SECTION 00801 – AGGREGATE CONFINEMENT SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aggregate confinement system for trail surfaces.

1.2 RELATED SECTIONS

A. Item 105 – Control of Work
B. Item 106 – Control of Material
C. Item 203 – Site Preparation
D. Item 301 – Subgrade, Subbase, and Base Preparation
E. Section 00900 – Special Conditions

1.3 REFERENCES

A. ASTM F 1951-08 Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
B. ASTM D 638-10 Standard Test Method for Tensile Properties of Plastics
C. ASTM C 33 Standard Specification for Concrete Aggregates

1.4 SYSTEM DESCRIPTION

A. The aggregate confinement system provides load support for gravel areas and reduces erosion and rutting.
B. Major Components of the Complete System
    1. Aggregate confinement system units, assembled in rolls or other units.
    2. Engineered gravel base course.
    3. Installation accessories as required by aggregate confinement system manufacturer.
    4. Gravel fill aggregate.
    5. Portland cement binder.
C. The aggregate confinement system units, gravel fill, and base course work together to support imposed loading.
D. The aggregate confinement system units contain and restrict gravel fill from lateral and vertical movement.

1.5 SUBMITTALS

A. Submit under provisions of Item 105, Item 106, and Section 00900.
B. Shop Drawings: Submit design detail showing proper cross-section.
C. Samples: Submit manufacturer's sample of aggregate confinement system to Owner and Engineer.
D. Installation Instructions: Manufacturer’s printed installation instructions. Include methods for maintaining installed products.
E. Manufacturer’s warranty
F. Certificates:
    1. Manufacturer signed certificate stating the product is made in the USA.
    2. Submit Material Certificates for base course and gravel fill materials
    3. Product certificates signed by the manufacturer certifying material compliance of material used to make aggregate confinement system units.

4. Certification that manufacturer's quality management system is currently registered to ISO or other quality standards.

G. Substitutions: Aggregate confinement units (Gravelpave2) supplied by Invisible Structures, Inc. is the basis of this design. Proposed alternatives must be equivalent to Gravelpave2 and shall be submitted to the Engineer for approval. Manufacturers seeking to supply what they represent as equivalent material must submit records, data, independent test results, samples, certifications, and documentation deemed necessary by the Engineer to prove equivalency.

H. Manufacturer's Material Certification: Product manufacturers shall provide certification of compliance with all applicable testing procedures and related specifications upon written request. Request for certification shall be submitted by the purchasing agency no later than the date of order placement.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Protect aggregate confinement system units/rolls from damage during delivery and store under tarp to protect from sunlight when time for delivery to installation exceeds one week.

C. Store installation accessories in a secure location protected from theft or damage.

D. Handling: Protect materials during handling and installation to prevent damage.

1.7 MAINTENANCE SERVICE

A. Contractor is responsible for maintenance of aggregate confinement system until site work is complete.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. In cold weather, do not use frozen materials or materials mixed or coated with ice or frost, and do not build on frozen base or wet, saturated or muddy subgrade.

C. Protect partially completed surfaces against damage from other construction traffic when work is in progress.

D. DO NOT DRIVE, PARK ON, or use aggregate confinement system until system has been properly anchored and fully filled with gravel fill. Any barricades constructed must still be accessible by emergency and fire equipment during and after installation.

PART 2 PRODUCTS

2.1 AGGREGATE CONFINEMENT SYSTEM

A. Composition:

1. Manufactured in the USA.
2. High density polyethylene (HDPE): 100 percent recycled materials.
3. Geotextile fabric backing injection molded to the grid system or installed beneath units.
4. Color: black, gray or tan to match gravel fill material.
5. Color Uniformity: Uniform color throughout all unit rolls.
6. Carbon Black for ultraviolet light stabilization.
7. Installation accessories provided by manufacturer

B. Performance Properties:
   1. Maximum Loading Capability: 15,940 psi (2.29 million psf, 109,906 kPa) when filled with gravel.
   2. Wheelchair Access testing for ADA Compliance: Passing ASTM F 1951-08.
   3. Tensile strength, pull-apart testing: 458 lbf/in from ASTM D638 Modified.

C. Dimensions:
   1. Nominal Depth: 1 inch (2.5 cm) – for rolls and individual units.
   2. Volume Solid: 8 percent.

2.2 SYSTEM MATERIALS

A. Base Course: Flexible base (crushed stone) meeting the requirements of Item 301.

B. Gravel Fill: 3/8" crushed gravel with fines meeting the requirements of Item 301. 3/8" crushed gravel with fines shall be well-graded crushed gravel aggregate with particles no larger than 3/8" and 2-10% passing the #200 sieve.

C. Binder: Portland cement meeting the requirements of Item 301.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine subgrade and base course installed conditions. Do not start aggregate confinement system installation until unsatisfactory conditions are corrected. Check for improperly compacted trenches, debris, and improper gradients.

B. Start of installation constitutes acceptance of existing conditions and responsibility for satisfactory performance. If existing conditions are found unsatisfactory, contact Owner for resolution.

3.2 PREPARATION

A. Subgrade Preparation:
   1. Prepare subgrade as specified in Item 203 and the Plans. Scarify and recompact existing material a minimum of 6".
   2. Proper subgrade preparation will enable the aggregate confinement system rolls/units to connect properly and remain level and stationary after installation.
   3. Excavate area allowing for unit thickness, the engineered base depth (where required), and 0.5 inch (1.25 cm) for 0.25 inch (6mm) gravel overfill and slight recession to contain gravel.
   4. Provide adequate drainage from excavated area if area has potential to collect water, when working with in-place soils that have poor permeability.
   5. Ensure in-place soil is relatively dry and free from standing water.
   6. Uniformly grade base.
   7. Level and clear base of large objects, such as rocks and pieces of wood.

B. Base Preparation:
   1. Install Base as specified in Item 301.
   2. Coordinate base installation and preparation with drainage installation.
   3. Place flex base in lifts not to exceed 6 inches (150 mm), compacting each lift separately to 95 percent Modified Proctor.
   4. Leave 1 inch (2.5 cm) of depth below final grade for aggregate confinement system unit and gravel fill and 0.5 inch (1.25 cm) for overfill of gravel aggregate.

3.3 INSTALLATION

A. Install the aggregate confinement system units in accordance with manufacturer's instructions and by placing units with rings facing up/fabric below.
B. Smooth the fabric overlaps from one roll or unit to the adjacent unit. Take care to make sure there are no gaps in the fabric exposing base course.
C. Install gravel into rings after the units are anchored by "backdumping" directly from buckets mounted on tractors, with a minimum depth of 6", then exit the site by driving forward over rings already filled. Sharp turning of vehicles on bare rings must be avoided. The gravel is then spread laterally from the pile using power brooms, blades, flat bottomed shovels and/or wide "asphalt rakes" to fill the rings. A stiff bristled broom should be used for final "finishing". The gravel should be "compacted", if necessary, by using a vibrating plate or small roller, with the finish grade no less than the top of rings and no more than 6 mm (0.25") above top of rings.
D. Where cement is indicated in plans, mix dry at 10% by weight with fill stone. Place into rings after thoroughly wetting the base, then lightly mist the surface after fill and compaction. Then, cover with a water-resistant tarp, or plastic sheeting material for a minimum period of 3 days, or until the mixture has bonded.

3.4 PROTECTION

A. Prohibit traffic on the aggregate confinement system until installation is completed. Any traffic on the unfilled or un-anchored system is a safety risk and subject to irreparable damage to the product.

3.5 FIELD QUALITY CONTROL

A. Remove and replace segments of aggregate confinement system units where three or more adjacent rings are broken or damaged, reinstalling as specified, so no evidence of replacement is apparent.
B. Perform cleaning during the installation of work and upon completion of the work. Remove all excess materials, debris, and equipment from site. Repair any damage to adjacent materials and surfaces resulting from installation of this work.

3.6 MAINTENANCE

A. Keep area free of and remove organic material such as soil runoff, tree leaves, fruit, and other vegetation debris.
B. Broom or rake gravel smooth to no more than 6mm (0.25") above the rings.
C. Refill areas with gravel aggregate where walls of the rings are more than 3mm (0.125") exposed.

END OF SECTION