NDS, Inc. April 2015

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Product Guide Specification

Specifier Notes: This product guide specification is written in Construction Specifications Institute (CSI) 3-Part Format in accordance with *The CSI Construction Specifications Practice Guide,* including *MasterFormat, SectionFormat,* and *PageFormat.*

This section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with Division 1, other specification sections, and the Drawings. Delete all Specifier Notes after editing this section.

Section numbers and titles are based on *MasterFormat 2014 Update.*

1. 32 12 43

POROUS FLEXIBLE PAVING

Specifier Notes: This section covers NDS, Inc. “EZ Roll” gravel pavers to construct porous flexible paving. Consult NDS, Inc. for assistance in editing this section for the specific application.

Use of “EZ Roll” gravel pavers may contribute to LEED credits. Consult NDS, Inc. for more information.

* 1. GENERAL
     1. SECTION INCLUDES
        1. Porous flexible paving using gravel pavers.
     2. RELATED REQUIREMENTS

Specifier Notes: Edit the following list of related sections as necessary. Limit the list to sections with specific information that the reader might expect to find in this section, but is specified elsewhere.

* + - 1. Section 31 20 00 – Earth Moving: Subgrade preparation.
      2. Section 32 15 00 – Aggregate Surfacing: Gravel to fill gravel pavers.
      3. Section 33 46 00 – Subdrainage: Subsurface drainage.
    1. REFERENCE STANDARDS

Specifier Notes: List reference standards used elsewhere in this section, complete with designations and titles.

* + - 1. ASTM F1667 – Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
    1. PREINSTALLATION MEETINGS

Specifier Notes: Edit preinstallation meetings as necessary. Delete if not required.

* + - 1. Convene preinstallation meeting [1 week] [2 weeks] before start of Work of this Section.
      2. Require attendance of parties directly affecting Work of this Section, including Contractor, Architect, installer, and manufacturer’s representative.
      3. Review the Following:
         1. Materials.
         2. Protection of in-place conditions.
         3. Preparation.
         4. Installation.
         5. Adjusting.
         6. Protection.
         7. Coordination with other Work.
    1. SUBMITTALS

Specifier Notes: Edit submittal requirements as necessary. Delete submittals not required.

* + - 1. Comply with Division 1.
      2. Product Data: Submit manufacturer’s product data, including preparation and installation instructions.
      3. Samples: Submit manufacturer’s sample of one 24-inch by 24-inch gravel paver.
      4. Manufacturer’s Certification: Submit manufacturer’s certification that materials comply with specified requirements and are suitable for intended application.
      5. Sustainable Design Submittals: Submit manufacturer’s sustainable design submittals for gravel pavers.
         1. Recycled Content: Certify percentages of post-consumer and pre-consumer recycled content.
         2. Regional Materials: Certify distance between manufacturer and Project, in miles.
      6. Manufacturer’s Project References: Submit manufacturer’s list of successfully completed gravel paver projects, including project name and location, name of architect, and type and quantity of gravel pavers furnished.
      7. Installer’s Project References: Submit installer’s list of successfully completed gravel paver projects, including project name and location, name of architect, and type and quantity of gravel pavers installed.
      8. Warranty Documentation: Submit manufacturer’s standard warranty.
    1. QUALITY ASSURANCE
       1. Manufacturer’s Qualifications: Manufacturer regularly engaged, for a minimum of 10 years, in the manufacturing of gravel pavers of similar type to that specified.
       2. Installer's Qualifications:
          1. Installer regularly engaged, for a minimum of 5 years, in installation of gravel pavers of similar type to that specified.
          2. Employ persons trained for installation of gravel pavers.
    2. DELIVERY, STORAGE, AND HANDLING
       1. Delivery Requirements: Deliver gravel pavers to site in manufacturer’s original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
       2. Storage and Handling Requirements:
          1. Store and handle gravel pavers in accordance with manufacturer’s instructions.
          2. Keep gravel pavers in manufacturer’s original, unopened containers and packaging until installation.
          3. Store gravel pavers in clean areas, protected from exposure to harmful weather conditions.
          4. Store gravel pavers out of direct sunlight.
          5. Protect gravel pavers during storage, handling, and installation to prevent damage.
    3. AMBIENT CONDITIONS
       1. During Cold Weather:
          1. Do not use frozen materials.
          2. Do not use materials mixed or coated with ice or frost.
          3. Do not build on frozen Work.
       2. During Wet Weather: Do not build on wet, saturated, or muddy subgrade.
  1. PRODUCTS
     1. MANUFACTURERS
        1. Manufacturer: NDS, Inc., 851 North Harvard Avenue, Lindsay, California 93247. Toll Free 800-726-1994. Phone 559-562-9888. Toll Free Fax 800-726-1998. Fax 559-562-4488. Website [www.ndspro.com](http://www.ndspro.com). Email nds@ndspro.com.

Specifier Notes: Specify if substitutions will be permitted.

* + - 1. Substitutions: [Not permitted] [Comply with Division 1].
    1. MATERIALS
       1. Gravel Pavers: NDS “EZ Roll” gravel pavers, model “GP4X150”.
          1. Injection-molded, nested-honeycomb, rolled-plastic-panel gravel pavers for permeable, gravel paved environments.
          2. Load-transfer paving system.
          3. Use full rigid base coarse to prevent pavers from being pressed into subbase.
          4. Material: Polyolefin plastic with carbon black for UV stabilization.

Black Gravel Pavers: 100 percent recycled material.

Colored Gravel Pavers: Virgin material.

* + - * 1. Recyclable Content: 100 percent.
        2. Paver Size: Preassembled rolls comprised of 24-inch by 24-inch panels by 1 inch high with integrated connecting cross links.
        3. Wall Thickness: 0.12 inch.
        4. Cells:

Number per Paver: 72.

Shape: Hexagon.

Size: 2-1/4-inches.

Form: Nested honeycomb.

* + - * 1. Top Surface of Pavers: Smooth, without notches or grooves.
        2. Connections:

Connecting Clips per Paver: 24.

Between Panels to Form Rolls: End-to-end clips snap-lock together.

Between Rolls: Side-to-side clips snap-lock together.

* + - * 1. Bottom Open Area:

100 percent geotextile filter fabric.

Total Area per Paver: 478 square inches.

Specifier Notes: Specify color of gravel pavers.

* + - * 1. Paver Color: [Black] [Gray] [Tan] [Brick Red].
        2. Paver Compressive Strength, Empty Cells: 57,888 psf.
        3. Nominal Coverage Area per Paver: 4 square feet.
        4. Weight per Paver: 2.32 pounds.
        5. Chemical Resistance: Superior chemical resistance; totally inert.
        6. Geotextile Filter Fabric:

Nonwoven, spunbonded, continuous-filament, polypropylene filter fabric.

Thermally bonded to gravel paver bottom surface.

Grab Tensile Strength: 110 lbs.

Puncture Resistance: 30 lbs.

Apparent Opening Size (AOS), US Sieve Number: 50.

Permeability: 0.05 cm/sec.

Water Flow Rate: 95 gal/min/sf.

UV Stability: 70 percent.

* + - 1. Stakes: NDS model “GPSTAKE”.
         1. Compliance: ASTM F 1667.
         2. Material: Steel, C1004-C1008.
         3. Coating: Bright-dipped galvanized.
         4. Size: 12 inches by 3/8-inch diameter.
         5. Head: 3/4 inch.
         6. Point: Diamond.
         7. Shank: Smooth/ring.

Specifier Notes: Edit the following for the local available base course material and anticipated traffic loads. Consult NDS, Inc. for more information.

* + - 1. Base Course: Sandy gravel material from local sources, commonly used for road base construction, passing the following sieve analysis:

Percent Passing Sieve Size

100 3/4 inch

85 3/8 inch

60 #4

30 #40

< 3 #200

* + - * 1. Sources of the material may include pit run or crusher run.
        2. Crusher run material will typically require sand be added (33 percent by volume) to ensure long-term porosity.
        3. Should local sources not be available, alternative mixture can be created by mixing 2/3 crushed stone (0.75-inch diameter) with 1/3 sand, as available.
        4. Alternative materials, such as washed or clean stone (0.75-inch diameter typical) may be used.
        5. Confirm base course sieve analysis by testing material.

Specifier Notes: Edit the following for the local available gravel material and anticipated traffic loads. Consult NDS, Inc. for more information.

* + - 1. Gravel:
         1. Material: 1/2-inch-minus clean stone (#78 or #89) or pea gravel.
         2. Shape: Sharp and angular; not rounded.
         3. Do not use decomposed granite, limestone, and crushed granite.
  1. EXECUTION
     1. EXAMINATION
        1. Examine areas to receive porous flexible paving.
        2. Examine subgrade and base course installed conditions.
        3. Check for improperly compacted trenches, debris, and improper gradients.
        4. Notify Architect of conditions that would adversely affect installation or subsequent use.
        5. Do not begin preparation or installation until unacceptable conditions are corrected.
     2. PREPARATION
        1. Protection of In-Place Conditions: Protect adjacent areas and landscaping from installation of porous flexible paving.
        2. Place base course material over prepared subbase to grades indicated on the Drawings, in lifts not to exceed 6 inches.
        3. Compact each lift separately to minimum 95 percent Modified Proctor.
        4. Fill to final grade.
     3. INSTALLATION
        1. Install gravel pavers in accordance with manufacturer’s instructions at locations indicated on the Drawings.
        2. Install gravel pavers by placing units with cells facing up and connecting lateral snap locks together to maintain proper spacing and to interlock units.
        3. Install stakes in accordance with manufacturer’s instructions to anchor gravel pavers.
        4. Clearance: Leave 1-inch-minimum clearance between gravel pavers and fixed objects or surface structures.
        5. Anchor gravel pavers placed on curves and slopes to base course as required to secure pavers in place.
        6. Top of Cells: Leave top of cells 1/4 inch to 1/2 inch below surface of adjacent hard-surface pavements.
        7. Install gravel in cells and between cells as gravel pavers are laid in sections.
        8. Add gravel to gravel pavers from an area already filled with gravel.

Specifier Notes: Specify the gravel elevation or finished grade relative to the top surface of the gravel pavers.

* + - 1. Spread gravel to fill gravel pavers to [top of cells] [\_\_\_\_\_\_ inches above top of cells] [depth above top of cells as indicated on the Drawings].
      2. Fill gravel pavers within 30 days of being installed.
    1. ADJUSTING
       1. Remove and replace with new materials, segments of gravel pavers where 3 or more adjacent cells are broken or damaged.
    2. PROTECTION
       1. Protect Work of this Section from damage or deterioration during construction.

END OF SECTION