



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*.

SECTION 32 12 43

POROUS FLEXIBLE PAVING

Specifier Notes: This section covers NDS, Inc. "Tufftrack Grassroad" pavers to construct porous flexible paving. Consult NDS, Inc. for assistance in editing this section for the specific application.

Use of "Tufftrack Grassroad" pavers may contribute to LEED credits. Consult NDS, Inc. for more information.

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Porous flexible paving using grass pavers.

1.2 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.

- A. Section 31 20 00 – Earth Moving: Subgrade preparation.
- B. Section 32 80 00 – Irrigation: Irrigation system.
- C. Section 32 91 00 – Planting Preparation: Soil preparation.

Specifier Notes: Provide section number and title for method of planting grass specified in Part 3 of this section.

- D. Section 32 92 _____ – _____: Grass.
- E. Section 33 46 00 – Subdrainage: Subsurface drainage.

1.3 PREINSTALLATION MEETINGS

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

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

1.4 SUBMITTALS

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

- A. Comply with Division 1.
- B. Product Data: Submit manufacturer's product data, including preparation and installation instructions.
- C. Samples: Submit manufacturer's sample of one 24-inch by 24-inch grass paver.

- D. **Manufacturer's Certification:** Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.
- E. **Sustainable Design Submittals:** Submit manufacturer's sustainable design submittals for grass 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.
- F. **Manufacturer's Project References:** Submit manufacturer's list of successfully completed grass paver projects, including project name and location, name of architect, and type and quantity of grass pavers furnished.
- G. **Installer's Project References:** Submit installer's list of successfully completed grass paver projects, including project name and location, name of architect, and type and quantity of grass pavers installed.
- H. **Warranty Documentation:** Submit manufacturer's standard warranty.

1.5 QUALITY ASSURANCE

- A. **Manufacturer's Qualifications:** Manufacturer regularly engaged, for a minimum of 10 years, in the manufacturing of grass pavers of similar type to that specified.
- B. **Installer's Qualifications:**
 - 1. Installer regularly engaged, for a minimum of 5 years, in installation of grass pavers of similar type to that specified.
 - 2. Employ persons trained for installation of grass pavers.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. **Delivery Requirements:** Deliver grass pavers to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. **Storage and Handling Requirements:**
 - 1. Store and handle grass pavers in accordance with manufacturer's instructions.
 - 2. Keep grass pavers in manufacturer's original, unopened containers and packaging until installation.
 - 3. Store grass pavers in clean areas, protected from exposure to harmful weather conditions.
 - 4. Store grass pavers out of direct sunlight.
 - 5. Protect grass pavers during storage, handling, and installation to prevent damage.

1.7 AMBIENT CONDITIONS

- A. **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.
- B. **During Wet Weather:** Do not build on wet, saturated, or muddy subgrade.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: NDS, Inc.

Specifier Notes: Specify if substitutions will be permitted.
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- B. Substitutions: [Not permitted] [Comply with Division 1].

2.2 MATERIALS

- A. Grass Pavers: NDS "Tufftrack Grassroad" pavers, model "TT-24".
1. Injection-molded, nested-honeycomb, plastic-panel grass pavers for permeable, natural-grass paved environments.
 2. Load-bearing paving system.
 3. Use full rigid base course to prevent pavers from being pressed into subbase.
 4. Material: 100 percent recycled polyolefin plastic with carbon black for UV stabilization.
 5. Recyclable Content: 100 percent.
 6. Paver Size: 24 inches by 24 inches by 1-1/2 inches high.
 7. Wall Thickness: 0.12 inch.
 8. Cells:
 - a. Number per Paver: 120.
 - b. Shape: Hexagon.
 - c. Size: 2-1/2-inches.
 - d. Form: Nested honeycomb.
 9. Bottom of Each Cell:
 - a. 1-1/4-inch-diameter hole in center.
 - b. Six 0.475-inch by 0.212-inch perimeter slot openings through bottom of paver.
 - c. One opening at bottom of each cell wall to discourage root girdling within cell.
 10. Bottom Surface of Pavers: Flat, without vertical posts or obstructions.
 11. Top Surface of Pavers: Smooth, without notches or grooves.
 12. Latching System Between Pavers:
 - a. Tongue-and-groove latching system molded around perimeter lock pavers together.
 - b. Does not require additional parts or tools.
 - c. Tongues: 1 inch by 1 inch by 0.12 inch thick.
 - d. Grooves: 1 inch by 0.12 inch.
 13. Bottom Open Area: Greater than 41 percent, across entire bottom surface.
 - a. Total Bottom Open Area per Paver: Greater than 228 square inches.
 14. Paver Color: Black.
 15. Paver Compressive Strength, Empty Cells: 98,770 psf.
 16. Nominal Coverage Area per Paver: 4 square feet.
 17. Weight per Paver: 4.5 pounds.
 18. Chemical Resistance: Superior chemical resistance; totally inert.

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

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

<u>Percent Passing</u>	<u>Sieve Size</u>
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 with soil separator above stone base and below growing medium.
5. Confirm base course sieve analysis by testing material.

Specifier Notes: The selection of sandy loam or loam soil should be made based on the soil requirements of the grass variety selected for the project.

- C. Soil:
1. Sandy loam or loam soil.
 2. Sand: Not acceptable.

Specifier Notes: Select a grass variety well suited to the anticipated traffic frequency and local heat and growing conditions.

- D. Grass: Specified in Section 32 92 _____.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive porous flexible paving.
- B. Examine subgrade and base course installed conditions.
- C. Check for improperly compacted trenches, debris, and improper gradients.
- D. Notify Architect of conditions that would adversely affect installation or subsequent use.

- E. Do not begin preparation or installation until unacceptable conditions are corrected.

3.2 PREPARATION

- A. Protection of In-Place Conditions: Protect adjacent areas and landscaping from installation of porous flexible paving.
- B. Place base course material over prepared subbase to grades indicated on the Drawings, in lifts not to exceed 6 inches.
- C. Compact each lift separately to minimum 95 percent Modified Proctor.
- D. Leave minimum 1-1/2 inches for grass pavers and soil.
- E. Fill to final grade.

3.3 INSTALLATION

- A. Install grass pavers in accordance with manufacturer's instructions at locations indicated on the Drawings.
- B. Install grass pavers by placing units with cells facing up and connecting tongue and groove locks.
- C. Clearance: Leave 1-inch-minimum clearance between grass pavers and fixed objects or surface structures.
- D. Anchor grass pavers placed on curves and slopes to base course as required to secure pavers in place.
- E. Top of Cells: Leave top of cells 1/4 inch to 1/2 inch below surface of adjacent hard-surface pavements.
- F. Install soil in cells as grass pavers are laid in sections.
- G. Add soil to grass pavers from an area already filled with soil.
- H. Spread soil to fill grass pavers to top surface.

Specifier Notes: Specify one of following methods of planting grass: top dressing with sod, recessed sod planting, seeding, or hydroseeding. Include the section number for the section specifying the appropriate method of planting.

- I. Planting: Plant grass by [top dressing with sod] [recessed sod planting] [seeding] [hydroseeding] as specified in Section 32 92 ____.
- J. Fill grass pavers with soil and plant within 30 days of being installed.

3.4 ADJUSTING

- A. Remove and replace with new materials, segments of grass pavers where 3 or more adjacent cells are broken or damaged.

3.5 PROTECTION

- A. Protect Work of this Section:
 - 1. From traffic until grass is sufficiently established to handle traffic.
 - 2. From damage or deterioration during construction.

END OF SECTION