

Street, Large Scale and Industrial Pavements



UNI-GROUP U.S.A.
Manufacturers of UNI® Pavers



*Pier IX, Massey Coal Terminal, Newport News, VA
Inset: Mechanical Installation Eco-Optiloc®*

UNI® Traditional & Permeable Concrete Pavers

UNI® interlocking concrete traditional and permeable pavers are manufactured across the United States and Canada by the industry's leading paver producers. As the nation's oldest interlocking concrete paver association, UNI-GROUP U.S.A. producers offer unmatched technical and manufacturing expertise with large-scale, heavy-duty industrial, and permeable pavement applications.

Our UNI-Anchorlock® and Optiloc® traditional pavers and Ecoloc® and Eco-Optiloc® permeable pavers feature unique, patented anchor-interlocking shapes that offer superior resistance to twisting or tipping under heavy vertical loading, as well as forces from horizontal stresses. These shapes were designed for mechanical installation for cost savings on large scale projects and are ideal for heavily-loaded and trafficked commercial, municipal, and industrial pavement applications. An added advantage is that these traditional and permeable designs be used together where a combination of standard and permeable pavements are required.

Our Eco-Priora® permeable paver is offered in rectangular and square shapes with patented interlocking spacers, which offer added structural stability under vehicular loads. Its flat surface profile makes it an ideal product for large-scale pedestrian pavements such as municipal and institutional plazas.

And our original permeable paver, UNI-Eco-Stone®, was North America's first permeable paver, introduced in 1989 and still a popular choice for parking applications.



*Clockwise from top: South Shell Park, Oakville, ON - Eco-Optiloc - Unilock, Ltd.
Sterling Sugar Refinery, Franklin, LA - UNI-Anchorlock - Pavestone Company
Tacoma Community College, WA - Ecoloc - Mutual Materials
New Orleans Convention Center, LA - UNI-Anchorlock - Pavestone Company*

Streets, Intersections & Entryways



*Clockwise from top: Somerville, MA - Optiloc - Unilock New England
Battle Command Training Center Test Pad, Carson, CO - Eco-Stone - Pavestone Company
Canadian Tire, Toronto, ON - Ecoloc - Unilock, Ltd.
Residential Street - UNI-Anchorlock - Unilock Chicago*



*Fire Station Grand Traverse, MI
Eco-Optiloc® - Unilock Michigan*



*Port of Tampa, FL
UNI-Anchorlock® - Coastal*

Retail & Office Parking

All UNI® pavers are manufactured to meet or surpass ASTM C-936 industry standards, using a zero-slump concrete mixture subjected to high-frequency vibrations to achieve minimum 8,000 psi and maximum 5% absorption.

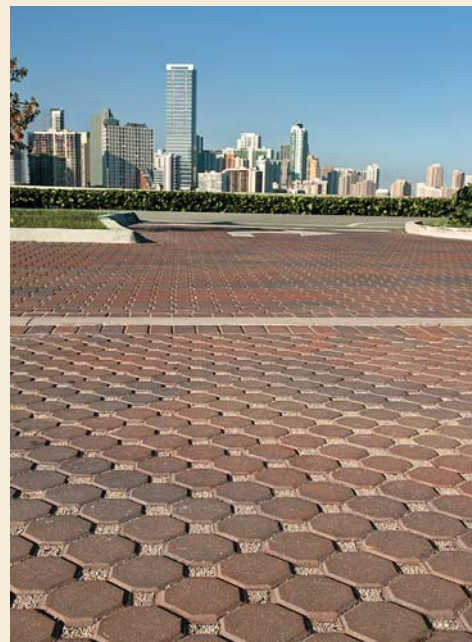
The high-quality of UNI® pavers and their advanced interlocking technology make them ideal for a wide array of residential, commercial, municipal, institutional, and industrial pavement applications.

- Plazas, courtyards and sidewalks
- Office, condo and retail parking lots
- Large-scale municipal and arena parking
- Low-speed streets and entryways
- Airport maintenance and hangar areas
- Depots, industrial yards, and rail yards
- Loading docks, marinas and ports



*Clockwise from top: Schmelz Volkswagen, St. Paul, MN - Eco-Stone - Borgert Products
Toronto Skydome, ON - Optiloc - Unilock, Ltd.
Worcester, MA - UNI-Anchorlock - Ideal Concrete Block Co.
Broadway West Retail Center - Eco-Stone - Borgert Products*

Parks & Municipal Pavements



*Clockwise from top: Streetscape - Optiloc - Unilock
Rickenbacker Causeway Park - Eco-Stone and Uni-Dcor - Coastal
Rhode Island Public Transit Authority - Eco-Optiloc - Unilock New England*



*Waubonsee Community College, IL
Eco-Optiloc® - Unilock Chicago*

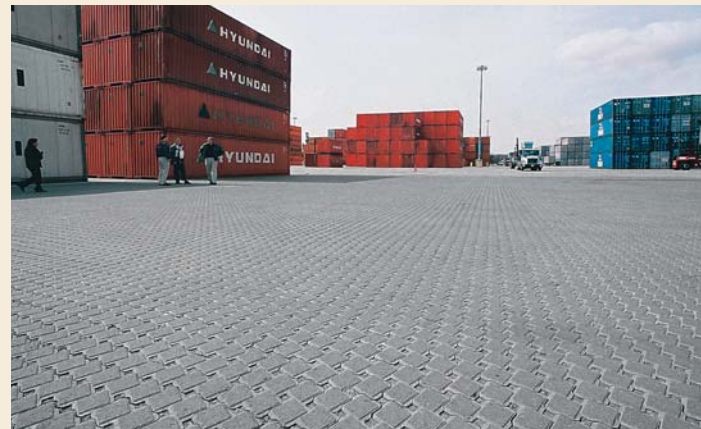


Port of Mobile, AL
UNI-Anchorlock® - BlockUSA

Storage Yards, Depots, Ports & Marinas

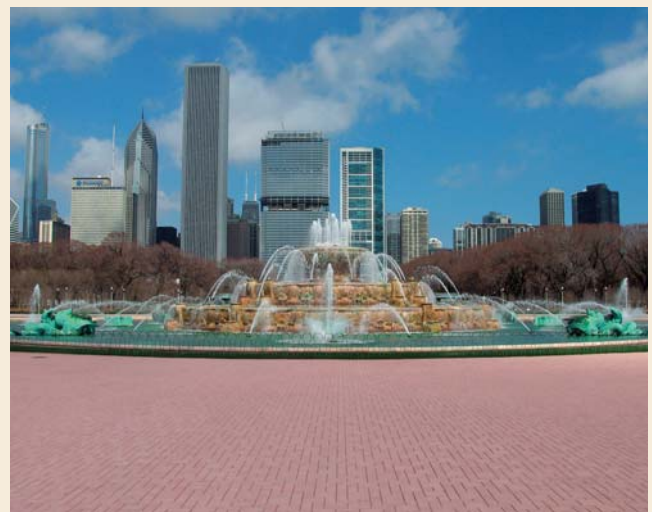
UNI® pavers offer numerous advantages over other types of pavement materials.

- *Exceptional durability and resistance to severe loads*
- *Withstands wheel-turning movements without surface degradation or raveling*
- *High density and low absorption*
- *Easy access to underground utilities for repairs and allows for easy reinstatement*
- *Ability to withstand temperature extremes*
- *Low life-cycle costs - long pavement life*
- *Superior skid-resistance*
- *Resistance to deicing salts*
- *Accommodates base or subgrade settlement*
- *Can be trafficked immediately after installation and compaction*



Clockwise from top: Charles City, IA Streetscape - Eco-Optilock - Unilock Chicago Westmoreland Street, Portland, OR - Ecoloc - Mutual Materials Howland Hook Container Terminal, Port of NY/NJ - Ecoloc - Unilock New York New Orleans Convention Center, LA - UNI-Anchorlock® - Pavestone Company White Mountain National Forest Headquarters - Eco-Stone - Ideal Concrete Block Co.

Office, Condo & Commercial Pavements



*Clockwise from top: Avenue 500 - Optiloc - Unilock
Howland Hook Container Terminal, Port of NY/NJ - Ecoloc - Unilock New York
Buckingham Fountain, Chicago, IL - Eco-Priora - Unilock Chicago
Drake Hill Commons, North Hampton, NH - Eco-Stone - Ideal Concrete Block Co.*

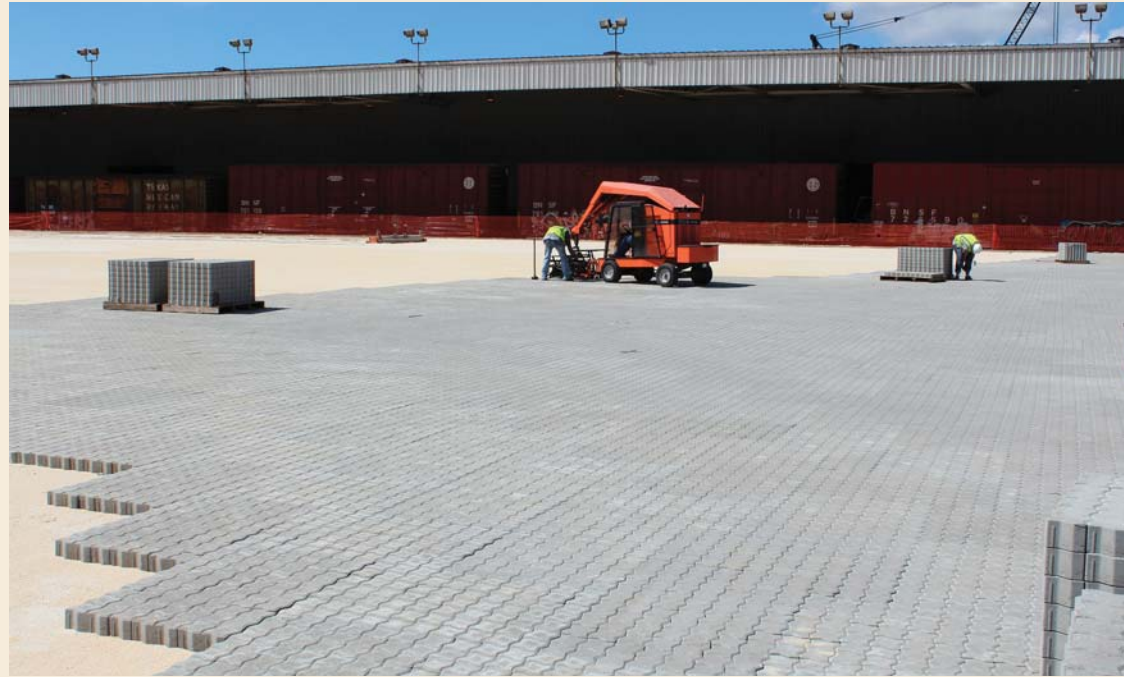


*Citi Field, Flushing Meadows, NY
Ecoloc® Bus Parking Lot - Unilock New York*



*National Renewable Energy Laboratory, Golden, CO
Eco-Priora® - Pavestone Company*

Institutional and Industrial Pavements



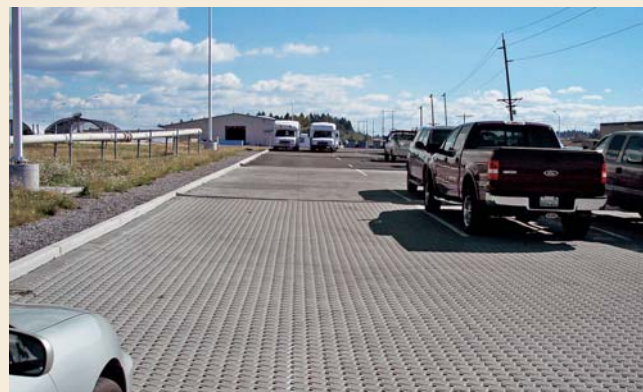
*Clockwise from top: Port of Mobile, AL - UNI-Anchorlock - BlockUSA
Stone Mountain Park, GA - Ecoloc - Pavestone Company
Fort Morgan, CO - Eco-Priora - Pavestone Company
Dominican University, River Forest, IL - Ecoloc - Unilock Chicago*

Permeable Interlocking Concrete Pavements



First introduced in 1989, the Eco-Stone Family of Permeable Pavers offers a proven solution to stormwater runoff. They are sustainable, economical, durable, and beautiful.

- *Can provide up to 100% infiltration on site and accommodates a variety of stormwater objectives*
- *Allows better land-use planning especially in high-density areas*
- *Reduces impacts on combined storm/sewer systems*
- *Can save money by combining parking and detention in one cost-effective system*
- *Mitigates runoff volumes and peak flows, reduces pollutants, addresses water quality/quantity*
- *Reduces heat-island effects and need for de-icing salts*
- *EPA-recommended BMP*
- *Contributes to groundwater recharge*
- *Qualifies for LEED® and other green accreditation*
- *Maintain with street sweeping/vacuuuming*



*Clockwise from top: Warrenville Road, IL - Eco-Optiloc - Unilock Chicago
Morton Arboretum - Ecoloc - Unilock Chicago
Tacoma Landfill, WA - Ecoloc - Mutual Materials
Whole Foods, Naperville, IL - Eco-Optiloc - Unilock Chicago*

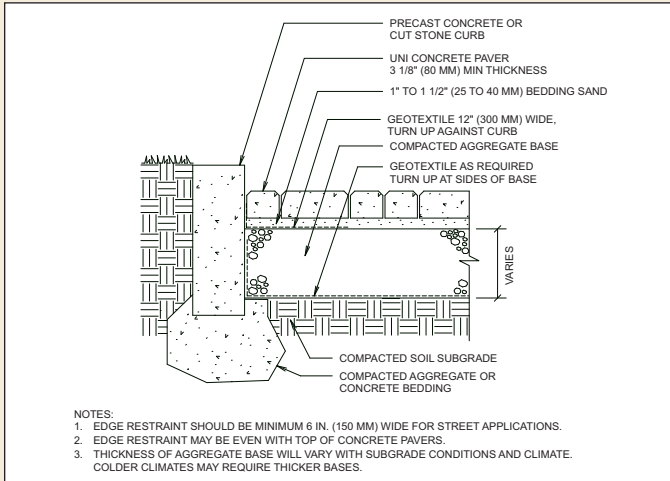


*Aurora Police Station, IL
Eco-Optiloc® - Unilock Chicago*

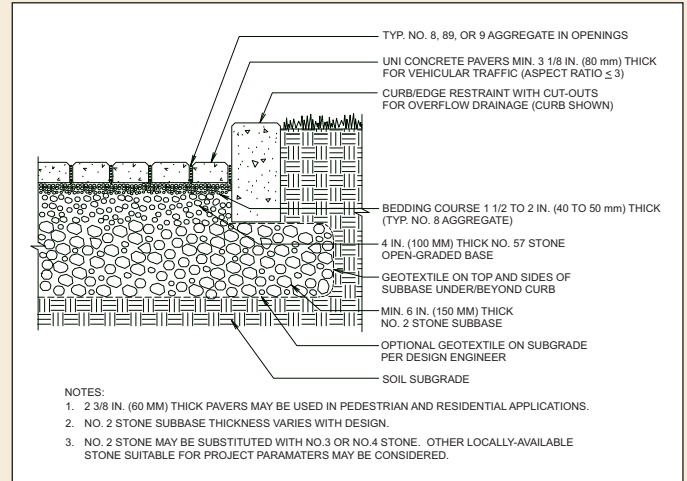


*Thule Street, Peterson Airforce Base, Denver, CO
Eco-Priora® - Pavestone Company*

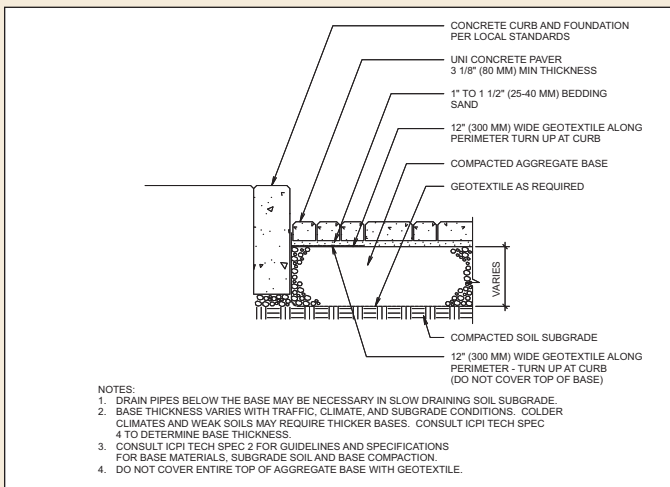
Typical Cross-Sections



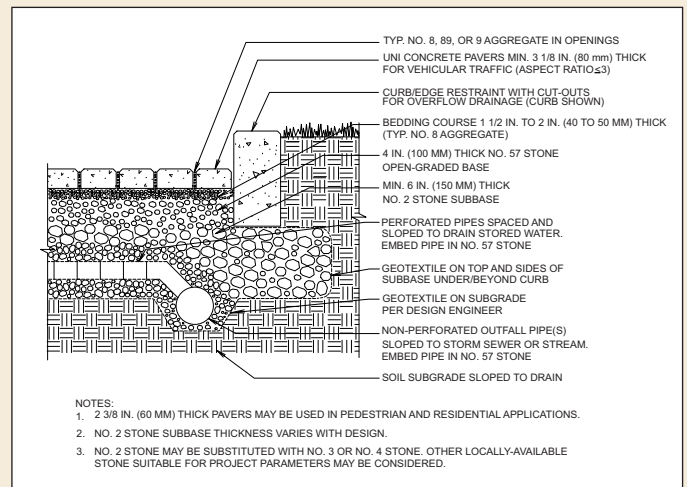
Street Pavement With Full-Depth Concrete Or Cut Stone Curb



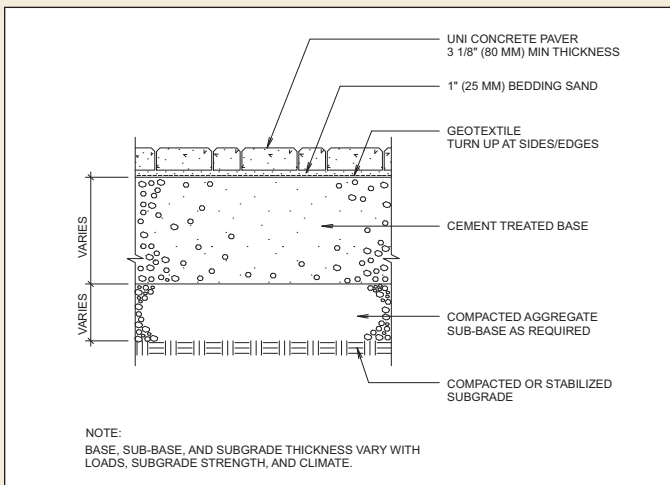
Permeable Pavement With Full Infiltration To Soil Subgrade



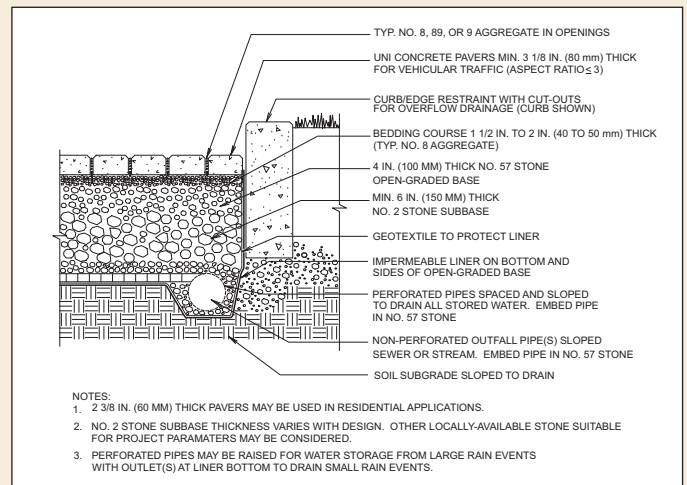
Street/Parking Lot On Compacted Aggregate Base



Permeable Pavement With Partial Infiltration To Soil Subgrade



Port/Industrial Pavement On Cement-Treated Base



Permeable Pavement With No Infiltration To Soil Subgrade

Pavement design varies with climate, available construction materials, design methods, soil conditions, and traffic loading. A qualified engineer should be consulted on heavy-duty and permeable pavement applications to ensure desired results. Please see the last page for industry references and guidance for the design of traditional and permeable interlocking concrete pavements.

Contact Us Today



Proven Performance in Any Climate

UNI® traditional and permeable pavers feature shapes that offer the highest degree of interlock and have been tested and proven worldwide for over 50 years. UNI® pavers can be mechanically installed, saving time and money on traditional or permeable pavement projects. Both types of pavers can withstand climate extremes and accommodate freeze-thaw, with hundreds of millions of square feet installed throughout North America and Canada. Both types of pavements can be snow-plowed.



UNI-Anchorlock® - Traditional Paver



Eco-Stone® - Permeable Paver



Optiloc®/Eco-Optiloc®



Eco-Priora®

Design References and Guidance

For design guidance and references, please refer to the references listed below, which may be downloaded via our website at www.uni-groupusa.org. For a list of our current manufacturers, please visit the website.

- *Lockpave® Pro structural design software / PC-SWMM™ PP hydrologic design software*
- *Applications for Concrete Paving Block in the United States Market - Rollings & Rollings*
- *The UNI Eco-Stone® Family of Permeable Interlocking Concrete Pavers Design Guide and Research Summary*
- *Pier IX Terminal Case Study - UNI-GROUP U.S.A.*
- *Sterling Sugar Refinery - UNI-GROUP U.S.A.*
- *Port of Tampa Case Study - UNI-GROUP U.S.A.*
- *Eco-Stone Family of Permeable Interlocking Concrete Pavers Project Profiles - UNI-GROUP U.S.A*
- *Interlocking Concrete Block Pavements At Howland Hook Marine Terminal - Walter E. Sieglen Jr. and Harald von Langsdorff*
- *Test Results on the Stiffness of Paved Surfaces - Brian Shackel, PhD., Johann Litzka, M. Zieger*
- *The Design & Construction of Interlocking Concrete Pavements - Brian Shackel, PhD.*
- *Airfield Pavement Design with Concrete Pavers - Roy D. McQueen, P.E., John Knapton, PhD., John Emery, David R. Smith*
- *Port and Industrial Pavement Design with Concrete Pavers - John Knapton, PhD.*
- *Structural Design Solutions for Permeable Pavements - John Knapton, PhD., David Morrell, Mihailo Simeunovich*
- *Permeable Shoulders With Stone Reservoirs - David K. Hein, P.Eng., Eric Strecker, P.E., Aaron Poresky, P.E., Dr. Robert Roseen, P.E. Marie Venner - Requested by: American Association of State Highway and Transportation Officials (AASHTO)*
- *Permeable Interlocking Concrete Pavements - Interlocking Concrete Pavement Institute*
- *ASCE/ANSI Standard 58-10 - Structural Design of Interlocking Concrete Pavements for Municipal Streets and Roadways*

This brochure provides an overview of the types and scope of traditional and permeable interlocking concrete pavements that are being designed and built in North America and is only to be used as a guideline. It is not intended to be relied upon as an industry standard or specification and is not intended to replace the judgement or expertise of professional engineers, architects or landscape architects, who should be consulted in the design and construction of permeable pavements. Design and construction will vary with local regulations and specifications, environmental conditions, materials, and established construction methods for that area.

Thank you to the Interlocking Concrete Pavement Institute for use of some project photos.

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Front Cover clockwise from top right:
Ferguson Avenue, Toronto, ON - Unilock, Ltd.
Port of Tampa, FL - UNI-Anchorlock - Coastal
U.S. Cellular Field - Eco-Optiloc - Unilock Chicago



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