The only Porous Paver design specifically for use with rhizomatous grasses

AT SOURCE Stormwater Capture!

GRASS REINFORCEMENT STRUCTURE
Introducing Turf Cell™ grass paver, the latest innovation in porous paving technology. Turf Cell™ grass paver allows occasional use impervious pavements to be converted to pervious, drivable grass surfaces.

But Turf Cell™ grass paver goes a step further. With lateral openings within the structure, Turf Cell™ grass paver not only protects roots against compaction, it allows the roots of rhizomatous grasses to spread through the block within the protected soil layer. This creates a living, self-healing system which is not only resilient, but looks great year round.

**Why use Porous Pavements?**

- Convert impervious pavements to pervious, drivable surfaces
- Reduce storm water runoff
- Reduce heat island effect
- Encourage infiltration to improve water quality
- Improve aesthetics

**Why is Turf Cell™ grass paver Different?**

- Lateral openings within the block allow roots to spread within the protected soil layer

### Reducing Runoff as much as 90%

Using the rational method to calculate peak runoff flows:

\[ Q = CIA \]

Where:

- \( Q \) = Peak Rate of Runoff
- \( C \) = Runoff Coefficient
- \( i \) = Intensity of the Event
- \( A \) = Area of the Contributing Basin

Turf Cell™ grass paver modifies the Runoff Coefficient (C). Typical pavements use a coefficient of .70 - .95, meaning that they shed 70% - 95% of the storm water that falls on them. Grass areas use a much lower coefficient, typically between .05 - .35, meaning they only contribute 5% - 35% of their rainfall to runoff. This reduction of 35% - 90% is infiltrated or consumed by the vegetation, and can drastically improve site hydrology.
Patients arriving at this Doctor’s Professional Building can park in the grass lot whenever the paved lot is full. Even during wet weather when grass fields can become sloppy and muddy, Turf Cell™ grass pavers keep this lot stable, making it pedestrian and vehicle friendly. It was construction friendly, too, as the entire 2323 m² (25,000 sf) lot was constructed over a single weekend. The lateral openings of the Turf Cell™ grass paver will work extremely well with the rhizomatous St. Augustine Grass to keep the lot looking great.
Installation Guide

1. **Excavate** - Excavate area to the proper depth, accounting for the thickness of the base materials [per engineer’s specifications, typically +/- 152mm (6’)] and Turf Cell™ grass pavers 52mm (2.05’). Top of Turf Cell™ grass pavers should be between 5-8mm (0.25’) below any adjacent paved surfaces. Base of excavation should be flat and relatively level (per engineer’s specifications, typically < 6%).

2. **Prepare Base** - Use of a woven monofilament geotextile is recommended as a separation layer between the subgrade and base. Although not required, this will help maintain longterm porosity of the pavement. Base materials should be a blend of open-graded stone (AASHTO #5) and topsoil. The topsoil content must not exceed the void space of the stone (typically < 40%). Place base materials into excavation and compact.

3. **Install Turf Cell™ grass pavers** - Turf Cell™ grass pavers are palletized in panels of nine blocks. These panels measure 1.04m x 0.96m (2.56’ x 4.73’) and are 1 m²/panel (12.1 sf/panel). Turf Cell™ grass paver panels are joined using a dove tail slip joint. Begin installation at intersection with paved areas to ensure correct elevation (see above). If units do not butt against any paved areas, use a string line to square the area. Working from this line, attach panels and fill-out installation area. Turf Cell™ grass pavers can be cut around obstacles such as light posts and sprinkler heads.

4. **Backfill & Seed/Sod** - Fill Turf Cell™ grass pavers with a mixture of sand & topsoil or compost (per engineer’s specifications, typically a 70/30 mix). Lime may be added during mixing to ensure long-term porosity of the system. Equipment to dump or spread infill materials may drive on filled units. Backfill should completely cover Turf Cell™ grass pavers, with an additional 5mm-8mm (1/2" - 3/4”) over the pavers to allow mix to settle. When available, water may be used to encourage backfill to settle into pavers. Backfilled pavers may be seeded or sodded (preferably with a rhizomatous variety) in a manner consistent with regional guidelines. Seed or sod must be watered frequently until established. All pedestrian and vehicular traffic must be diverted around the installation until grass is established (typically 4-6 weeks for seed, 3-4 weeks for sod).
Turf Cell™ Grass Paver Specifications

<table>
<thead>
<tr>
<th>Material</th>
<th>100% Post Consumer Recycled Polypropylene</th>
</tr>
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<tbody>
<tr>
<td>Chemical Resistance</td>
<td>Excellent</td>
</tr>
<tr>
<td>Unit Dimensions</td>
<td>52mm x 260mm x 480mm (10.24&quot; x 18.9&quot;)</td>
</tr>
<tr>
<td>Panel Dimensions</td>
<td>(8 assembled units) - 1.04m x 0.96m (9 assembled units) - 2.56' x 4.73'</td>
</tr>
<tr>
<td>Unit Depth</td>
<td>52mm (2.05&quot;)</td>
</tr>
<tr>
<td>Cells per Unit</td>
<td>45</td>
</tr>
<tr>
<td>Nominal Weight</td>
<td>4.58 kg/m² (0.94 lbs/sf)</td>
</tr>
<tr>
<td>Compressive Strength - Confined</td>
<td>greater than 400 t/m² (6030 psi Ultimate)</td>
</tr>
<tr>
<td>Compressive Strength - Unconfined</td>
<td>148.58 t/m² (166 psi Ultimate)</td>
</tr>
<tr>
<td>Service Temperature - Unfilled</td>
<td>-30° to 120°C (-22° to 248° F)</td>
</tr>
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CAD Design

Plan View

Side View

Front View
Permeable Paving Solutions

Turf & Gravel Reinforcement

Ideal to house and protect grass
Turf Cell™ reinforcement structure is the only product available that allows both horizontal and vertical root growth. Unlike concrete systems, the roots remain cool and grass growth thrives. Driving vehicles onto the grass has no effect on the protected roots. Aesthetically, the product allows the grass to fill in completely, creating a lush lawn with an invisible reinforcement structure.

Gravel Cell™ reinforcement structure creates an attractive, durable hard surface suitable for light to medium loaded parking areas.

Applications
The cells can be used in any situation where low to medium use parking surfaces, access roads and driveways are required.

The cells can also be used for the construction of swales to collect rainwater and direct water to surface infiltration areas such as Atlantis™ sub surface Infiltration channels.

Cost Benefits
The sub-base required for cells is equal to or less than the sub-base required for concrete or bitumen. Elimination of the traditional stormwater system required by impermeable carpark installations provides an immediate cost saving when installing Turf Cell™ or Gravel Cell™ pavers for the same application.

Benefits

Reduces Surface Temperature
- Reduces surface temperature around buildings.

Reduces Surface Run-off
- Water easily filters through structure.
- Permeable surfaces reduce stormwater run-off in creeks and rivers, and reduce pollution.
- Collected water can be reused and managed as a resource.

No Surface Drains Required
- Concrete pits, grated trench drains and other traditional stormwater inlets are not necessary.

Strong Structure
- Turf Cell™/Gravel Cell™ reinforcement structure can support heavy loads up to 148.58 t/m² unconfined.

Easy Installation
- Can be installed by unskilled labour
- Product is quickly clipped together.

Rigid Clipping System
- Unique easy to use interlocking system.
**Turf Cell™ reinforcement structure installed for reinforced grass car park area at the state hockey centre in Victoria.**

**Turf Cell™ reinforcement structure used in grass car park application.**

**Turf Cell™ reinforcement structure installed for council access road.**

**Turf Cell™ reinforcement structure installed for a domestic car parking space.**

**Turf Cell™ reinforcement structure installed for an internal road of a housing development.**
Permeable Parking Lot - Designed with grass parking bays and gravel access road.

Completed project with flourishing turf.

Gravel Cell™ reinforcement structure used for access roads.

Turf Cell™ reinforcement structure used for parking bays.
Parking Lot Design Considerations

**Typical Carpark Design With Full Infiltration**

- Backfill compacted to 95% sandy, modified proctor density 600mm (20") minimum, 900mm (36") maximum depth (top of the tank)
- Utility markers. Use metallic tape at corners of install to mark the area for future utility detection.
- Geogrid or equivalent on gravel or permeable geotextile on sand
- Excavation line and impermeable liner when required
- Suitable structural backfill compacted to 95% sandy modified proctor density (sides and bottom of the tank)
- 150mm (6")
- 300mm (12") minimum or, to allow space for proper compaction

**Typical Carpark Design With Gravel Cell™ Infiltration Areas**

- Backfill compacted to 95% sandy, modified proctor density 600mm (20") minimum, 900mm (36") maximum depth (top of the tank)
- Utility markers. Use metallic tape at corners of install to mark the area for future utility detection.
- Geogrid or equivalent on gravel or permeable geotextile on sand
- Excavation line and impermeable liner when required
- Suitable structural backfill compacted to 95% sandy modified proctor density (sides and bottom of the tank)
- 150mm (6")
- 300mm (12") minimum or, to allow space for proper compaction

**NOT TO SCALE**
To get ready for a major tourism boom for the 400 year anniversary of the first permanent English settlement in the United States, establishing overflow parking without creating a visual eyesore - or additional runoff - was paramount. Of the many available options, Turf Cell™ grass paver was selected for its lateral openings that allow grass roots to spread within the protected topsoil zone. This allows damaged areas - or areas that get frequent traffic during the tourism boom - to repair themselves without additional over seeding, creating a self-healing system.
Off-Street Parking Improvements
Ponte Verdra, FL

Road and storm sewer improvements in this high-end neighborhood included an opportunity for the city to offer residents attractive, environmentally friendly off-street parking. To accomplish this goal, Turf Cell™ grass pavers were extended from the edge of the road nearly 4m (13 feet) into home owners' front yards. Once sodded, parking area blends seamlessly into the landscape, providing beautiful off-street parking that cleans and infiltrates storm water rather than discharging contaminated runoff.

Bachelor Enlisted Quarters (BEQ)
Yorktown Naval Weapon Station - Yorktown, VA

The military demanded that their new Bachelor Enlisted Quarters (BEQ) be designed and built as a LEED Silver project. That meant strict limits on the amount of impervious area that could be created. Instead of a traditional fire-lane, a porous Turf Cell™ road was created, reducing the impervious area and improving the aesthetics of the finished project.
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