

SECTION 32 12 18 – PERVIOUS PAVEMENT SURFACE

PART 1 GENERAL

1.1 DESCRIPTION

Rubberway multi-layer pervious rubber pavement is a flexible, poured in place, paving system used for the following applications as indicated and per the detail drawings.

1.2 APPLICABLE SECTION INCLUDES:

- A. Pavements
- B. Pathways
- C. Walkways
- D. Jogging Trails
- E. Sidewalks
- F. Drainage Applications
- G. Tree Wells
- H. Plaza Surrounds
- I. Training Tracks
- J. Fitness Stations
- K. Wheel Chair Accessibility
- L. Golf Cart paths
- M. Overlays

1. RELATED SECTIONS: 32 12 18 - Permeable Surface

1.3 DEFINITIONS:

- A. Subbase: A layer in a paving system between the sub-grade and the surface course, or between the subgrade and the permeable paving.
- B. Base Reinforcement: The use of a geo synthetic within the aggregate base course to enhance the performance of the paving.
- C. Geogrid: Biaxial or triaxial woven polypropylene material for base course reinforcement and confinement, and subgrade stabilization and increased subgrade load capacity.
- D. Subgrade: The soil prepared and compacted to support a structure or paving system.
- E. Panel: An individual paving slab bordered by joints or slab edges.
- F. Exposure Conditions, Moderate: Exposure to a climate where the paving will not be in a saturated condition when exposed to freezing and will not be exposed to deicing agents or other aggressive chemicals.
- G. Exposure conditions, Severe: Exposure to deicing chemicals or other aggressive agents or where the paving can become saturated by continual contact with moisture or free water before freezing.
- H. Permeable/ Porous Paving: A paving system comprising of material with sufficient continuous voids to allow water to pass from the surface to the underlying layers.

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- I. Pervious/ Permeable: The property of a material which permits movement of water through it under ordinary hydrostatic pressure.

1.4 SUBMITTALS:

- A. Samples:
 - 1. Submit (1) Color chart representing full range of manufactures color options
 - 2. Submit (1) Specified Rubberway Labeled Sample, Project Specific 4" x 4" square in full thickness of color selected by Architect or Owner
 - 3. Submit (1) Copy of Manufacturer's Technical Data Sheets on each product to be used
 - 4. Submit (1) Installation Overview
- B. Shop Drawings: Project specific shop drawing shall include plan view cross section
- C. Contractor's Project References:
 - A. Submit a list of successfully completed projects. The Submittal must include the project name, date, location, picture, and a valid updated contact name, email and phone number for the projects submitted.
- D. Close Out Submittals:
 - 1. Submit (1) Manufacturer standard product materials warranty / Signed by company officer with Corporate Seal
 - 2. Submit (1) Standard labor warranty
 - 3. Submit (1) Copy of Surface Care and Maintenance guide

1.5 QUALITY ASSURANCE

- B. The Manufacturers Qualifications: Manufacturer must have a minimum of 15 years manufacturing with the products specified.
- C. Contractors Qualifications: The installing foreman must be a Certified Rubberway installer or authorized agent and have specialized or similar experience installing and performing the work of this section that is required for this project scope.
- D. Permeable Paving system shall be installed by Certified Rubberway authorized factory trained technicians only, to be warranted.
- E. Manufacturer authorized certified Rubberway Onsite Technical Training Directors are available for hire, to oversee and train uncertified, qualified contractors, interested to become certified on a given project. There is a fee related to this service and the system will be warranted. The contractor's installing foreman must have experience installing the specified type of synthetic surface and shall employ no less than one manufacture-certified technician on staff who directly oversees or performs the installation during all installation placement, unless otherwise agreed. (Onsite supervision by manufacturers authorized certified installers may be considered and will be required for outside contractors on patented system technology. Independent contractor consulting fees will be applicable for oversight supervision services being requested)

1.6 DELIVERY AND STORAGE

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- A. Delivery of Materials: Materials should be delivered to site in manufacturer's unopened container with labels clearly identifying the product name and manufacturer. See manufacturer's guidelines for temperature requirements for the locale of installation.
- B. Storage of Materials: The trade contractor shall provide a secure, clean, dry location for storage of materials at temperatures above 50°F. Under no circumstances should materials be stored outside unless fully protected from moisture with 10 mil polyethylene barrier and tarpaulin. All materials stored outside shall be inspected by dealer for moisture contamination before application. Store out of direct sunlight to avoid moisture and condensation.

1.7 PROJECT SITE CONDITIONS

- A. Environmental site conditions must be between 50 and 85 degrees F. Do not install when sub base is saturated or wet or when ground is frozen.
- B. Sub-base shall be free of any materials and debris and released to the applicator clean and in good stable compacted condition.
- C. Protect area after installation to avoid damage- up to 24 hours
- D. Upon completion of installation, installer shall remove all unused materials, tools, equipment, and rubbish.
- E. No smoking, open flames, or sparks from electrical equipment shall be permitted during the application of materials.

1.8 MATERIAL GUARANTEE

- A. The permeable pavement shall be guaranteed against defects in materials for (10) years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: USSA, Inc. (United Sustainable Surfacing of America)
Telephone: 877-288-0045
US Headquarters, West Coast: 4000 Barranca Parkway, Suite 250, Irvine, CA. 92604
East Coast: 275 Greenwich Ave. Suite 3A, Greenwich, CT 06830
Mid Atlantic: 825 10th Ave. NW Suite 755, Washington DC 20001
email: info@rubberway.com
web: www.rubberway.com
 - 1. Acceptable polyurethane manufactures are Rubberway Inc.
 - 2. All materials made in the USA and must be obtained through a Rubberway distributor.
- B. Substitutions: Will be considered in accordance with product requirements and providing valid submittal documentation which is equivalent or better in test results and are performed by accredited 3rd party test labs as outlined below in Section 2.2.

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- C. Requests for substitutions will be considered in accordance with provisions of Section 01 0 00 –Product requirements and must be requested within 10 days before prior to the bid date.

2.2 INDEPENDENT 3rd PARTY TESTING SYSTEM CHARACTERISTIC REQUIREMENTS

A. PRODUCT: RUBBERWAY SIDEWALK: SPECIFIED THICKNESS: 1.5”

1. ADA Compliant: Pass
2. FM5-565 COF of Permeability: 0.29 CM/2 (6 gallons per sf / per minute)
3. ASTM D638 Tensile Strength: 78% minimum 40%
4. Tensile Strength of Binder: 2000 PSI
5. Elongation at mean: 290%
6. Freeze Thaw Change -25 cycles(+) .44%: No Change in visual
7. ASTM 2047 -96 COF: 94 dry and 79 wet
8. ASTM F970 Static Load Limit –Results 99% recovery
9. EPA-TCLP-Method 6010B- Heavy Metal Leachate: Pass
10. EPA-STLC- (DHS WET EPA 6010B)-Pass
11. EPA 8270C- Pass
12. EPA 8260B-Pass
13. EPA 7470A- Pass
14. EPA 7470A STLC Mercury (DHS WET) Pass
15. Fish Bioassay - Results >750 mg/l Analyte was not detected
16. SRI- Solar Reflectance Index: 31 when using Grey
17. Water Extractable 0% Organic Extractable: Free of Volatile Organic Compounds
18. ASTM E84-01 Flame Spread Result 65 Smoke Density <450
19. ASTM D2859 Flammability Passes
20. UL 94 Flammability Passes
21. ASTM E108- Rooftop- Passes
22. ASTM E303 Skid Resistance 45
23. ASTM F970 Static Load 99% recovery
24. GMAX-F-355 Force Reduction 143

- B. LEED CREDITS: This system will qualify for recycled content, heat island effect when using Grey, White, Ivory or Eggshell colors, storm water drainage, innovation in design and when possible, regional labor and materials.

1. Heavy Metal leaching tests required to meet EPA 1312 standards.
3. Recycled content must exceed 60% postconsumer per unit of product.
4. System must meet a 20 year design life.
5. Local and or regional materials within 500 miles, when feasible.
6. System must be manufactured on site.
7. Solar reflectance Index value exceed - 31 with grey color

2.3 RUBBER SIDEWALK, TREEWELL, PAVEMENT MATERIALS

- A. BONDING AGENT: Must have the capacity to bind with: rubber, wood, steel, concrete, aluminum, compacted aggregate, enamel tile or fiberglass.
- B. BONDING Material- Delivered in 5 gallon pails or Drums-

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1. BASE LAYER BONDING: Labeled RUBBERWAY 3000
2. WEAR LAYER BONDING: Labeled RUBBERWAY 3000 (STANDARD)
3. WEAR LAYER BONDING: Labeled RUBBERWAY 4000 (HAS AN UPCHARGE)

C. RECYCLED RUBBER BASE LAYER

1. RUBBER: Recycled Rubber, clean, free of metals and fiber, consistent in size–5/9
Labeled RUBBERWAY bagged in 50 lbs bags or 2000 lb super sacks

D. WEAR SURFACE LAYER

1. EPDM, Synthetic Virgin Rubber, clean, free of dust, consistent in size 5/9
2. Packaged in clear bags displaying color - bagged in (55 lbs)
3. COLOR OPTIONS: Refer to manufactures color option chart

2.4 MIX DESIGN

- A. Using materials acceptable by the manufacturer and owner, design a tentative mix and test mock up for the consistency intended for use on the system specified. Follow instructions per the manufacturer's installation overview provided.

2.5 FORMS

- A. Make forms with temporary wood, steel, concrete or pressure treated lumber or other material that is sufficiently rigid to maintain specified tolerances, and capable of supporting finished surfacing to specified height.
- B. Forms shall be clean and free of debris of any kind, including rust.
- C. Form release: Bio Performance Maintenance solvent or TXIB finishing solvent.

PART 3 EXECUTION

3.1 SUBGRADE PREPARATION

- A. Prepare subgrade as specified in the contract documents and detailed drawings.
- B. Construct subgrade to ensure that the required paving thickness is obtained in all locations.
- C. Keep all traffic off the subgrade during construction to the maximum extent practical. Regrade subgrade disturbed by delivery vehicles or other construction traffic as needed.
- D. Compact the material added to obtain final subgrade elevation.
- E. Determine subgrade permeability in accordance with ASTM D3385 before porous paving placement.

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3.2 GEO TEXTILE FABRIC

- A. Geo textile fabric shall be a permeable non-woven geo textile composite composed of polypropylene fibers which are formed into a stable network such that the fibers retain their relative position. The Marafi 140 NC or equal is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids. The flow rate shall be 140 (gal/min/sq.ft) Fabric shall be installed over compacted sub grade under permeable aggregate.
 - 1. Fabric shall be held in place with sub base aggregate.

3.3 SUB BASE

- A. Prepare subbase in accordance with contract documents and detail drawings
- B. Subbase shall be performed in conformance to the alignment, grade and cross section indicated on the drawing. The stone shall be placed in horizontal layers and each layer proof rolled to 90- 95% compaction.
- C. (Modified proctor) with a vibratory smooth drum roller.
- D. Moisture content of the stone shall be 4-7%of dry weight to ensure no migration of fines during transport and installation.

3.4 SITE PREPARATION:

- A. The Contractor shall strip all debris and organic matter from areas to be graded and shall haul this material off site for legal disposal.
- B. The Contractor shall be responsible for placing and compacting approved base material in accordance with the specifications.
- C. The Contractor shall be responsible to have adjacent grass edged and removed from all areas receiving the synthetic surface. It may be necessary to apply a liquid herbicide such as Roundup to any adjacent edges of surfacing areas.
- D. Turn off any surrounding adjacent sprinklers 1 week prior to work being performed

3.5 EXAMINATION

- A. Do not begin installation until substrates have been properly laid and compacted according to manufacturer's instructions and inspected by an authority approved by the owner.
- B. Consulting arborist is recommended for tree root inspection when porous pavement is being installed around tree roots. Roots can be left intact up to 1 ½" from grade (flush to base layer of proposed system detail when installation is specific to sidewalk repair and the sub-base is permeable). Any tree root trimming should be approved and supervised by a consulting arborist.
- C. Protect all surrounding areas to avoid damage to adjacent surfaces.

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PART 4 INSTALLATION

4.1 PLACING FINISHED PAVING

- A. Installation of the permeable paving surface material shall take place only when proper environmental conditions and the temperature is 50 degrees F and rising. If, in the installer's opinion, the weather or climate conditions are harmful for proper surface installation, work will be delayed until conditions are agreeable.
- B. The materials shall be prepared in a mechanical mixer until a homogenous mix is obtained.
- C. Application to be monolithic, in one single layer to the specified depth, unless otherwise specified.
- D. Install per manufacturer's installation instructions provided specific for the project. All joint work shall be troweled flush with the adjacent mat.
- E. All cold dry seams shall be cut straight at an inward 45 degree angle and primed prior to commencing with subsequent work.

4.2 EDGING

- A. When curbs or steel edging are not used, temporary forms can be used and then bevel the edge of the top surface to a 45 degree angle. If concrete curbs are used prime the interior edges of concrete curbs with binding agent.

4.3 PROTECTION

- A. No traffic or other trades shall be allowed on the surface following completion for ample cure time.
- B. Other Trades: It shall be the responsibility of the general contractor to protect the surface from damage by other trades before acceptance by the Owner or his agent. Completely cover the paving surface with 4 mil thick polyethylene sheet if necessary until the project is completed and turned over to the owner.

PART 5 GUARANTEE

The surface shall be guaranteed against defects for a period of ten (10) years from the date of completion.

The installed system guarantee excludes the following as applicable:

- Where materials or the installation is damaged by others or use of improper equipment.
- The surface has not been properly maintained according to manufacturer's maintenance instructions and recommendations.
- Damage from improper vehicle traffic, other than those specified by manufacturer.
- Failure of the asphalt base, concrete, or aggregate sub base.
- Defects caused by vandalism, Force Majeure, or natural disasters.

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- Unless other terms and conditions are previously agreed upon by both parties and stipulated in the contract.

This guarantee is in lieu of all other warranties, expressed or implied, including but not limited to any warranty of merchantability or fitness for a particular purpose and shall not include any other damages, either direct or consequential.

END OF SECTION