UNI-GROUP U.S.A.
Traditional Paver Installation

Overview

Interlocking concrete pavements typically consist of a soil subgrade, an aggregate base, a sand bedding layer, the concrete paver wearing surface, edge restraints, and drainage structures. Geotextiles are also sometimes used. It is recommended that installation be performed by experienced interlocking concrete paver contractors. Pavement design and installation varies with climate, available construction materials, design methods, soil conditions, and traffic loads. A qualified engineer, architect, and/or landscape architect should be consulted in concrete paver applications.

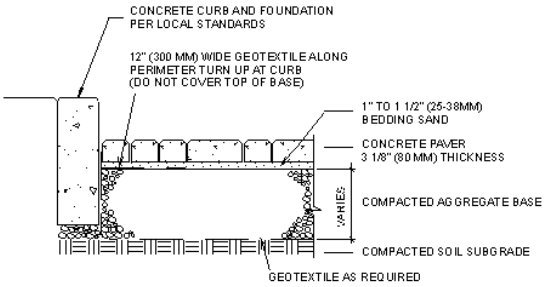
UNI® interlocking concrete pavers can be installed either manually or mechanically. In mechanized installation, specialized paver installation equipment speeds construction time by installing approximately one square yard (one square meter) of pavers at a time in rapid succession.

This information is provided as a general guide for pedestrian and many vehicular pavement applications. For heavy-duty or industrial pavements, consult a qualified civil engineer for design and installation guidelines. Contact your local UNI® Manufacturer or see our web site – www.uni-groupusa.org – for detailed installation specifications, cross-sections, and construction guidelines. You may also order our Lockpave Pro® software for the structural design of interlocking concrete pavements.

Subgrade

Excavate any unsuitable, unstable or unconsolidated materials and compact the soil subgrade. Compaction should be at least 95% Proctor density (per ASTM D 698) for pedestrian areas and residential driveways. For areas subjected to vehicular traffic, compact to at least 95% Modified Proctor Density (per ASTM D 1557). Weak or saturated soils may not reach the minimum levels of density and may have to be stabilized or require drainage to remove excess water. Consult the compaction equipment manufacturer's guidelines for applying the proper equipment for compaction of a given soil type.

STREET / PARKING LOT
ON COMPACTED AGGREGATE BASE



NOTES:
1. DRAIN MAY BE NECESSARY IN SLOW DRAINING SUBGRADE.
2. BASE THICKNESS VARIES WITH TRAFFIC, CLIMATE, AND SUBGRADE CONDITIONS. COLDER CLIMATES AND WEAK SOILS MAY REQUIRE THICKER BASES.
3. DO NOT COVER ENTIRE TOP OF AGGREGATE BASE WITH GEOTEXTILE.

Aggregate Base

Aggregate base materials used in interlocking concrete pavements should conform to those used to construct asphalt pavements. Many localities determine base thickness with the 1993 Guide for the Design of Pavement Structures by the American Association of State Highway and Transportation Officials (AASHTO). Others may have specific local requirements and specifications. If no local, state or other standards exist, then the requirements for aggregate base materials in ASTM D 2940 are recommended, or consult our web site for specifications and material gradations tables.

The thickness of the base will be determined by traffic loads, the subgrade soil type, climate conditions, and drainage. The base thicknesses used with asphalt pavements can usually be applied to interlocking concrete pavements. Like compaction of the subgrade, compaction of the base is critical to minimize settlement of the pavement surface. Special attention should be given to areas adjacent to edge restraints, catch basins, and utility structures. The base should be compacted in 4 to 6 inch (100-150 mm) lifts. Compaction for pedestrian areas and residential driveways should be at least 95% of Standard Proctor Density (as per ASTM D 698), while vehicular trafficked areas should be compacted to at least 98% Modified Proctor Density (as per ASTM D 1557 or AASHTO T180). Site inspections and testing of compacted soil and base materials are recommended to ensure standards have been met. The surface of the compacted base should be smooth, with a maximum tolerance of plus or minus 3/8 inch (10 mm) over a 10 ft (3 m) straight edge. Stabilized compacted base materials may be used in heavy-load industrial applications or over weak soil subgrades.

Sand Bed

Bedding sand should conform to the grading requirements of ASTM C 33. DO NOT USE MASON SAND. Stone dust or waste screenings should also not be used as they can have material passing the No. 200 (0.075 mm) Sieve. Screed sand level to an even thickness of 1 to 1 1/2 inch (25 to 40 mm). Do not use bedding sand to fill any depressions in the base material as they will eventually be reflected in the surface of the pavement. Fill any depressions with base material and compact before installing the bedding layer. In certain places, such as areas adjacent to curbs, drainage and utility structures, or over a stabilized base, a geotextile may be used to prevent migration of bedding sand. When used, the geotextile should be turned up against vertical surfaces to contain the bedding sand.

Joint Sand

Bedding sand may be used for joint sand, however extra time and effort may be required for sweeping and compacting the sand into the joints between the pavers. As a result, a fine dry sand is recommended for jointing sand that conforms to ASTM C 144. Please see our web site for specification details and aggregate materials tables.

Installing UNI® Concrete Pavers

The shape of the concrete pavers determines the range of available laying patterns. For pavements subjected to vehicular traffic, either 45° or 90° herringbone patterns are recommended for maximum interlock and structural performance. Some products, such as UNI-Anchorlock®, have unique laying patterns specific to their geometry and offer superior interlocking ability under heavy loads. Running bond and basketweave or parquet patterns can be used for pedestrian and residential driveway applications. Stack bonds should only be used for pedestrian pavements.

Some manufacturers produce edge units that are designed to fit against edge restraints. In many cases, some cutting of pavers at the edges will be required. Cut pavers to not less than one-third of a full unit size with a splitter or masonry saw. Always use proper protective eyewear and gloves when cutting concrete pavers.

After the pavers are installed in the specified pattern, they are compacted into the bedding sand with a plate compactor capable of exerting a minimum force of 5,000 lb (22kN) and frequency of 75-100 hz. After the initial compaction, sand is swept into the joints and the pavement compacted again until the joints are full. This may require two or three passes of the compactor.

Edge Restraints

Edge restraints around the perimeter of an interlocking concrete pavement are essential to performance. The edge restraints hold the pavers and sand together, enabling the system to stay interlocked. Edge restraints are typically placed before installing the bedding layer and pavers, however some edge restraints such as plastic, steel, aluminum, and troweled concrete can be installed after placement of the pavers.

For walks, patios, and residential driveways, steel, aluminum, and troweled concrete or submerged concrete curb (both recommended for non-freeze climates only) may be used. Plastic edging specially designed for concrete paver installations also is a popular choice for these applications. Precast concrete or cut stone curbs are suitable for streets, driveways, and parking lot applications. Concrete restraints are recommended for crosswalks, streets, parking areas, driveways, and industrial pavement projects.

Drainage Considerations

All surface and subsurface drainage systems, as well as pavement grades should conform to that used for flexible pavements.

See our web site – www.uni-groupusa.org – for other information pertaining to construction and design of interlocking concrete pavements, including specialized installation, cross-sections and patterns, specifications, software, PowerPoint® presentations, technical data, applications, projects, a glossary of terms, and FAQs.

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