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PART 1 GENERAL

1.1 DESCRIPTION:

Rubberway pervious pavement is a single layer, monolithic, rapid draining, flexible, pour-in-place pavement system.

1.2 SECTION INCLUDES:

- A. Pavements
- B. Pathways
- C. Fitness Facilities
- D. Walkways
- E. Sidewalks
- F. Drainage Applications
- G. Tree Wells
- H. Plaza Surrounds
- I. Medians
- J. Public Right of Way
- K. Horse Stables
- L. Erosion Control

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 manufacturers 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 Manufacturers Technical Data Sheets on each product to be used
 4. Submit (1) Manufacturer's Installation Overview
- B. Shop Drawings: Project specific shop drawing shall include plan view cross section
- C. Contractor's Project References:
 1. Submit a list of 20 successfully completed projects for the type of application being specified including project name, location, and type of surfacing installed
- 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

- A. The Manufacturers Qualifications: Manufacturer must have a minimum of 15 years manufacturing with the products specified.
- B. 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.
- C. Permeable Paving surface system shall be installed by Certified Rubberway authorized factory trained technicians only, to be warranted.
- D. 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.

1.6 DELIVERY AND STORAGE

- 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

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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 rubber pavement shall be guaranteed against defects in materials for (10) years.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. 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. All materials made in the USA and must be obtained through the manufacturer Rubberway, Inc or an approved distributor acceptable to Manufacturer.
- A. Substitutions: Will be considered in accordance with product requirements and providing valid submittal documentation which is equivalent or better with all test results and are performed by accredited 3rd party test labs as outlined below in Section 2.2.
- B. 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 PP3000: SPECIFIED THICKNESS: 1.5 up to 3”

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1. ADA Compliant: Pass
2. Freeze Thaw Change -25 cycles (+) .44%: No Change in visual
3. FM5-565 COF of Permeability .015 CM/2 56 gallons/min/sf
4. ASTM D638 Tensile Strength 78% minimum 40%
5. Tensile Strength of Binder 2000 PSI
6. Elongation at mean 290%
7. Slip Resistance C0128 Federal Spec AA60005 Test RR-F-621E: 99 dry and 76 wet
8. Proof load test 25,000 lbs- ASTM F970 Static Load Limit –Results: 98.78% 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 No VOC's

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

1. Heavy Metal leaching tests required to meet EPA 1312 standards.
2. Recycled content must exceed 80% postconsumer per unit of product.
3. System must meet a 20 year design life.
4. Local and or regional materials within 500 miles, when feasible.
5. System must be manufactured on site.
6. Solar reflectance Index value exceed- 31 with grey color

2.3 RUBBER PAVEMENT MATERIALS

- A. BONDING AGENT: Must have the capacity to bind with: rubber, wood, steel, concrete, aluminum, compacted aggregate. Must be polyurethane based and water repellent.
BINDER- Delivered in 5 gallon pails or Drums- Labeled RUBBERWAY 3000

B. RECYCLED RUBBER BITS

1. RUBBER: Recycled Rubber Bits with encapsulated color coat, clean, free of metals and fiber, consistent in size 3/8-5 mesh (-) Labeled RUBBERWAY BITS bagged in 50 lb bags or 2000 lb super sacks
2. COLOR OPTIONS
MAHOGANY BROWN, BRICK RED, TAN, GOLDEN BROWN, NUTMEG, MID GREY, BEIGE, BLACK, GREEN

2.4 MIX DESIGN

- A. Using materials acceptable by the manufacturer, 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 at the time of installation.

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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: TXIB, Bio Based Bio Premier, MEK or Xylene 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.

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.

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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 PERMEABLE AGGREGATE

A. Rubber surfacing system shall be installed on dry sub-structure. The system shall be installed over a 90%, 4" depth, compacted #57 Permeable stone topped off with a 1/2" #8 Choker Course. Permeable material used for permeable base construction and shall conform to the following specifications sieve noted in graph below. If the sub-base is not required to be permeable, in many circumstances this is acceptable to provide a limestone or class 2 road base compacted 95%, provided it is approved by the manufacturer, as well as noted in the contract documents and detail drawings per landscape architect or civil engineer.

Sieve No.57 Sub Base Aggregate	mm	Percent Passing %
1 1/2"	37.5	100%
1"	25	95-100%
1/2"	12.5	25-60%
4	4.75	0-10%
8	2.36	0-5%

Sieve No.8 Choker Course	mm	Percent Passing %
1/2"	12.5	100%
3/8"	9.5	85-100%

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4	4.75	10-30%
8	2.36	0-10%
16	1.18	0-5%

Aggregate Requirements:

Fragmentation must be at 90%. Depending on the type of rock present in the crushed stone mix, other mechanical characteristics might be necessary for approval. Do not use rounded aggregate.

Compaction of sub base should be with at least 5 passes of roller compactor or one with vibration. Stabilization of the soil or base material may be necessary with weak or saturated soil.

3.6 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.

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. On site installation manual provided for client review, specific to project. All joint work shall be troweled flush with the adjacent surface.
- E. All cold dry seams shall be cut straight at an inward 45 degree angle and primed prior to commencing with subsequent work.

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

The surface installation labor shall be guaranteed against defects in workmanship for a period of one (1) year from the date of completion. This one year guarantee shall be provided directly to the owner by approved installation company. This 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 manufactures 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.
- 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