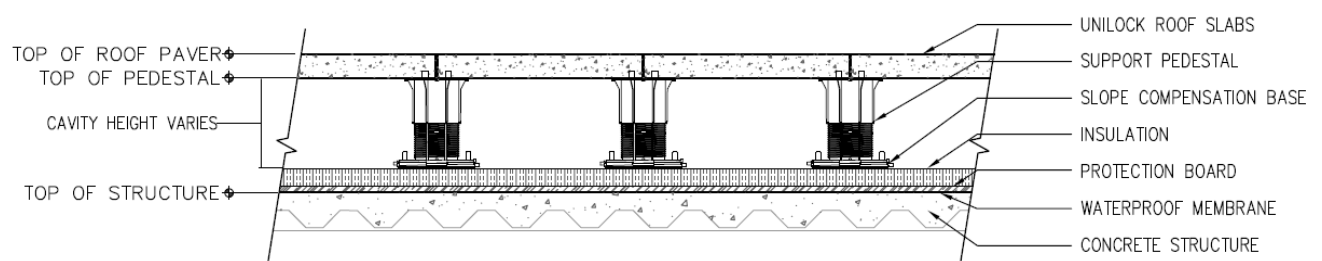


07-76-00

Roof Pavers

For any additional information or assistance with this spec please contact your Unilock Representative.



***** Delete all text in RED after modifying the text in BLUE. All BLUE text requires modification. *****

FOREWORD

These specifications have been prepared for the general guidance of architects, landscape architects, engineers, contractor and superintendents associated with the construction of interlocking concrete pavements. Consult with a licensed architect, landscape architect or engineer to determine the suitability of the design, confirm site conditions and monitor the installation in critical applications. Unilock is not responsible for the information in this specification meeting local or national building codes. The Architect, Landscape Architect or Engineer of Record is responsible selecting products that meet any and all building code requirements to gain occupancy permit and updating this specification as necessary.

INTRODUCTION

Unilock® roof concrete pavers are manufactured in a variety of shapes and colors. They offer design professionals several options that are efficient, durable, economical and aesthetically attractive. Unilock® roof concrete pavers are manufactured to tight dimensional tolerances meet flexural requirements.

Some of the information contained in this specification has been provided by Bison Innovative Products, manufacturer of Versadjust Pedestals for use with Unilock Roof Concrete Pavers.

SECTION 07 76 00

ROOF CONCRETE PAVERS PEDESTAL SYSTEM

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes the following:
 - 1. Concrete Roof Pavers
 - 2. Support Pedestal System

1.02 REFERENCES

- A. ASTM International, latest edition:
 - 1. C 33, Standard Specification for Concrete Aggregates.
 - 2. C 936, Standard Specification for Solid Concrete Interlocking Paving Units.
 - 3. C 979, Standard Specification for Pigments for Integrally Colored Concrete.
 - 4. C 1645, Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units.
 - 5. ASTM C 1782, Standard Specification for Utility Segmental Concrete Paving Slabs

Note: In order to determine the latest version of the listed specifications and standards, please consult the ASTM web page (www.astm.com)
- B. Canadian Standards Association
 - 1. A231.1-06 Precast Concrete Paving Slabs
- C. U.S. Green Building Council Leadership in Energy and Environmental Design (LEED)
 - 1. Building Design + Construction, latest edition

1.03 SUBMITTALS

- A. Roof Concrete Pavers:
 - 1. Samples for verification: Three representative full-size samples of each paver type, thickness, color and finish that indicate the range of color variation and texture expected upon project completion.
 - 2. Accepted samples become the standard of acceptance for the product produced.

3. Test results from an independent testing laboratory for compliance of concrete pavers with ASTM C 936, ASTM C 293 and/or CSA A231.1.
 4. Manufacturer's catalog product data, installation instructions, and material safety data sheets for the safe handling of the specified materials and products.
- B. Pedestal System:
1. Submit manufacturer's data sheets on each product to be used, including:
 - a. Preparation instructions and recommendations.
 - b. Storage and handling requirements and recommendations.
 - c. Installation methods.
 2. Submit shop drawings detailing the installation methods. Coordinate placement with locations noted on the Contract Drawings.
 3. Provide the Support Pedestal System manufacturer an executed copy of the manufacturer's standard document outlining the terms, conditions and limitations of their limited warranty against manufacturing defect for a period of three (3) years.
- C. Roof Concrete Paver and Support Pedestal Installation Contractor:
1. Provide job references from a minimum of three projects similar in size and complexity. Provide Owner/Client/General Contractor names, postal address, phone, fax, and email address.
- D. LEED (required only for LEED projects, delete otherwise)
1. LEED Materials and Resources Credit 4, Recycled Materials: Submit letter from manufacturer certifying the products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content.
 - a. Include statement indicating costs for each product having recycled content.
 2. LEED Materials and Resources Credit 5, Regional Materials: Submit letter from manufacturer certifying products having been extracted, harvested, or recovered, as well as manufactured within 500 miles of the project site.
 - a. Include a statement indicating the percentage by weight which is extracted, harvested, or recovered within 500 miles of the project site.
 3. LEED Sustainable Sites Credit 7.1, Non-roof: Submit letter from manufacturer certifying the solar reflectance index (SRI) of the paver is 29 or greater.

1.04 QUALITY ASSURANCE

- A. Utilize a manufacturer having at least ten years of experience manufacturing concrete pavers on projects of similar nature or project size.
- B. Source Limitations:
1. Obtain Roof Concrete Pavers from one source location with the resources to provide products of consistent quality in appearance and physical properties.
 2. Obtain Pedestal System from one manufacturer with complete integrated and adjustable products of consistent quality and function.
- C. Roofing and Paving Contractor Qualifications:
1. Utilize an installer having successfully completed a roof concrete paver and pedestal system installation similar in design, material, and extent indicated on this project.
- D. Mockups:
1. Install a minimum 4 ft x 4 ft paver area.
 2. Use this area to determine surcharge of the Setting Bed Sand layer, joint sizes, lines, laying pattern(s) and levelness. This area will serve as the standard by which the workmanship will be judged.
 3. Subject to acceptance by owner, mock-up may be retained as part of finished work.
 4. If mock-up is not retained, remove and properly dispose.
- E. Special Considerations:
1. Verify and confirm the structural capability and adequacy of the structure to carry the dead and live load weight(s) involved, and that the density of any insulation is satisfactory to resist crushing and damaging the waterproofing membrane.
 2. Immediately report any concerns or discrepancies.

1.05 DELIVERY, STORAGE & HANDLING

- A. In accordance with Conditions of the Contract and Division 1 Product Requirement Section.
- B. Deliver Roof Concrete Pavers in manufacturer's original, unopened and undamaged container packaging with identification labels intact.
 - 1. Coordinate delivery and paving schedule to minimize interference with normal use of streets and sidewalks adjacent to paver installation.
 - 2. Deliver Roof Concrete Pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.
 - 3. Unload pavers at job site in such a manner that no damage occurs to the product or adjacent surfaces.
 - 4. Evenly disperse bundled material on structural areas to eliminate overloading point load limits.
- C. Deliver and store Support Pedestal System components with labels intact and legible.
 - 1. Inspect all delivered materials to insure they are undamaged and in good condition.
- D. Store and dispose of solvent-based materials such as construction adhesive, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction
- E. Store and protect materials free from mud, dirt and other foreign materials.

1.06 PROJECT/SITE CONDITIONS

- A. Environmental Requirements:
 - 1. Install Support Pedestal Systems free of standing water or ice.
 - 2. Install Support Pedestal Systems free of saturated or frozen granular base materials.
 - 3. There are no Support Pedestal System installation temperature restriction guidelines other than the practical considerations of working in any unsafe condition or inclement weather.
- B. Do not exceed structural capacity of roof.
- C. Roof Concrete Pavers and Support Pedestal System specified are to be used with pedestrian traffic only.
- D. Restrain Roof Concrete Pavers by perimeter blocking or walls on all sides. Lateral movement greater than one tab width is unacceptable and will be rejected.
- E. Provide positive drainage to the substrate immediately below the Support Pedestal System.
- F. Roof Concrete Pavers and Support Pedestal System over roofing and waterproofing:
 - 1. Install roof systems meeting local building codes and be in accordance with the NRCA recommended good construction practices. Use only roofing manufacturer approved systems.
 - 2. Install the Support Pedestal System only over substrate surfaces structurally capable of carrying the dead and live loads anticipated.
 - 3. If integral roof insulation is installed immediately below the membrane, the type and density of the insulation is of utmost importance. Use Pedestal System Floating Insulation Bases (FIB) when installing on roofing systems having "common" insulations with a medium density of 20 psi. FIB's are installed immediately below the Roof Concrete Paver and Support Pedestals System to disperse the load.
 - 4. If high density closed cell extruded 60 psi polystyrene insulation is installed on top of the membrane in a protected membrane system, Roof Concrete Paver Support Pedestals Systems may be installed directly on top of this type of insulation.
 - 5. Do not use Roof Concrete Paver and Supports Pedestal Systems over any insulation less than 20 psi or with low density polystyrene (bead board) insulation.
- G. Roof Concrete Pavers and Support Pedestal Systems on grade:
 - 1. Install the Support Pedestal System only over well compacted soils structurally capable of carrying the dead and live loads anticipated.

2. Adequately compact and slope to drain any substrate soil that is to receive Support Pedestals Systems. Install and compact a four inch granular base (at 1/4 inch minus) at each Support Pedestals location.
3. Provide Floating Foundation Bases (FFB) beneath all on grade Support Pedestals. Level the surface and set directly on grade as a base.
4. A wall or perimeter containment on all open sides is required. Install structural perimeter containment that restrains the entire Roof Concrete Pavers.

1.07 WARRANTY

- A. Warrant all work will remaining free from installation and manufacturer defects used for a minimum of three (3) years.
 - B. Coordinate warranty requirements with any related sections or adjacent work. Notify the Architect immediately of any potential lapses or limitations in warranty coverage.
- Note: For use with pedestrian traffic only – Never use Support Pedestal Systems to support Roof Concrete Pavers that have wheeled, motorized or equipment traffic.

1.08 ROOF CONCRETE PAVER OVERAGE AND ATTIC STOCK

- A. Provide a minimum of 5% additional material for overage to be used during construction.
- B. Furnish 10 square feet of each product and size used to owner for maintenance and repair. Furnish Roof Concrete Pavers from the same production run as installed materials.
- C. Manufacturer to supply maintenance manuals for Roof Concrete Paver units.

1.09 LEED REQUIREMENTS (required only for LEED projects, delete otherwise)

- A. Add any specific requirements necessary for achieving desired credits.

PART 2 PRODUCTS

2.01 ROOF CONCRETE PAVERS

- A. Basis-of-Design Product: The Roof Concrete Paver products are based on:
 1. Unilock: (Select product or products being used)
 - a. Umbriano
 - b. Arcana
 - c. Skyline
 - d. New Product
 2. As manufactured by:
Unilock (Add location)
Address
City, State and Zip
Contact: (insert Unilock representative name and phone number) or your local Territory Manager
 3. The specified products establish minimum requirements that substitutions must meet to be considered acceptable.
 - a. To obtain acceptance of unspecified products, submit written requests at least 7 days before the Bid Date.

Note: Unless required by the owner, an "or equal" line is not necessary when using a basis-of-design specification with the above information is listed and outline in Division 1, Product Substitution Procedures.

Or choose number 3 below and delete above number 3.
 3. Substitutions: No substitutions permitted.
- B. Product requirements:
 1. Roof Concrete Paver Type 1: Unilock Umbriano
 - a. Finish: Granite appearance – this is a face mix finish.
 - b. Color: Insert product color
 - c. Edge: Chamfer - 3 mm rolled

- d. Size: Manufacture the sizes indicated with a maximum tolerance of plus or minus 1/16 inch for length and width. Maximum height tolerance of plus or minus 1/8 inch.
 - 1. 600 mm (24 in) x 600 mm (24 in) x 70 mm (2-3/4 in) thick (31 lbs./SF)
 - 2. 606 mm (24 in) x 606 mm (24 in) x 50 mm (2 in) thick (22 lbs./SF)

Note: Imperial dimensions are nominal equivalents to the metric dimensions.
 - 2. **Roof Concrete Paver Type 2: Unilock Arcana**
 - a. Finish: Arcana
 - b. Color:
 - 1. Lugano
 - 2. Modena
 - 3. Corvara
 - 4. Vivanto
 - c. Edge: Chamfer - 3 mm rolled
 - d. Size: Manufacture the sizes indicated with a maximum tolerance of plus or minus 1/16 inch for length and width. Maximum height tolerance of plus or minus 1/8 inch.
 - 1. 606 mm (24 in) x 606 mm (24 in) x 50 mm (2 in) thick (22 lbs./SF)
 - 2. 453 mm (18 in) x 606 mm (24 in) x 50 mm (2 in) thick (22 lbs./SF)
 - 3. 301 mm (12 in) x 606 mm (24 in) x 50 mm (2 in) thick (22 lbs./SF)

Note: Imperial dimensions are nominal equivalents to the metric dimensions.
 - 3. **Roof Concrete Paver Type 3: Unilock Skyline**
 - a. Finish: Premier – This is a face mix finish
 - b. Color: Insert product color
 - 1. Buff
 - 2. Medium Grey
 - 3. other
 - c. Edge: N/A
 - d. Size: Manufacture the sizes indicated with a maximum tolerance of plus or minus 1/16 inch for length and width. Maximum height tolerance of plus or minus 1/8 inch.
 - 1. 606 mm (24 in) x 606 mm (24 in) x 50 mm (2 in) thick (22 lbs./SF)

Note: Sizes are imperial sizes.
- C. Provide pavers meeting the minimum material and physical properties set forth in ASTM C 1782, Standard Specification for Utility Segmental Concrete Paving Slabs. Efflorescence is not a cause for rejection.
- 1. Average Modulus of Rupture 725 psi (5 MPa) with no individual unit under 650 psi (4.5 MPa).
 - 2. Conforming to ASTM C 1645 when tested for freeze-thaw requirements.
- Note:** Efflorescence is a whitish powder-like deposit that sometimes appears on concrete products. Calcium hydroxide and other water-soluble materials form or are present during the hydration of Portland cement. Pore water becomes saturated with these materials, and diffuses to the surface of the concrete. When this water evaporates, the soluble materials remain as a whitish deposit on the concrete surface. The calcium hydroxide is converted to calcium carbonate during a reaction with carbon dioxide from the atmosphere. The calcium carbonate is difficult to remove with water. However, the efflorescence will wear off with time, and it is advisable to wait a few months before attempting to remove any efflorescence. Commercially available cleaners can be used, provided directions are carefully followed. Some cleaners contain acids that may alter the color of the pavers.
- OR FOR CANADIAN SPECIFICATIONS**
- C. Provide pavers meeting the minimum material and physical properties set forth in CSA A231.1-06, Precast Concrete Paving Slabs. (For all Roof Paver types)
- 1. Minimum compressive strength 5000 psi (55MPa).

- D. Accept only pigments in concrete pavers conforming to ASTM C 979.
Note: ACI Report No. 212.3R provides guidance on the use of pigments.
- E. Provide pavers meeting the minimum slip resistance for coefficient of friction of 0.6 per the NIST-Brungraber Test.
- F. Maximum allowable breakage of product is 5%.

2.02 SUPPORT PEDESTAL SYSTEM

- A. Basis-of-Design Product: The Support Pedestal System is based on:
 - 1. Bison Deck Pedestal Systems: (Select product or products being used)
 - a. Versadjust - Typical Height Range 2 ¼" -36 inches, Weight Bearing 1500 lbs/pedestal. Spacer Tabs: Specify 1/8 inch or 3/16 inch.
 - b. Level-It
 - 2. As manufactured by:
Bison Innovative Products
1975 W. 13th Ave, P.O. Box 40246
Denver, CO 80204.
Toll Free: 888-412-4766.
Phone: 303-628-7950
Email: Sales@BisonIP.com.
www.BisonIP.com
Made in the USA
Contact:
 - 3. The specified products establish minimum requirements that substitutions must meet to be considered acceptable.
 - a. To obtain acceptance of unspecified products, submit written requests at least 7 days before the Bid Date.

Note: Unless required by the owner, an "or equal" line is not necessary when using a basis-of-design specification with the above information is listed and outline in Division 1, Product Substitution Procedures.

Or choose number 3 below and delete above number 3.

 - 3. Substitutions: No substitutions permitted.
- B. Product requirements:
 - 1. Pedestal System Type 1: Versadjust Paver Pedestals
 - a. Adjustable Pedestals:
 - 1. Model: V1 - 2¼" – 2 ¾" (57mm – 70mm)
 - 2. Model: V2 - 2¾" - 3¾" (70mm – 95mm)
 - 3. Model: V3 - 3¾" - 5¾" (95mm – 146mm).
 - 4. Model: V4 - 5¾" - 9¾" (146mm – 248mm)
 - 5. Model: VC2 – coupler adds between 0" to 4" inches (0mm-102mm)
 - 6. Model: V4 + VC2 - 9 3/4 inches to 13 3/4 inches (248mm – 349mm)
 - 7. Model: V4 + VC2 + VC2 – 13 3/4 inches to 17 3/4 inches (349mm - 451mm)
 - 8. Model: V4 + VC2 + VC2 + VC2 – 17 3/4 inches to 21 3/4 inches (451mm - 552mm)
 - 9. Model: V4 + VC2 + VC2 + VC2 + VC2 – 21 3/4 inches to MAXIMUM HEIGHT 24 inches (552mm - 610mm)
NOTE: If over 24" use couplers in conjunction with Support Pedestal Brace system.
 - b. Base Unit:
 - 1. Includes 2 adjusting base leveler disks.
 - 2. 8" inch (203 mm) diameter x 3/16 inch (4.75mm) top wall thickness.
 - 3. Bearing Surface Area: 50.24 square inches (1276 sq. mm.).
 - 4. Six (6) - 1/4 inch (6mm) diameter holes for drainage and / or mechanical attachment.
 - c. Top Unit: 5/32" inch (4mm) thick plate with a 42.39" square inch (736.6 sq. mm.) bearing surface area.

- d. Spacer Tabs for uniform spacing between pavers:
 - 1. Fixed Sizes:
 - a. Model: VT18 - 1/8 inch (3.175 mm) tab thickness.
 - b. Model: VT316 - 3/16 inch (4.5mm) tab thickness.
 - 2. Height: 1/8 inch (3.175 mm)
 - 3. Bearing Surface: 17.75 inches.
 - 4. Material: Mineral Filled High Density Copolymer Polypropylene.
 - a. Contains 20% Post industrial recycled material.
 - 5. Load Capacity: Maximum 1500 lbs (567 kg) per pedestal with a Safety Factor of 2 (FS:2).
- 2. Pedestal System Type 2: Fixed Low Height Pedestal Supports (NOTE: NO slope compensation is included with these models)
 - a. Fixed Sizes:
 - 1. Model: VT18
 - 2. Model: VT316
- 3. Pedestal System Type 3: Stackable Low Height Pedestal Supports (NOTE: NO slope compensation is included with these models)
 - a. Stackable Sizes:
 - 1. Model: HD25 Stackable 1/4 inch (6.4mm) tall, with integral Spacer Tabs
 - 2. Model: HD50 Stackable 1/2 inch (13mm) tall, with integral Spacer Tabs
 - 3. Model: HD75 Stackable 3/4 inch (19mm) tall, with integral Spacer Tabs
 - b. Integral Spacer Tabs: (Choose size)
 - 1. 1/8 inch
 - 2. 3/16 inch
 - c. Material: Mineral Filled High Density Copolymer Polypropylene.
 - 1. Contains 20% Post industrial recycled material.
 - d. Bearing Surface Area: 37.68" sq inches (9032 sq mm).
NOTE: Do not exceed 4 units high.
- 4. Pedestal System Type 4: Adjustable Low Height Pedestal Supports (NOTE: NO slope compensation is included with these models)
 - a. Model: Adjustable LO
 - b. Height: 1 1/4 inches to 2 inches (32mm - 51mm).
 - c. Rotating Base:
 - 1. Size: 7 7/8 inch (200mm) diameter x 3/16 inch (4.75mm) top wall thickness.
 - 2. Bearing Surface Area: 48 square inches (310 sq. cm.).
 - 3. Four (4) - 1/4 inch (6mm) diameter holes for drainage and / or mechanical attachment.
 - d. Top Unit: 5/32 inch (4mm) thick plate with a 29 square inch (187 sq. cm.) bearing surface area
 - e. Material: Mineral Filled High Density Copolymer Polypropylene
 - 1. Contains 20% Post industrial recycled material.
- 5. Pedestal System Accessories:
 - a. Base Leveler Disks:
 - 1. Model: LD4 - Placed beneath pedestals to compensate for slopes up to 1 inch per foot.
 - a. Slope: 1/4 inch per foot each. Two additional LD4 units may be added.
 - b. V Series Pedestals include two (2) Model VB Integral Base Leveler Disks.
 - c. All other pedestals may stack up to four LD4's under one pedestal for up to 1 inch of slope compensation.
 - d. Dimensions: Center point thickness 3/8 inch (9.5mm).
 - e. Material: Mineral Filled High Density Copolymer Polypropylene.
 - 1. Contains 20% Post industrial recycled material.
 - b. Shims:
 - 1. Model: B11 Flexible Shim 1/16 inch

- a. Material: (1.5mm) Sanaprene.
 - 2. Model: PS1 Rigid Poly Shims 1/8 inch (3.175mm)
 - a. Material: Mineral Filled High Density Copolymer Polypropylene.
 - 1. Contains 20% Post industrial recycled material.
 - c. Base Pads:
 - 1. Model FFB: Pedestal base pad for on grade use, provides a large 12 inch by 12 inch x ¼ inch (305mm x 305mm x 6 mm) base bearing surface for on grade installations.
 - 2. Model FIB: Pedestal base pad for use on roofing and waterproofing installations over low density insulation, provides a large 12 inch by 12 inch x 11/16 inches (305mm x 305mm x 17.5mm) base bearing surface.
 - 3. Material: Mineral Filled High Density Copolymer Polypropylene. FIB also contains galvanized metal pad.
 - a. Contains 20% Post industrial recycled material.
 - d. Support Pedestal Brace System: Required for added stability for installations 24"-36" in height or for applications requiring additional stability.
NOTE: Select required size(s) from the next seven options.
 - 1. Model: BB-C – Bison Brace Collar, Fits Model V3 & V4 only
 - 2. Model: BB-S – Short Brace Kit
 - a. For 16"-22" Deck Tiles
 - b. Kit contains 2 each 8" long brace pieces, Screw & Nut
 - 3. Model: BB-L Long Brace Kit
 - a. For 22"-36" Deck Tiles
 - b. Kit contains 2 each 16" long brace pieces, Screw & Nut
 - 4. Model: BB-Pegs
 - a. Individual pegs to be inserted into Versadjust Pedestal Base
 - 5. Model: BB-P
 - a. Pegs pre-inserted into Versadjust Pedestal Base at the factory
 - 6. Add to any Versadjust Pedestal Model – for example specify: V4 + BB-P
 - 7. Material: Mineral Filled High Density Copolymer Polypropylene.
 - a. Contains 20% Post industrial recycled material.
- C. Provide a complete adjustable Support Pedestal System with a maximum cavity height of up to:
 - 1. Versadjust Pedestals maximum cavity height 24 inches (610 mm).
 - 2. Use Support Pedestal Brace System for excess height installations from 24-36 inches.

NOTE: Support Pedestal Systems are not designed for supporting Roof Concrete Pavers that carry vehicular traffic or equipment including but not limited to snow removal equipment, ATV's, forklifts, scissor lifts or any motorized vehicles.
- D. Consult the Manufacturer regarding the following:
 - 1. When spacer tab condition or design requires spacing between Roof Concrete Pavers other than the standard spacing required by the manufacturer.
 - 2. When considering use for other than a raised decks (e.g. interior floors, stairs, etc.).
 - 3. When the required pedestal height exceeds the safe limits as determined by the Manufacturer.
 - 4. When pedestal load capacity exceeds the maximum listed.
 - 5. When anticipating installation of any items with excess weight on top of the Roof Concrete Paver surface.
 - 6. When using Support Pedestals System on grade (soil).
 - 7. When greater pedestal load capacity is required.

2.03 ACCESSORIES (Optional depending on project needs)

- A. [Cleaners] [Sealers] [Joint sand stabilizers]
 - 1. Supplier: Unilock (add location, address, City, State and Zip)

Contact: (Insert Unilock representative name and phone number) or your local Territory Manager

2. Material Type and Description: (Specify material type and description)
3. Material Standard: (Specify material standard)

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas indicated to receive Support Pedestal System bases for compliance with requirements for installation tolerances and other conditions affecting performance for the following items before placing Roof Concrete Pavers.
 1. Verify location, type, and elevations of edge restraints, concrete collars around utility structures, and drainage inlets.
 2. Notify Architect of unsatisfactory preparation before proceeding if substrate preparation is the responsibility of another installer.
 3. Verify all elevations, required pedestal heights and deck dimensions before commencing work.
- B. Do not begin installation until substrates have been properly prepared.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.
 2. Setting of Support Pedestal units signifies acceptance of building roof membrane and protection board substrates.

3.02 PREPARATION

- A. Keep area where Roof Paver Pedestal System is to be constructed free from nails, screws, debris, etc. during entire job. Repair all damage to roof substrate.
- B. Complete construction of all roof drain inlets and other drainage structures before the commencement of Support Pedestal System installation.
- C. Do not damage roof drains, roof substrate, and/or other drainage appurtenances during installation. Report all damage immediately.
- D. Protect HVAC, ventilation pipes and other structures during Roof Concrete Paver and Support Pedestal System installation.
- E. Clean and free projections and debris impairing the performance of the pedestals or the total system from the substrate.
- F. Establish accurate lines, levels and pattern.
- G. Installation requirements vary for each individual project site. Provide Roof Concrete Pavers materials used, pattern, grid layout, starting point, and finished elevation on plan view shop drawings which have been prepared and approved.
- H. Establish a starting point and the finished elevation of the Roof Concrete Paver surface. Mark the Support Pedestal System elevation (finished elevation minus paver material thickness) around the perimeter using a transit "torpedo" water level or laser leveling device.
- I. Define the paver surface area by accurately taking precise measurements. Mark off and square all outside edges with control lines (chalk lines or spray paint). Install two (2) lines that are perpendicular to each other across the paver surface area. Continue to mark a grid of lines in both directions marking the location of each pedestal. Implement control lines as references to periodically check the layout during installation to assure a square layout.

3.03 INSTALLATION

- A. PEDESTAL SYSTEM
 1. Install in accordance with manufacturer's instructions.
 2. If required, place a Floating Insulation Base (FIB) board or Floating Foundation Base (FFB) in the location on the grid of each pedestal.
 3. Place a Support Pedestal where each measured grid line meets the perimeter.
 - a. Remove two (2) spacer tabs in line with one another on top of each pedestal placed around the perimeter.

- b. Remove all four (4) spacer tabs at corners.
4. Adjust each Support Pedestal to a “top of pedestal” elevation marked around the perimeter. (Normally the deck support is positioned as close to the perimeter as possible, with the two remaining spacer tabs aligned with the grid line.) Stretch a string line along (or utilize a laser leveling device) and slightly ahead of the second row of Support Pedestals.
5. Pre-sort and pre-set the Support Pedestals to the proper elevation and place in position prior to the installation of the Roof Concrete Pavers.
6. Plumb Support Pedestals.
7. Rotate the pedestal base or bottom to vertically adjust the Support Pedestal elevation while being loaded with pavers. Clockwise rotation of the pedestal base will raise the bearing surface and the paver units. Counter-clockwise rotation will lower the top bearing surface.
8. Support Pedestal Systems have built in safety thread engagement ‘bumps’. When pedestal is fully extended, thread engagement “bumps” will be felt and heard, indicating the maximum height of the pedestal.
 - a. Do not extend pedestal beyond the thread engagement “bumps”.
 - b. Do not exceed maximum height listed on pedestal, use the next size pedestal. A VC2 coupling unit must be added to the V4 model to achieve greater heights.
 - c. Always maintain adequate thread engagement. Never over extend any pedestal.
9. Slight irregularities in Roof Concrete Paver thickness can be compensated for by using one to two shim segments. Place shims on top of the pedestal, under the corner(s) of the decking tile or paver. Never use more than two (2) shims on top of the pedestal and always adhere 1/4 wedges with construction adhesive.
10. Stackable Fixed Height Pedestals: Complete grid layout as instructed above. Stack no more than four (4) fixed height pedestals together and place in lieu of adjustable pedestals where needed. Remove spacer tabs to accommodate perimeter and corner support locations.
11. V Series Slope Compensation:
 - a. The V Series has integrated base leveler disks that compensate for up to 1/2 inch per foot slope. Additional slope compensation can be added by placing two additional LD4 disks under the pedestal base to compensate for up to 1 inch per foot of slope.
 - b. Place the thickest edge of the disk (located on the edge by a small finger tab) at the down slope side of the deck support, one disk compensates for 1/4 inch per foot of slope. Using two to four disks, rotate one in relation to the other to create a level deck support.
 - c. Shims may be used in multiples, whole or segmented, and placed under the base to level the pedestal support.
 - d. Under a pedestal: Adhere all shims under a pedestal to each other or the pedestal (NOT to the roofing membrane) with construction adhesive. Shim no more than 1/8 inch (3mm) beneath each pedestal.
 - e. On top of a pedestal: Use no more than 2 shims.
12. Versadjust Series Pedestal Bracing with Support Brace
 - a. Excess Height: Required for added Stability for Installations 24”-36” in height
 - b. For Installations requiring additional stability: Install one level of Support Pedestal Brace Collars at the mid-point height of the pedestal column. Maintain the same level of Collar placements once the standard height is established (i.e. 18” for 36” overall height).
NOTE: Establish final adjustment for top of Roof Concrete Paver height prior to setting the standard height for the Brace Collars.
 - c. BB – S Short Bison Brace: Install around the outside perimeter of a walk surface where pedestals are installed where less than the typical 24” spacing occurs and shorter arms are required.

- d. BB – L Long Bison Brace: Install in the interior area of a walk surface where pedestals and 23 - 7/8" x 23 – 7/8" surfacing panels are installed providing uniform 24" spacing.
 - e. Install Support Pedestal Braces by placing the two-hole brace ends over the self-locking pegs on Collar or base, fit brace arms together making sure all brace teeth are firmly interlocked and secure with Screw and Wing Nut. Install Braces as tightly as possible to create a rigid bracing system between each vertical pedestal column.
 - f. Two Support Pedestal Brace arms extend outward from each corner pedestal in perpendicular rows. These results in a series of braces attached to Collars (BB – C) in each horizontal direction from one side of the Roof Concrete Pavers to the other and from one end to the other.
 - g. Place the Roof Concrete Paver units once the horizontal perpendicular run(s) of Support Pedestal Braces are properly installed at the correct height(s) and as the decking system progresses.
13. Support items (such as planters, concrete benches, sculptures, hot tubs, grills, or industrial equipment) directly with additional pedestals directly and independently of the main Roof Concrete Pavers and Support Pedestal System.

B. ROOF CONCRETE PAVERS

1. Do not use pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.
2. Mix Pavers from a minimum of three (3) bundles simultaneously drawing the paver vertically rather than horizontally, as they are placed, to produce uniform blend of colors and textures.
NOTE: Color variations occur with all concrete products. This phenomenon is influenced by a variety of factors, e.g. moisture content, curing conditions, different aggregates and, most commonly, from different production runs. By installing from a minimum of three (3) bundles simultaneously, variation in color is dispersed and blended throughout the project.
3. Exercise care in handling face mix pavers to prevent surfaces from contacting backs or edges of other units.
4. Install Roof Concrete Pavers using pattern as indicated.
5. Place the corner of the Roof Concrete Paver directly over the center of the Support Pedestal where more than one unit meets.
6. Place units hand tight against spacer bars or pedestal spacer tabs. Adjust horizontal placement of laid pavers to align straight.
7. Provide space between paver units of 1/32 in. (1 mm) wide to achieve straight bond lines.
8. Set surface elevation of Roof Concrete Pavers 1/16 in. (1.5 mm) above adjacent drainage inlets, concrete collars or channels.
9. Do not exceed joint (bond) lines more than ±1/2 in. (±15 mm) over 50 ft. (15 m) from string lines.
10. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.
11. Remove any cracked or structurally damaged pavers and replace with new units.
12. Tolerances: Do not exceed 1/32-inch (0.8-mm) unit-to-unit offset from flush (lippage). Do not exceed 1/8 inch in 10 feet (3 mm in 3 m) from level, or indicated slope, for finished surface of paving.

3.04 SUPPORT PEDESTAL SYSTEM PLACEMENT AND FINAL ADJUSTMENT

- A. Place Support Pedestal System and the Roof Concrete Pavers per the manufacturer written instructions. Utilizing labor saving devices, such as paver lifters or vacuum devices where applicable, especially on large jobs.

- B. Support Pedestals are designed to be rotated for final slight adjustment when system is fully loaded. Level Support Pedestals in each succeeding row as the installation proceeds. Adjust final height or maintenance adjustments by rotating the base in a clockwise or counter-clockwise direction to raise or lower the surface material.
- C. Provide additional sections of shims for regular maintenance. Install Shims in multiples, whole or segmented, and placed under the base or on top the pedestal to level the Roof Concrete Pavers.
- D. On top of pedestal: Provide construction adhesive to adhere sections of shims. Construction adhesive is not required when using whole shims on top of a pedestal.
- E. Beneath a pedestal: Provide a small amount of construction adhesive to adhere sections of shims and/or whole shims to each other or to the pedestal. Unless specified to do so, DO NOT adhere pedestal or shims to insulation, roofing or waterproofing membrane.

3.05 PERIMETER CONTAINMENT

- A. Contain and 'box-in' any area of a Roof Concrete Pavers that are not restrained by a parapet or foundation wall. The Roof Concrete Paver panels will move if all sides are not adequately restrained. Restrain Roof Concrete Pavers on all sides and do not allow lateral movement in excess of one tab width.

3.06 FIELD QUALITY CONTROL

- A. Verify final elevations for conformance to the drawings after sweeping the surface clean.
 - 1. Prevent final surface finish grade elevations from deviating more than $\pm 1/4$ in. (± 5 mm) under a 10 ft (3 m) straightedge or indicated slope, for finished surface of Roof Concrete Pavers.
- B. Lippage: No greater than $1/32$ in. (1 mm) difference in height between Roof Concrete Pavers or adjacent surfaces such as walkways and door thresholds.
- C. Inspect often during installation to assure that grid spacer lines are being maintained in a straight and consistent pattern and that Roof Concrete Pavers are level and not rocking.
- D. Confirm that Support Pedestals height does not exceed the specified height for the V Series:
 - 1. 24 inches (610mm) maximum pedestal height unless using the Support Pedestal Brace System.
- E. Unless otherwise specified in writing to allow for expansion, inspect to assure that all paver spacing between units and at perimeter containment does not exceed a tab width. Pay particular attention to assure that all pedestrian entry or access points to the Roof Concrete Pavers are level and that the surfaces are not randomly raised or uneven creating a tripping or safety hazard.

3.07 IMMEDIATELY FOLLOWING INSTALLATION

- A. Carefully inspect the Roof Concrete Paver and Support Pedestal System to ensure that:
 - 1. The new Roof Concrete Paver system is adequately blocked on all sides to contain the material and related components.
 - 2. There is no more than tab width spacing between any deck panels and at all sides of the deck perimeter.
 - 3. There is no ballasting rock used to fill in any perimeter voids.
 - 4. There is no 'rocking' of Roof Concrete Pavers as foot traffic is applied to the surface.
 - 5. All required spacer tabs are in place and visible.

3.08 REPAIRING, CLEANING AND SEALING

- A. Remove and replace Roof Concrete Pavers that are chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.
- B. Cleaning: Remove excess dirt, debris, stains, grit, etc. from exposed Roof Concrete Paver surfaces; wash and scrub clean.

1. Clean Roof Concrete Pavers in accordance with the manufacturer's written recommendations.
- C. Seal as indicated. (If not indicated elsewhere in the contract documents, sealing is not required and remove this section 3.05, C.)
1. Apply Sealer for Permeable Concrete Pavers in accordance with the sealer and paver manufacturer's written recommendations.
- 3.09 PROTECTION
- A. Protect completed work from damage due to subsequent construction activity on the site.
- 3.10 LIFE CYCLE ACTIVITIES
- A. Cleaning:
 1. Clean Roof Concrete Pavers as needed to remove staining, dirt, debris, etc.
 2. Clean per manufacturers recommendations.
 - B. Maintenance:
 1. Provide information about performing routine maintenance of the Concrete Roof Paver and Support Pedestal System as part of the close out documents.
 2. Check for rocking pavers and adjust or shim immediately. Substrates can settle and pedestals may have to be readjusted. Failure to do so can cause a tripping hazard.
 3. Periodically check spacer tabs and immediately replace broken tabs to limit deck movement. Verify the edge restraint stays intact and structurally sound.

END OF SECTION