SECTION 07 76 00
ROOF PEDESTAL CONCRETE PAVER SYSTEM WITH WINDSTRONG ENGINEERED PAVER RESTRAINT SYSTEM FOR WIND UPLIFT

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Adjustable pedestal supports.

B. Rooftop concrete pavers / tiles.

C. WindStrong engineered paver restraint system for wind uplift restraint of pedestal-supported rooftop concrete paver systems.

D. WindStrong-compatible SkyWalk concrete pavers with recessed corners where required for restraint components.

E. WindStrong clips, stainless steel securing screws, EPDM rubber base pads, architectural caps, and related accessory components.

1.2 RELATED SECTIONS:

A. Section 04 22 00 - Concrete Unit Masonry.

B. Section 04 40 00 - Stone Assemblies.

C. Section 61 50 00 - Wood Decking.

D. Section 07 33 63 - Vegetated Roof System.

E. Section 07 55 00 - Membrane Roofing.

F. Section 09 69 00 - Access Flooring.

1.3 REFERENCES

A. American National Standards Institute (ANSI):
   1. ANSI A137.1 - Standard Specifications For Ceramic Tile.

B. ASTM International (ASTM):
   1. ASTM C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
   2. ASTM C140 - Standard Practice for Capping Concrete Masonry Units, Related Units and Masonry Prisms for Compression Testing.
   3. ASTM C293 - Standard Test Method for Flexural Strength of Concrete (Using Simple

Beam With Center-Point Loading).
4. ASTM C936 - Standard Specification for Solid Concrete Interlocking Paving Units.
5. ASTM C1491 - Standard Specification for Concrete Roof Pavers.
6. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

B. Product Data:
1. Manufacturer's data sheets on each product to be used.
2. Preparation instructions and recommendations.
3. Storage and handling requirements and recommendations.
4. Typical installation methods.
5. WindStrong System Product Data: Submit manufacturer data for WindStrong clips, stainless steel securing screws, EPDM rubber base pads, Architectural Cap finishes, WindStrong-compatible recessed concrete pavers, and compatible SkyJack pedestal components.
6. Wind Uplift Testing Data: Submit manufacturer test information indicating ASTM E330 testing and negative design pressure rating for the WindStrong system where applicable to the submitted assembly.
7. Component Compatibility: Submit confirmation that proposed paver size, layout pattern, pedestal model, cap color, and restraint components are compatible with the WindStrong system.

C. Verification Samples:
1. Architectural Pavers: Submit samples for type, color and texture required.
2. Pedestals: Submit samples of each pedestal component.
3. WindStrong Components: Submit samples of WindStrong clip, EPDM rubber base pad, securing screw, and Architectural Cap in selected finish.
4. WindStrong-Compatible Paver: Submit sample showing recessed corner configuration required to receive the rubber base pad, WindStrong clip, and Architectural Cap.

D. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.
1. Scaled drawings to include plan of installation area, layout of all paver and pedestal areas, starting point and elevations, and construction details at critical terminations of pedestal paver system with adjacent construction.
2. Shop drawings shall identify WindStrong restraint component locations, paver layout and pattern, and interface with adjacent walls, parapets, edge restraints, drains, doors, and other penetrations or interruptions.
3. The necessity for and design of an upturned ledger angle or other perimeter support detail should be determined by the project engineer or other qualified design professional, not by SkyDeck USA.

E. Delivery, storage and handling requirements and recommendations.

F. Installer shall be experienced in rooftop pedestal paver installations and shall install the system in accordance with Skydeck USA’s published installation instructions and approved project documents.

G. Warranty: Submit manufacturer warranty and ensure Owner's name is registered with manufacturer.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of five years documented experience.

B. Single Source Responsibility: Manufacturer shall provide the following:
   1. WindStrong-compatible SkyWalk recessed concrete pavers
   2. Pedestal Support System
   3. WindStrong Engineered Paver Restraint System components
   4. Adhesive for perimeter pavers

C. Installer Qualifications: Installers shall be experienced in rooftop pedestal paver installations and shall install the system in accordance with Skydeck USA's published installation instructions, approved submittals, and project documents.

D. WindStrong Performance: WindStrong system has been tested in accordance with ASTM E330 and achieved a negative design pressure rating of -70 psf, including a 2x safety factor, for the tested assembly. Project-specific wind design requirements, roof zones, edge conditions, building height, exposure category, parapet conditions, substrate conditions, and local code requirements shall be verified by the project engineer or other qualified design professional.

E. Wind Design Responsibility: Manufacturer test data is not a substitute for project-specific engineering. The project design professional shall determine whether the WindStrong system and any related perimeter or ledger restraint details are suitable for the project-specific wind uplift loads and applicable codes.

F. Preconstruction Testing: Conduct to verify following.
   1. Membrane Roofing Manufacturer: Conduct inspection by certified manufacturer's technical representative to verify that the in-place membrane roofing system meets the manufacturer's specifications, is waterproof, and is approved for installation of the pedestal paver system. Verify membrane protection layer (if required) and other requirements to maintain roofing manufacturer's warranty provisions. A copy of the inspection report shall be submitted to the pedestal paver manufacturer prior to installation of the pedestal paver system.
   2. Membrane Integrity Test: The roof area or portions thereof shall be leak tested by means of electronic testing or flood testing for a period of 48 hours to check the integrity of the membrane installation. The Membrane integrity test shall be conducted by roof membrane contractor and attested in writing to pedestal paver manufacturer by the roofing contractor prior to the pedestal paver system being installed.

G. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress.
   1. The intent of mock-up is to demonstrate quality of workmanship and visual appearance.
   2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
   3. Retain mock-up during construction as a standard for comparison with completed work.
   4. Do not alter or remove mock-up until work is completed or removal is authorized.

1.6 PRE-INSTALLATION CONFERENCE

A. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.

1.7 DELIVERY, HANDLING, STORAGE, PROTECTION

A. Deliver materials to project site in the original packaging with the manufacturer's labels intact

and legible.

B. Inspect all materials to ensure they are undamaged and in good condition.

C. Store materials in a clean, dry, and protected location.

D. Ensure waterproofing membrane is not damaged while delivering, storing, or handling material.

E. Take measures to locate and spread loads in manner to not exceed load capacity of roof deck.

F. Store paver and pedestal components and materials over plywood panels or protective sheeting. Do not allow products, grit, debris, and pedestrian traffic on unprotected roofing.

G. During installation, protect the roof deck and membranes with appropriate material such as plywood sheeting. Never scrape or puncture membrane protection layer or membranes. Keep roof surfaces free of soil, grit, or debris at all times.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, precipitation) within limits recommended by manufacturer for optimum results. Do not install products in any unsafe condition, inclement weather or under environmental conditions outside the manufacturer's recommended limits.

B. Deck supports specified are to be used with pedestrian traffic only. All four sides of the deck system must restrain and contain the decking panels with perimeter blocking or walls. Decking panels must not be allowed to move laterally.

C. WindStrong restraint components are intended for pedestrian rooftop paver applications using compatible SkyWalk concrete pavers and compatible SkyJack pedestals. Do not use WindStrong components for vehicular traffic or other applications not approved by manufacturer. Do not allow other trades to walk on, work on or carry materials across the paver pedestal system.

D. WindStrong assemblies shall be used only with compatible pedestal heights and paver configurations approved by Skydeck USA. WindStrong shall be used with SD-M pedestals or taller compatible SkyJack pedestals.

E. All membrane waterproofing and protection board surfaces to receive pedestals must be frost/ice free, and free of dirt, oil, debris, or any rough foreign matter, which may impair the waterproofing / roofing manufacturers guarantee or protection requirements.

F. Installation or anticipated installation of additional heavy roof top feature such as, planters, benches, water features, industrial equipment etc. must be supported directly by additional pedestals that are in addition to the main deck paver pedestal system. Failure to adequately support the additional weight of any such features or items may cause significant damage to the deck, underlying structure, or waterproofing. Hot tubs should be installed directly on the roof not on the pedestal paver system. Heavy objects must never be moved across the paver area and should be installed prior to the paver pedestal system.

G. All decks shall be designed to not exceed the design capacity of the pedestal or paver, whichever has the lower weight capacity.

H. The substrate immediately below the pedestal supports shall provide positive and adequate drainage in accordance with good building practice and applicable building codes.

I. Do not install Sky Deck Pedestal Paver System over any insulation less than 60psi or with low-density polystyrene (bead board insulation).

1.9 WARRANTY

A. Manufacturer's Warranty: Paver and pedestal system manufacturer shall warrant the materials to remain free from defects for a period of three (3) years.
   1. SkyWalk Concrete Pavers: Limited 3 year warranty.
   2. SkyJack Pedestal System: Limited 3 year warranty.

B. WindStrong Paver Restraint System Components: Limited 3 year warranty.

C. Contractor's Warranty: The contractor shall warrant the work to remain free from defects of labor and materials used in conjunction with their work in accordance with the general conditions for this project for a maximum period of two (2) years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Skydeck USA, which is located at: 1181 58th St SW, Wyoming, MI 49509
Tel: 502-230-3325; Email: info@skydeckusa.com; https://skydeckusa.com

B. Skydeck USA WindStrong™ Paver Restraint System with SkyWalk concrete pavers and SkyJack adjustable pedestals.

C. Substitutions: Substitutions shall meet or exceed the performance, component compatibility, wind uplift restraint, paver integration, and installation requirements of the specified system and shall be submitted for review prior to approval.

2.2 MATERIALS

A. SkyJack Adjustable Height and Slope Compensating Pedestals
   1. Material: Fully Recyclable High Density Copolymer Poly Propylene (HDCPP)
      a. Resistant to UV Radiation, Aging and Decay.
   2. Temperature Range: -20 to 200 degrees F (-29 to 93 degrees C).
   3. WindStrong-compatible Pedestal Height Range: 2" up to 37.75". SD-M pedestals or
   4. taller. For pedestal heights over 21.75", use SkyHeights Pedestal Bracing System.
      Pedestal Bracing System: For pedestal applications over 21-3/4 inches (552 mm) in
   5. height.
   6. Weight Bearing Design Capacity: 2150 lbs (975 kg) per pedestal.
   7. Spacer Tabs: 3/16 inch (5 mm).
   8. Slope Stabilization Head: Compensates for slope up to 7 percent.
      Pedestal Components:

      1) Model SD-M: A base, screw ring, screw, and spacer tabs.
         a) Comes in one assembled piece with spacer tabs in a separate bag.
         b) Height Adjustment: Made by twisting the ergonomic handles, using the hand tool or the drill bit tool.
         c) Adjustment Range: 1.75 to 3 inches (44 to 75 mm).

      2) Model SD-L: A base, screw ring, screw, and spacer tabs.
         a) Comes in one assembled piece with spacer tabs in a separate bag.
         b) Height Adjustment: Made by twisting the ergonomic handles, using the hand tool or the drill bit tool.
         c) Adjustment Range: 3 to 6 inches (75 to 150 mm).

3) Adjustable Pedestal Model SD-XL: A base, screw ring, screw, and spacer tabs.

a) Comes in one assembled piece with spacer tabs in a separate bag.
b) Height Adjustment: Made by twisting the ergonomic handles, using the hand tool or the drill bit tool.
c) Adjustment Range: 6 to 13.75 inches (150 to 349 mm).

4) Extender Sleeve:
1) Model SD-XL-EXT. 8" extender sleeve used to increase the height range of SD-XL pedestals.
a) Screws into the SD-XL pedestal base.
b) The screw head is applied to the extender top.

2) Pedestal Heights Greater than 21-3/4 inches (552 mm): Use Skydeck USA SkyHeights bracing system to stabilize pedestals.

5) Base Slope Corrector:
1) Model SD-BSC. Placed underneath the SD-M, SD-L and SD-XL pedestals to compensate for slopes up to 5 percent.
a) Twist to adjust the slope correction from 0 to 5 percent.

b) Base slope correctors are required on pedestals 21.75" or taller.

6) Regulation Shim: Used to eliminate uneven pavers and to compensate small differences in height of terrace pavers. Can be cut into halves and quarters, as necessary.

1) Model SD-XL-SH2. Used with all adjustable pedestals.
2) Thickness: 1/16 inches (1.6 mm).

B. **WindStrong Engineered Paver Restraint System.**

1. System Description: Non-penetrating, mechanically restrained wind uplift restraint system for pedestal-supported rooftop concrete paver assemblies, consisting of compatible SkyJack pedestals, WindStrong-compatible recessed SkyWalk concrete pavers, EPDM rubber base pads, WindStrong clips, stainless steel securing screws, and snap-in Architectural Caps.

2. Performance: Tested in accordance with ASTM E330; achieved negative design pressure rating of -70 psf, including a 2x safety factor, for the tested assembly.

3. WindStrong Clip: High-strength restraint clip used to lock adjacent recessed concrete paver corners together and resist wind uplift. Approximate exposed cap footprint: 5 inches by 5 inches. Clip shall be secured to compatible SkyJack pedestal head with manufacturer-approved stainless steel screw. Do not over-tighten.

4. Securing Screw: Manufacturer-approved stainless steel screw used to fasten WindStrong clip to compatible SkyJack pedestal head. Provide minimum one securing

screw per WindStrong clip unless otherwise required by manufacturer or project-specific engineering.

5. Rubber Base Pad: EPDM rubber shim/base pad set into recessed paver corner to provide stable bearing surface for WindStrong clip and Architectural Cap. Approximate size: 5 inches by 5 inches unless otherwise indicated by manufacturer.
6. Architectural Cap: Snap-in cap used to conceal WindStrong clip hardware and provide finished appearance. Available finishes include Matte Black, Sandstone Tan, Stone Gray, and Limestone White.
7. WindStrong-Compatible SkyWalk Concrete Pavers: Concrete pavers with recessed corners designed to accept the rubber base pad, WindStrong clip, and Architectural Cap. Available in SkyWalk concrete paver sizes, colors, and running bond patterns approved by manufacturer.
8. Optional Protection Pad: Durable protection pad placed directly on roofing membrane below pedestal to provide membrane protection and sound dampening where specified.
9. Perimeter and Corner Zone Adhesive: Where required by project documents, wind design, or manufacturer instructions, apply manufacturer-approved adhesive at perimeter and corner pedestal heads to bond perimeter pavers to pedestal heads. Adhesive selection, compatibility with roofing membrane and pedestal materials, cure conditions, and application rates shall be verified for project conditions.
10. Perimeter ledger: Where required by project documents, wind design or project engineer, ledger should be mechanically fastened to parapet or building structure to pin down perimeter pavers.
11. Compatibility: WindStrong components shall be used only with compatible SkyDeck USA SkyWalk concrete pavers, compatible SkyJack adjustable pedestals, and approved roof assembly conditions. Verify compatibility with roof assembly, waterproofing system, insulation, protection board, paver size, paver thickness, paver pattern, and pedestal layout before installation.

C. SkyWalk Architectural Concrete Patio Pavers.
   1. Hydraulically pressed per ASTM C936.
   2. Composition: Aggregates and cement, limestone, water, sand, with no chemicals or agents per ASTM C936.
   3. Unit Weight: 90 lbs per ASTM C936.
   4. Physical Concrete Properties:
      a. Compressive Strength per ASTM C140/C1491: 8,500 psi.
      b. Minimum Flexural Strength per ASTM C140/C1491: 1,100 psi.
   5. WindStrong-compatible SkyWalk paver technical data require minimum flexural strength of 1,100 psi and maximum water absorption less than 4.1 percent when indicated by current manufacturer data.
      a. Density: 150 lbs per cubic foot.
      b. Water Absorption per ASTM C140: Not to exceed 4.1 percent.
      c. Freeze Thaw: Not to exceed 1 percent loss of dry weight.
      d. Freeze Thaw Resistance per ASTM C67: 50 cycles.
      e. Dynamic Coefficient of Friction per ANSI A137.1; Wet: 0.80.
   6. Type: Drain Paver.
   7. Type: ADA-Certified.
   8. Type: Brick-Faced.
   9. Type: Diamond Cut.
   10. Type: Aggregate.
   11. Size: 11-3/4 x 11-3/4 inches (298 x 298 mm).
   12. Size: 12 x 36 inches (305 x 914 mm).
   13. Size: 15-3/4 x 15-3/4 inches (400 x 400 mm).
   14. Size: 17-5/8 x 23-1/2 inches (448 x 597 mm)
   15. Size: 18 x 18 inches (457 x 457 mm).
   16. Size: 23-1/2 x 23-1/2 inches (597 x 597 mm).
   17. Size: 23-1/2 x 35-3/8 inches (597 x 899 mm).
   18. Size: 24 x 24 inches (610 x 610 mm).
   19. Size: 35-1/2 x 35-1/2 (902 x 902 mm).

20. Size: ___ x ___ inches (___ x ___ mm).
21. Paver Thickness: ____ inches (must be 2" or thicker)
22. Paver Thickness: 3 inches (76 mm).
23. Color: Natural Diamond Cut Gray. Solar Reflective Index: 29
24. Color: Almond. Solar Reflective Index: 42
25. Color: Ginger. Solar Reflective Index: 34
26. Color: Meteor. Solar Reflective Index: 31
27. Color: Wheat. Solar Reflective Index: 47
28. Color: Light Gray. Solar Reflective Index: 38
29. Color: Speckled Gray. Solar Reflective Index: 38
30. Color: Medium Gray. Solar Reflective Index: 24
31. Color: Monument. Solar Reflective Index: 39
32. Color: Dark Gray. Solar Reflective Index: 17
33. Color: Salmon. Solar Reflective Index: 35
34. Color: Brick Red. Solar Reflective Index: 36
35. Color: Speckled Brick. Solar Reflective Index: 34
36. Color: Gold Rush. Solar Reflective Index: 34
37. Color: Moon Rock. Solar Reflective Index: untested
38. Color: Poolside Retreat. Solar Reflective Index: 52
39. Color: Scottsdale. Solar Reflective Index: 55
40. Color: Cloud. Solar Reflective Index: 41
41. Color: Arctic White. Solar Reflective Index: 85
42. Color: Black. Solar Reflective Index: untested
43. Color: Stoney Creek. Solar Reflective Index: untested
44. Color: Downtown Brown. Solar Reflective Index: untested

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared and related work penetrating the plane of the roof is completed.
   1. Carefully inspect installed work of other trades and verify that such work is complete to the point where work of this section may properly commence.
   2. Notify the Architect in writing of the conditions detrimental to the proper and timely completion of work.

B. Verify the Following:
   1. Substrates, membranes, and protection boards are ready for installation of pedestal and paver system.
   2. The roof deck will sustain the weight of the pedestal paver system.
   3. Deck dimensions and elevations and pedestal heights before commencing work.

3.2 PREPARATION

A. Clean and prepare deck free of all debris in accordance with manufacturer's instructions.

B. Install membrane protection layer under all pedestals if specified by roofing membrane manufacture.

C. Establish accurate lines, levels, and pattern.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
   1. Determine starting point and layout the paver and pedestal grid layout determining where full and cut pavers will be installed.
   2. Mark perpendicular guidelines on substrate surface to ensure square layout.
   3. Install initial pavers along guidelines forming a "T" pattern.
   4. Install Pavers tightly butted into pedestals. Form even joint width determined by

pedestal spacer tabs.

B. For WindStrong installations, set compatible SkyJack pedestals and adjust to height. Add round shims as needed so recessed paver corners are flush and level. Set WindStrong-compatible recessed concrete pavers on pedestals and verify they are level, square, and aligned before installing restraint clips.

C. After pavers are set, place EPDM rubber base pad in each recessed paver corner receiving WindStrong restraint. Install WindStrong clip over the recessed paver corners and fasten clip into compatible pedestal head with manufacturer-approved stainless steel screw. Do not over-tighten.

D. Snap Architectural Cap into the WindStrong clip after clip installation is complete. Architectural Caps shall sit flush and conceal restraint hardware while maintaining intended joint appearance.

E. Do not install WindStrong clips until pavers are installed, level, aligned, and fixed at all required corners. Verify full clip seating and cap engagement at each restraint location.

F. At roof perimeter and corner zones, thoroughly apply manufacturer-approved adhesive to perimeter and corner pedestal heads where shown in project documents or required by wind design. All perimeter pavers requiring adhesive shall be adhered to pedestal heads in accordance with manufacturer instructions and adhesive manufacturer requirements.
   1. Checks shall be made constantly for correct elevation and spacing of the installed pavers using laser level, automatic leveler, or mason's line.
   2. Slight irregularities in paver thickness and/or deck heights can be compensated for by using one or more regulation shims.
   3. Any section of paver, pedestal or protection course which is not restrained by an abutting wall or parapet must be "boxed in" by some field installed restraint.

3.4 UPTURNED LEDGER ANGLE AND PERIMETER SUPPORT DETAILS

A. Upturned ledger angle details, edge restraint details, and similar perimeter support details shown in SkyDeck USA materials are conceptual or illustrative unless specifically engineered and sealed by the project design professional.

B. Ledger angles, anchorage, fasteners, welds, substrate attachment, structural support, corrosion protection, load transfer, waterproofing interface, and code compliance shall be designed, specified, reviewed, and approved by the project engineer or other qualified design professional in accordance with applicable codes and site-specific loading requirements.

C. SkyDeck USA does not engineer, size, select, approve, or assume responsibility for ledger angle anchorage or associated structural connections unless such services are expressly provided under a separate written agreement. The upturned ledger support detail has not been wind-tested as part of the WindStrong system; therefore, SkyDeck USA assumes no responsibility for the structural performance, adequacy, or code compliance of the ledger anchorage design or installation.

3.5 CLEANING AND PROTECTION

A. Clean products in accordance with the manufacturer’s recommendations.

B. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 ROUTINE MAINTENANCE AND CARE

A. Remove and replace pavers, which are loose, chipped, broken, stained or otherwise

damaged. Make sure edge restraints stay intact and are structurally sound.

B. Inspect WindStrong clips, stainless steel securing screws, rubber base pads, Architectural Caps, perimeter adhesive locations, and related edge restraint conditions. Replace damaged, missing, loose, or improperly seated components in accordance with manufacturer recommendations.

C. Regularly inspect adhesive at perimeter pavers to confirm adhesion is maintained and pavers remain securely restrained against movement.

D. Remove mortar stains and all other types of soiling from exposed paver surfaces, wash, and scrub clean.

E. Efflorescence is a naturally occurring white residue or stain that is on the surface of new concrete. The residue will dissipate naturally with time.

F. Provide final protection and maintain conditions in a manner acceptable to installation, which ensures paver work being without damage or deterioration at time of substantial completion.

G. Joints and drains should be kept clean to protect from water back up.

END OF SECTION