



PRODUCT GUIDE SPECIFICATION

SECTION 32 14 33.13 – PERMEABLE PLASTIC PAVING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Base material, over sub base prepared by others.
- B. Porous pavement system with S-flexural joints for seasonal expansion and contraction.
- C. Parking, fire lane, and traffic delineation.
- D. Gravel fill.
- E. Grass fill.

1.2 RELATED REQUIREMENTS

- A. Section 31 20 00 – Earth Moving: Subgrade Preparation.
- B. Section 33 41 00 – Subdrainage: Subsurface Drainage.
- C. Section 32 10 00 – Bases, Ballasts, and Paving.
- D. Section 32 80 00 – Irrigation: Irrigation System.
- E. Section 32 30 00 – Site Improvements.
- F. Section 32 92 00 – Turf and Grasses.

1.3 PREINSTALLATION MEETINGS

- A. Convene pre-installation meeting a minimum of two weeks prior to start of porous paving systems Specifier Notes:
- B. Verify project requirements, subbase and base conditions, manufacturer's installation instructions and coordinate with other related work.
- C. Require attendance of parties directly affecting work of this section, including the contractor, architect, engineer, and installer. Manufacturer's representative may attend by phone conference as needed.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01.
- B. Product Data: Submit manufacturer's product data.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop drawings: Submit manufacturer's shop drawings including laying pattern and parking delineation locations.
- D. Samples: Submit two square samples of TRUEGRID Paver units.
- E. LEED and other Sustainable Design Submittals: Provide documentation of how the requirements for credit/certification will be met including, but not limited to: Recycled content, stormwater management, heat-island mitigation, water use reduction, site development, and regional materials.
- F. Manufacturer's Certificates: Certify products meet or specified requirements.
- G. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic fertilizing and maintenance.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Manufacturer with a minimum of five years documented experience with products specified.
- B. Installer Qualifications: Installer experienced in performing work of this section that has specialized in installation of work similar to that required for this project. Installer must also be able to provide skilled workman with satisfactory record of performance on landscaping or paving projects of comparable size and quality.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect porous paver units from damage during delivery and store under tarp when the time from delivery to installation exceeds 30 days.
- C. Protect materials during handling and installation to prevent damage.

1.7 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions recommended by manufacturer for desired results. Do not install products under conditions outside manufacturer's absolute limits.
- B. Do not begin installation of porous pavements until all hard surface paving adjacent to porous pavement areas, including concrete walks and asphalt paving, is completed.
- C. Install turf when ambient air temperature is at least 55 degrees F.
- D. In wet weather, do not build on wet, saturated or muddy subgrade.

- E. In cold weather, do not use frozen materials or materials coated with ice or frost, and do not build on frozen base or wet, saturated or muddy subgrade.
- F. Protect partially completed porous paving against damage from other construction traffic when work is in progress.
- G. Protect grass fill / sodded paving areas from traffic until grass root system has matured for at least 3 to 4 weeks. Use barricades to only permit access by emergency and fire equipment.

1.9 WARRANTY

- A. Provide the manufacturer's 10-year limited warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: TRUEGRID Pavers; 2500 Summer St., Suite 3225, Houston, TX 77007. Phone: 1-855-355-GRID. Email: info@truegridpaver.com Website: www.truegridpaver.com.
- B. Substitutions: Not permitted.

2.2 PRODUCTS

- A. Permeable Pavers, TRUEGRID PRO PLUS for grass or gravel applications.
 - 1. AASHTO H20, HS20 Rated.
 - 2. Manufactured in the USA.
 - 3. High density polyethylene (HDPE): 100 percent post-consumer recycled materials
 - 4. Recycled and recyclable content: 100 percent.
 - 5. S-Flexural joints molded in for soil seasonal expansion and contraction.
 - 6. Color: black- carbon black additive for long-term UV stabilization.
 - 7. Paver size: 24 inches by 24 inches by 1.8 inches.
 - 8. Pre-assembled: 4-foot by 4-foot sections.
 - 9. Cylindrical cell design for column strength.

10. Cell size: 3.30 inch inside diameter.
 11. Co-joined cells at 48 places for strength.
 12. Wall thickness: 0.150 inches / .250-inch nominal.
 13. A minimum of 2 co-joined common walls per cell for structural integrity.
 14. Connections:
 - a. No clips or stakes necessary.
 - b. No additional parts or tools needed.
 - c. Integral male-female three-point locking system.
 - d. Wall thickness at tabs: 0.290 inch.
 15. Molded in X-anchors to stabilize pavers: no stakes necessary.
 16. Nominal Coverage per Paver: 4 square feet.
 17. Weight per paver: 5.25 lbs.
 18. Permeability of System: 100 percent.
 19. Compressive Strength (filled): 1,152,000 psf; 8000 psi.
 20. Material Safety: Groundwater neutral, 100 percent inert.
 21. Chemical Resistant: Excellent: highly resistant to hydrocarbons, oils.
- B. Parking Delineators: TRUEGRID SuperSpots for grass or gravel applications.
1. H20, HS20 rated.
 2. Domed and ribbed for super strength.
 3. Long-term UV stabilized.
 4. 0.90-inch profile above grid.
 5. 3.25-inch diameter.
 6. Available Colors: Yellow, white, blue, and red.
- C. Reflective Parking Delineators: TRUEGRID Reflectors for grass or gravel applications.
1. H20, HS20 rated.
 2. 360° Degree omni-directional light reflection.
 3. Long-term UV stabilized.
 4. 0.90-inch profile above grid.
 5. 3.25-inch diameter.
 6. Available Colors: Translucent yellow, white, blue, and red.
- D. ADA, Traffic, and Parking Identifiers: TRUEGRID Plates for grass or gravel applications.
1. Durable, long lasting, weather resistant and highly visible.

2. Slip-resistant tread.
- E. Base Material: TRUEGRID PRO PLUS was developed to accept multiple acceptable base materials. Locally sourced angular stone/clean for base material. Crushed granite, sandy gravel material, crushed concrete, limestone rock, and crushed lava are some of the acceptable materials. Common base materials include:
1. AASHTO #57 Stone.
 2. Hard, clean, angular, and open-graded (uniform size) drain rock -- from 3/4" to 1-1/2".
 3. Base Course: Graded aggregate base course conforming to the following sieve analysis and requirements:
 - a. Percent Passing: 100 - Sieve Size: 3/4 – 1 inch
 - b. Percent Passing: 85 - Sieve Size: 3/8 inch
 - c. Percent Passing: 60 - Sieve Size: #4
 - d. Percent Passing: 30 - Sieve Size: #40
 - e. Percent Passing: <3 - Sieve Size: #200
- F. Gravel Fill: Obtain clean, washed angular rock to fill the 1.8-inch-tall TRUEGRID PRO PLUS cells and spaces between. TRUEGRID PRO PLUS can be filled to top of cells and exposed or overfilled to hide cells. Fill rock should be 5/8 inch to 3/4-inch diameter.
1. TRUEGRID PRO PLUS's design does not require anchors on level ground or slopes up to 10 degrees. TRUEGRID PRO PLUS is designed for slopes above 10 degrees. However, as a precaution, anchors/staking may be considered per each sloped install above 10 degrees.
 2. Fill rock, level to the top of cells for ADA compliance.
- G. Base Course for Grass Filled TRUEGRID: Use base course from above *Section 2.2 D-3* or comparable base material suitable for grass growth and traffic loads. Choose materials with neutral pH ranges and avoid sources from recycled/reclaimed concrete or asphalt.
- H. Grass Surface with Soil Fill: A sandy loam or loam soil should be used to fill the empty TRUEGRID PRO PLUS grid. The selection of sandy loam or loam soil should be made

based upon the soil requirements of the turf variety selected for the project. Other soils if compatible with type of seed or sod are acceptable.

1. Choose turf grasses with deep-growing vertical roots, high wear capacity, and for the local growing zone and climate.
2. Grass – Choose either sod or seed:
 - a. Seed – The Preferred Method: Hydro-seeding/mulching is recommended with a wood or paper cellulose commercial mulch.
 - b. Sod shall be grown in sand or sandy loam soils only. Sod grown in soils of clay, silt, or high organic materials such as peat, will not be accepted.
3. Geofabric or geogrid by others.
 - a. Choose for properties suitable for soil conditions, loading requirements, and permeability / impermeability requirements.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Before beginning installation, verify site conditions are as indicated on the drawings. Notify the Architect if site conditions are not acceptable. Do not begin preparation or installation until unacceptable conditions have been corrected.
- B. Ensure that adjacent hard-surfaced paving work is completed before installing porous pavement system.

3.2 PREPARATION

- A. Subgrade:
 1. Prepare subgrade as specified in Section 33 41 00. Verify subgrade in accordance with porous paving system manufacturer's instructions.
 2. Excavate area allowing for unit thickness and the engineered base depth (where required).
 3. Provide adequate drainage from excavated area if area has potential to collect water when working with in-place soils that have poor permeability.
 4. Ensure in-place soil is relatively dry and free from standing water.

5. Uniformly grade base.
 6. Level and clear base of large objects, such as rocks and pieces of wood.
 7. Install irrigation, if applicable, in accordance with Section 32 80 00.
 8. Install and secure geofabric or geogrid mesh as needed for soil stabilization and loading requirements.
- B. Install Base as specified in Section 32 10 00. Verify engineered base is installed in accordance with porous paving system manufacturer's instructions.
1. Coordinate base installation and preparation with subdrains specified in Section 33 41 00.
 2. If required, place a geotextile separation layer between the natural ground and the engineered base.
 3. Place base course material over prepared sub base to grades indicated on the drawings or from manufacturer's recommended depths per application type.
 4. Place in lifts not to exceed 4 inches, compacting each lift separately to 95 percent Modified Proctor for non-open grade material. Open grade base material to be leveled and heavily compacted in 4-inch lifts to settle and lock in angular stone.
 5. If required, install irrigation in accordance with Section 32 80 00.
 6. Leave minimum 1.8 inches for Permeable Paver unit for final elevation.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install TRUEGRID PRO PLUS Permeable Paver units by placing cells face up. Sheets are preassembled in 4-foot by 4-foot sheets are connected with friction fit interlocking connectors. No tooling is required to connect or disconnect units. Sheets may be separated into 4 Individual 24 inch by 24-inch pieces and reconfigured as needed. Cut units around curves and organic shapes with an electrical handsaw. Place units to maintain a 1-inch clearance to any pre-installed object or surface structure. Top of cells shall be between 0.25 inch to 0.5 inch below the surface of adjacent hard-surface pavements. Utilize TRUEGRID's S-Flexural joints for undulations or grade reversals when required by design or in freeze-thaw climates for expansion and contraction.

- C. Parking, Traffic, and Fire Lane Delineators: Install TRUEGRID SuperSpots, TRUEGRID Reflectors, and TRUEGRID Plates as indicated on the drawings or per manufacturer's recommendations.
1. Align SuperSpots, Reflector, and Plate locking tabs with grooves in TRUEGRID PRO PLUS grid.
 2. Push SuperSpots, Reflectors, and Plates into TRUEGRID PRO PLUS grid until it locks.
 3. All TRUEGRID delineators and markers can be removed and repositioned by disconnecting the locking tabs and pulling out of the grid.
- D. Gravel Surfacing: Install Gravel into TRUEGRID cavities by back dumping directly from dump truck or from buckets mounted to tractors. Hand shoveling fill gravel into the cells is also acceptable for smaller jobs.
1. Direct vehicles to exit the site by driving forward. Avoid sharp turns over unfilled rings.
 2. Spread gravel fill using steer loaders, power brooms, blades, flat-bottomed shovels, and/or wide "asphalt rakes" to fill the cells.
 3. Compact gravel when the cells are at capacity with a roller for larger areas or vibrating plate for smaller areas.
 4. If fully covering TRUEGRID cells, typical coverage is 0.25 inch to 0.5 inch above cells.
- E. Grass Surfacing:
1. Install soil into TRUEGRID cavities by back dumping directly from dump truck or from buckets mounted to tractors. Hand shoveling soil mix into the cells is also acceptable for smaller jobs.
 - a. Fill level to the top of the TRUEGRID wall – 1.8" – for seeding application and thin-cut sod (1/2" soil thickness).
 - b. Fill soil mix to the top of the TRUEGRID wall minus the depth of soil on the thick-cut sod (greater than 1/2" soil thickness).
 2. Hydroseeding/Hydro-Mulch Surfacing: Provide and place as specified in 32 92 00 – Turf and Grasses. Homogeneously mix a combination of water, seed, and fertilizer in a truck mounted tank. Spray the seed mixture onto the site at specification rates. Coverage should be uniform and complete. Following germination of the seed, areas lacking germination larger than 8-inches by 8-inches must be reseeded

immediately. Seeded areas must be fertilized and kept moist during development of the turf.

- F. Sod: Provide and place as specified in 32 92 00 – Turf and Grasses.
 - 1. Preferred: Use ½” (soil thickness) rolled sod from a reputable grower. Species should be wear resistant, free from disease, and in excellent condition.
 - 2. Spray the sod rolls until saturated.
 - 3. Use a heavy sod roller over entire sodded area to ensure root contact with the fill soil and TRUEGRID interface.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Gravel fill: Avoid sharp turns or “jack knives” in trailered vehicles when cells are empty. Damage due to buckling can occur. TRUEGRID can be driven on pre-fill by gravel trucks and construction equipment to speed the installation process.
- C. Grass Fill / Seeded: Protect seeded areas from any traffic, other than emergency vehicles, for a period of 4 to 6 weeks, or until the grass is mature to handle traffic. Avoid sharp turns or “jack knives” in trailered vehicles when cells are empty. Damage due to buckling can occur.
- D. Grass Fill / Sodded: Sodded areas must be protected from any traffic, other than emergency vehicles, for a period of 3 to 4 weeks, or until root system has been established.
- E. Dumpster areas: A concrete pad is recommended for dumpster areas due to the drop and drag action. Permeable pavers are not recommended in these areas under and directly around the dumpster.
- F. Repair or replace damaged products before substantial completion.

3.5 MAINTENANCE

- A. For gravel fill surfaces, maintain a 0.5 in (13 mm) surcharge of aggregate as a surface wear course. Surface should be inspected from time to time to identify signs of slight cell infill loss.
- B. Maintain grass in accordance with manufacturer's instructions and as specified in Section 32 92 00 – Turf and Grasses.
- C. Monitor pavement to ensure traffic frequency and loading does not exceed the pavement design.
- D. When snow removal is required, keep a metal edged plow blade from coming in contact with the surface during plowing operations to avoid causing damage to the units. Use a plow blade a minimum of 1 inch above the surface and with a flexible rubber edge or with skids on the lower outside corners so the plow blade does not come in contact with the units.

END OF SECTION