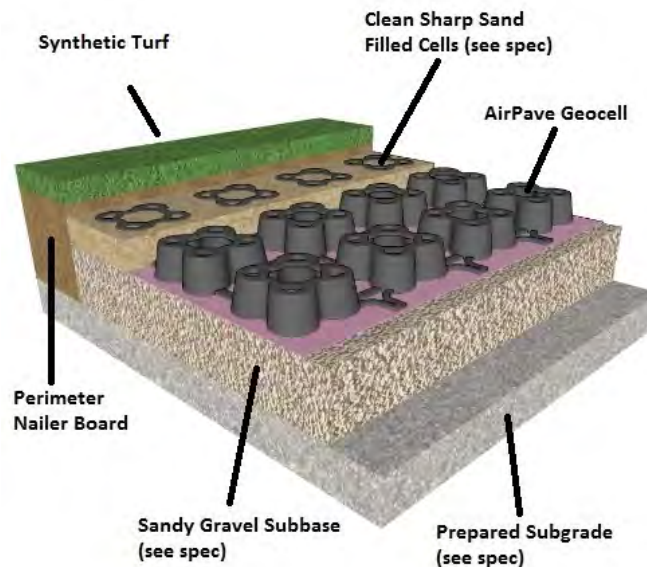


AirPave[®] with Synthetic Grass,

A flexible porous paving and drainage system for synthetic grass paver fire lanes, reinforced synthetic turf paving and swales. With over 400 installations across the country AirPave for grass pavers is 233 psi unfilled, **6,747 psi sand filled** and is made of 100% recycled content which can contribute to LEED™ points. **The AirPave is rounded very important not to have sharp edges as they will eventually cut the turf.**

AirPave with Synthetic Grass is a perfect solution for areas where you don't have irrigation or have limited rainfall. The fire lane will stay green all year and is easily delineated from the surrounded landscape. Installed properly there should be very little maintenance needed for this fire lane.

AirPave can save the owner up to \$0.80 per square foot or more over our nearest competitors. CSI Master Format #32 12 43, #32 92 00 and #32 14 43.

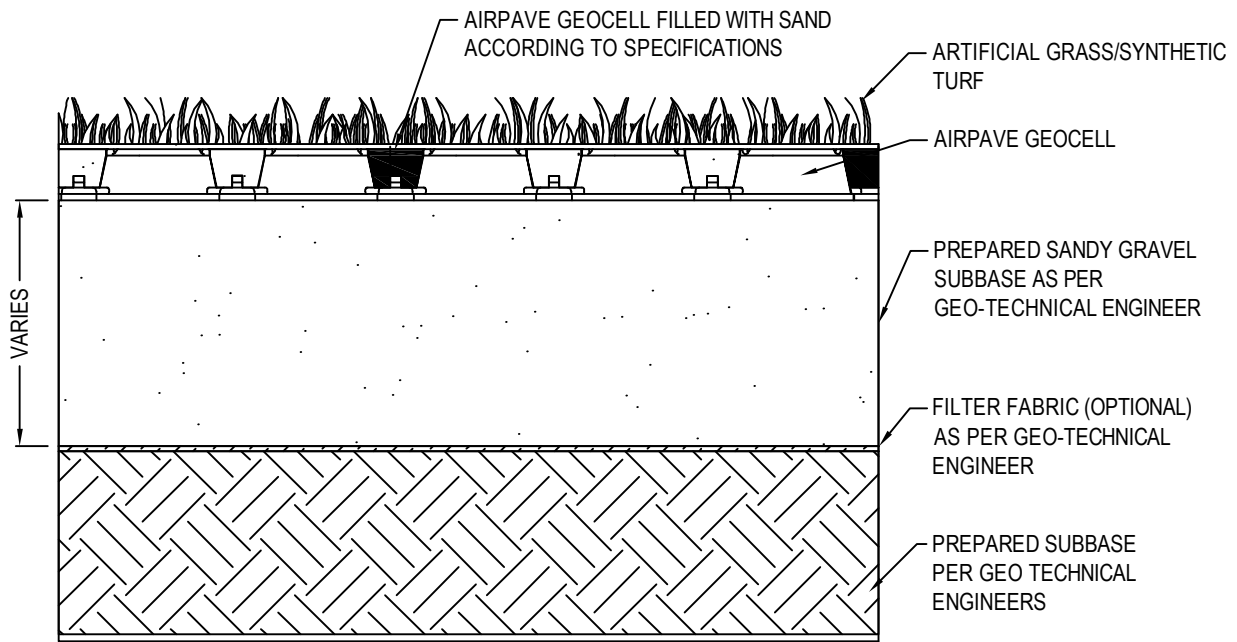


Benefits of an AirPave Synthetic Grass Paver System include:

- A 40% or more material cost savings over most competitors
- Up to 45% cost savings on shipping, compared with rolled grass paver systems
- Synthetic Grass requires less maintenance and water
- AirPave has been installed in over 400 flexible porous paving projects
- AirPave is made with 100% recycled copolymer polypropylene plastic with an impact modifier added to achieve a (NO-BREAK) plastics classification and a minimum 3% carbon black added for UV protection.
- Loading capability is equal to 233 psi empty and **6,747 psi when filled with clean sharp sand, over an appropriate base depth that provides adequate support for project design loads exceeding H-20 & H-25 requirements.**
- **AirPave grid is rounded and will not cut the turf big problem with some other products!**



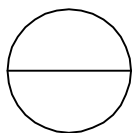
AIRFIELD SYSTEMS, LLC
 8028 N. MAY AVE, STE 201
 OAKLAHOMA CITY, OK 73120
 PHONE: (405) 359-3775
 FAX: (405) 348-9945
 www.airfieldsystems.com



SECTION

NOTES:

1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. DO NOT SCALE DRAWING.
3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 975-095.



POROUS FLEXIBLE PAVING

GRASS PAVING: AIRPAVE GRASS PAVING DETAIL



SECTION 32 12 43

ARTIFICIAL GRASS COVERING FLEXIBLE POROUS PAVING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Base course of sandy gravel, over sub-base prepared by others.
- B. Porous flexible paving and anchors.
- C. Sand cover.
- D. Synthetic Turf cover for paver units.

1.2 RELATED SECTIONS

- A. Section 31 20 00 - Earth Moving.
- B. Section 33 46 19.13 - Underslab Drainage Piping.
- C. Section 32 10 00 - Bases, Ballasts, and Paving.
- D. Section 32 30 00 - Site Improvements.
- E. Section 32 84 23 - Underground Sprinklers.
- F. Section 32 90 00 - Planting.

1.3 REFERENCES

- A. AASHTO M6 - Standard Specification for Fine Aggregate for Hydraulic Cement Concrete.
- B. ASTM C 33 - Standard Specification for Concrete Aggregates.
- C. United States Golf Association (USGA) - Greens section sand mix "The Root Zone Mixture."

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 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 anchoring.
- D. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
 - 1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
 - 2. Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
- E. Samples: Submit two 10 inch square samples of Porous Flexible Paving Units product specified.
- F. Manufacturer's Certificates: Certify base course, sand fill materials and products meet or exceed specified requirements.
- G. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic fertilizing and maintenance.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer with a minimum for five years documented experience with the 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.
- C. Pre-Installation Meetings:
 - 1. Convene a pre-installation meeting a minimum of two weeks prior to start of porous paving systems.
 - 2. Verify project requirements, subbase and base conditions, manufacturer's installation instructions and coordination with other related work.
 - 3. 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.

1.6 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 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 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.
- E. Protect partially completed porous paving against damage from other construction traffic when work is in progress.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Airfield Systems, which is located at: 8028 N. May Ave. Suite 201 ; Oklahoma City, OK 73120; Tel: 405-359-3775; Web: www.airfieldsystems.com ; Email: michaelb@airfieldsystems.com
- B. Substitutions: Not permitted.

2.2 MATERIALS

- A. Base Course: Sandy gravel material from local sources commonly used for road base construction and conforming to the following sieve analysis and requirements:
 - 1. Sieve Analysis:
 - a. 100 percent passing sieve size 1 inch (25 mm).
 - b. 90-100 percent passing sieve size 3/4 inch (19 mm).
 - c. 70-80 percent passing sieve size 3/8 inch (9 mm).
 - d. 55-70 percent passing sieve size #4.
 - e. 45-55 percent passing sieve size #10.
 - f. 25-35 percent passing sieve size #40.
 - g. 3-8 percent passing sieve size #200.
 - 2. For turf pavers, provide materials nearly neutral in pH (range from 6.5 to 7.2) to provide adequate root zone development for turf.
 - 3. Material may be either "pit run" or "crusher run." Crusher run material will generally require coarse, well-draining sand conforming to AASHTO M6 or ASTM C 33 to be added to mixture (20 to 30 percent by volume) to ensure long-term porosity.

4. Alternative materials such as crushed shell, limerock, or crushed lava may be used for base course use, provided they are mixed with sharp sand (20 to 30 percent) to ensure long term porosity, and are brought to proper compaction. Without added sand, crushed shell and limerock set up like concrete and become impervious.
- B. Porous Flexible Paving Units: AirPave Geocell Grass Paving Units.
1. Materials:
 - a. Lightweight injection-molded copolymer polypropylene plastic units using impact modifier.
 - b. Plastic is 100 percent post-consumer recycled copolymer polypropylene resin using a polymer impact modifier, with minimum 3 percent carbon black added for UV protection.
 - c. Chemical resistance: Excellent.
 - d. UV resistance: High.
 - e. Toxicity: Non-Toxic.
 2. Performance Properties:
 - a. Loading capability is equal to 233 psi empty capacity and 6,747 psi when filled with sand, over an appropriate base depth that provides adequate support for project design loads.
 3. Dimensions:
 - a. AirPave Grid: 31.784 inches by 31.880 inches by 1.000 inches or 7.03 SF.
 - b. Weight (Nominal): 3.10 lbs per paver grid, 8 percent solid.
- C. Paver Unit Anchors: 8 inch Chisel Point Pins 6 gauge BB Wire with 1.5 inch round attached washer, as required by the Architect or licensed geotechnical engineer to secure units in place. (AirField suggests using at least 5 pins per part for Synthetic Turf / Artificial Grass installations)
- D. Sand Cover:
1. Coarse, well-draining sand (washed concrete sand conforming to AASHTO M6 or ASTM C-33.
 2. United States Golf Association (USGA) greens section sand mix "The Root Zone Mixture."
 3. Other Soil Mix as recommended by the manufacturer.
- E. Grass: Synthetic Turf
1. Install Synthetic Turf per turf manufacturers specification
- F. per spec is critical to the success of the project.
- G. Firelane Signage and Markings: Identify entrance and physical location of firelanes using signs if gates, curbs, bollards, and other built elements do not adequately indicate firelanes; comply with requirements of local fire authorities.

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.
 1. Complete all hard surface paving adjacent to flexible paving areas, including concrete walks and asphalt paving prior to installation of flexible paving.
- B. Obtain approval of local fire authorities of sub-base prior to installation of base course for flexible porous paving.

- C. Ensure that sub-base Specified in Section 32 10 00 - Bases, Ballasts, and Paving is adequate to receive designed base course, wearing course, and the required design loads. Ensure that grading and soil porosity of the sub-base will provide adequate subsurface drainage.

3.2 PREPARATION

- A. Subgrade Preparation:
 - 1. Prepare subgrade as specified in Section 32 10 00 - Bases, Ballasts, and Paving. 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. Provide a subdrainage system as specified in Section 33 46 19.13 - Underslab Drainage Piping.
 - 5. Ensure in-place soil is relatively dry and free from standing water.
 - 6. Uniformly grade base.
 - 7. Level and clear base of large objects, such as rocks and pieces of wood.
- B. Base Course: Place base course material over prepared sub-base to grades indicated on the Drawings. Place in lifts not to exceed 6 inches (150 mm), compacting each lift separately to 95 percent Modified Proctor. Leave 1 inch (25 mm) of depth below final grade for porous paver unit and gravel fill.
- C. Base Preparation:
 - 1. Leave minimum 25 mm (1 inch) to 35 mm (1.5 inches) for porous flexible paving units and sand/sod fill to final grade.

3.3 INSTALLATION

- A. Paving Units: Install Porous Flexible Paving Units in accordance with manufacturer's instructions.
 - 1. Install by placing units with connectors and the pinning platforms flush against the prepared subbase with the larger diameter clover openings (cup side down) and pinning platforms facing downwards (grid side down). Place the first unit panel to the field's upper left hand corner. Orient the paving unit materials with the integral indicator tab (painted yellow) to the panel's bottom left hand corner. Proper sequencing and orientation of panels will result in a more rapid installation.
 - 2. Install unit panels across the field in a rowed pattern. Staggering of rows will allow for multiple row completion by a multi-manned crew. Secure the first panel to the base with pins and commence with panels 1-2, 1-3 and so on with one directional pull to secure. After each one directional pull secures the panel connectors together, slightly push back each panel to allow for contraction space at each connector. Verify each integral connector is snapped in place with sufficient contraction room allowed as panel installation proceeds.
 - 3. Once the first row has progressed across the project, start with the second row. By maintaining proper panel orientation, the top edge panel connectors will drop into the previously installed panel receptors after the one directional pull secures the panel.

4. Panels can be shaped to individual field areas as needed with an appropriate cutting device. If you have many parts to trim use a circular saw with a no melt, plastic cutting saw blades.
 5. Anchor units to base course on curves, slopes, high traffic areas and any other areas as required.
 6. Anchor units using paver unit anchors. Tops of clovers shall be between 6 mm to 13 mm (0.25 inch to 0.5 inch) below the surface of adjacent hard-surface pavements.
- B. Sand: Place sand in clovers by back-dumping directly from a dump truck, or from buckets mounted on tractors, which then exit the site by driving over clovers already filled with sand. Spread sand laterally from the pile using flat bottomed shovels and/or wide asphalt rakes filling the clovers. Use a stiff bristled broom for final finishing of the sand uniformly over the clovers. Compact sand by using water from hose, irrigation heads, or rainfall, with the finish grade no less than the top of clovers and no more than 6 mm (0.25 inch) above top of clovers.
- C. Grass: Synthetic Turf
1. Install Synthetic Turf per manufacturers specification.

3.4 MAINTENANCE

- A. Remove and replace segments of porous paving units where three or more adjacent clovers are broken or damaged, reinstalling as specified, so no evidence of replacement is apparent.

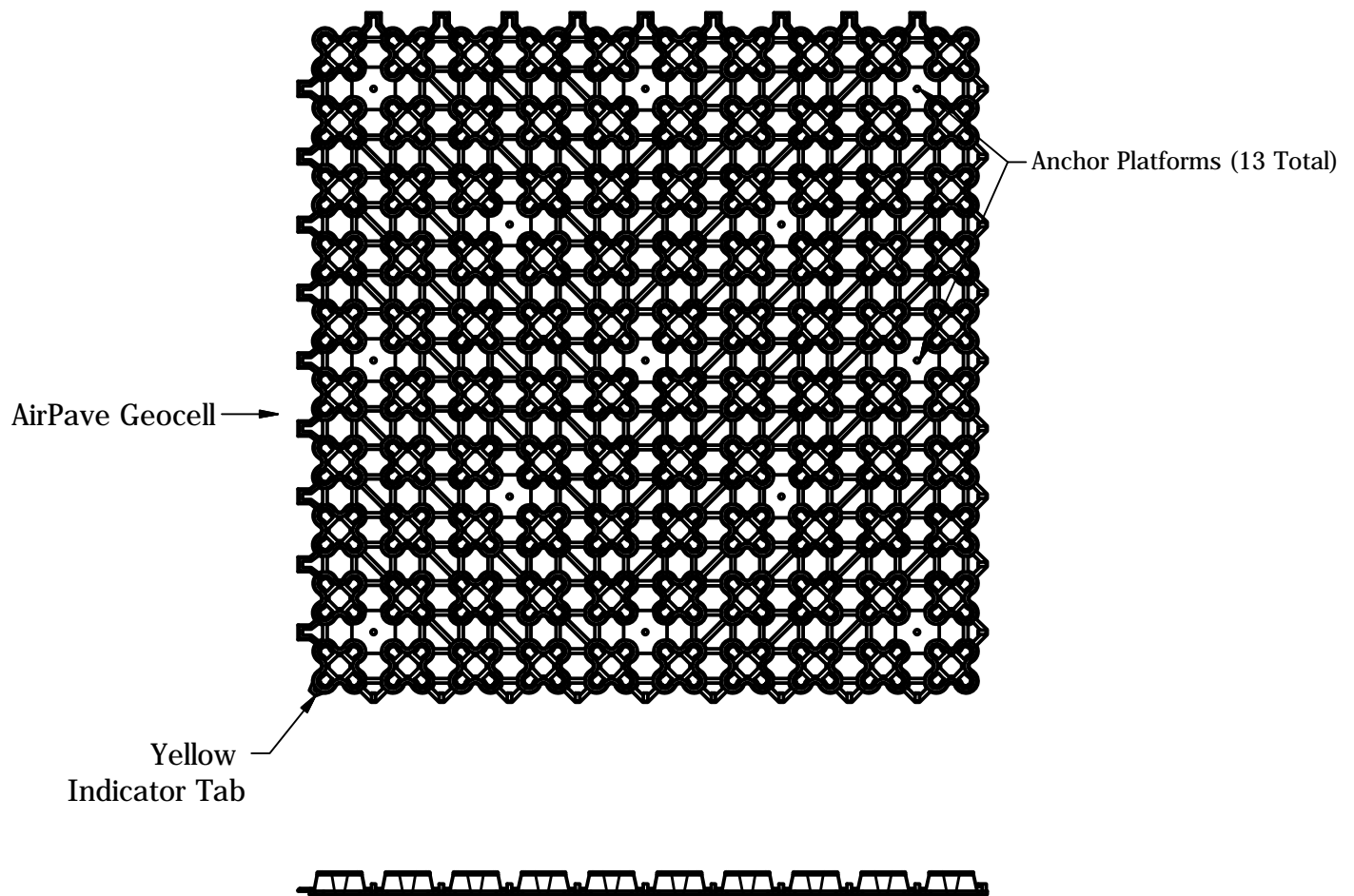
3.5 PROTECTION

- A. Protect turf area from any traffic for a period time per Synthetic Turf seams to set.
- B. Perform cleaning during the installation of work and upon completion of the work. Remove all excess materials, debris, and equipment from site. Repair any damage to adjacent materials and surfaces resulting from installation of this work.
- C. Repair or replace damaged products before Substantial Completion.

END OF SECTION

DISCLAIMER: The preceding and following drawings and/or general installation guidelines are provided only to show a concept design for installation and are not instructions for any particular installation. These drawings and general instructions are not complete and are provided only to assist a licensed Geo-Technical Engineer, a Landscape Architect and/or Civil Engineer in preparing actual construction and installation plans. These drawings and instructions must be reviewed by a licensed Geo-Technical Engineer, a Landscape Architect and/or Civil Engineer and adapted to the condition of a particular installation site and to comply with all state and local requirements for each installation site.

THESE DRAWINGS AND/OR GENERAL INSTRUCTIONS DO NOT MODIFY OR SUPPLEMENT ANY EXPRESS OR IMPLIED WARRANTIES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IF APPLICABLE RELATING TO THE PRODUCT.



Unit Panel Specifications:

Size:	32" x 32" x 1"
Weight:	3.1 lb
Strength:	233 psi (unfilled) 6747 psi (filled)
Resin:	100% Recycled (PIR) Copolymer with Impact Modifier "No Break" Polymer Material
Color:	Black (3% carbon black added for UV Protection)

AirPave Cross Section

Scale 0.12:1

Typical

For AirPave Systems



Airfield Systems, LLC
8028 N May Ave, Suite 201
Oklahoma City, OK 73120
(405) 359-3375

www.airfieldsystems.com

Drawing No. APCS001.idw

General Information			
General			
Construction	Injection Molded Copolymer		
Composition	Copolymer Polypropylene Using an Impact Modifier		
Dimensions	31.784” x 31.880” x 1.000” (7.03 sq ft.)		
Unit Weight	3.1 lbs.		
Material	Resin Pellets		
Shipping			
Parts Per Pallet	114		
Pallet Dimensions	33” x 33” x 48”		
Pallet Weight	390 lbs.		
Area Coverage Per Pallet	798 sq. ft.		
Pallets Per Trailer	114 (3 wide x 2 tall x 19 deep)		
Area Covered Per Trailer	90,972 sq. ft.		
ASTM and ISO Properties ¹			
Physical		Nominal Value	Test Method
Specific Gravity		0.940	ASTM D792
Melt Mass-Flow Rate (230°C/2.16 kg)		20 g/10 min	ASTM D1238
Mechanical		Nominal Value	Test Method
Density		57.490 lb/ft³	ASTM D1505
Tensile Strength (Yield, 73°F)		2,145 psi	ASTM D638
Tensile Elongation (Yield, 73°F)		16%	ASTM D638
Flexural Modulus (73°F)		100,175 psi	ASTM D790
Compression Strength (73°F)		233 psi unfilled	ASTM D6254
Impact		Nominal Value	Test Method
Notched Izod Impact (73°F, 0.125 in)			ASTM D256
Thermal		Nominal Value	Test Method
Deflection Temperature Under Load 264 psi, Unannealed		160°F	ASTM D648
Expansion/Contraction Index ¹			
Temperature	Humidity	Length	Width
100°F	98%	31.881”	31.817”
-5°F	0%	31.765”	31.713”
Change		.116”	.104”
Joint Expansion/Contraction Capacity		.420”	.572”
Safety Factor		362%	550%
Examples of Usage			
Application	Required Strength	Safety Factor	
Auto	40 psi	x 168	
Truck	110 psi	x 61	

¹ Independent laboratory testing conducted by TRI/Environmental, Inc., TSI/Testing Services, Inc. and Wassenaar.

Permeable Pavement Axle Loads / Surface Pressure

Vehicle Type	Max Weight / Axle		AASHTO Load Class	Surface Pressure		
	lbs	kg		psi	psf	kPa
ATV (Trailer Vehicle Only)	1,200	544.31		3	432	20.68
Passenger Vehicle	3,000	1,360.78	H10	7.5	1,080	51.71
Light Truck	3,000	1,360.78	H10	7.5	1,080	51.71
Pickup	4,000	1,814.37	H10	10	1,440	68.95
80 HP Tractor	5,700	2,585.48	H10	14.25	2,052	98.25
100 HP Tractor	11,000	4,989.52	H10	27.5	3,960	189.61
Van Delivery Truck	16,000	7,257.48	H10	40	5,760	275.79
Rural Fire Truck	22,000	9,979.03	H15	55	7,920	379.21
Large Delivery Truck	24,000	10,886.22	H15	60	8,640	413.69
Garbage Truck (Single Axle)	26,000	11,793.40	H20/HS20	65	9,360	448.16
Loaded Dump Truck	30,000	13,607.77	H20/HS20	75	10,800	517.11
Heavy Delivery Truck	32,000	14,514.96	H20/HS20	80	11,520	551.58
Heavy Semi Truck	32,000	14,514.96	H20/HS20	80	11,520	551.58
Standard Logging Truck	33,600	15,240.70	H25/HS25	84	12,096	579.16
Concrete In-Transit Mixer Truck	38,000	17,236.51	H25/HS25	95	13,680	655.00
Garbage Truck (Tandem Axle)	42,000	19,050.88	H25/HS25	105	15,120	723.95
Off Highway Log Truck	43,000	19,504.47	H25/HS25	107.5	15,480	741.19
Fire Apparatus Single Axle Weights						
Single Steering Axle	23,000	10,432.62	H25/HS25	95.80	13,800	660.50
Single Steering Axle / Aerial	31,000	14,061.36	H25/HS25	129.16	18,600	890.53
Single Drive Axle	24,000	10,886.22	H25/HS25	100.00	14,400	689.47
Single Pumper Drive Axle	27,000	12,247.00	H25/HS25	56.25	8,100	387.83
Tandem Drive Axle	48,000	21,772.43	H25/HS25	50.00	7,200	344.74
Tandem Aerial Drive Axle	53,000	24,040.40	H25/HS25	55.20	7,950	380.59
Tridem Drive Axle	54,000	24,493.99	H25/HS25	37.50	5,400	258.55
Fire Apparatus surface pressures are per square inch of tire contact area / tire						

100% Post Manufactured Content

Recycled

The AirPave GeoGrid is made of 100% post-manufactured material, so you can feel good about helping the planet while adding valuable LEED Points to your project. We also add an impact modifier for incredible strength and superior performance in extreme heat and cold - on top of the already durable AirPave design.

AirPave Co-Polymer with an Impact Modifier Performance and Temperature Durability Attached you will find the specification of the resin used to produce both the 32 x 32 and the 32 x 18 Geo cells. This material is a co-polymer polypropylene that is 100% recycled resin. In order to be able to produce a consistent recycled resin a PIR (post industrial resin) is used for the base resin. This is the only way to produce a consistent material as opposed to a PCR (post consumer resin) which is dependent on the consumer to supply a consistent material. Using the PIR as a base resin 3% carbon black is added to insure good UV stabilization and metallocene (an ethylene base material) is used as an impact modifier.

Impact Modifier

The impact modifier is added in an amount to achieve a 10.0 Notched Izod Impact which comfortably qualifies this material as a NO BREAK material (4.0 and greater are normally considered no break material). The AirPave resin offers an advantage over many ethylene and HDPE products since the AirPave resin is often superior when it comes to pliability, warpage and internal stress related issues. Referring to the attached specification sheet you will notice that all testing is done to specific ASTM Standards.

Resin Blends

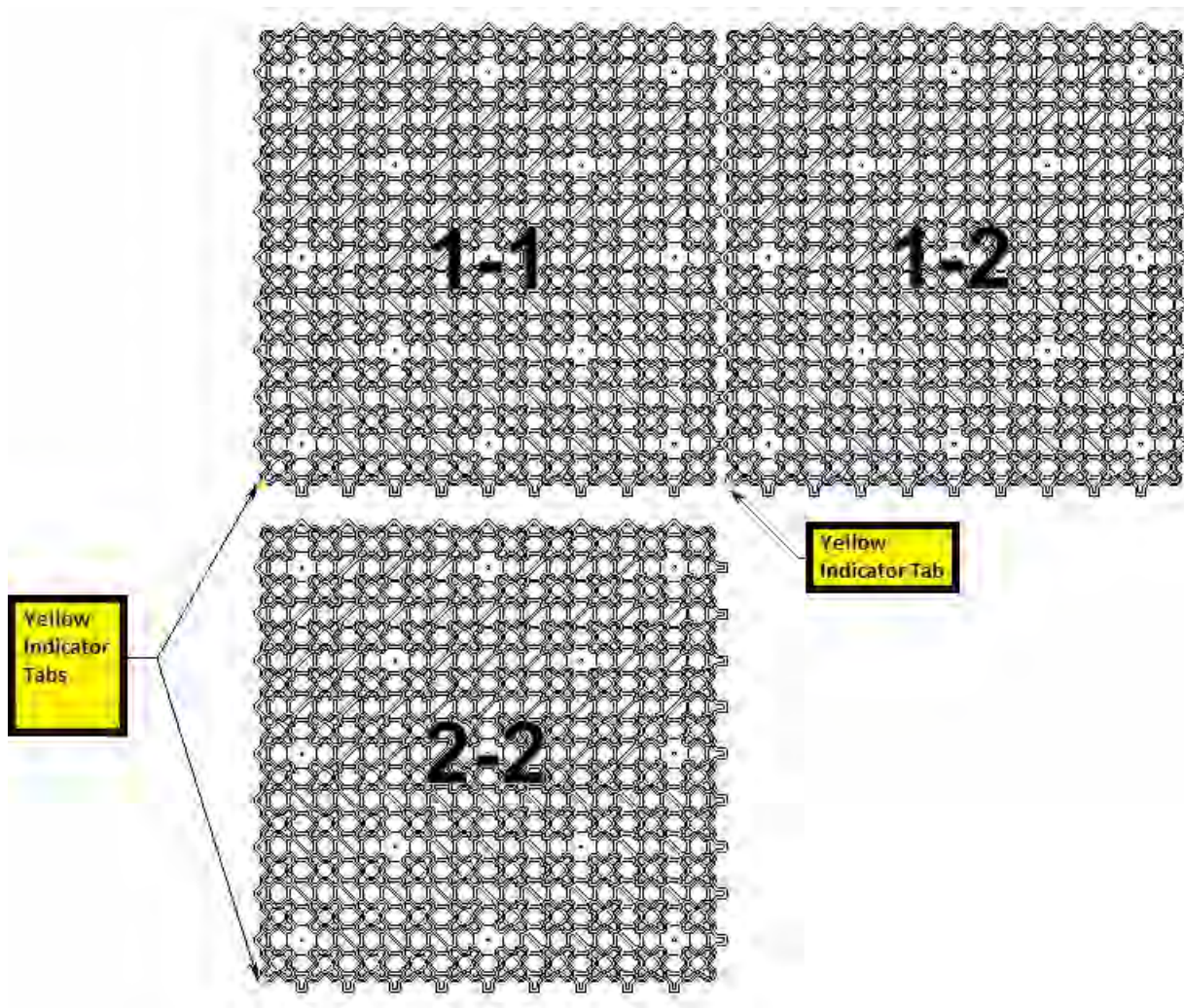
AirPave's blend of resins gives it the ability to perform in extreme temperatures. AirPave does not need a temperature above 50 degrees Fahrenheit to be installed or warmed in the sun to be pliable on site for install. In addition, AirPave's unique resin blend also helps prevent breakage and cracking in extreme temperatures.

Proper Sequencing and Orientation of AirPave GeoCell Panels for Rapid Installation

Pallet Staging: AirPave pallets cover approximately 798sqft. per pallet and should be staged accordingly within the installation area to minimize the amount of time to stage the AirPave grid. AirPave pallets are typically placed every 65 feet across and 15-20 feet back from each other. (Call AirField with questions that you might have about proper staging and installation.)

All Installations must start in the Top Left Corner of the project and work Left to Right to be installed properly.

1. Orientate the AirPave GeoCell materials with the integral indicator tab to the panel's bottom left corner (painted yellow). **Install the AirPave units by placing units with connectors and the pinning platforms flush against the prepared subbase. If the female connectors do not go over the male connectors then the orientation is incorrect, please call AirField Systems Immediately at 405-359-3775**



2. Install the AirPave panels across the field in a rowed pattern. Staggering of rows will allow for multiple row completion by a multi-manned crew.

3. Secure the first panel to the base with pins (Only in AirPave grass pave installations) and commence with panels 1-2, 1-3, and so on with one directional pull to secure. (Optional)
4. Once the first row has progressed across the project, start with a second row. Have a person staging the panels in groups of three snapped together along the row. The crew can then install the left side of the panel while elevating slightly the top portion (so the male and female connectors don't touch each other) once the left side has been snapped with a pull along the row direction, the top portion should fall into place and with a bottom vertical pull holding the inside of parts 1 & 3 snap all three parts in place.



5. AirPave panels can be shaped to individual field areas as needed with appropriate cutting device.
 - A. If only a few parts need to be trimmed, use tin snips.
 - B. If many parts require trimming, set up a table and use a circular saw with a no melt, plastic cutting saw blade.
6. AirPave units placed on curves and slopes shall be anchored to the base course, using 8 inch (203 mm) Chisel Point Pins 6 gauge BB Wire and 1 1/2 (35 mm) round attached washers, as required to secure units in place.

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