

# GRASS CELL

## Technical Specification

### **PART 1 - GENERAL 1.01 General Provisions**

- A. The Conditions of the Contract and all Sections of Division 1 are hereby made a part of this Section.

### **1.02 Description of Work**

- A. Work Included:
1. Provide and install subsurface excavation grading and compaction per Geotechnical Engineer's recommendations and/or as shown on drawings, to provide positive drainage and support for surfaces above. See 2.02 Materials.
  2. Provide and install products, including ACF Environmental Grass Cell, geotextile filter fabric and/or geomembrane, and additional pipe and/or drainage structures as may be identified elsewhere in these plans and specifications.
- B. Related Work:
1. Subgrade preparation as per Geotechnical Engineer's recommendations.

### **1.03 Quality Assurance**

- A. Installation: Performed only by skilled work people with satisfactory record of performance on drainage or paving projects of comparable size and quality.

### **1.04 Submittals**

- A. Submit manufacturer's product data and installation instructions.
- B. Submit 500mm (19.68") x 600mm (23.62") x 50mm (1.96") section of ACF Environmental Grass Cell material for review. Reviewed and accepted samples will be returned to the contractor.
- C. Submit 5 Sqm samples of geotextile, and/or geomembrane, materials, along with technical specifications for review and approval.

### **1.05 Delivery, Storage, and Handling**

- A. Protect ACF Environmental Grass Cell units from damage during delivery and store under tarp for protection from sunlight when time from delivery to installation exceeds one week.

### **1.06 Project Conditions**

- A. Review installation procedures and coordinate ACF Environmental Grass Cell work with other work affected.
- B. All major subsurface and surface construction adjacent to ACF Environmental Grass Cell areas, especially including utilities, must be completed prior to installation of ACF Environmental Grass Cell.
- C. Cold weather:
  1. Do not use frozen materials or materials mixed or coated with ice or frost.
  2. Do not build on frozen work or wet, saturated or muddy subgrade.
  3. Do not lay ACF Environmental Grass Cell product when air temperatures are below 55 degrees F.

# Grass Cell Base Technical Specification

## 1.02 Description of Work

### A. Work Included:

1. Provide and install subsurface excavation grading and compaction per Geotechnical Engineer's recommendations and/or as shown on drawings, to provide positive drainage and support for surfaces above. See 2.02 Materials.

## PART 2 - PRODUCTS

### 2.1 Availability

- A. ACF Grass Cell - Manufacturer: ACF Environmental, 2831 Cardwell Road, Richmond, Virginia 23234.  
ACF Environmental Grass Cell: Lightweight injection-molded plastic units, usually supplied in 500mm (19.68") x 600mm (23.62") x 50mm (1.96") sheets, with a chessboard pattern allowing maximum water infiltration and conveyance. The plastic used is 100% recycled PP. The ACF Environmental Grass Cell have a cup structure in the bottom for passive irrigation and retain essential moisture and humidity for prolonged dry periods.
- B. Geotextile Fabrics and Geomembranes shall be supplied from reliable and proven sources, with known characteristics suitable to each specific application. These materials may be used to underlay, overlay, or surround the ACF Environmental Grass Cell product, depending upon specific need.

## PART 3 - EXECUTION

### 3.1 Inspection

- A. Examine subgrade and base course installed conditions. Do not start ACF Environmental Grass Cell installation until unsatisfactory conditions are corrected. Check for improperly compacted trenches, debris, and improper gradients.
- B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance. If existing conditions are found unsatisfactory, contact Project Manager for resolution.

### 3.2 Preparation

- A. Prepare base soils or granular fill materials to grades shown on plans, suitable for drainage application (as determined by Project Engineer). Allow 50mm (1.96") for ACF Environmental Grass Cell thickness.
- B. Ensure that any vertical projections through the ACF Environmental Grass Cell layer are properly protected from settlement, and/or water penetration (if critical) prior to placement of liners or ACF Environmental Grass Cell.
- C. Ensure that any sharp objects on the subsurface are removed to avoid penetration of fabric or membrane liners. Keep the subsoil surface as smooth as possible while working.

### 3.3 Installation of ACF Environmental Grass Cell

- A. Install the underlayment liner (fabric or membrane), if called for, over the prepared subgrade, according to manufacturer's guidelines for seams, joints, bonding, etc.
- B. Install the ACF Environmental Grass Cell units by placing units with rings facing up, using connectors provided to maintain proper spacing and interlock the units. Units can be easily shaped, or rings and grid removed, with pruning shears or knife. Units placed on slopes and vertical surfaces shall be secured as appropriate to maintain units in place.
- C. Place overlay liner (fabric or membrane) as specified by Designer, according to manufacturer's guidelines.
- D. Place coarse cover material (landscaping, backfill, flooring, pavement, etc.) on top of the overlay liner as specified by the Designer, taking care to avoid punctures or dislodging of the liner.

END OF SECTION

# Grass Cell Data Sheet

## ACF Environmental Grass Cell Data Sheet

### Product Description

**Materials:** ACF Environmental Grass Cell is made with an injection molded consisting of very strong chess board Pattern. ACF Environmental Grass Cell are made of 100% recycled PP.

Core materials contain special inhibitors, which are non-biodegradable, and offer excellent chemical resistance.

This product can also be provided pre-assembled with one or both sides having layers of non-woven polypropylene (PP), or polyester, geotextile fabric (featuring low stretch characteristics) with joints sewn as required to keep soils out. Fabrics must be selected to meet local engineering requirements, are supplied locally, and installed on-site.

Size: ACF Environmental Grass Cell is supplied in sheets of 500mm (19.68") x 600mm (23.62") x 50mm (1.96").

### Applications

Standard Use: ACF Environmental Grass Cell is a lightweight, yet incredibly strong drainage core, ready to be covered with geotextile fabric for vertical and horizontal drainage applications, including:

- Landfills Drains
- Roof Decks
- Sports Turf Facilities
- Foundation Walls
- Subfloors
- Tunnels
- Retaining Walls
- Highway Edge Drains
- Landscape French Drains

ACF Environmental Grass Cell is designed to intercept and collect only excess water from soils, and then transport this water to ACF Environmental R-Tanks.

The standard fabric characteristics and open nature of the structure provide capability for large infiltration and flow volume.

# Grass Cell

## Features

- Very high compressive load.
- Very high lateral flow capacity.
- Fit-in system.
- Low weight - reduces deck loads.
- Thin - reduces depth of cover.
- Reduces hydrostatic forces upon subgrade walls.
- Easy to shop, store and install.

## Maintenance

Under normal conditions, with acceptable backfill materials used, ACF Environmental Grass Cell will require no maintenance.

## Warranty

ACF Environmental warrants that ACF Environmental Grass Cell will be supplied without manufacturing defects, and will perform as stated in this document provided the applications and installation methods follow our recommendations.

If defects are found prior to installation, we will replace the product free of charge, or refund the purchase price of the product.

Product replacement or refund is the Buyer's sole remedy for breach of warranty or negligence and we will not be liable for any indirect, consequential, special or resultant damages.

To the best of our knowledge, the information contained herein is accurate. Final decisions as to the suitability of information or product is sole responsibility of user.

## 1. Installation:

### Horizontal Installation:

1. Waterproof the base and the sidewall surface as per engineering details.
2. Lay geotextile if specified.
3. Lay ACF Environmental Grass Cell as a uniform continuous blanket.
4. Place the ACF Environmental Grass Cell continuously over the top of drains inlets. Place some form of marker at finish grade to locate drain inlets.
5. ACF Environmental Grass Cell can be cut or bent to meet inside or outside corners with an electric saw. ACF Environmental Grass Cell may be cut with diagonal cutter, pruning shear, or snips.
6. Unroll geotextile fabric over panels using widest roll possible to minimize joints. Fabric joints should be made with overlaps of 50 minimum - secured with duct tape or similar as necessary to prevent soil intrusion.
7. Torn or punctured fabric must be covered with patches of new fabric, held in place by tape or continuous bead of adhesive.
8. Cover the panels as soon as possible, taking care to not puncture or tear the fabric, using materials least likely to clog the fabric - avoid fine silts, clays, and dusty organic materials. Perform clogging test beforehand if questions of backfill suitability exist.

# Grass Cell

## Placement of Other Materials:

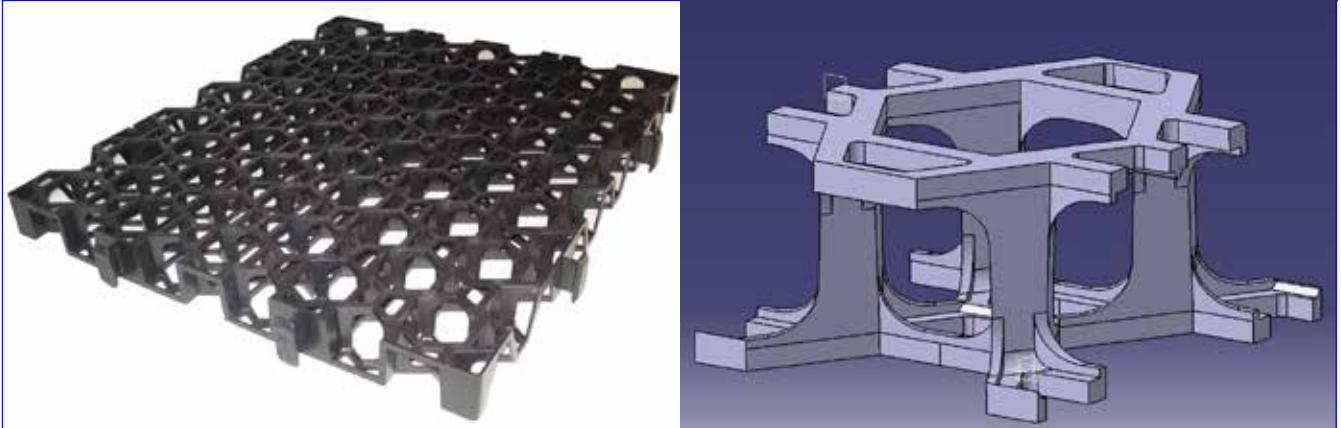
Other materials placed directly upon the fabric should be done with caution as follows:

- Large Tree Balls - a slight cone of sand should be placed at the center point of the tree location, with a 30 mm (1.18") liner (min. thickness) 600mm (2') larger in diameter than the tree ball placed over the sand cone. This will encourage strong tree roots to grow horizontally. Drainage water will flow to the edge of the liner before passing into the drainage layer.
- Paving materials - such as brick, concrete pavers and slabs, wood decking, stone slabs, etc., can be placed directly upon the fabric - provided the edges of the materials will not tear or puncture the fabric during handling. This will allow weight to be minimized. Otherwise, use traditional setting beds of sand, or lightweight aggregate and cement binder (allowing for drainage) between the drainage fabric and the paver. Aluminum or plastic "L" or "T" edging materials can be used to contain paving materials.
- Planter Retaining Walls - masonry or wood (railroad ties) planter walls can be placed directly upon the ACF Environmental Grass Cell and fabric covered structure, preferably with an additional layer of geotextile in between to act as a cushion. These planter walls should be designed to be self supporting, with opposite walls tied together to maintain shape and resist "blow-out" pressure. Segments of upstanding precast concrete pipe can be used successfully for planters also.
- Irrigation systems - If possible, use of low-pressure spray, or drip, irrigation systems should be used (especially on roof decks) with all lines placed above the drainage fabric to minimize penetrations and chances for soil leakage. Valve boxes, supply mains and manifolds can be placed below and/or through the drainage layer and treated like any other vertical obstruction.
- Electrical Wiring - all electrical wiring for current above 24v should be placed in conduit with watertight joints per electrical codes, and placed above the drainage fabric layer. If codes allow, low voltage wiring can be laid loose, secured to bottom side of protection board (1x2), or run in plastic pipe conduit (which allows easy replacement without disturbance of landscaping). Penetrations of drainage fabric layer should be avoided, or at least minimized.

**END OF SECTION**

# 50 Mil Grass Cell Specifications

## Product Photo



## Specifications

Item	Metric	Unit	English	Unit
Width	500.00	mm	19.68	inches
Length	600.00	mm	23.62	inches
Height	50.00	mm	1.96	inches
Area	0.30	square meters	3.23	square feet
Surface Open Area	> 90	%	> 90	%
Internal Void Area	> 95	%	> 95	%
Base Material	100% Recycled Polypropylene			
Biological & Chemical Resistance	Unaffected by mold, algae, soil-born chemicals, bacteria and bitumen			
Service Temperature	-10 to 85	degrees Celcius	-14 to 185	degrees Farhenheit
Compressive Strength (Unconfined)	225.00	t / sm	320.02	psi
Compressive Strength (Confined)	4,465.7	t / sm	6,351.7	psi

**Note:** GrassCell Product and Systems are Design Registered or Design Registration Pending

**Safety Factors:** Engineers, designers and geotechnical engineers should design and calculate safety factors to a serviceable limited state to suit specific project requirements.

**Disclaimer:** All information provided in this publication is correct to the best knowledge of the company and is given in good faith. This information is intended only as a general guide. No responsibility can be accepted for any errors, omissions or incorrect assumptions. As each project is unique, and as ACF Environmental and its distributors have no direct control over the methods employed by the user in specifying, installing or supervising the use of this product, no responsibility can be accepted by ACF or its distributors. Users should satisfy themselves as to the suitability of the product for their specific purpose.



800-448-3636

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