 x 24") with Smooth Premier finish in Opal Blend and Steel Grey, II Campo® finish in Dark Charcoal and Granite and Promenade™ (8 x 24") with Smooth Premier finish in Opal Blend.

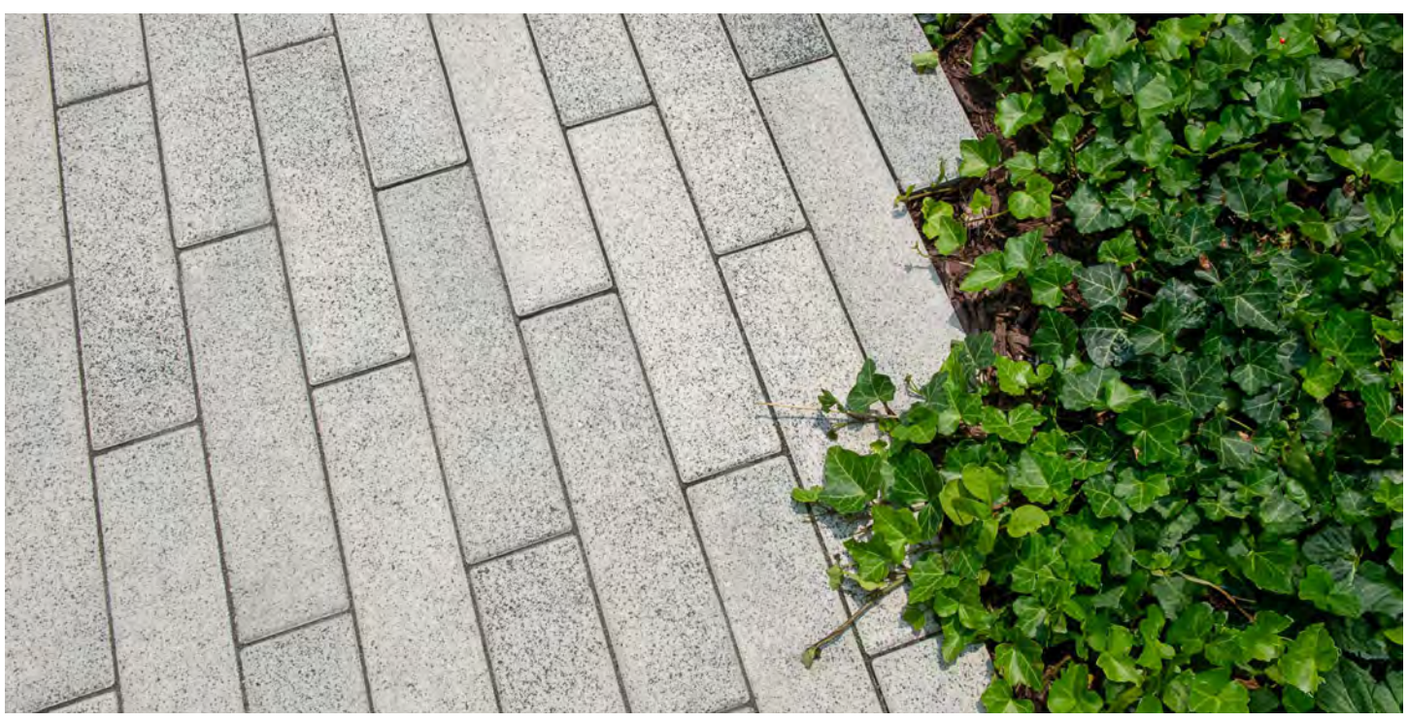
PROJECT: Court Street Plaza, Cinncinati, OH. **DESIGN:** Human Nature Inc.
PRODUCT: Eco-Promenade® (4 x 16") with Smooth Premier finish and Courtstone®.

PROJECT: 300 Third Ave, Waltham, MA. **DESIGN:** Paul Finger Asssociates.
PRODUCT: Umbriano® (8 x 16") in French Grey.

PROJECT: Grafton Lumberyard, Grafton, WI. **DESIGN:** Breckenridge Landscape. **PRODUCT:** Eco-Promenade® (3 x 12") in Granite Blend and Estate Wall™ in Sierra.

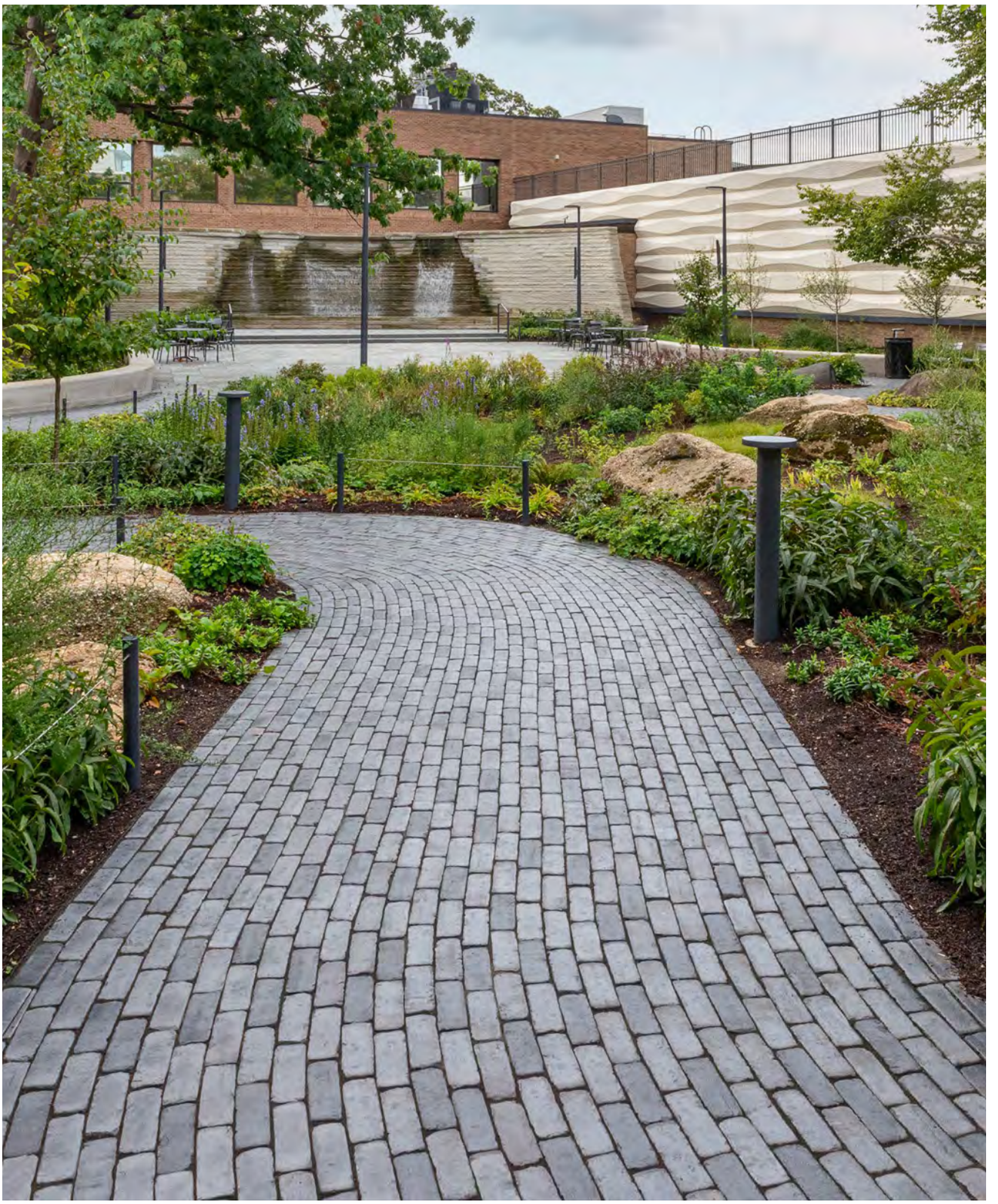
PROJECT: Place des Arts, Quartier des spectacles, Montreal, QC. **DESIGN:** Vlan Paysages. **PRODUCT:** Promenade™ (8 x 24" and 4 x 16") with Smooth Premier finish in Granite.

PROJECT: Bridgewater, Burlington, ON. **DESIGN:** 02 Planning Toronto (NAK Design Group). **PRODUCT:** Promenade™ (4x12") with Il Campo® finish in Granite and Umbriano® (12x24") in Midnight Sky.
PHOTO CREDIT: Adrian Stiles Photography.



PROJECT: Brush Park, Detroit, MI. **DESIGN:** Hamilton Anderson Associates. **PRODUCT:** Promenade™ (4 x 16") with Umbriano® finish in Winter Marvel.

HISTORIC



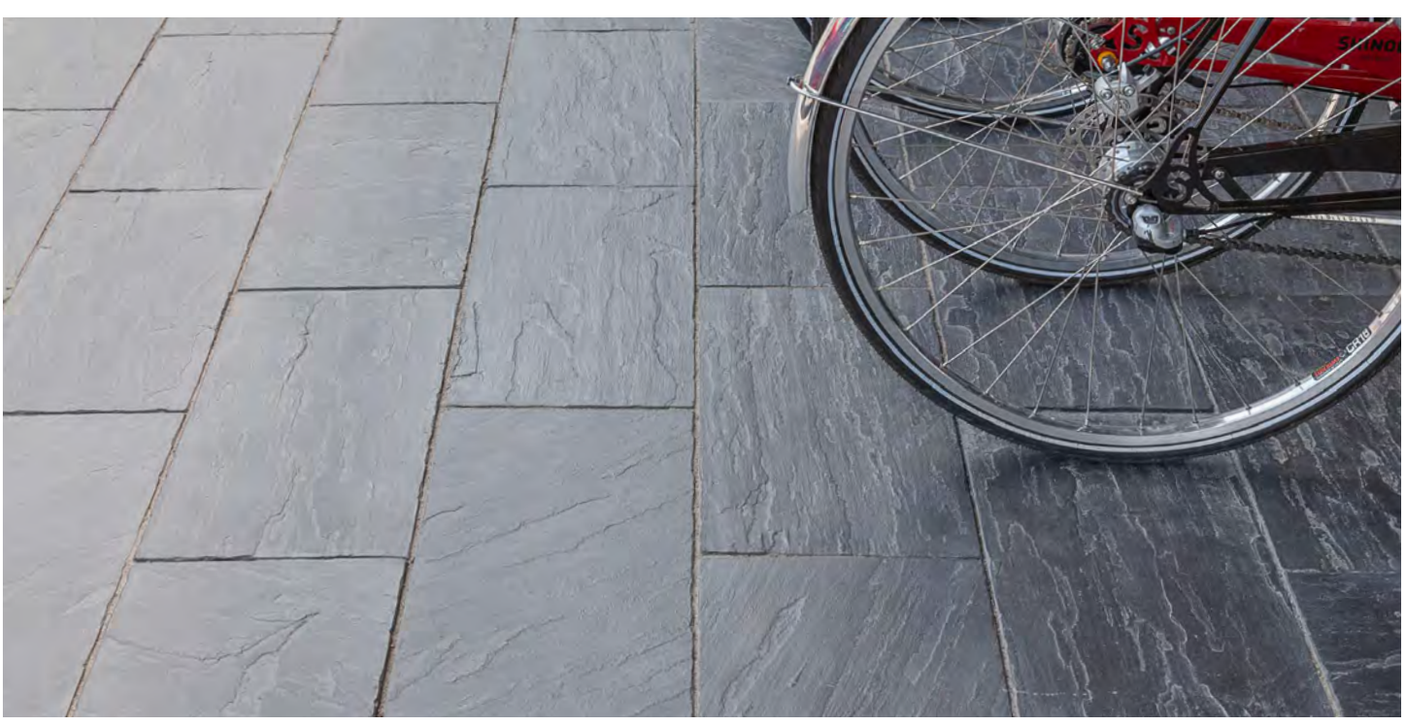
PROJECT: Cleveland Museum of Natural History, Cleveland, OH. **DESIGN:** Pashek + MTR. **PRODUCT:** Copthorne® (2⅝ x 7⅞") in Basalt and Steel Blue.

DESIGN HAS EVOLVED through the ages but sometimes the right style is not the most recent. From old-world cobblestones to historic brick-style street pavers, Unilock offers authentic surface textures, colors and the assurance of the latest technology to deliver durable long-lasting products for your designs.

PROJECT: Court Street Plaza, Cinncinati, OH. **DESIGN:** Human Nature Inc. **PRODUCT:** Courtstone® in Belgian Blue.

PROJECT: Newton Streetscape, Newton, NC. **DESIGN:** Allison Platt and Associates. **PRODUCT:** Richcliff® (Random Bundle) in Dawn Mist and Town Hall® (3⅜ x 9⅞") in Burgundy Red and Burnt Clay.

PROJECT: Riverside Downtown Train Station, Riverside, IL. **DESIGN:** Christopher B Burke Engineering Ltd. **PRODUCT:** Town Hall® (3⅞ x 9⅞") in Burgundy Red, Old Oak and Burnt Clay.



PROJECT: Shinola Hotel, Detroit, MI. **DESIGN:** Mannik & Smith Group. **PRODUCT:** Richcliff® (8⅞ x 11⅞") in Smoke Shale.

PROJECT: Riley Park, Bradley Beach, NJ. **DESIGN:** Leon S Avakian Inc. **PRODUCT:** Copthorne® (2⅝ x 7⅞") in Burgundy Red, Burnt Clay, Old Oak and Basalt.

PROJECT: Miss Porter's School - Admissions Building, Farmington, CT. **DESIGN:** The Berkshire Design Group Inc. **PRODUCT:** Town Hall® (3⅞ x 9⅞") in Burgundy Red and Old Oak and Rivercrest® Wall in Costal Slate.

PROJECT: Avalon Somerville Station, Somerville, NJ. **DESIGN**: Melillo Bauer Carmen | Landscape Architects. **PRODUCT:** Town Hall® (3⅜ x 9⅞") in Basalt and Burnt Clay.

PROJECT: Mt. Kisco Streetscape, Westchester County, NY. **DESIGN:** Kellard Sessions Consulting. **PRODUCT:** Richcliff® (Random Bundle) in Dawn Mist and Pebble Taupe and Town Hall® (3⅜ x 9⅞") in Basalt.

PROJECT: Newton Streetscape, Newton, NC. **DESIGN:** Allison Platt and Associates.
PRODUCT: Richcliff® in Dawn Mist and Town Hall® (3⅜ x 9⅞") in Burgundy Red and Burnt Clay.

PROJECT: Adachi Resturant, Birmingham, MI. **DESIGN:** Michael J Dul & Associates.
PRODUCT: Copthorne® (2⅝ x 7⅞") in Basalt.

TRADITIONAL

PROJECT: U of M Alexander G. Ruthven Building, Ann Arbor, MI. **DESIGN:** Beckett & Reader. **PRODUCT:** Eco-Priora™ (5 x 10") with Smooth Premier finish in Heritage Brown.

THERE ARE MANY INTERPRETATIONS of traditional paving design from formal to rustic. Explore possibilities in this expansive style from standard brick pavers to natural stone, smooth surfaces or riven flagstone. Whether your preference is simple rectangle or multi-unit random collections, there are many product styles to consider for your traditional design.

PROJECT: Princeton Witherspoon Streetscape, Princeton, NJ. **DESIGN:** T&M Associates. **PRODUCT:** Hollandstone (4 x 8") with Umbriano® finish in Midnight Sky.

PROJECT: YMCA, Sheboygan, WI. **DESIGN:** Greenscape. **PRODUCT:** Brussels Block® (4⅛ x 6⅞", 6⅞ x 8¼" and 8¼ x 13¾") in Coffee Creek.

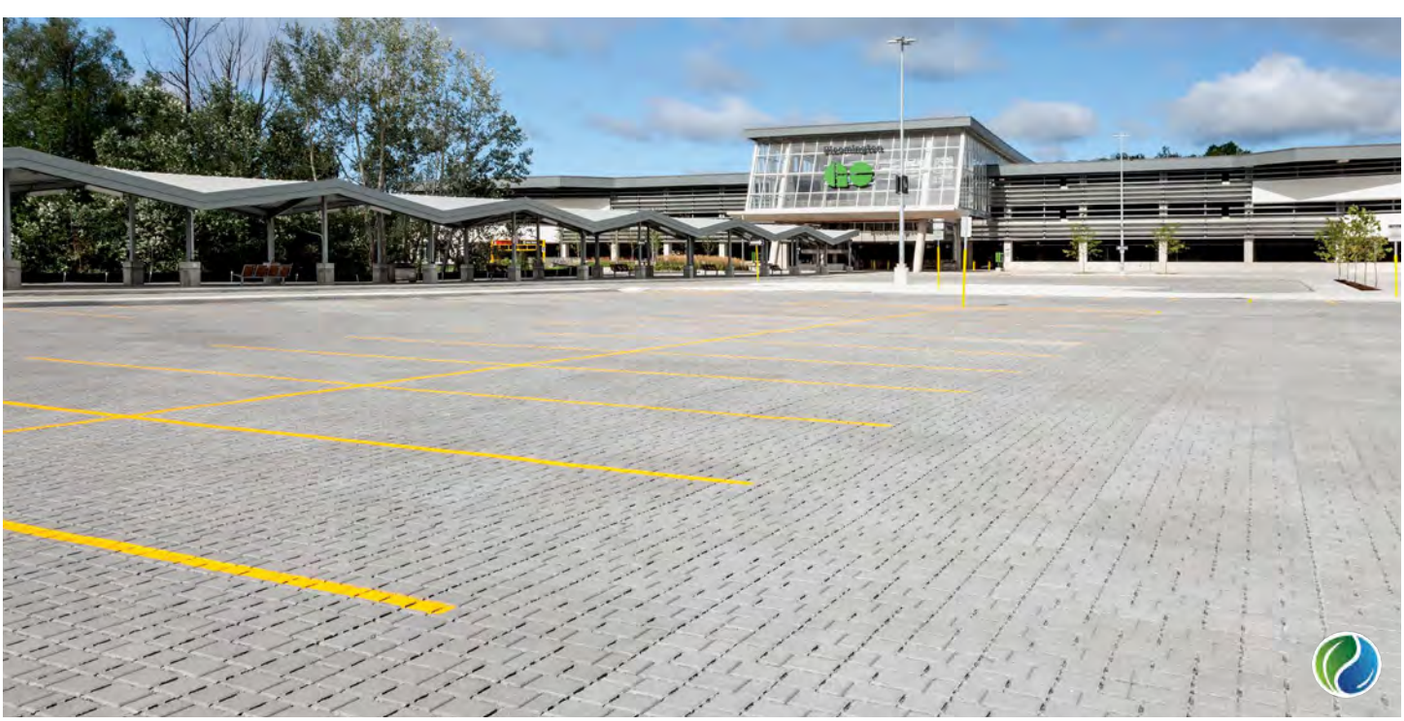
PROJECT: Village of Kenilworth, Kenilworth, IL. **DESIGN:** Village of Kenilworth. **PRODUCT:** Eco-Optiloc® (9⅞ x 9⅞") with Series™ finish in Nordic Star.

PROJECT: Stone Creek Blvd Roundabout, Cincinnati, OH. **DESIGN:** Decorative Paving Co.
PRODUCT: Tribeca Cobble™ (Random Bundle) in Crystalline Basalt.

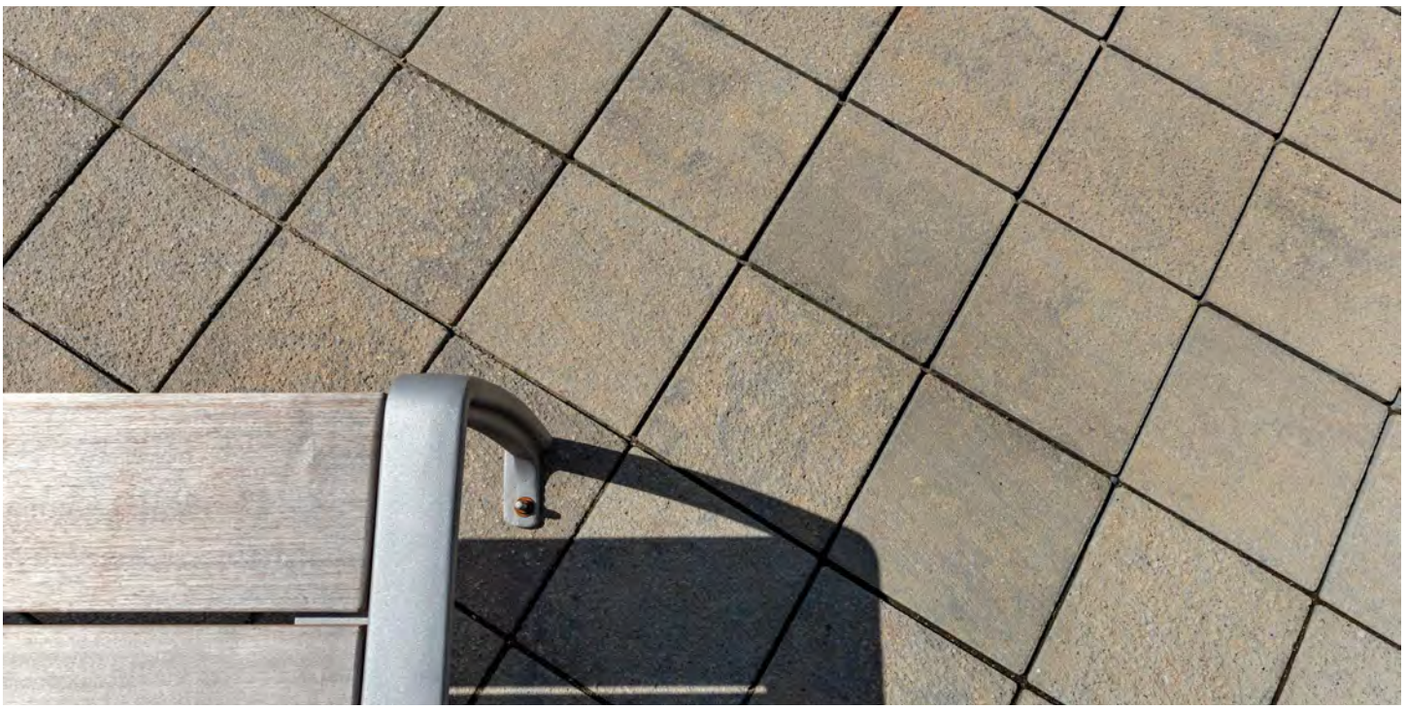
PROJECT: St. Vitus Parish, Cleveland, OH. **DESIGN:** The Riverstone Company.
PRODUCT: Eco-Priora™ (5 x 10") with Classic finish in Rustic Red and Natural.

PROJECT: Unionville Gardens, Markham, ON. **DESIGN:** SBK (Strybos Barron King). **PRODUCT:** Artline™ (7 Unit Random Bundle) in Sunset Fusion and Sycamor Fusion and Umbriano® (8 x 16" and 7 x 14") in French Grey and Midnight Sky. **PHOTO CREDIT:** Adrian Stiles Photography.

PROJECT: 616 Lofts on Monroe, Grand Rapids, MI. **DESIGN:** Integrated Architecture. **PRODUCT:** Il Campo® (4 x 12", 6 x 8" and 12 x 12") in Granite Blend.



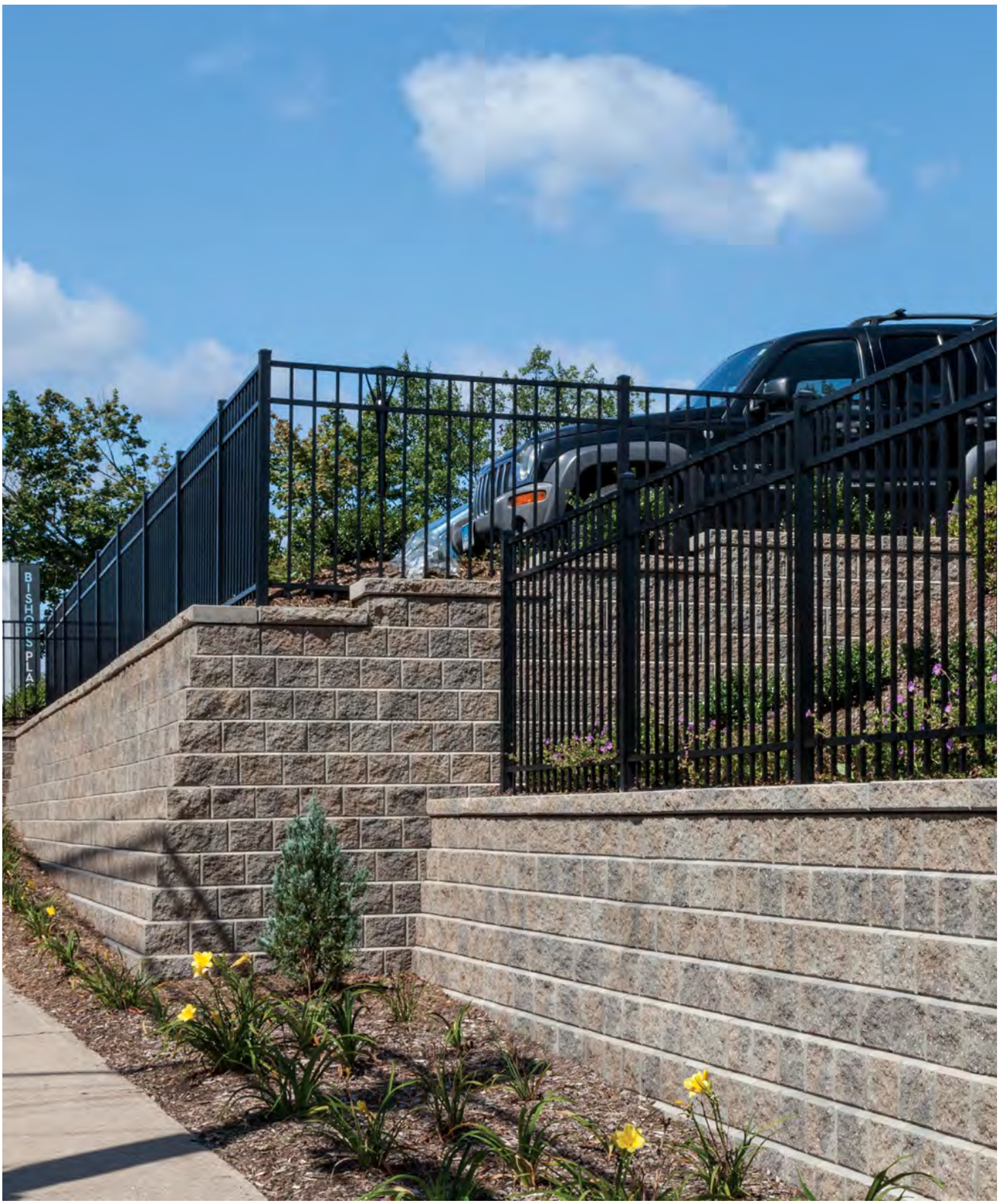
PROJECT: Bloomington Go Station, Richmond Hill, ON. **DESIGN:** IBI Group. **PRODUCT:** Eco-Optiloc® (9⅞ x 9⅞") with Classic finish in Natural.



PROJECT: Pinnacle Uptown Condos, Mississauga, ON. **DESIGN:** NAK Design Strategies. **PRODUCT:** Il Campo® (10 x 10") in Santa Fe.

PROJECT: Hydro-Systems Laboratory - University of Illinois, Urbana, IL. **DESIGN:** Upland Design. **PRODUCT:** Eco-Priora™ (5 x 10") with Series™ finish in Golden Tan and Il Campo® finish in Heritage Brown.

WALLS



PROJECT: Bishops Place West Hartford, West Hartford, CT. **DESIGN:** CR3 LLP. **PRODUCT:** Pisa™ in Almond Grove.

RETAINING WALLS range from non-structural to structural, contemporary to natural, and small-scale to large. Unilock offers many different styles to meet the needs of the application and aesthetic for your project with additional resources, such as design support available as you need it.

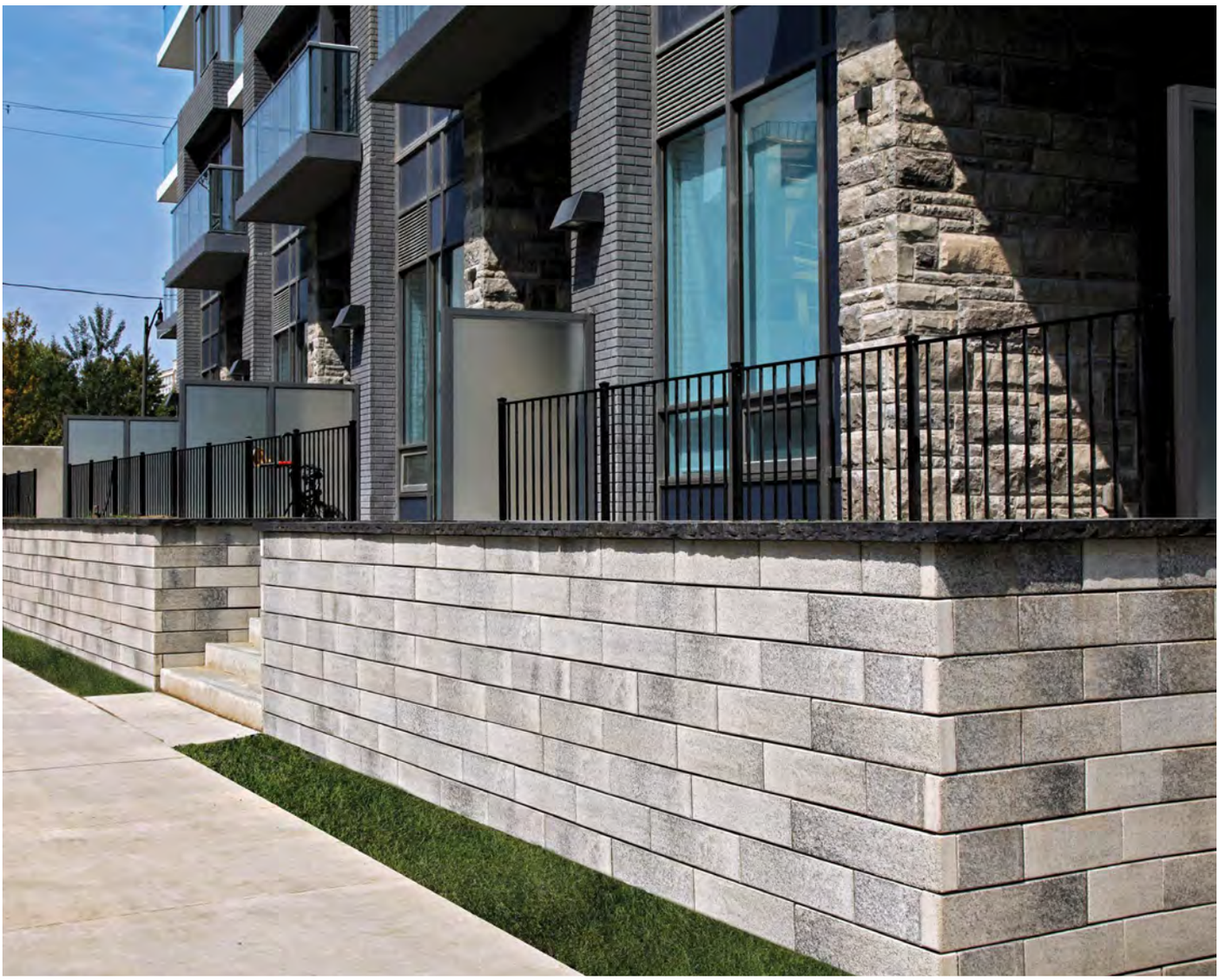
PROJECT: Oak Knoll Subdivision, Richmond Hill, ON. **DESIGN:** RisiStone Engineering / Jewell G D Engineering. **PRODUCT:** SienaStone™ Smooth / SienaEdge™ in Granite.

PROJECT: Crystal Gardens, Markham, ON. **DESIGN:** Cosburn Nauboris Ltd.
PRODUCT: U-Cara® with Umbriano® finish fascia panels in Summer Wheat and Midnight Sky.

PROJECT: Synergy Apartments, Wauwatosa, WI. **DESIGN:** New Eden Landscape Architecture.
PRODUCT: Lineo™ Dimensional Stone in Granite with Universal Coping in Buff.

PROJECT: North Village, East Douglas, MA. **DESIGN:** Coweeset Engineering. **PRODUCT:** Pisa™ XL / Concord Wall® XL in Granite Blend.

PROJECT: DAV National Headquarters, Erlanger, KY. **DESIGN:** Bayer Becker. **PRODUCT:** U-Cara® Multi-Face Wall with Umbriano® finish fascia panels in Midnight Sky.

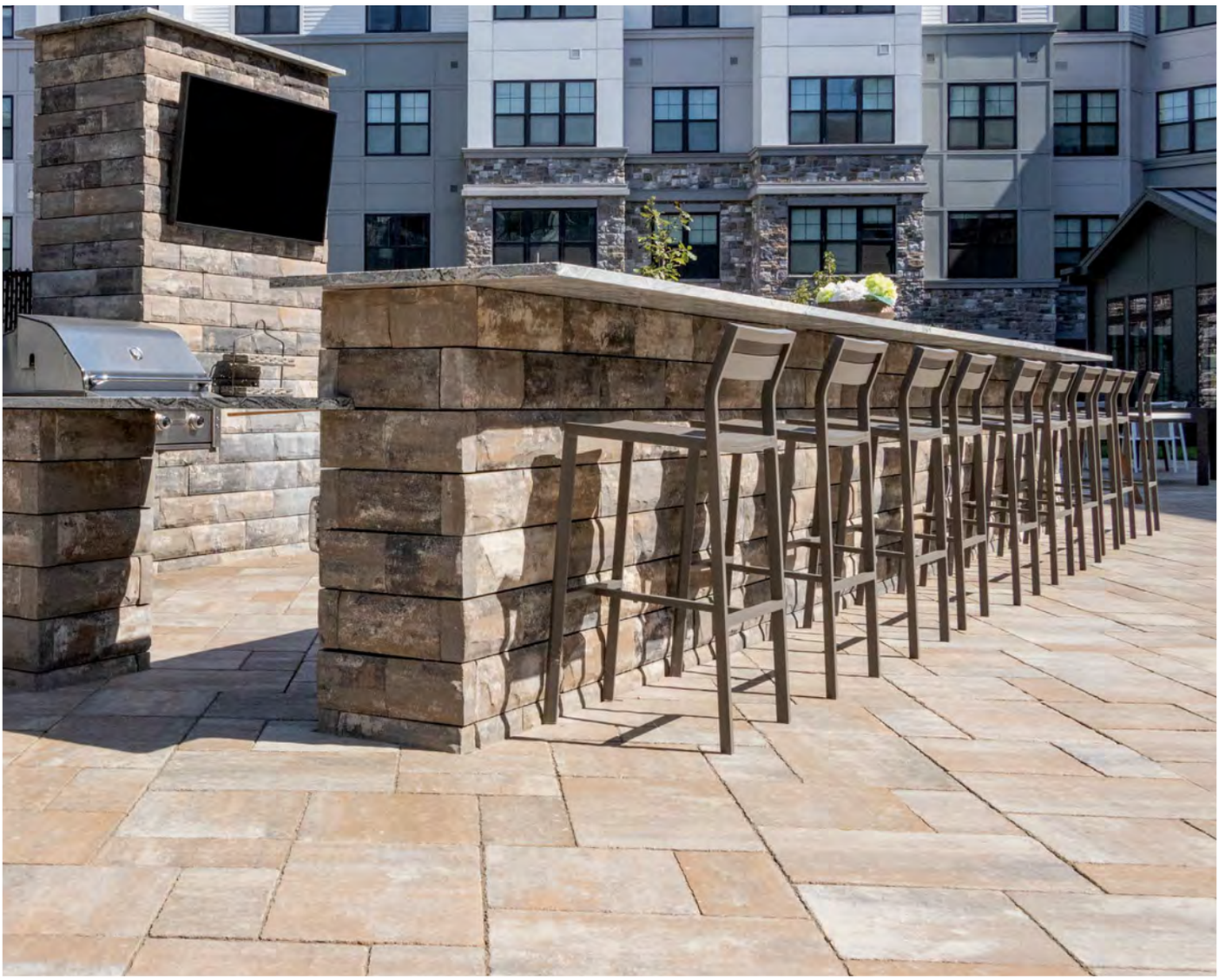


PROJECT: Lotus Condominium, Toronto, ON. **DESIGN:** STUDIO TLA. **PRODUCT:** U-Cara® Multi-Face Wall with Umbrino® finish fascia panels in Winter Marvel.

PROJECT: West London Dyke, London, ON. **DESIGN:** RisiStone Engineering. **PRODUCT:** DuraHold® in Natural.

PROJECT: Private Office, Plymouth, MI. **DESIGN:** Grissim Metz Andriese Associates. **PRODUCT:** U-Cara® Multi-Face Wall with Smooth Premier finish in Natural.

PROJECT: Colby College Sportfield, Waterville, ME. **DESIGN:** Activitas. **PRODUCT:** Sienastone® in Natural.



PROJECT: Carraway Harrison - Toll Brothers, West Harrison, NY. **DESIGN:** Melillo/Bauer/Carmen Landscape Architecture. **PRODUCT:** U-Cara® Multi-Face Wall with Pitched finish fascia panels in Almond Grove and Bristol Valley® in Bavarian Blend.

PROJECT: Ursuline College, Pepper Pike, OH. **DESIGN**: DiFrancesco and Siebold Hiti Inc. **PRODUCT:** Rivercrest® Wall in Buff.

THE DETAILS

Every project's success is directly proportionate to the attention paid to the many details. At Unilock, we take pride in supporting designers with those fine details, from **product choice and finish selection, to cross-sections, construction documents and installation guidelines**. We're present from the very beginning of your design process right through to project completion.

THE BEST Product

SUPERIOR CHOICE

Surfaces must be engineered to withstand the test of time. Unilock pavers not only satisfy requirements for structural integrity, safety, cost, environmental impact, maintenance and field-proven performance, but they also provide superior skid resistance and weathering. Because of the unique combination of product strength, ease of maintenance, aesthetics and reusability, they have a better life-cycle cost than other products. Pavers are a flexible system, so their surface area can move slightly without jeopardizing structural integrity. Concrete pavers require less maintenance than other products and can withstand heavy loading. They can also be manufactured in different shapes, colors and finishes for your large scale projects.

STRENGTH AND DURABILITY

All Unilock pavers and walls are manufactured to meet and exceed the ASTM standards without compromising the composition. They are stronger than other materials with their higher compressive strength, which is achieved by a specialized manufacturing process, and have lower absorption rates that are essential in freeze-thaw climates. At Unilock, we will not sacrifice quality for cost.

STANDARDS & TEST METHODS

ASTM STANDARDS - PAVERS & SLABS

Type	ASTM	Compressive Strength	Water Absorption	Freeze/Thaw (49 cycles)	Flexural Strength	Flexural Strength	Dimensional Accuracy
PAVERS	ASTM C936	8,000 PSI MIN.	< 5%	<500 G/M2			L&W: ± 1/16" (1.6MM) H: ± 1/8" (3.18MM)
SLABS	ASTM C1782	8,000 PSI MIN.	< 5%	<500 G/M2	>725 PSI AVG.	>650 PSI MIN.	L&W: ± 1/16" (1.6MM) H: ± 1/8" (3.18MM)

Unilock® meets and exceeds C936 paver manufacturing standards and C1782 Standard Specification for Paving Slabs.

Pavers

> C140 for Compressive Strength and Absorption
> C1645 for Freeze-Thaw Durability

Slabs

> C140 for Absorption and Compressive Strength
> ASTM C1645 for Freeze-Thaw Durability
> ASTM C1782 or CSA 231.1 for Flexural Strength

ASTM STANDARDS - WALLS

TYPE	ASTM	ASTM/ NCMA Compressive Strength	Water Absorption	Freeze/Thaw (50 cycles)	Dimensional Tolerances
WALLS	ASTM 1372 NCMA Zone 3	3000/5,500 PSI MIN.	< 7LB/FT²	≤1.5%	± 1/8" (3.2MM)

Unilock meets and exceeds C1372 Standard Specification for Dry Cast Segmental Retaining Wall Units.

Dry Cast Retaining Walls

> C140 for Compressive Strength and Absorption
> ASTM C1262 for Freeze-Thaw Durability
> NCMA Zone 3 with de-icing salt exposure guidelines

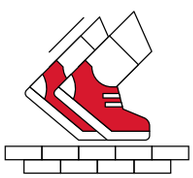
ACCESSIBILITY

The Americans with Disabilities Act Accessibility Guidelines (ADAAG) provides measurable criteria to determine compliance, not individual product evaluation. Gaps, joints or openings, greater than ½" horizontal and ¼" vertical should be avoided as they can disrupt wheelchair maneuvering (United States Access Board – Guidelines and Standards).

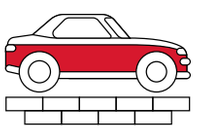
THE IMPORTANCE OF ASPECT RATIO

Simply defined, aspect ratio is the overall length of a paver divided by its height.
LENGTH/HEIGHT = ASPECT RATIO

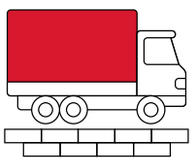
If an insufficient aspect ratio is used, any flexing or rocking caused by movement on the surface such as pedestrian or vehicular traffic, could result in breakage of the paver units. Not only is this breakage unsightly, but it can also compromise the integrity of the segmental system.



OVER 5 : 1
Pedestrian Only



4 : 1
Light-Duty
Vehicular

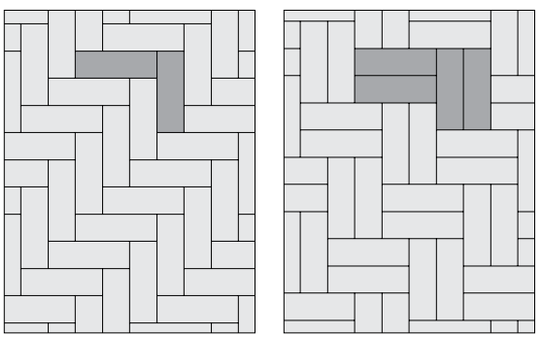


3 : 1 OR LESS
Heavy-Duty
Vehicular

LAYING PATTERN CONSIDERATIONS

The laying pattern used in your application can also add a significant amount of strength to your design. A herringbone pattern provides the best 'lock-up', adding strength against rotational forces such as tires at a roadway intersection in the same way the 'L' shaped paver provides maximum performance.

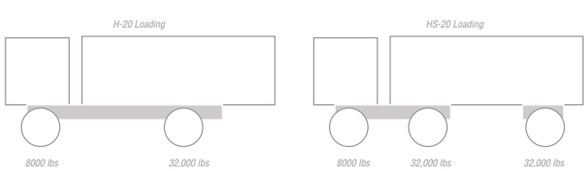
SPEAK WITH YOUR UNILOCK REPRESENTATIVE FOR MORE INFORMATION.



HEAVY-DUTY CONSIDERATIONS

Unilock has a variety of shapes and sizes available to fit your heavy-duty application and style preferences. For maximum performance where twisting and tipping will be factors, consider the unique "L" interlocking shape as it provides superior resistance under heavy loads. The patented locking features work in tandem with the "tri-axis" technology. The result? A stronger, more stable pavement surface.

Heavy-duty Unilock paving systems are also designed for rapid mechanized installation, making them competitive and affordable.



H-20 & HS-20 LOAD RATING
Similar to top of deck stresses per AASHTO H-20 loading conditions (32,000 lbs/14,500 kg), Unilock pavers can support 3-4 axle vehicles. This would include delivery, fire and semi-truck and trailer traffic in light-duty roadway applications.

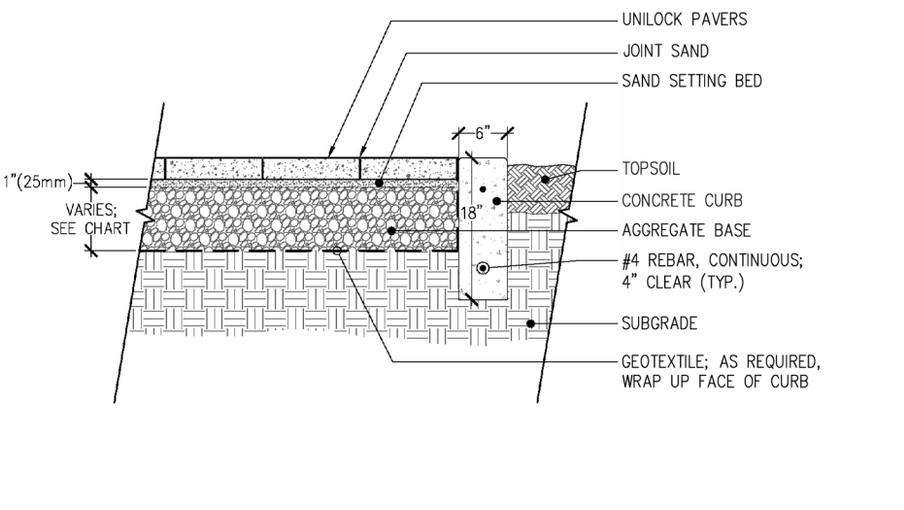
APPLICATION BY SIZE, THICKNESS & PRODUCT****

Product	Product Size	Thickness	Pedestrian	Commercial Pedestrian*	Light-Duty Vehicular	Commercial Vehicular	Heavy-Duty	Permeable
Anchorlock™		80 mm	✔	✔	✔	✔	✔	
Artline™		100 mm	✔	✔	✔			
Artline™		70 mm	✔					
Beacon Hill™		80 mm	✔	✔	✔			
Beacon Hill™		60 mm	✔					
Bristol Valley®		60 mm	✔					
Brussels Block®		70 mm	✔	✔	✔			
Brussels Dimensional™ Stone		100 mm	✔	✔	✔	✔		
Hex™		70 mm	✔	✔	✔	✔		✔
Copthorne®		60 mm	✔	✔	✔	✔		
Courtstone®		60 mm	✔	✔	✔	✔		
Dura-Mat		100 mm			✔			✔
Eco-Hex™		80 mm	✔	✔	✔	✔		✔
Eco-Line®		100 mm	✔	✔	✔	✔	✔	✔
Eco-Optiloc™		80 mm	✔	✔	✔	✔	✔	✔
Mattoni™		70 mm	✔	✔	✔			
Optiloc™		80 mm	✔	✔	✔	✔	✔	
Richcliff®		60 mm	✔	✔	✔	✔		
Thornbury™		70 mm	✔	✔	✔			✔
Town Hall®		70 mm	✔	✔	✔	✔		✔
	36 x 36	100 mm	✔					
	18 x 36	60 mm	✔					
	18 x 36	100 mm	✔					
	24 x 24	100 mm	✔	✔	✔			
	24 x 24	70 mm	✔					
	24 x 24	60 mm	✔					
	24 x 24	50 mm	✔					
	12 x 36	50 mm	✔					
	12 x 36	100 mm	✔					
	12 x 24	150 mm	✔	✔	✔	✔		
	12 x 24	100 mm	✔	✔	✔ **			
	12 x 24	70 mm	✔					
	12 x 24	50 mm	✔					
	8 x 24	150 mm	✔	✔	✔			
	8 x 24	100 mm	✔	✔	✔ **			
	8 x 24	70 mm	✔					
	6 x 24	150 mm	✔	✔	✔	✔		
	6 x 24	70 mm	✔					
	16 x 16	100 mm	✔	✔	✔	✔		
	16 x 16	80 mm	✔	✔	✔			
	16 x 16	70 mm	✔	✔	✔			
	8 x 16	100 mm	✔	✔	✔	✔		
	8 x 16	70 mm	✔	✔	✔			
	7 x 14	60 mm	✔					
	7 x 14	80 mm	✔	✔	✔			
	4 x 16	100 mm	✔	✔	✔	✔		✔
	12 x 12	100 mm	✔	✔	✔	✔		
	12 x 12	70 mm	✔	✔	✔			✔
	12 x 12	60 mm	✔					
	6 x 12	100 mm	✔	✔	✔	✔	✔	
	6 x 12	80 mm	✔	✔	✔	✔		
	6 x 12	70 mm	✔	✔	✔			
	10 x 10	80 mm	✔	✔	✔	✔		✔
	5 x 10	80 mm	✔	✔	✔	✔	✔	✔
	8 x 8	100 mm	✔	✔	✔	✔	✔	
	8 x 8	80mm	✔	✔	✔	✔		
	8 x 8	70 mm	✔	✔	✔	✔		
	8 x 8	60 mm	✔	✔	✔			
	6 x 8	70 mm	✔	✔	✔	✔	✔	
	4 x 12	100 mm	✔	✔	✔	✔	✔	
	4 x 12	70 mm	✔	✔	✔			
	3 x 12	100 mm	✔	✔	✔	✔	✔	✔
	6 x 6	70 mm	✔	✔	✔	✔		
	5 x 5	80 mm	✔		✔	✔		✔
	4 x 8	80 mm	✔	✔	✔	✔	✔	
	4 x 8	70 mm	✔	✔	✔	✔		
	4 x 8	60 mm	✔	✔	✔			
	4 x 4	70 mm	✔	✔	✔	✔		
	3 x 6	100 mm	✔	✔	✔	✔	✔	

*All pavements require a site specific design. A herringbone laying pattern is essential for most vehicular trafficked pavements and becomes more critical as the demands on the pavements increase. Please contact your local Unilock Representative for specific design details. This chart is only a guideline. *Subject to occasional light duty service vehicles. **Installed on a concrete base. *** Not all sizes are available in all regions. Consult with your Unilock Representative for more information.*

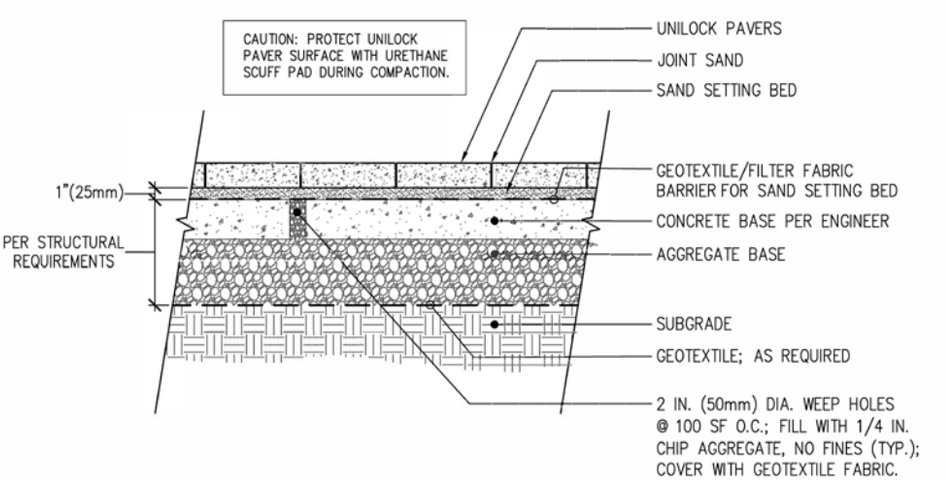
NON-PERMEABLE INSTALLATIONS

Commercial environments are demanding and having the correct base design is essential. Below are a couple of examples of the base detail; however, every base detail must be specific to site conditions and load capacity. Contact your Unilock Representative to learn more.



PAVER INSTALLATION ON GRANULAR

From pedestrian to heavy-duty applications this detail is tried and true. Contact your Unilock Representative to learn more. Specific installation details may vary based on site conditions.



PAVER INSTALLATION ON SAND OVER CONCRETE

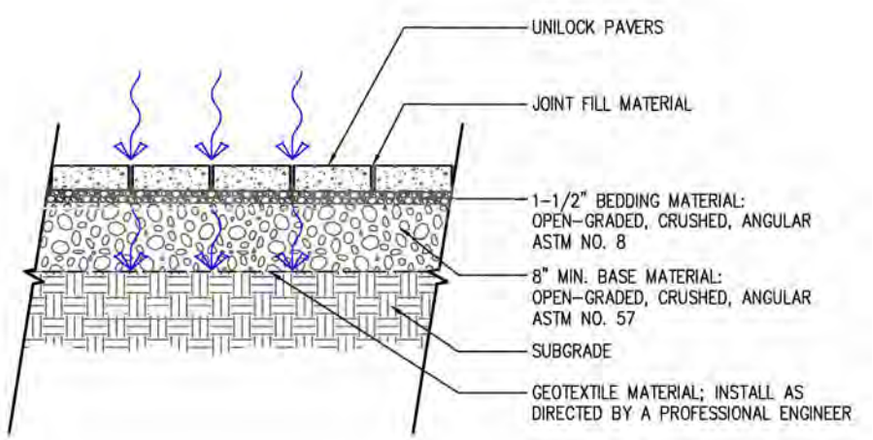
Ideal for heavy-duty applications, this detail ensures adequate base support under heavy loads. Approving the proper sand type and gradation is critical for lock-up and drainage in vehicular applications. Contact your Unilock Representative to learn more. Specific installation details may vary based on site conditions.

PERMEABLE INSTALLATIONS

Similar to the non-permeable paver systems structural component, permeable paver installations offer secondary purpose for capturing and detaining rainwater. Common uses can range from sidewalk and plaza areas, to heavy-duty parking lots and roadways and include various base depths as shown in the two details below.

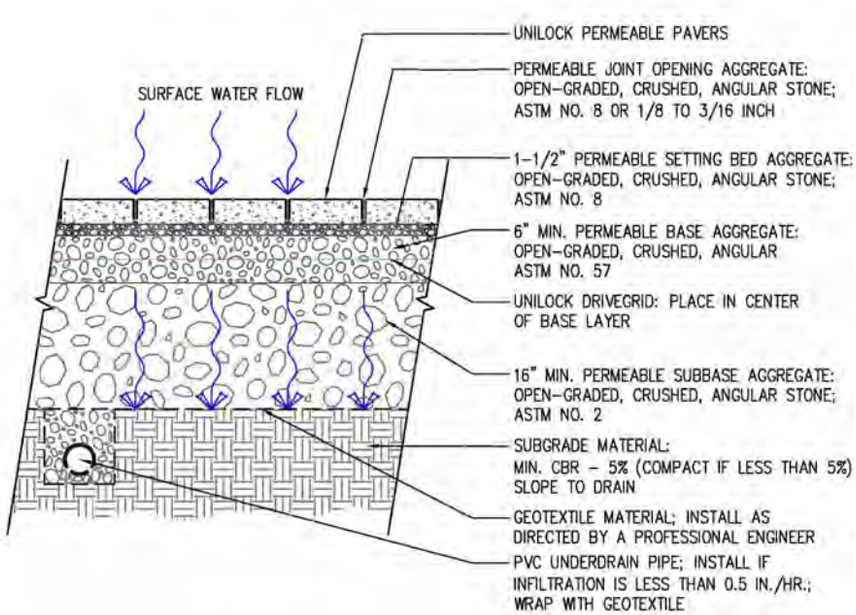
PERMEABLE ON OPEN-GRADED AGGREGATE - LIGHT DUTY

This cross-section is an example of a light-duty pedestrian sidewalk application. Contact your Unilock Representative to learn more. Specific installation details will vary based on site conditions.



PERMEABLE ON OPEN GRADED AGGREGATE - HEAVY-DUTY

Heavy-duty permeable applications require additional base support as illustrated below. This cross section is only an example. Contact your Unilock Representative to learn more. Specific installation details will vary based on site conditions.



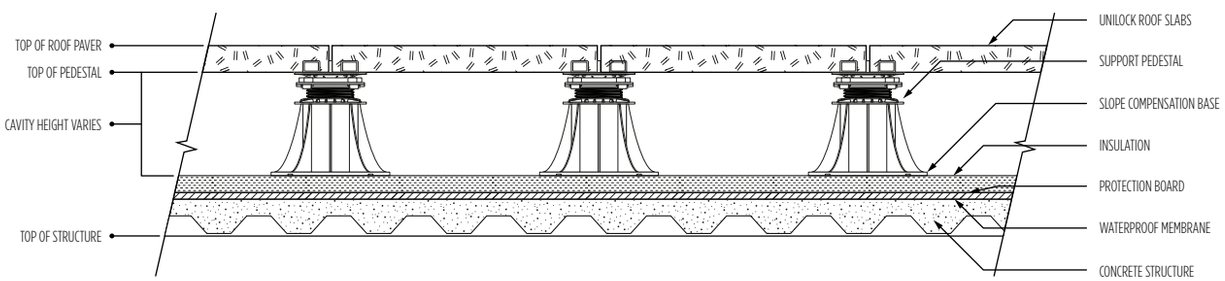
ARCHITECTURAL SLABS

Unilock has many options for paving products on roof decks. Various installation methods will determine the appropriate products for the application. While pedestal installation typically utilizes the square or large slabs, a granular installation will extend your product choice and design flexibility. **Ask your Unilock Representative for details.**

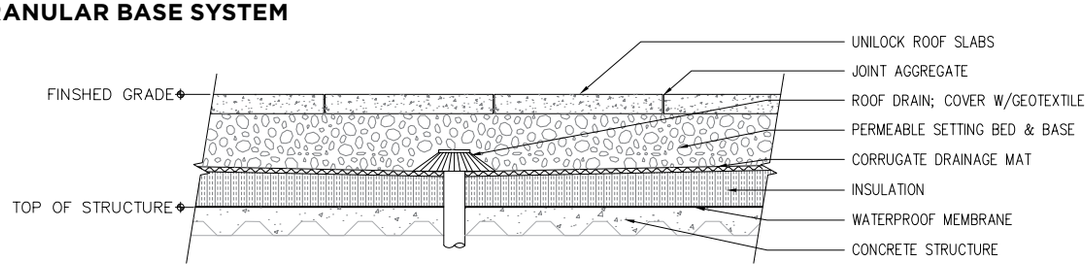
Product Type	Thickness	Shape	Product Weights
Arcana™ + Skyline™	50mm	606 x 606mm	24 lbs/sq.ft.
Beacon Hill™ XL	60mm	900 x 540mm** 720 x 540mm**	27.5 lbs/sq.ft.

PEDESTAL SYSTEM

Unilock offers adjustable and stackable pedestal systems for your project. Contact your Unilock Representative to learn more. Specific installation details may vary based on pedestal height, load-bearing requirements, safety standards and wind-lift.



GRANULAR BASE SYSTEM



The cross sections shown are examples of the type of installation systems and technical features of Unilock products. Unilock shall not be deemed responsible for improper use of the product or of damage deriving from any use different from those recommended and/or installation procedures not in line with the following instructions relevant to a raised installation. **All roof top slab/pedestal installations must be engineered by a professional engineer.**

LEED® Credit Opportunities

LEED, Leadership in Energy & Environmental Design, is a green building certification program that recognizes building strategies and practices that have a positive impact on the health of occupants, while promoting renewable, clean energy. To receive LEED certification, building projects satisfy prerequisites and earn points to achieve different levels of certification. Unilock products can contribute toward achieving your certification goals with sustainable components/characteristics, Environmental Product Declarations and Health Product Declarations.

POTENTIAL LEED CREDITS FOR UTILIZING UNILOCK PAVERS

LEED v4.1: Materials and Resources:

> **Sourcing of Raw Materials**
Responsible Sourcing of Raw Materials
• 1-2 points
> Recycled Content

> **Material Ingredients**
Material Ingredient Reporting • 1 point
> Health Product Declarations

> **Environmental Product Declarations**
Option 1: Environmental Product Declaration (EPD) • 1 point
> Environmental Product Declarations

LEED v4.1: Sustainable Sites

> **Rainwater Management**
Option 1. Percentile of Rainfall Events
• 1-3 points except Healthcare, 1-2 points Healthcare

> **Heat Island Reduction**
Option 1. Nonroof and Roof • 2 points except Healthcare, 1 point Healthcare

See LEED v4.1 for more specific project/ site details when calculating credits.

Solar Reflectance

Solar Reflectance Index (SRI) is a criterion used by USGBC that measures values of sunlight and radiation bouncing from built surfaces. It is used to measure urban heat island effects in city centers. Dark pavement absorbs heat during the day and then releases it at night. This process creates a situation that causes urban centers to stay warmer all the time which contributes to air pollution and increased energy consumption. Careful selection of materials and colors can help reduce urban heat island effects.

SAMPLE OF QUALIFIED UNILOCK COLORS (≥33) *

Surface Finish	Color	Swatch	Solar Reflectance	SRI*
Umbriano® (Mottled)	Grenada White		0.45	52
	Summer Wheat		0.42	48
	Winter Marvel		0.35	38
Series™ (Exposed Granite)	SS0025		0.42	48
	SS0016		0.41	46
	Golden Tan		0.40	45
	Chardonnay Tan		0.39	44
	Peppered Granite		0.38	42
	Coral Gem		0.37	41
	SS0026		0.37	41
	Ice Grey		0.35	38
Arcana™	Avorio		0.56	66
	Modena		0.46	53
	Corvara		0.30	34
Soreno™	Toscana Beige		0.64	77
	Light Granite		0.44	50
Smooth Premier	Cream		0.49	57
	SS0080		0.44	50
	Bavarian Blend		0.42	47
	Chamois		0.41	46
	Red		0.40	44
Classic Finish	Canvas		0.33	36
	River		0.32	34
	Dusk		0.46	53
	Safari		0.44	50
Elegance™	Arctic Grey		0.49	57
	Old Oak		0.37	41
	Burnt Clay		0.36	40
	Burgundy Red		0.35	38
Revela™	Frost		0.57	68

** Values may change slightly by region due to variations in local aggregate and granite. Contact your local Unilock Representative for more information.*

PROJECT: Robert C Valade Park, Detroit, MI. **DESIGN:** Groundswell Design Group. **PRODUCT:** Artline™ (7 Unit Random Bundle) with Smooth Premier finish in Granite.

Dedication to **QUALITY**

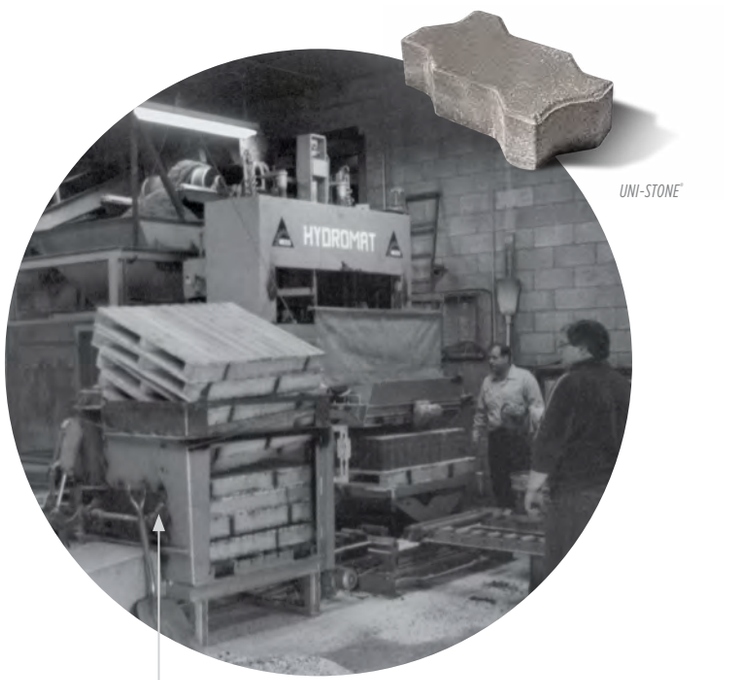
FOR US, IT'S PERSONAL

Over 50 years ago, our founder stumbled upon a unique little European product called the UNI-Stone. Intrigued by the benefits of this revolutionary paving method, he decided to license the product and bring the concept to North America. He purchased a basic paver machine from Europe and hired a small staff to produce the stones.

In those early days, most sales of Unilock were to large-scale commercial properties and streetscapes. Any lapse in quality would be costly and would jeopardize our owner's personal reputation, so quality was of paramount importance.

From these humble beginnings, through to the multinational company we are today, Unilock has remained a family-owned company that puts quality first. For us, it's not just a matter of dollars and cents, it's our personal reputation that's on the line.

Homeowners, Contractors, Landscape Designers and Architects across North America know they can rely on us to supply them with top quality product every time.



The first Unilock press produced a humble 817 square feet of pavers a day.

Today we produce approximately 500,000 square feet of pavers a day.

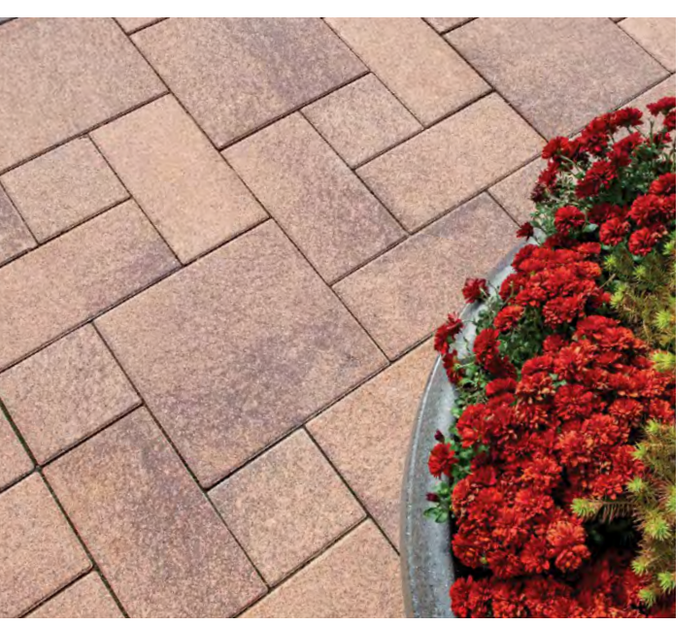
Standing the **TEST OF TIME**

Why do design professionals choose Unilock pavers and walls? In a word: confidence. Confidence that Unilock products have the performance capabilities needed to build extraordinary projects that stand the test of time. As North America's orginal manufacturer of pavers and walls, Unilock has the most proven products on the market.

Shops @ Don Mills *by* **Quinn Design Associates Inc.**

Toronto, Ontario
Umbriano® pavers installed in 2009.

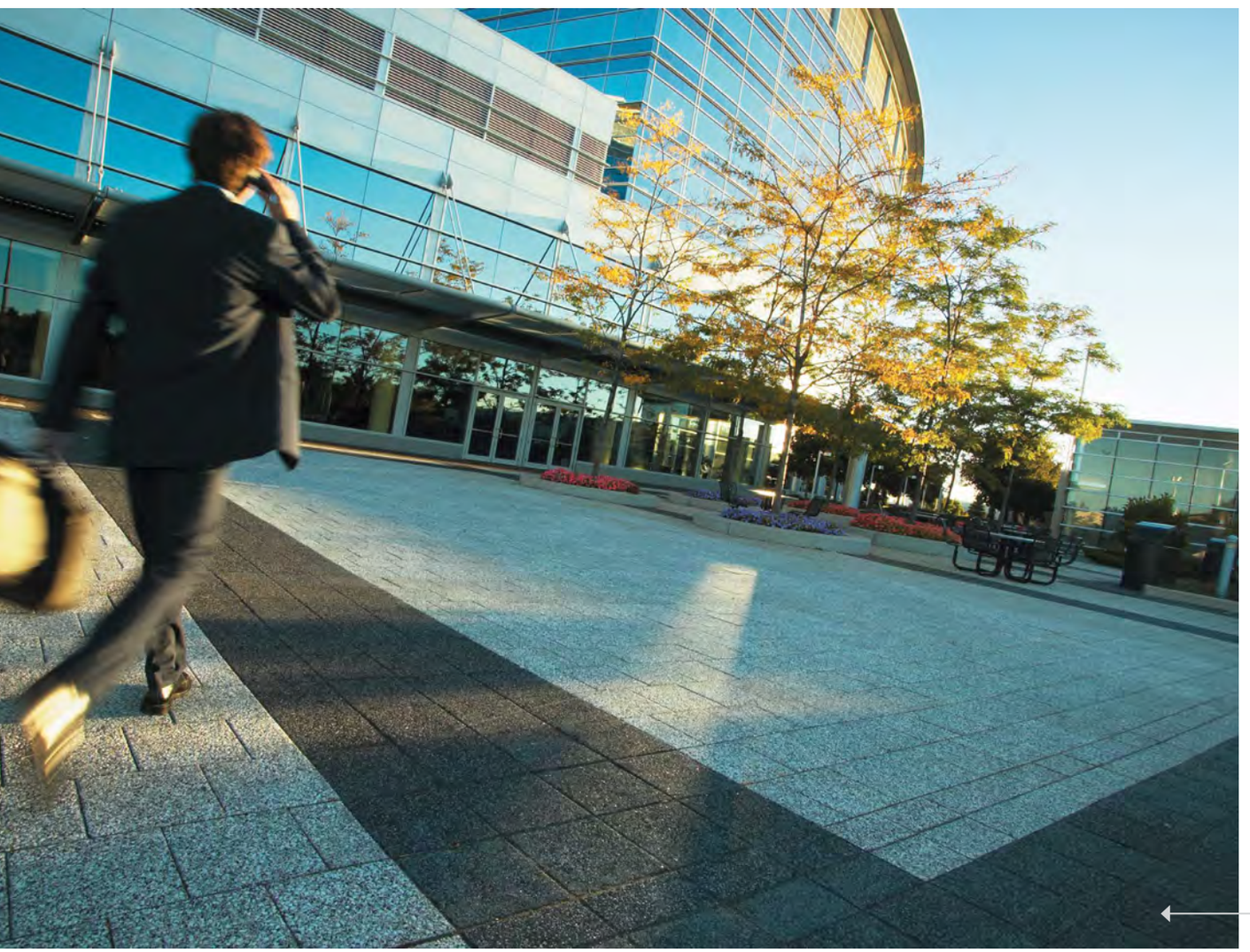
2009



2022

RBC Office Plaza *by* **The MBTW Group**

Misissauga, Ontario
Series™ pavers installed in 2002.



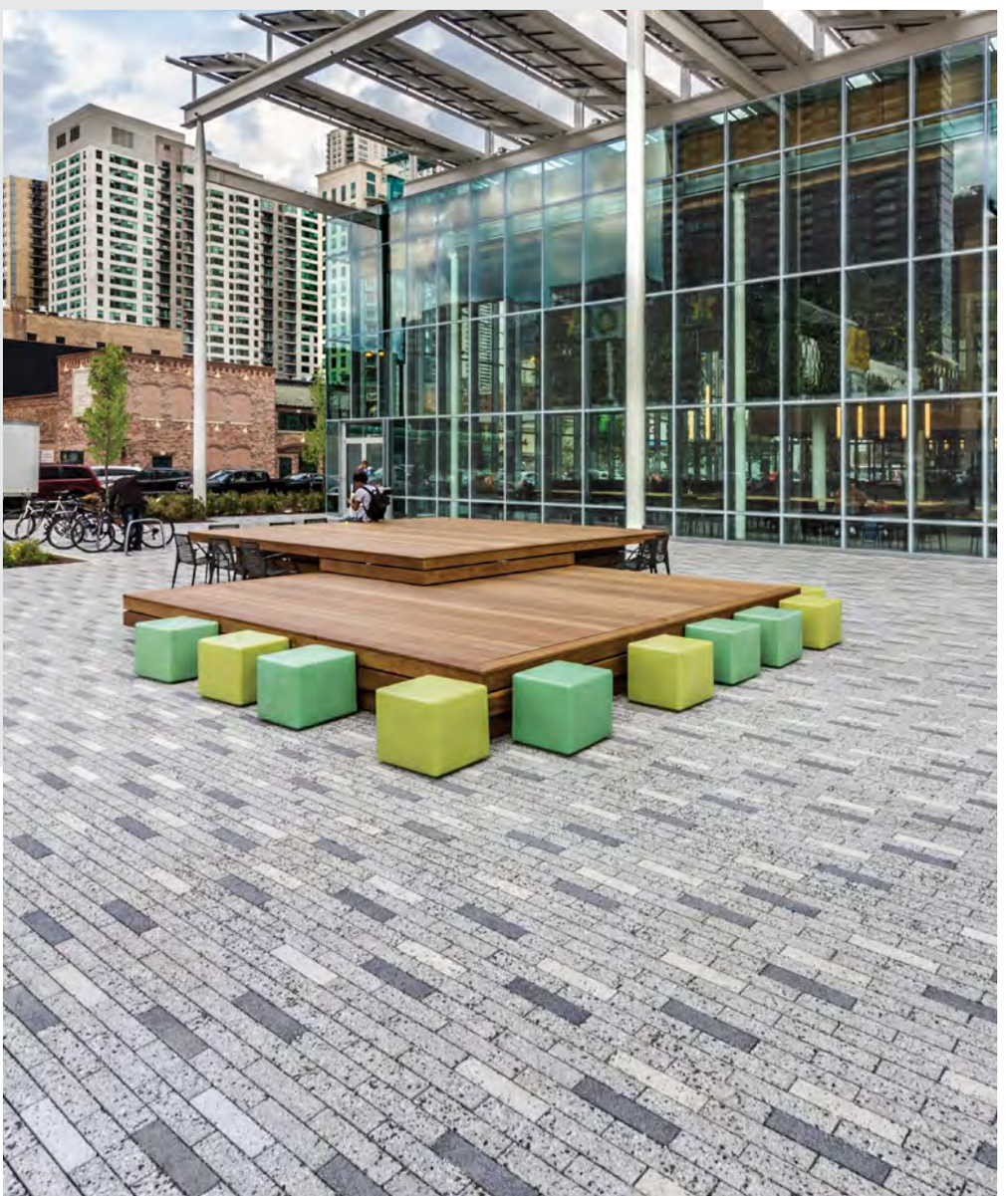
2002

2022

SUSTAINABILITY

Unilock is committed to becoming a **carbon neutral company** by 2035. We have implemented initiatives that continue to minimize our use of fossil fuels, recycle and harvest water, and replace cement in our products with supplementary cementitious materials while manufacturing the highest quality product.

By working towards carbon neutrality and making our products and our company more sustainable, we will be able to build a legacy of beautiful landscapes that enhance our lives, our health and our environment.



JOURNEY TO CARBON NEUTRAL

Unilock introduced paving stones to North America in 1972 as a new alternative to asphalt and poured concrete. In the 1990's we introduced permeable paving systems that have become a best management practice for flood mitigation and environmental stewardship.

At the same time, we began to supplement the cement content in our concrete design with supplementary cementitious materials (SCMs) such as slag. Over time, our mix design has evolved to include more SCM cement alternatives that are byproducts of other industries, reducing our product's embodied carbon.

Today we are measuring all aspects of our company; the use of fuels and electricity, employee commute and business travel, our purchases of goods and services and more, in order to identify where we can strategically decrease our carbon footprint to achieve carbon neutral.

CURRENT INITIATIVES

- We can substitute up to 55% of the cement in our concrete mix design with supplementary cementitious materials (SCMs)
- Most on-site concrete waste is recycled
- Solar panel pilot project in Rittman, Ohio
- Some of our packaging/labels are made of recycled material
- We are testing EV forklifts
- Water in production is treated and recycled for reuse at many production plants
- We are utilizing chemical technologies to facilitate the curing of concrete with less dependence on fossil fuels
- All Catalogs and Product Resource Guides are printed on FSC compliant paper ensuring they are sourced from responsibly managed forests
- Efforts are underway to quantify our carbon footprint

Climate Positive **DESIGN**

Climate positive design extends beyond individual product selections. It involves designing projects to counterbalance materials with embodied carbon by integrating features that actively sequester carbon. There's a diverse range of carbon sequestration options, such as boosting on-site greenery, optimizing soil for carbon capture, diversifying plant species, and implementing green roofs. It's crucial to broaden the scope beyond the embodied carbon of products; a holistic approach is essential to assess the entire design's impact on daily life and the environment.

CREATE WALKABLE COMMUNITIES

Trasportation has a significant negative impact on our environment. Improving the walkability score of an urban area presents an opportunity to reduce emissions. Establishing an environment where all essential amenities are within walking distance, coupled with the implementation of safe, clean, and dependable infrastructure, contributes to the development of walkable communities.

PERMEABLE PAVING SYSTEMS

Including permeable paving systems in your design significantly decreases your project carbon footprint while incorporating stormwater management. These systems reduce local flooding, improve water quality and mitigate the risk of heating local waterways, but also demonstrate exceptional durability and low maintenance requirements.

COMPLETE STREETS

Comprehensive street designs, known as complete streets, are an essential component of walkable communities and have positive environmental impacts. Offering safe transportation alternatives that are net-zero, such as walking or biking, results in reduced emissions. Improving safety, encouraging health and wellness, stimulating economic growth, while creating a sense of place, and improving social interaction benefits site users of all ages.

HIGH SOLAR REFLECTANCE

Reduce heat island effect by choosing pavers with a High Solar Reflectance Index (SRI) value. The surface will reflect the sun's energy, which will prevent heat absorption, reduce urban temperatures, and minimize the heating of runoff water that enters neighboring creeks and streams, that would otherwise disrupt the natural ecology.

POCKET PARKS

Created from vacant lots, forgotten and underutilized spaces, pocket parks serve to enhance communities and the environment, as well as improve mental and physical well-being. They foster social improvements, engage neighborhoods, mitigate heat island effect, allow for simple implementation and maintenance, all while functioning as a carbon sink, thereby assisting in offsetting local emissions.

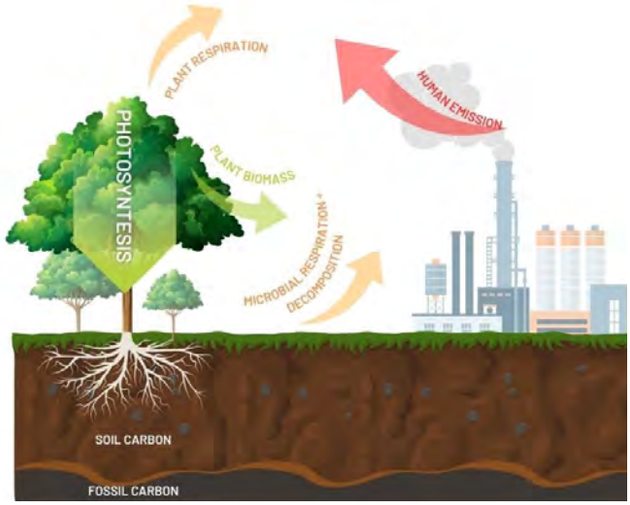
UNDERSTANDING MATERIAL OPTIONS

Employ innovative design approaches that reduce material consumption or integrate reclaimed, recycled and sustainably harvested materials. Understand how materials work within their systems to mitigate effects on the climate. Look for locally sourced materials and fully understand the deconstruction process of the project at the end of its life cycle.

MORE THAN A NUMBER - A SYSTEMIC APPROACH

Landscaping projects are living, breathing systems. These systems breathe in the carbon dioxide from our atmosphere and sequester the carbon in the trees, soils, and even concrete. Each product in your project is assigned an embodied carbon value; however, consideration must be given to how that product works within the system to soak up carbon.

A recent study says that about 55% of the global cumulative cement process emissions were sequestered by cement materials from 2000-2013. Carbon uptake by cement materials in 2021 was equivalent to 7.67% of the global industrial emissions of C02 and approximately 8.23% of the average global land carbon sink. There is no doubt that concrete can sequester C02, however, a value must be applied to your designs.

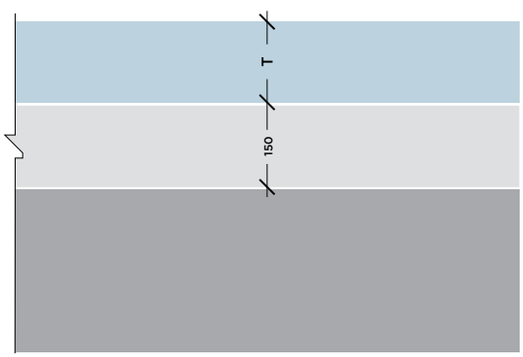


OPTIMIZE SPECIFICATION ALTERNATIVES

When comparing pavers to alternate materials, such as poured in place concrete, you have a real opportunity to save in material and embodied carbon value on your project. For a pedstrian application with a spec of 150mm (6") Poured-In-Place (PIP) concrete, a 6cm paver alternative could be used, creating a 60% material savings and 25% embodied carbon savings.

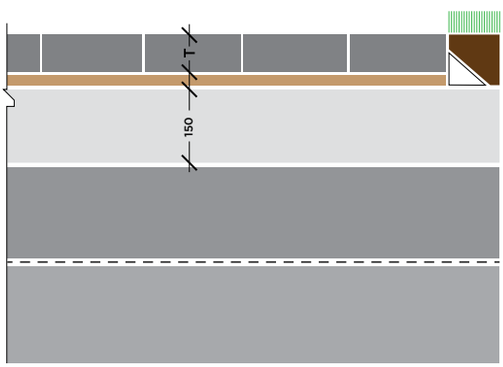
Poured-in-Place Concrete Installation

(T) Thickness of concrete = 150mm
Embodied Carbon Value = 400kg CO2e per m3



Concrete Paver Installation

(T) Thickness of concrete = 60mm
Embodied Carbon Value = 750kg CO2e per m3



Concrete paver installation resulting in 60% concrete material savings and 25% embodied carbon savings.

ENVIRONMENTAL PRODUCT DECLARATIONS (EPD)

In order to calculate your project's total carbon value, EPDs provide you with the Global Warming Potential (GWP or embodied carbon) value of the products. There are four types of EPDs, Industry wide (least specific), Product, Supply Chain, and Facility specific. These documents are developed in accordance with Product Category Rules (PCR) in compliance with ISO regulations and for a specific Life Cycle Analysis duration. In order to compare product EPDs, you must ensure that all of these types align for each category for an apple to apple comparison. For more information, speak with your Unilock Representative.

UNILOCK TECHNOLOGIES

Unilock has relationships with prestigious product innovation groups which gives us exclusive access to **leading edge product designs** and manufacturing processes.

UNILOCK®

ARCHITECTURAL FINISHES

Only Unilock offers Architectural Finishes. These products set a new standard for everlasting beauty thanks to proprietary blends of some of nature's highest performing minerals such as granite and quartz, combined with manufacturing technologies that are unique to Unilock.

ENDURACOLOR™

The refined surface of Unilock EnduraColor products is achieved with a **two-step manufacturing process** that combines a base of coarser aggregates for a **stronger foundation,** with concentrated color and **wear-resistant finer aggregates on top.** This process protects the surface from the appearance of fading over time because the top layer prevents large, lighter color aggregates from ever showing through. Now, with U-Cara®, walls are available with EnduraColor too!

CLASSIC

Unilock Classic pavers and walls are manufactured to exceed ASTM standards for quality and strength. Available in classic shapes and styles, these products utilize a traditional **product mix of large and small aggregates,** that is consistent from top to bottom, with color mixed throughout.

Unilock
TECHNOLOGIES

All **products are not created equal**. Many products look great when they're first installed, but after time the difference shows. With durabililty that is second to none, color that lasts, unique textures, and exclusive technologies, designers can rely on Unilock products to create world-class commercial spaces.

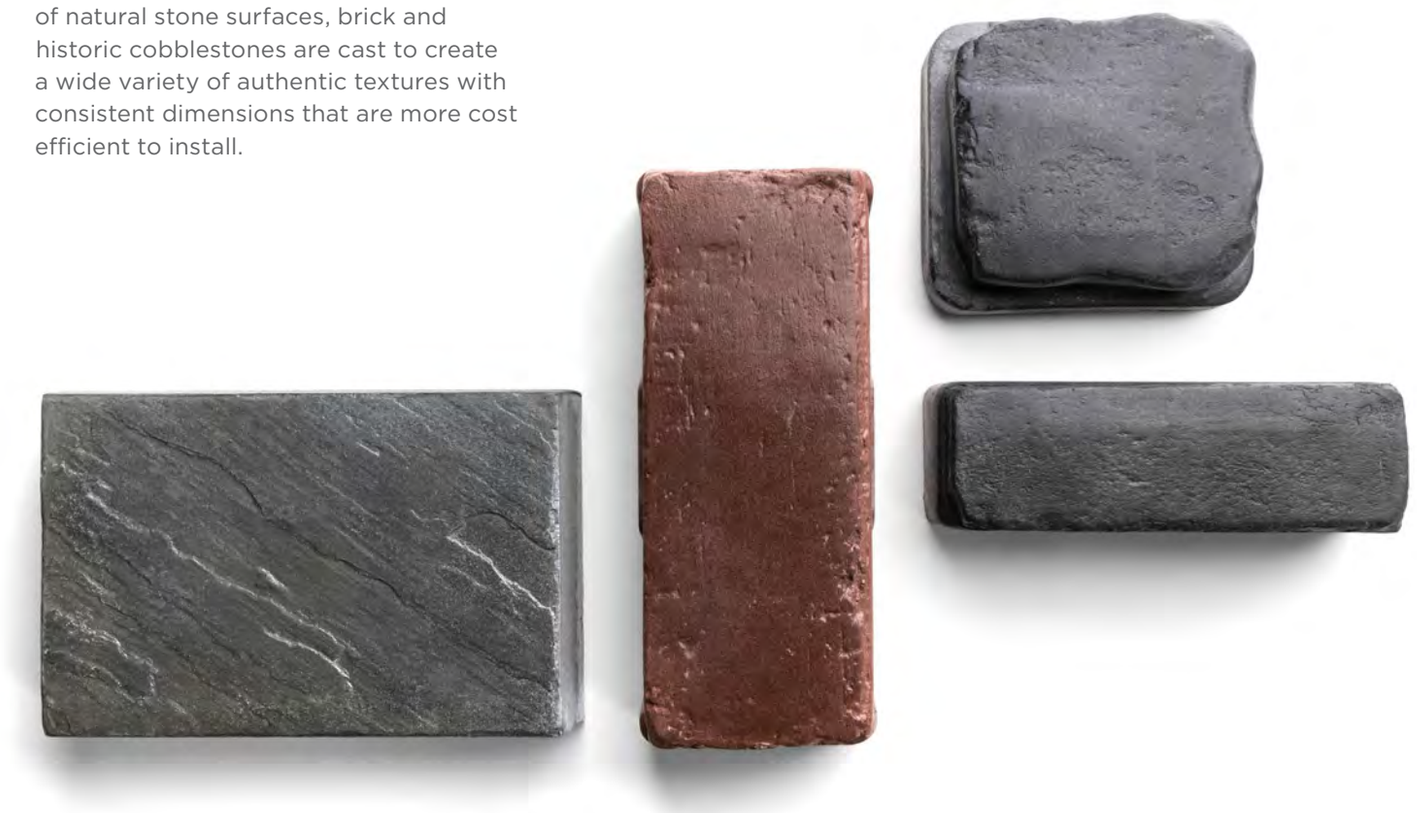
Ultima™

Only Unilock has the technology in North America to manufacture Ultima Concrete resulting in pavers up to four times stronger than poured concrete. With Ultima, the look you purchase is the look that will last.

Products with Ultima:
COPTHORNE®, COURTSTONE®, RICHCLIFF® AND TOWN HALL®

Reala™

Utilizing Reala technology, a multitude of natural stone surfaces, brick and historic cobblestones are cast to create a wide variety of authentic textures with consistent dimensions that are more cost efficient to install.



Products with Ultima:
COPTHORNE®,
COURTSTONE®,
RICHCLIFF®
AND TOWN HALL®

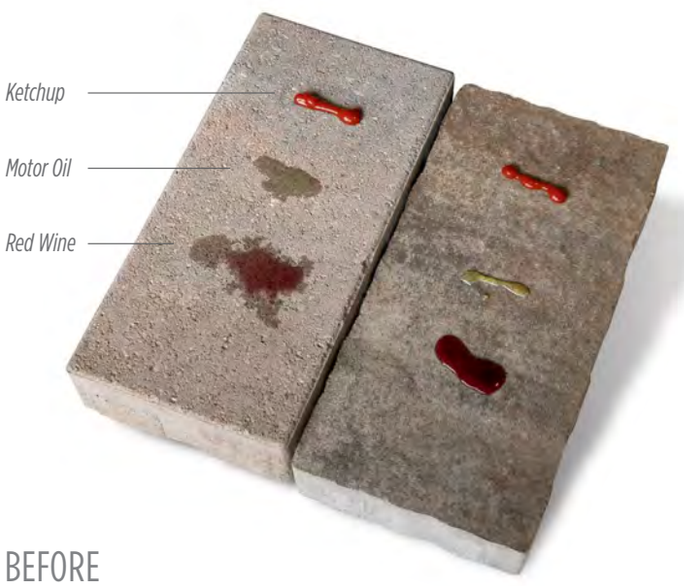
EasyClean™

With EasyClean, the occasional spill doesn't have to leave a lasting mark on your new pavement. Unlike costly after-market sealers which merely coat the top, EasyClean goes beyond the surface and becomes integral to the product during manufacturing, making spills and other debris easier to clean before a stain can develop. Ask your Unilock Representative for more information about adding EasyClean to the products on your commercial projects.

Nothing protects pavers from stains like EasyClean.

Pavers are pre-sealed at the factory
Enhanced resistance to weathering
Reduced dirt absorption
Stains from leaves, coffee, ketchup, mustard, wine and BBQ oils are easier to remove

Products with EasyClean:
ARCANA™, BRISTOL VALLEY®, MATTONI™ AND UMBRIANO®



BEFORE

AFTER 30 min

Stains set for thirty minutes, then removed with damp paper towel, hand scrub brush and mild soap.

Classic Coat

Factory sealed standard finish pavers are available with Classic Coat to protect the surface texture and color. Ask your Unilock Representative for more information about using products with Classic Coat on your commercial projects to save time and money post installation.

Products with Classic Coat:
CONSULT YOUR REGIONAL PRODUCT DATA

ColorFusion™

The look of natural granite is achieved when color and granite particles are randomly dispersed using proprietary ColorFusion technology to achieve a unique mottled surface. ColorFusion pavers are made with the same durable concrete and fortifying manufacturing processes that make Unilock pavers last for decades.

Products with ColorFusion:
UMBRIANO® AND U-CARA®

EcoTerra™

Unilock presents award-winning EcoTerra technology, unleashing a new, greener era in hardscaping.

Manufactured with a cement free face-mix, EcoTerra technology achieves up to 15% reduction in CO2. Also manufactured with EnduraColor™ technology, EcoTerra products have a stronger foundation, with concentrated color and wear-resistant finer aggregates on top.

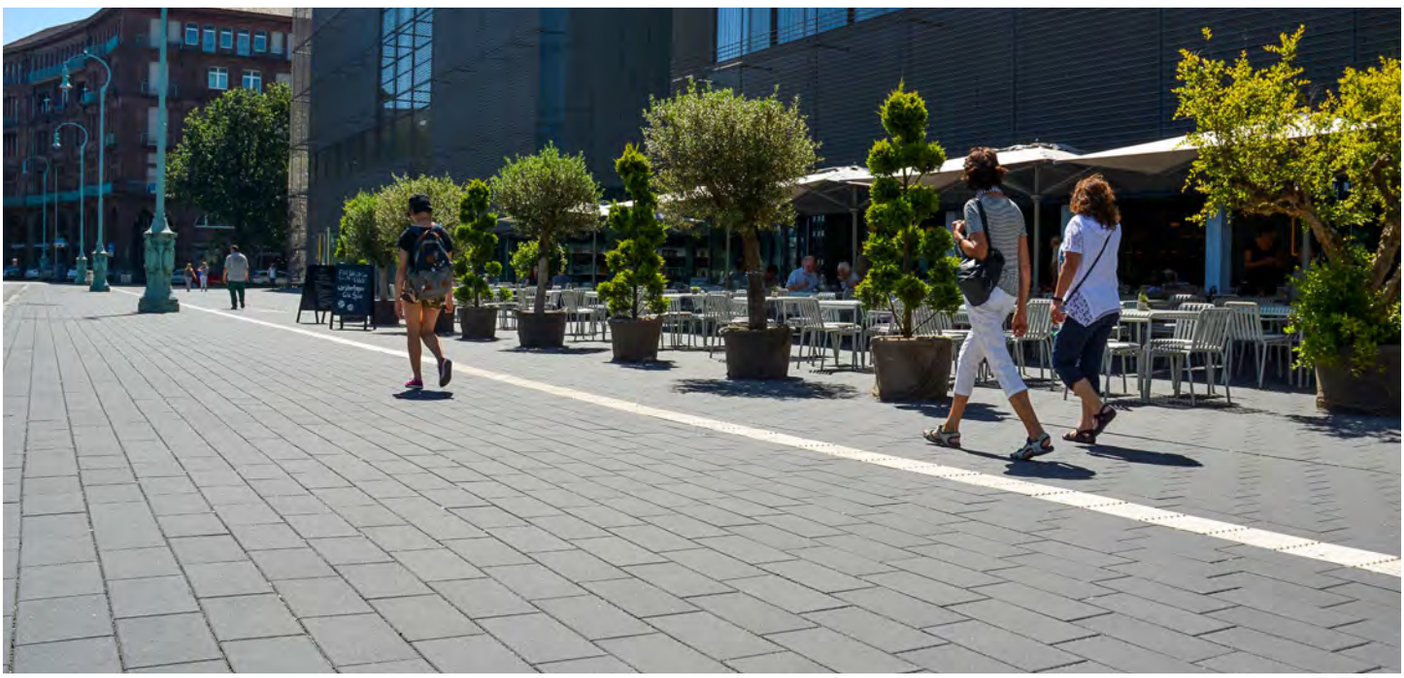
Products with EcoTerra:
PROMENADE™

Benefits of EcoTerra

Reduction in CO2
Free from efflorescence
Durable surface and color
Easier to clean

Load Lock™

Load Lock is a patented, fully-interlocking system with integrated protection against shifting. The cutting-edge jointing technology prevents tilting and jamming of paving edges from heavy traffic, despite excessive loads and torque. Load Lock also offers the flexibility to create unique laying patterns and designs, ensuring that your aesthetic vision can be achieved while delivering maximum strength and performance.



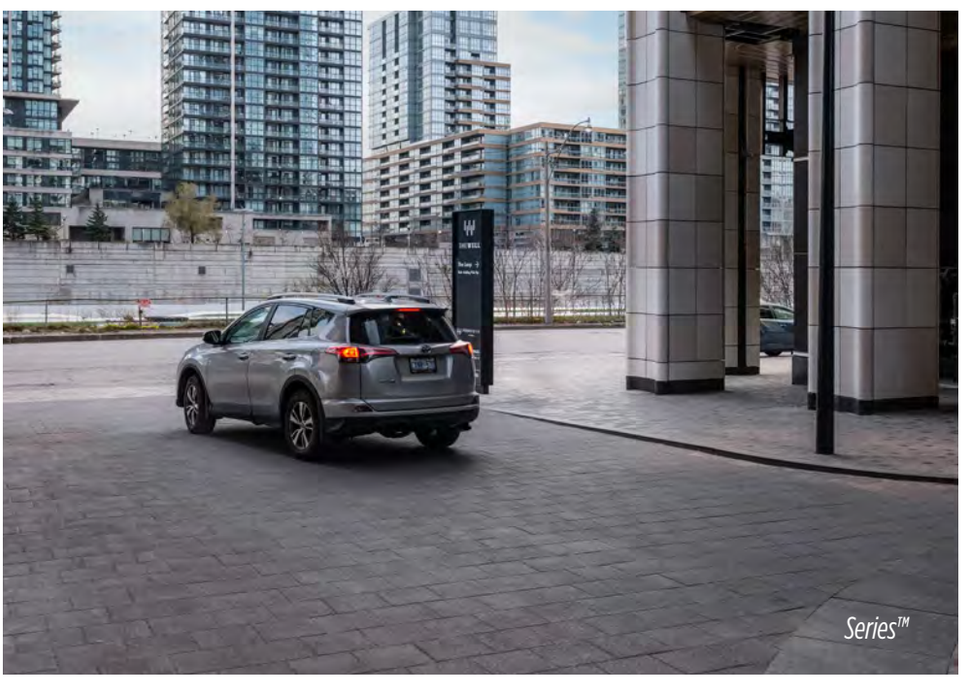


PHOTO CREDIT: Adrian Stiles Photography

Load Lock™

Products with LoadLock:
SERIES™

NON-STANDARD
OFFERINGS AVAILABLE

FINISHES

Unilock finishes are one-of-a-kind.
Discover the unique design opportunities by exploring our finishes and color ranges. Speak with your Unilock Representative about in stock and special order opportunities in your market.

UNILOCK®

ARCHITECTURAL FINISHES

Proprietary blends of some of nature's highest performing minerals such as granite and quartz are combined with manufacturing technologies that are exclusive to Unilock.

Umbriano® Mottled Finish
with ColorFusion™ and EasyClean™

Series™ Exposed Granite Finish

Il Campo® Brushed Finish

Smooth Premier Finish

Flagstone Premier Finish

Revela™ Shot-Blast Finish

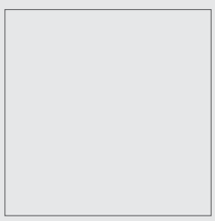
Classic Thru-Mix Finish

CLASSIC FINISH

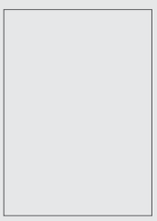
Classic finish utilizes a traditional product mix of large and small aggregates, that is consistent from top to bottom, with color mixed throughout. Rest assured they are manufactured to exceed ASTM standards for quality and strength.

SHAPES & SIZES

SLABS



23⅞ x 23⅞" (606 x 606mm)
T: 50mm

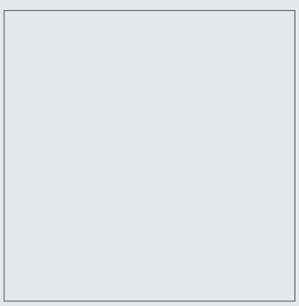


17⅞ x 23⅞" (453 x 606mm)
T: 50mm

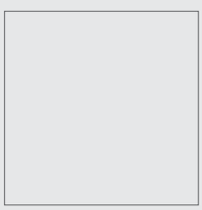
11⅞ x 23⅞" (301 x 606mm)
T: 50mm

11¹⁵⁄₁₆ x 23½" (300 x 600mm)
T: 50mm

SQUARES



36 x 36" (900 x 900mm)
T: 100mm



24 x 24" (600 x 600mm)
T: 60, 70 or 100mm

16 x 16" (400 x 400mm)
T: 70, 80 or 100mm

12 x 12" (300 x 300mm)
T: 60, 70 or 100mm

8 x 8" (200 x 200mm)
T: 60, 70, 80 or 100mm

6 x 6" (150 x 150mm)
T: 70mm

4 x 4" (100 x 100mm)
T: 70mm

RECTANGLES

18 x 36"
(450 x 900mm)
T: 60 or 100mm

12 x 24"
(300 x 600mm)
T: 50, 70, 100 or 150mm

8 x 16"
(200 x 400mm)
T: 70 or 100mm

7 x 14"
(180 x 360mm)
T: 60 or 80mm

6 x 12"
(150 x 300mm)
T: 70, 80 or 100mm

5 x 10"
(120 x 240mm)
T: 80mm

6 x 8"
(150 x 200mm)
T: 70mm

4 x 8"
(100 x 200mm)
T: 60, 70 or 100mm

3 x 6"
(75 x 150mm)
T: 100mm

PLANKS

12 x 36" (300 x 900mm)
T: 50, 100mm

8 x 24" (200 x 600mm)
T: 70, 100 or 150mm

6 x 24" (150 x 600mm)
T: 70 or 150mm

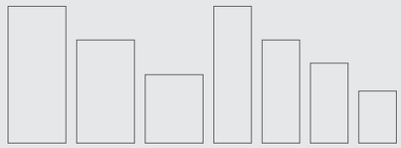
4 x 16" (100 x 400mm)
T: 100mm

4 x 12" (100 x 300mm)
T: 70, 80 or 100mm

3 x 12" (75 x 300mm)
T: 100mm

2¼ x 9½" (60 x 240mm)
T: 60 or 70mm

RANDOM BUNDLES



Artline® Platform
6¾ - 17¾ x 4⅞ and 7½" (170-450 x 125 and 187.5mm)
T: 70mm or 100mm

Beacon Hill® Platform
22½ x 15, 15 x 15, 7½ x 15" (570 x 380, 380 x 380, 190 x 380mm)
T: 60 or 80mm

Thornbury Platform
13¾ x 16½, 13¾ x 8¼, 6⅞ x 8¼"
(350 x 420, 350 x 210, 170 x 210mm)
T: 70mm

Tribeca Platform
5⅛ x 12, 5⅛ x 9, 5⅛ x 7"
(130 x 305, 130 x 230, 130 x 175mm)
T: 70mm

GEOMETRICS

8 x 8" (200 x 200mm)
T: 70mm

10¼ x 10¼" (260 x 260mm)
T: 80mm

6x12x16¾" (150 x 300 x 424mm)
T: 70 or 80mm

8⅞ x 5⅝" (147 x 224mm)
T: 80mm

PERMEABLE OPTIONS

8 x 8" (200 x 200mm)
T: 80mm

10¼ x 10¼" (260 x 260mm)
T: 80mm

9⅞ x 9⅞" (250 x 250mm)
T: 80mm

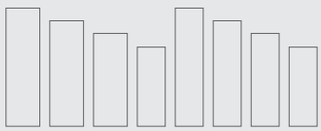
4 x 16" (100 x 400mm)
T: 100mm

3 x 12" (75 x 300mm)
T: 100mm

10 x 10" (240 x 240mm)
T: 80mm

5 x 10" (120 x 240mm)
T: 80mm

5 x 5" (120 x 120mm)
T: 80mm



Eco-Line® Random Bundle
9⅜ - 14 x 3 3/16 and 4" T:100mm

Not all shapes and sizes are available in all regions, or in all finish or edge options (not shown). Consult your Unilock Representative for more information. All measurements are nominal.

T = height / thickness of the slab or paver

PERMEABLE

Since **Unilock introduced permeable pavers to North America** more than thirty years ago, we have steadily increased our selection of sizes, shapes, colors and finishes.
Our permeable pavers are **suitable for a variety of applications** and have joint spacing that is appropraite for accessibility.

Permeable Paver **Innovation**

Unilock introduced permeable paving to North America in 1991, and has continued to lead the charge with new innovative products. Our extensive involvement in permeable paving and long-standing international alliances have allowed us to gain valuable knowledge, experience, and best practices that we can share with clients to help ensure their projects are a success.

1991

UNI ECO-STONE™

2000

ECOLOC®

2006

ECO-OPTILOC™

2008

ECO-PRIORA™

2011

ECO-HEX™

2012

TOWN HALL®

2012

THORNBURY™

2013

ECO-LINE®

2014

ECO-PROMENADE®

2017

TRIBECA COBBLE™

LATEST INNOVATION

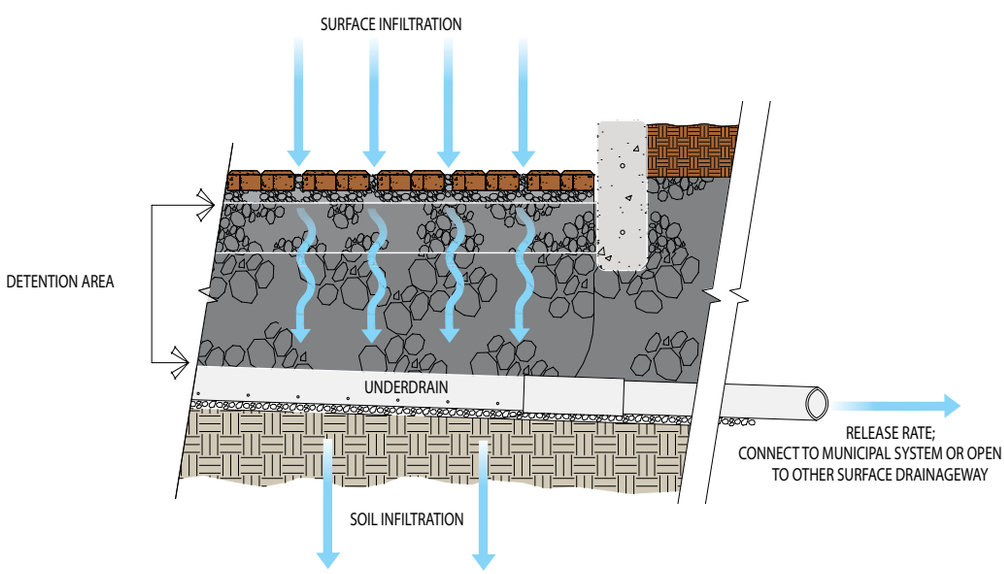
DURAFLOW™

Special openings in the paver unit called 'cupules' allow for easier maintenance of permeable systems.

The problem with stormwater is that it has to have somewhere to go, ideally back into the ground. Today's urban environments are covered with impervious hard surfaces such as rooftops, parking lots and highways in excessive amounts, instead of pervious fields and forests. This runoff flows into storm drains and ultimately into local rivers, lakes and streams, carrying heavy metals, bacteria and other pollutants that foul our water and put our health at risk.

Some communities use separate systems for sewage and stormwater, however, older urban communities use combined sewer systems that allow for overflow from the two inputs that release directly into local rivers and coastal waters when the system is overloaded. This allows for millions of gallons of raw waste and other pollutants into the waters we may fish, swim, boat or may be sources of drinking water.

Storm frequencies, intensities and duration are shifting and in many regions more severe storms occur more frequently than expected. Increased rainfall and snowfall will place increased demands on stormwater sewer and flood control systems.



PROJECT: Yolanda Garcia Park, Bronx, NY. **DESIGN:** New York City Parks. **PRODUCT:** Eco-Hex™ (7⅞ x 7⅞") with Smooth Premier finish in Dark Charcoal, Medium Grey and White.

Permeable Paver
DESIGN CONSIDERATIONS

Rainfall intensity and duration are typically analyzed together for traditional non-permeable surfaces. However, with a permeable paver surface, intensity is less of a factor as the surface infiltration rate will exceed the capabilities of most storms. A permeable paver surface is **capable of handling more than 100" (2,540 mm) per hour.** The paver joints must be adequately maintained to allow for maximum infiltration.

Although many rainfall events only last for a few minutes, for larger rainfall events, the impact of duration is important to recognize. A heavy rain could fall at the intensity rate of 6" (152 mm) per hour, but the duration may only last for 10 minutes with a resulting actual rain amount of only 1" (25 mm). Longer duration events can often be more demanding, even with less intensity. Actual monthly rainfalls in the Midwest U.S., for example, average 4" (100 mm). Therefore, permeable paving systems can easily contain most rainfall events.

Runoff coefficient (C value) is used to measure the percentage of water that runs off different surface types. For example, bituminous asphalt has a C value of 0.85. This means that during a rainfall, 85 percent of the water will run off the surface. (Source: Design and Construction of Sanitary and Storm Sewers, American Society of Civil Engineers, New York, p. 332, 1969). In comparison, turf has a C value of 0.15 or 15 percent. **The C value of permeable paving, with up to a 5 percent slope, is actually zero,** unless the rainfall intensity exceeds the surface infiltration rate or the entire open-graded base reaches capacity. With a properly designed permeable paver system, capacity will rarely be reached. To achieve maximum surface infiltration, maintenance of the joints may be necessary.

Soil infiltration is another way to absorb runoff. During the site investigation project phase, conducting a geotechnical or porosity test will determine the soil infiltration rate, which will establish stormwater design requirements. Typical industry recommendations suggest installing an underdrain for soil with less than 0.5" (13 mm) per hour of infiltration. It is possible for underdrain systems to be eliminated for soils with infiltration rates greater than 0.5" (13 mm) per hour.

Release rate refers to the volume of water that is allowed to be discharged into a municipal system or waterway, usually measured in cubic feet per second. Many stormwater regulatory agencies require that the post-development release rate not exceed pre-development conditions. **Permeable paving slows and detains stormwater in the open-graded base so that it can be gradually released.** Local jurisdictions should be contacted for required release rates.

Benefits of **INFILTRATION**

Rainwater infiltration is extremely important to the groundwater supply. According to the U.S. Geological Survey, one of America's most important natural resources is groundwater. Half of the drinking water in the U.S. comes from groundwater, with the balance coming from lakes and rivers. It is vital to agriculture and other industries, as well as essential for ensuring the health of rivers, streams, wetlands and other water bodies. Urban sprawl contributes to the decrease in pervious area for rainwater infiltration and reduced groundwater levels. Soil infiltration is a simple method for ensuring future water availability.

Installing a permeable paver system above porous soils allows for rainwater infiltration, reducing runoff and flooding. Most soils, even clay, allow for some infiltration. Soils with high porosity, such as sand, can have a higher infiltration rate than the actual rate of rainfall. For example, if it is raining at a rate of 2" (51 mm) per hour, and the soil has an infiltration rate of 4.5" (114 mm) per hour, the soil will absorb water before it can run off. Even poor soil with a low infiltration rate will work. For example, a soil with 0.25" (6 mm) per hour of infiltration will have complete infiltration after about four hours per inch of rainfall.

TYPICAL INFILTRATION RATES OF VARIOUS SOIL GROUPS

Soil Conservation Service Group	Typical Soil Type	Saturated Infiltration Rate	
		in/hr	mm/hr
A	Sand	8.27"	210 mm
A	Loamy Sand	2.41"	60 mm
B	Sandy Loam	1.02"	26 mm
B	Loam	0.52"	12.7 mm
C	Silt Loam	0.27"	6.8 mm
C	Sandy Clay Loam	0.17"	4.3 mm
D	Clay Loam and Silty Clay Loam	0.09"	2.3 mm
D	Clay	0.06"	1.5 mm

INFILTRATION RATES FOR UNILOCK PERMEABLE PAVERS *Newly Installed*

		PAVER	JOINT MATERIAL	Joint Width*	Void Space*	Infiltration Rate**	Minimum Infiltration Rate** for Rainfall intensity of:			
							2"/hr	4.5"/hr	6.5"/hr	11"/hr
ADA ACCESSIBLE	Small: 1/4" Joint	Eco-Line®	ASTM # 9 Aqua Rock	6.25 mm	5.8%	560	34	78	112	190
		Eco-Promenade®	ASTM #9 - SEK Chip	7 mm	10.12%	934	20	44	64	109
		Eco-Priora™ Herringbone	ASTM #9 - SEK Chip	7 mm	7.08%	676	28	64	92	155
		Eco-Priora™ 5 x 10	Kafka - 1/8 to 3/16"	7 mm	6.8%	633	29	66	96	162
		Eco-Priora™ Pattern H	ASTM #9 - Roscoe Chip	7 mm	5.7%	509	35	79	114	193
		Eco-Priora™ Pattern H	IDOT FA 22	7 mm	5.7%	347	35	79	114	193
		Eco-Priora™ 10 x 10	Kafka - 1/16 to 3/16"	7 mm	4.6%	327	43	98	141	239
		Treo® Permeable	ASTM #9 - SEK Chip	7 mm	5.5%	335†	36	81	118	200
	Medium: 1/4" to 3/8" Joint	Town Hall®	Kafka - 1/8 to 3/16"	9 mm	6.5%	784	31	69	100	169
		Eco-Hex™	ASTM #9 - SEK Chip	10 mm	4.2%	934	48	107	155	262
	Large: 3/8" to 1/2" Joint	DuraFlow™	ASTM #8 IDOT CA-16	12 mm	8%	912	25	56	81	138
		Eco-Optiloc™	HPB	12 mm	7.3%	404	27	62	89	151
		Eco-Optiloc™	ASTM #8 IDOT CA-16	12 mm	7.3%	912	27	62	89	151
	Extra Large: >1/2"	Tribeca Cobble™	ASTM #9 Aqua Rock	10mm	5.6%	400	36	80	116	196
		Thornbury™	ASTM # 9 Aqua Rock	18mm	4.4%	385	45	102	148	250
		Eco-Stone™	ASTM #8 IDOT CA-16	6 mm	10.18%	784	19	42	60	102
		Ecoloc®	Kafka - 1/8 to 3/16"	7 mm	12.18%	1060	18	41	59	99

NOTE: The 2", 4.5", 6.5" and 11" per hour Rainfall Intensity examples are based on common 5 minute rainfall intensity charts and are not the same as total rainfall quantity. *Joint Width is measured at the top of the paver. Void Space is calculated at the base of the paver. **Infiltration rate is inches per hour based on testing done when first installed and is an approximation. † Estimate based on similar void space data.

Detention and **VOLUME CONTROL**

BASE STORAGE CAPACITY

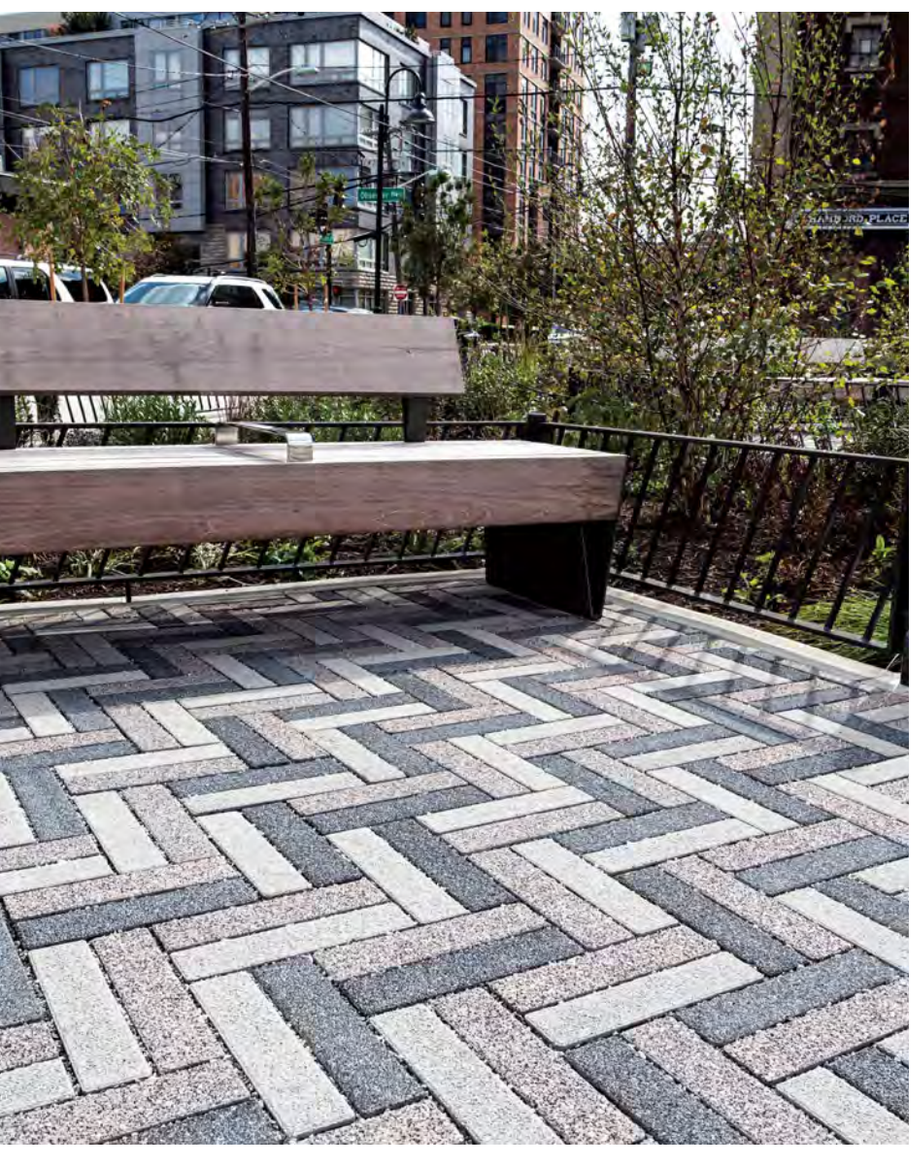
Traditional surface detention ponds which act as holding facilities for rainfall are an inefficient use of space. For most land uses and all impervious areas, such as roofs, roads and parking lots, stormwater runoff flows through a system of pipes that release it into detention or retention ponds. This valuable surface area could be much more effectively utilized.

A permeable paving base for stormwater detention is a very efficient use of land. With this system, the surface is pervious, allowing detention area to be contained underneath. The detention is created under every square foot of permeable paving, as deep as necessary.

Permeable paver systems use crushed, angular, open-graded aggregate base materials. These materials are entirely different from those used for traditional impervious roads and parking lots. Those traditional systems use dense-graded aggregates containing fines, making them extremely slow-draining. Conversely, the **use of open-graded aggregates provides a void space or porosity of approximately 40 percent.** This is utilized for detention and allows for a rapid surface infiltration rate of over 500″ (12,700 mm) per hour (see page 30 for aggregate infiltration rates).

CRITERIA				RAINWATER HARVEST VOLUME			BASE STORAGE CAPACITY			SURPLUS / (DEFICIT) STORAGE			% USED
Rainfall In/Hr (mm/hr)	Surface Area Ft2 (m2)	Base Depth In (mm)	Void Space	Cubic Ft (m3)	Acre Feet	Gallons (m3)	Cubic Ft (m3)	Acre Feet	Gallons (m3)	Cubic Ft (m3)	Acre Feet	Gallons (m3)	
1 (25 mm)	43,560 (4,047 m^2)	14 (35 mm)	40%	3,630 (103 m^3)	0.08	27,154 (103 m^3)	20,328 (576 m^3)	0.47	152,064 (576 m^3)	16,698 (473 m^3)	0.38	124,910 (473m^3)	17.9%
1 (25 mm)	43,560 (4,047 m^2)	18 (46 mm)	40%	3,630 (103 m^3)	0.08	27,154 (103 m^3)	26,136 (740 m^3)	0.60	195,511 (740 m^3)	22,506 (637 m^3)	0.52	168,357 (637 m^3)	13.9%
1 (25 mm)	43,560 (4,047 m^2)	22 (56 mm)	40%	3,630 (103 m^3)	0.08	27,154 (103 m^3)	31,944 (905 m^3)	0.73	238,958 (905 m^3)	28,314 (802 m^3)	0.65	211,804 (802 m^3)	13.9%
3.04 (77 mm)	43,560 (4,047 m^2)	14 (35 mm)	40%	11,035 (312 m^3)	0.25	82,548 (312 m^3)	20,328 (575 m^3)	0.47	152,064 (575 m^3)	9292.92 (263 m^3)	0.21	69,516 (263 m^3)	54.3%
3.04 (77 mm)	43,560 (4,047 m^2)	18 (46 mm)	40%	11,035 (312 m^3)	0.25	85,548 (312 m^3)	26,136 (740 m^3)	0.60	195,511 (740 m^3)	15,101 (428 m^3)	0.35	112,963 (428 m^3)	42.2%
7.58 (19 mm)	43,560 (4,047 m^2)	14 (35 mm)	40%	27,515 (779 m^3)	0.63	205,827 (779 m^3)	20,328 (575 m^3)	0.47	152,064 (575 m^3)	(7,187) 203 m^3)	(0.16)	53,763 (204 m^3)	135.4%
7.58 (19 mm)	43,560 (4,047 m^2)	22 (56 mm)	40%	27,515 (779 m^3)	0.63	205,827 (779 m^3)	31,944 (905 m^3)	0.73	238,957 (905 m^3)	4,429 (125 m^3)	0.10	33,131 (125 m^3)	86.1%

Detention volumes or storage capacities for permeable paving are based on different rainfall events.



PRODUCT: Eco-Promenade™ (3 x 12") with Series™ finish.

CASE STUDY

Southwest Park *by* **Starr Whitehouse**

Hoboken, New Jersey

As part of an extensive resiliency plan to mitigate flooding in a Hoboken neighborhood, a one-acre parking lot was turned into a unique park. The new space offers a refined spot for a variety of recreational activities with moveable seating areas, a lawn, child-friendly play zones and much more.

Permeable pavers helped the park meet the city's demand for sustainability with integrated green infrastructure capable of managing 200,000 gallons of stormwater in its underground water detention system. Permeable Planks were designed to direct rainwater back into the subbase and detention system through the joint material and keep it away from sewer systems.

The paving pattern was achieved using three colors of special order Unilock Series finish in the Permeable Plank shape. The colors play on the hues of neighborhood buildings creating an interesting and vibrant space for all to enjoy.

Improved **WATER QUALITY**

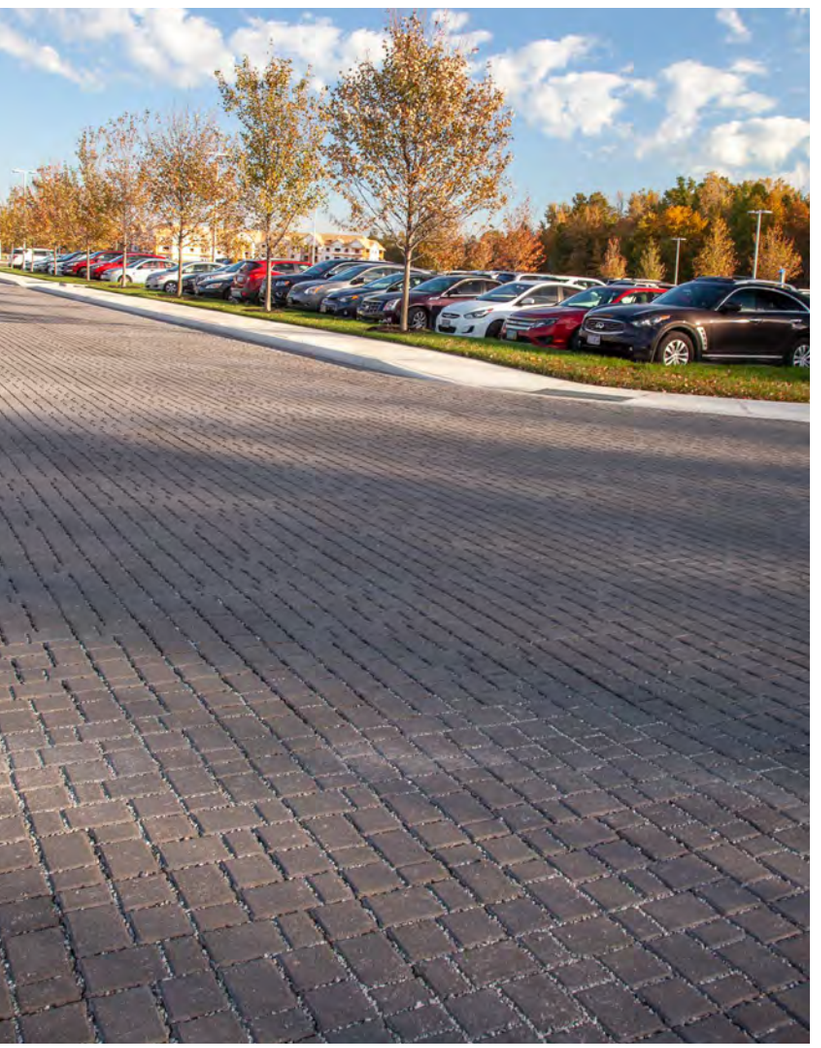
MEDIAN POLLUTANT REMOVAL

Without water, life cannot survive. For fish, wildlife and humans, clean water is a necessity. Even plants need a certain quality of water. The infiltration process of a permeable paving system will remove harmful pollutants such as oil. **The EPA recognizes permeable paving as a best management practice (BMP)** for non-point source pollutants. Utilizing permeable pavers is a simple step to ensure cleaner water and to minimize increases in water temperature. Often forgotten, water temperature is an important quality issue. Increased water temperatures can increase the amount of bacteria and algae, and can decrease aquatic life. Allowing the water to immediately drain from the surface ensures it will not be heated from an impervious surface before it reaches a runoff area.

The Interlocking Concrete Pavement Institute (ICPI) has conducted tests that determine water quality. Their findings indicate that **cleaner water results from being filtered through a permeable paving system.** Traditional systems have no means for cleaning water. Many municipalities in North America have begun to implement strategies to improve water quality by using BMPs like permeable paver systems. Even smaller communities have joined in the effort to create more sustainable water management systems.

POLLUTANT	INFILTRATION TRENCH DESIGN TYPE*			INFILTRATION TRENCHES & POROUS PAVEMENT
	0.5 in (13mm) Runoff per Impervious Acre	1.0 in (25mm) Runoff per Impervious Acre	2-Year Design Storm Treatment	Median Pollutant Removal**
Total Suspended Solids	60–80%	80–100%	80–100%	95%
Total Phosphorous	40–60%	40–60%	60–80%	70%
Total Nitrogen	40–60%	40–60%	60–80%	51%
Biological Oxygen Demand	60–80%	60–80%	80–100%	-
Bacteria	60–80%	60–80%	80–100%	-
Metals	60–80%	60–80%	80–100%	99% (Zn)

*Note: These rates are not based on actual data since monitoring what enters and leaves any infiltration facility is difficult to measure. This data is based on land application of pollutants and their treatment through soils. **Actual monitored removal rates.



PRODUCT: Eco-Optiloc™ in Natural.

CASE STUDY

Cleveland Clinic Hospital *by* Cawrse & Associates, Inc.

Avon, Ohio

WETLAND REQUIREMENTS. Cleveland Clinic Hospital located in Avon, Ohio needed to expand in order to continue meeting the health care needs of its community. The clinic identified the need to build a new, multi-story tower and significantly increase parking on a tight budget. The challenge the design team faced was that much of the available property and the adjacent property was wetland. Stormwater runoff from the parking lot was not allowed in order to protect the wetland.

The design team, in conjunction with the Army Corps of Engineers, decided that permeable pavers were the best approach to deal with the stormwater sensitivities. The high infiltration rate of Eco-Optiloc meant that stormwater would be reabsorbed below ground and the 'L' interlocking shape of Eco-Optiloc provided superior resistance to heavy vehicular and truck traffic. The mechanical installation of the pavers, coupled with the low cost of maintenance, kept the project on budget in the short and long term.

Nine components of a highly **Successful Permeable Pavement**

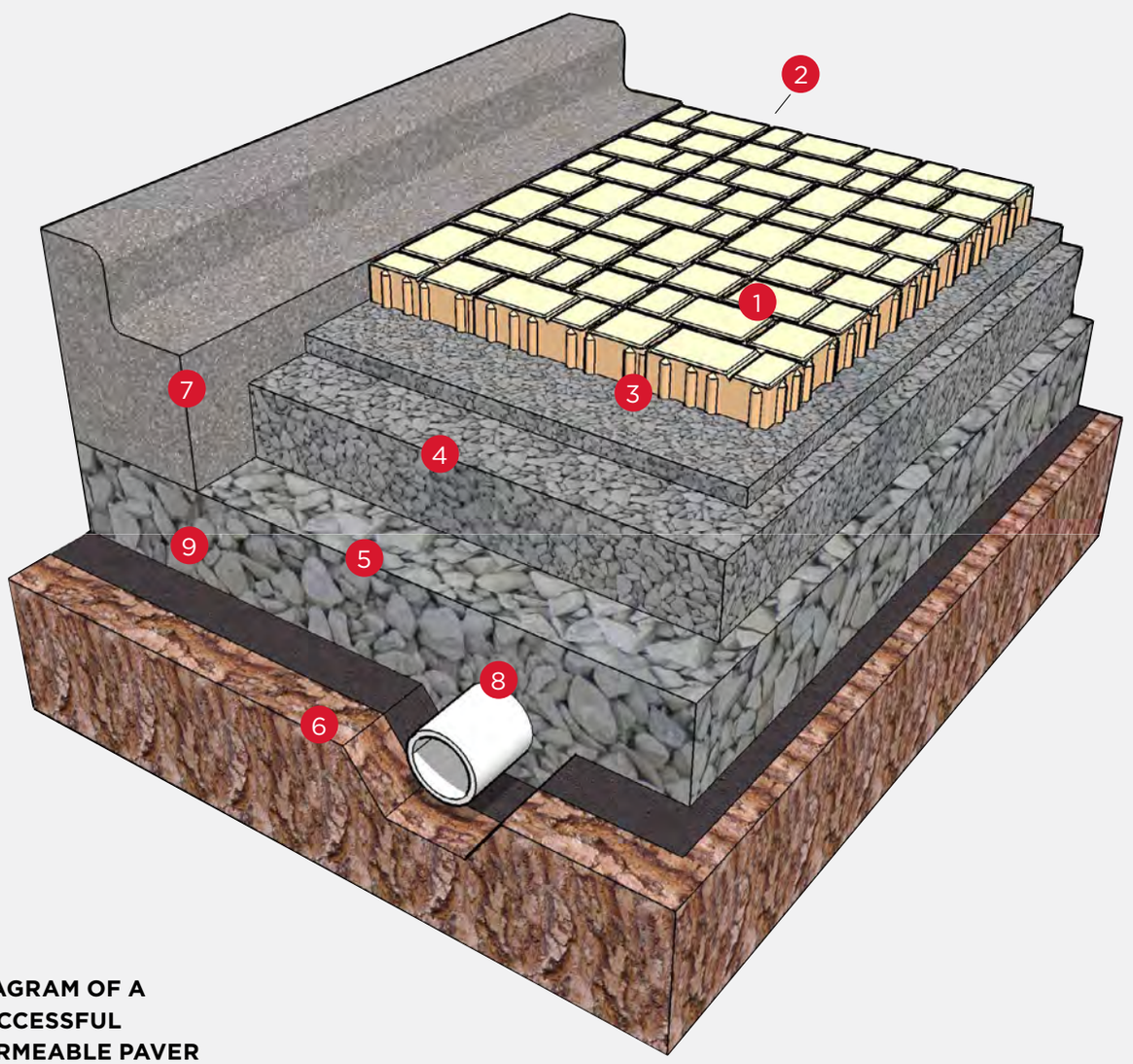


DIAGRAM OF A SUCCESSFUL PERMEABLE PAVER INSTALLATION

1 | Unilock Permeable Interlocking Concrete Paver
With various aesthetically pleasing colors and textures, creative choices are not compromised by function. Permeable Interlocking Concrete Pavers (PICPs) are the most durable of any porous pavement material. Unilock's minimum 8,500 psi (57 MPa), high-strength, no-slump concrete allows water to infiltrate between paver units instead of through the material. The joint sizes vary between paver options, ranging from 0.25″ (6 mm) to 0.5″ (13 mm), which meet the Americans with Disabilities Act specifications for permeable pavement, and allows a minimum of 100″ (2,540 mm) per hour of surface infiltration.

2 | Joint Aggregate – ASTM No. 8 OR 9
As the initial filtering layer, the 0.25″ (6 mm) crushed, angular, chip stone captures approximately 80 percent of debris in the first 1″ (25 mm) to 2″ (51 mm). The secondary function of the joint aggregate is to increase the positive interlock between the paver units, which is essential to the structural stability of the PICPs. The joint aggregate must always remain filled to the lip of the PICP units to reduce unnecessary clogging.

3 | Setting Bed Aggregate – ASTM No. 8
Using the 0.25″ (6 mm) crushed, angular, chip stone, instead of sand, provides a smooth leveling course for placing pavers and additional structural interlocking of the PICPs. Unlike sand, the setting bed aggregate allows for rapid water infiltration with over 500″ (12,700 mm) per hour through the 40 percent void-space. Sand must be avoided as a setting bed in a PICP application.

4 | Base Aggregate – ASTM No. 57
When subsoil conditions are conducive to supporting the ASTM No. 57 (12.5-25mm) crushed, angular, open-graded base material without migration, it can be used without ASTM No. 2 (50-63mm) subbase aggregate. Minimum thickness must be designed to sufficiently support anticipated loads, as well as accommodate stormwater detention in the 40 percent void space of the material. The ASTM No. 57 base aggregate, with a minimum thickness of 4″ (102 mm), serves as a transition material between the ASTM No. 8 (2-10mm) setting bed and the ASTM No. 2 subbase aggregate. The infiltration rate of the ASTM No. 57 is over 500″ (12,700 mm) per hour.

5 | Subbase Aggregate – ASTM No. 2
Subsoil conditions will dictate the necessity of this larger ASTM No. 2 (50-63mm), crushed, angular, open-graded subbase aggregate thickness. Installation of such material will provide increased structural stability on sites with poor soil conditions. A minimum thickness of 8″ (203 mm) is required for effective performance. Subbase aggregate thickness must be designed to sufficiently support anticipated loads. As an added feature, the ASTM No. 2 subbase aggregate temporarily detains stormwater runoff in the 40 percent void-space of the material. The ASTM No. 2 also has an infiltration rate of over 500″ (12,700 mm) per hour.

6 | Subgrade
Existing soil materials will determine the performance capabilities of the PICP system. Pre-construction soil analysis, including percolation, California Bearing Ratio and penetrometer measurements (blow counts), are mandatory for proper design. Subsoils with less than 0.5″ (13 mm) per hour of infiltration may require underdrainage, scarification and potentially amendments. Subsoils with greater than 0.5″ (13 mm) per hour are considered highly permeable. Subsoil compaction can cause a detrimental reduction in permeability and can be eliminated.

7 | Edge Restraint
PICP containment is vitally important to the success of interlocking properties. Lack or failure of an edge restraint will negatively impact the integrity of the pavement surface. For all vehicular PICP applications, an edge restraint, such as a concrete curb, is required. For non-vehicular and pedestrian areas, a plastic edging is sufficient when properly anchored into the subbase.

8 | Underdrain
In PICP systems, the underdrain pipe is based on several factors, such as the permeability of the subsoil, detention requirements, and stormwater release rate of the site. With highly permeable subsoils over 0.5″ (13 mm) per hour, the underdrain pipe could be eliminated. Underdrain pipe size is inconsequential, provided the flow rate is greater than the release rate.

9 | Mechanical Base Stabilization
Subsoil characteristics will determine the need for base stabilization. Specifically designed geogrid style systems, such as DriveGrid™ system, can be placed between the subsoil and ASTM No. 57 (12.5-25mm) base aggregate or ASTM No. 2 (50-63mm) and subbase. DriveGrid is not required between aggregate material layers. The base stabilization must be determined by soil conditions specific to each project. DriveGrid should be considered for any weaker subsoils.

Design and TECHNICAL INFORMATION

Typical Runoff Coefficients for the Rational Method

Land Use Type	Recommended Value
Industrial	0.75
Downtown Business District	0.85
Single-Family Residential	0.40
Multi-Family Residential	0.60
Parks	0.20

Surface Type	Recommended Value
Bituminous Asphalt	0.85
Pour-In-Place Concrete	0.85
Lawns – Sandy Soils	0.13
Lawns – Heavy Soils	0.20
Permeable Pavers	0.0*

Source: Design and Construction of Sanitary and Storm Sewers. American Society of Civil Engineers, New York, p. 332, 1969.

Coefficients are based on 5 – 10 year storm frequencies.

** Actual value until detention in permeable base reaches capacity.*

		SOIL SUBGRADE TEXTURE / INFILTRATION RATE INCHES / HOUR (MM/SEC)										
		Sand	Loamy Sand	Sandy Loam	Loam	Silt Loam	Sandy Clay Loam	Clay Loam	Silty Clay Loam	Sandy Clay	Silty Clay	Clay
Criterion	T_s (hrs)	8.27 ($6x10^{-5}$)	2.41 ($2x10^{-5}$)	1.02 ($7x10^{-6}$)	0.52 ($4x10^{-6}$)	0.27 ($2x10^{-6}$)	0.17 ($1x10^{-6}$)	0.09 ($6x10^{-7}$)	0.06 ($4x10^{-7}$)	0.05 ($3x10^{-7}$)	0.04 ($2x10^{-7}$)	0.02 (10^{-7})
f x T_s / V_r	24	496 (12.6)	145 (3.7)	61 (1.5)	31 (0.8)	16 (0.4)	10 (0.25)	5 (0.12)	4 (0.1)	3 (0.07)	2 (0.05)	1 (0.02)
for	48	992 (25.2)	290 (7.4)	122 (3.1)	62 (1.6)	32 (0.8)	20 (0.5)	11 (0.3)	7 (0.17)	6 (0.15)	2 (0.15)	2 (0.05)
(V_r = 0.4)	72	1489 (37.8)	434 (11)	183 (4.6)	93 (2.4)	149 (1.2)	31 (0.8)	16 (0.9)	11 (0.13)	9 (0.2)	7 (0.17)	4 (0.1)

T_s = Maximum allowable storage time V_r = Voids ratio Lowest values unless base exfiltration is supplemented with drain pipes.

Maximum allowable depths, inches (m) of storage for selected maximum storage times (Ts in hours), minimum infiltration rates and inches/hour (mm/sec)(31).

The Natural Resources Conservation Service (NRCS) method typically uses 24-hour storm events as the basis for design. Therefore, this design method is based on controlling the increased runoff for a specific 24-hour storm. The specific duration and return period (e.g., 6 months, 1 year, 2 years, etc.) are provided by the locality. If the increase in peak discharge associated with the storm event cannot be managed, a first-flush event should be the minimum selected for design.

BASE & AGGREGATE CHARTS

Careful selection of base material, as described below, ensures that an installation can handle almost any amount of rainfall. Testing results of all the aggregates listed below show a void ratio of approximately 40 percent. Choosing the correct void filter is critical as well. The aggregate infiltration rates below illustrate the performance of the system.

Aggregate Infiltration Rates

Approximate Particle Size	Permeability (k) in./hr (m/s)
ASTM No. 8 (2 – 10 mm)*	1,400 - 4,000 (3×10^{-1} to 1×10^{-2})
ASTM No. 9 (2 – 5 mm)	140 - 1,400 (1×10^{-2} to 1×10^{-3})
ASTM No. 10 (1 – 3 mm)	14 - 140 (1×10^{-3} to 1×10^{-4})
ASTM No. 57 (12.5 – 25 mm)*	500 - 2,000
ASTM No. 2 (50 – 63 mm)*	>1,000

Permeability ranges of joint fill aggregates for permeable pavers.
** Unilock recommendations*

Setting Bed Aggregate

Sieve Size	Percent Passing
0.5″ (12 mm)	100
0.375″ (9.5 mm)	85 – 100
(4.75 mm) (No. 4)	10 – 30
(2.36 mm) (No. 8)	0 – 10
(1.16 mm) (No. 16)	0 – 5

Grading requirements for ASTM No. 8 bedding and joint / opening filler.
Setting bed aggregate can be used as joint aggregate for Eco-Optiloc™.

Base Aggregate

SIEVE Size	Percent Passing
1.5″ (37.5 mm)	100
1″ (25 mm)	95 – 100
0.5″ (12 mm)	25 – 60
(4.75 mm) (No. 4)	0 – 10
(2.36 mm) (No. 8)	0 – 5

Grading requirements for ASTM No. 57 base.

Subbase Aggregate

Sieve Size	Percent Passing
3″ (75 mm)	100
2.5″ (63 mm)	90 – 100
2″ (50 mm)	35 – 70
1.5″ (37.5 mm)	0 – 15
0.75″ (19 mm)	0 – 5

Sieve sizes for ASTM No. 2 aggregates.

BASE THICKNESS

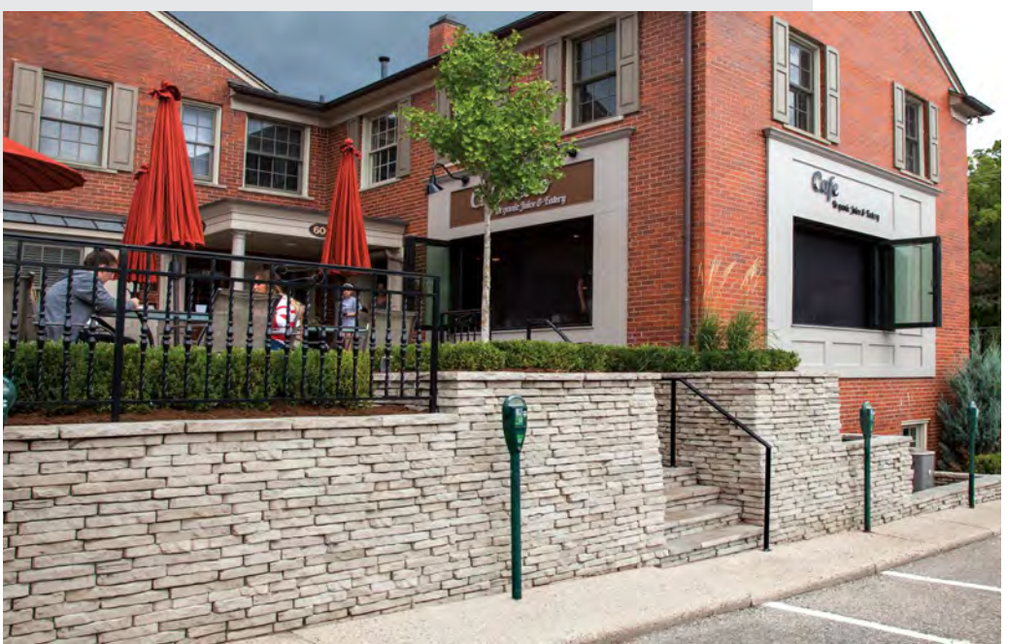
Permeable paving is not a typical segmental pavement. Unilock recommends that a professional engineer design a site-specific plan based on available site information. Along with information provided in this brochure, Unilock offers comprehensive software solutions, and industry-experienced consultants to assist you in the design of your pavement.

Pavement Use	Subbase ASTM No. 2	Base ASTM No. 57	Minimum Total
Heavy-duty industrial	14″ (355 mm)	6″ (152 mm)	20″ (559 mm)
Municipal street	12″ (305 mm)	6″ (152 mm)	18″ (457 mm)
Light-duty parking lot	8″ (203 mm)	6″ (152 mm)	14″ (356 mm)
Residential driveway	n/a	12″ (305 mm)	12″ (305 mm)
Non-vehicular sidewalk	n/a	10″ (254 mm)	10″ (254 mm)

Notes: 1) All permeable pavers require a 1.5″ (38 mm) setting bed of ASTM No. 8 for placement. 2) All thicknesses are after compaction. 3) Geotextiles between subgrade and ASTM No. 2 are optional and based on soil conditions. 4) Geotextiles are not required between the subbase, base or setting bed layers.

RETAINING WALLS

A great retaining wall should provide an aesthetic that **blends subtly with the environment and surrounding architecture**. For decades, Unilock segmental retaining walls have been the choice of Landscape Architects, Designers and Engineers who are looking for **classic, clean lines and timeless appeal.**



RETAINING WALL Design

SEGMENTAL RETAINING WALLS

Why do so many engineers select Unilock for retaining walls? In a word: confidence. Confidence that Unilock manufactured products have the structural, safety and weathering capabilities needed for the project. Confidence in the field performance of a vast portfolio of structures. Confidence that Risi Stone will provide the engineering support required to get the job done accurately and expeditiously.

PROJECT: Office Complex Mississauga Rd. Mississauga, ON. **DESIGN:** RisiStone Engineering. **PRODUCT:** SonomaStone™ in Natural.

	ASTM C1372 / NCMA Zone 3 (de-icing exposure)	**UNILOCK STD.**
Compressive Strength - Minimum	3000/5500 PSI	5500 PSI
Absorption - Maximum (No individual unit greater than)	15 lb/ft^3	7 lb/ft^3
Dimensional Tolerance (length, width, or height)	± 1/8" (± 3.2mm)	± 1/8" (± 3.2mm)

SOLID CORE CONSTRUCTION

The solid body tongue and groove design provides engineers with the assurance that the structural properties are guaranteed. Not having to fill a hollow block core and the ability to easily modify blocks on-site is a considerable labor savings. Owners can be confident in the proven long-term performance of the wall's integrity.

QUALITY MANUFACTURING

Each unit's structural integrity and performance is ensured by manufacturing to specifications that meet or exceed American Society of Testing and Materials (ASTM) standards. The Unilock manufacturing system provides peace of mind by exceeding technical standards set by the National Concrete Masonry Association (NCMA) recommendation for Roadway and Non-Roadway Applications - Zone 3 - with exposure to de-icing salts, as well as local building codes.

BUILT TO LAST

Unilock manufactured retaining wall systems are engineered to last. Individual units range from 19lbs (8.6kg) to 1,700lbs (772.7kg), and some can be used to construct walls up to 40ft (12.2m) high. The mechanical installation characteristics of Unilock retaining walls surpass conventional modular wall systems in speed and performance. Vespa.RS advanced engineering software from Risi Stone lets you analyze all important factors including height, differing soil types, unique site conditions and loading requirements directly from CAD, saving valuable time.

SOLID ADVANTAGES

FEATURE	ADVANTAGE	BENEFIT
Solid Blocks	Provides greater durability	• More resistant to breakage and minor damage
	Easy to split or modify	• Blocks can be simply cut/altered with no risk to final wall integrity
	No hollow cores to fill with gravel & compact	• Ensures maximum weight of each block is present • Maximum resistance to overturning • Reduced installation time and labor costs
Modular System	Wall is flexible, while still retains its structural integrity	• Absorbs movement and settlement • Requires minimal embedment
	Array of complementing special blocks	• Easily create site-specific features • Coping can be selected for various wall arrangements • Pre-fabricated corner blocks intensify corner strength and appearance, while speeding construction
	Requires only a compact granular base	• Reduces installation cost
Interlocking Tongue & Groove	Interlocking mechanism is molded directly in to the block	• Easy, quick installation • No separate pins or clips to install
	Maximum shear strength	• Shear strength is maintained along the entire length of block • Allows for superior geogrid connection
	Automatic alignment & self-battering	• Once the first course is installed flat and level, successive blocks stack quickly and easily
	Blocks are dry-stacked	• Lower cost — No mortar requirements • Minimal training is required to achieve excellent results
	Continuous interlock achieved throughout the wall	• Creates a stronger, more damage-resistant structure
Combined with Geogrid Reinforcement	Higher walls can be achieved	• Able to use the same fascia throughout the project on lower and higher walls (i.e. Gravity and geogrid reinforced walls can be mixed as site conditions dictate)

SUPPORT AND ASSISTANCE

Unilock & Risi Stone®

Unilock manufactures a number of Risi Stone Systems licensed retaining walls: Pisa2™, Concord Wall™, RomanPisa™, Rivercrest® Wall, SienaStone™, SonomaStone™, DuraHold® and DuraHold®2. With installations more than 25 years old, we offer the most proven SRW systems on the market.

Design assistance

Risi Stone offers many different levels of assistance. From general product information, typical cross-sections and software programs, to site specific final design packages, they will work with you to achieve the best possible design solution.

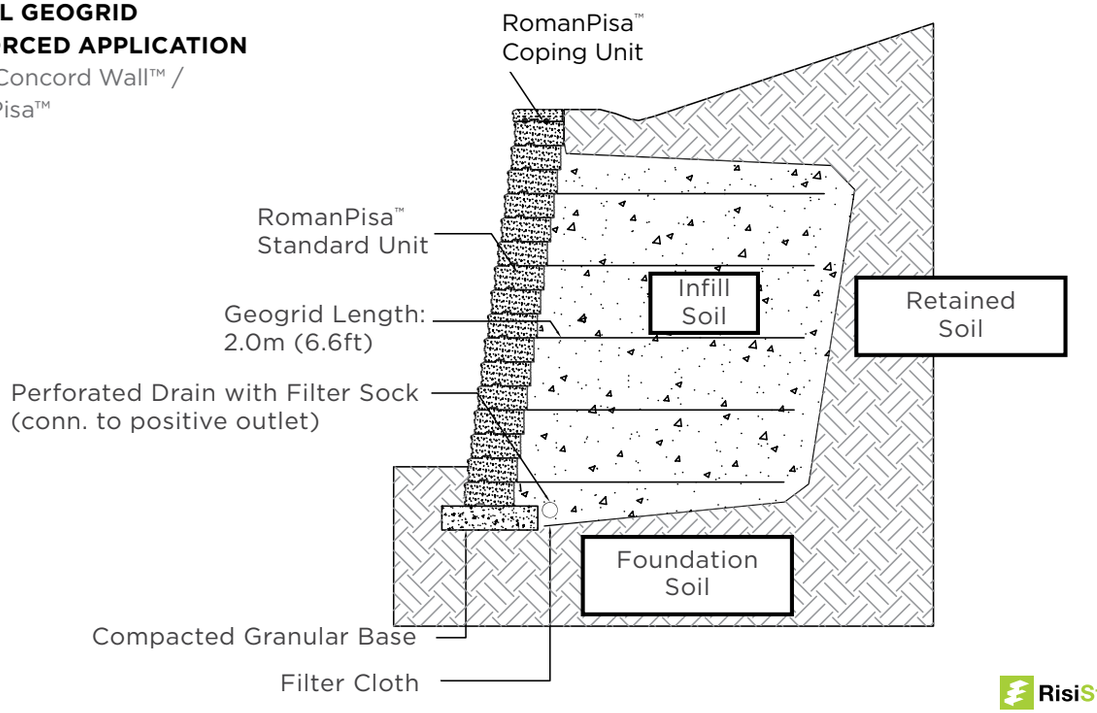
Preliminary Sections

For preliminary design, bidding or feasibility purposes, Risi Stone Systems have created one of the industry's most comprehensive collections of pre-engineered typical cross-section drawings for a variety of applications. These sections have been designed to meet very specific criteria in an attempt to be as close to your particular project as possible. They are sorted according to the main criteria used in the design of a segmental retaining wall. The search tool at www.unilock.com allows you to select the Risi Stone licensed product, the loading and the height of the wall, according to your project requirements to find cross sections that most closely match your project needs.

TYPICAL CROSS SECTIONS

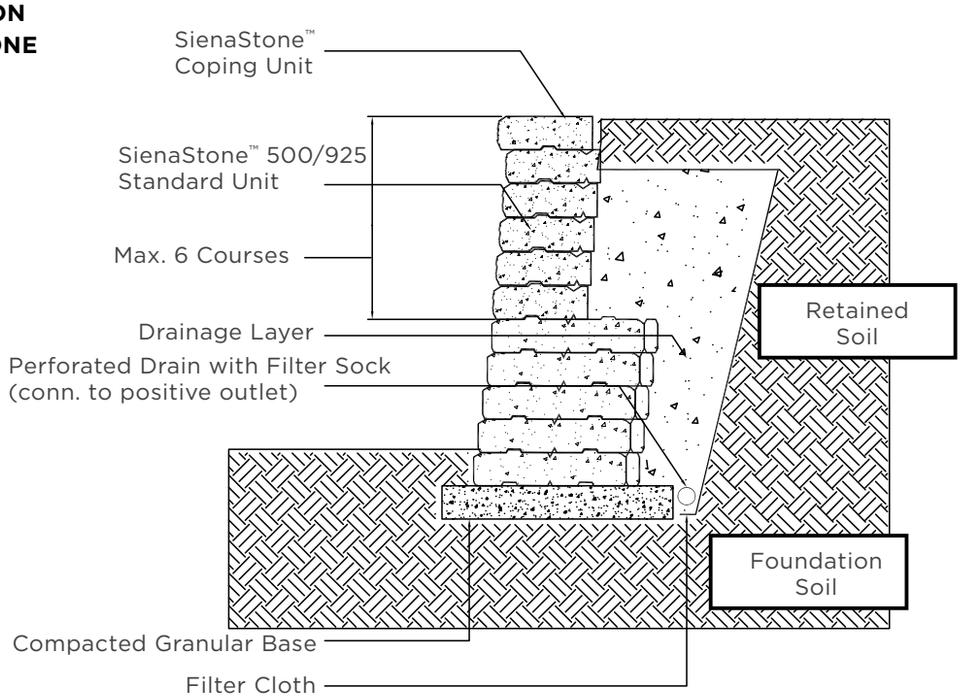
TYPICAL GEOGRID REINFORCED APPLICATION

Pisa2™/Concord Wall™ / RomanPisa™



RisiStone

TYPICAL GRAVITY APPLICATION – SIENASTONE



RisiStone

PROJECT SUPPORT

YOUR TRUSTED PARTNER

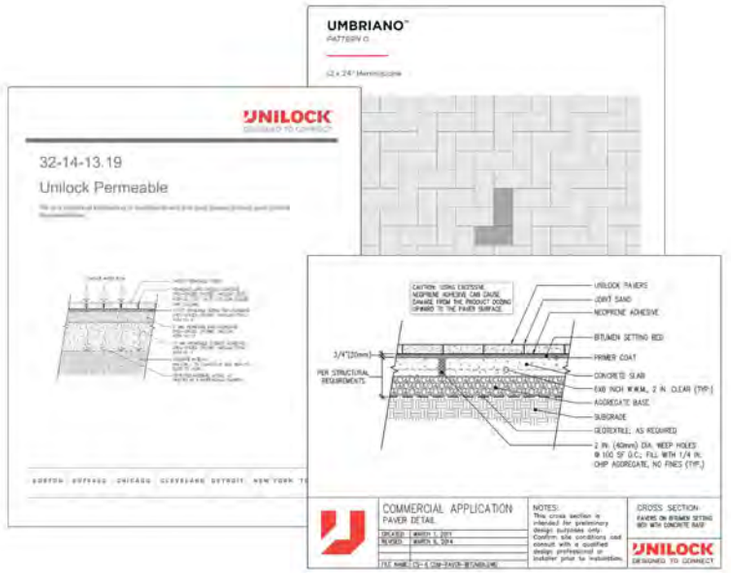
Our years of industry-leading expertise and unparalleled personal attention and collaboration ensure that every intricate detail of your project runs smoothly. Our level of support is tailored to meet your needs. We're here to help through every step of your project. Talk to your Unilock Representative today to get all the details.

CEU SEMINARS

Live in-person or online seminars are available to you to provide learning experiences that expand your professional skills and knowledge while keeping you up-to-date on industry trends and relevant topics. Ask your Unilock Representative about seminars that also earn you valuable continuing education credits.

DETAILS AND SPECS

Cross sections, details, specifications and technical support are assets available to you to build out your documents and drawings. Contact your Unilock Representative for more information.



DESIGN FILES AND SAMPLES

Choosing the perfect product has never been easier. Our BIM files, repeatable swatches and hatch patterns allow you to visualize our materials in your 2D and 3D designs. And when the time comes to finalize your product selection, your Unilock Representative will bring you all the real life samples you need.

OUTDOOR IDEA CENTERS

Unilock Outdoor Idea Centers provide you with the perfect place for inspiration and a great destination for client feedback. When you visit be sure to see, touch and experience all that Unilock has to offer.

PROJECT: The Well, Toronto, ON. **DESIGN:** CCxA (Claude Cormier + Associés). **PRODUCT:** Series™ finish pavers (12 x 12") with Load Lock™ technology in custom colors and Series™ finish pavers (4 x 4", 4 x 8", 4 x 12" & 4 x 16") in custom colors. **PHOTO CREDIT:** Adrian Stiles Photography.

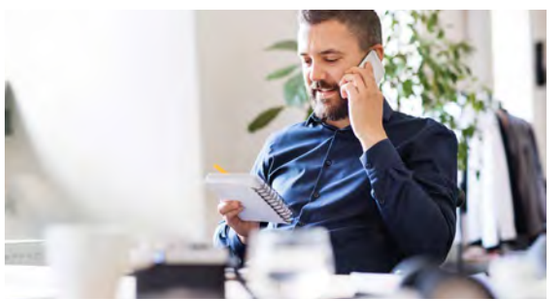
CUSTOMIZATION

Unilock allows you to customize products to suit your project. Our vast array of sizes, edges, finish and color options make it easy to achieve your design vision. Choose a shape first, then narrow down the desired finish and color range. Once your preliminary selections have been made, call your Unilock Representative. They will guide you through the special order options available in your market and all of our other custom capabilities including specialty aggregates, additional processing for unique surface textures, and technology add-ons like factory sealing.

STEP 1
CHOOSE SHAPES

STEP 2
CHOOSE FINISHES & COLORS

STEP 3
CONTACT YOUR
UNILOCK REPRESENTATIVE



Creating products to suit your unique design ideas is what we do best. Call us early in the design process to ensure every aspect is accurate, from shape, finish and color to edge detail and product technology add-ons. Let's see what we can create together!

Special pricing, minimum quantities and additional lead times for manufacturing may apply. Contact your Unilock Representative to confirm all details before creating your specification.

INDEX

ON THE COVER

PROJECT: Frederik Meijer Gardens & Sculpture Park.
DESIGN: Todd Williams Billie Tsien Architects & Progressive AE
PRODUCT: Promenade™ (4 x 16", 4 x 12" and 8 x 24") with Series™ finish in a custom color and Umbriano® finish in French Grey.

PROJECT: Walnut Street, Des Moines, IA. **DESIGN:** Confluence. **PRODUCT:** Series™ (4 x 8") in Arctic Grey, Nordic Star, Onyx Black, Platinum Grey and two special order colors.

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