

# UltraBaseSystems®



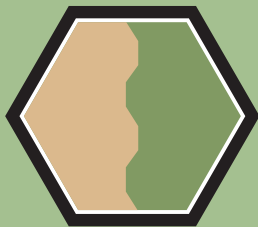
The Ultimate Base Replacement Solution



**UltraBaseSystems®**

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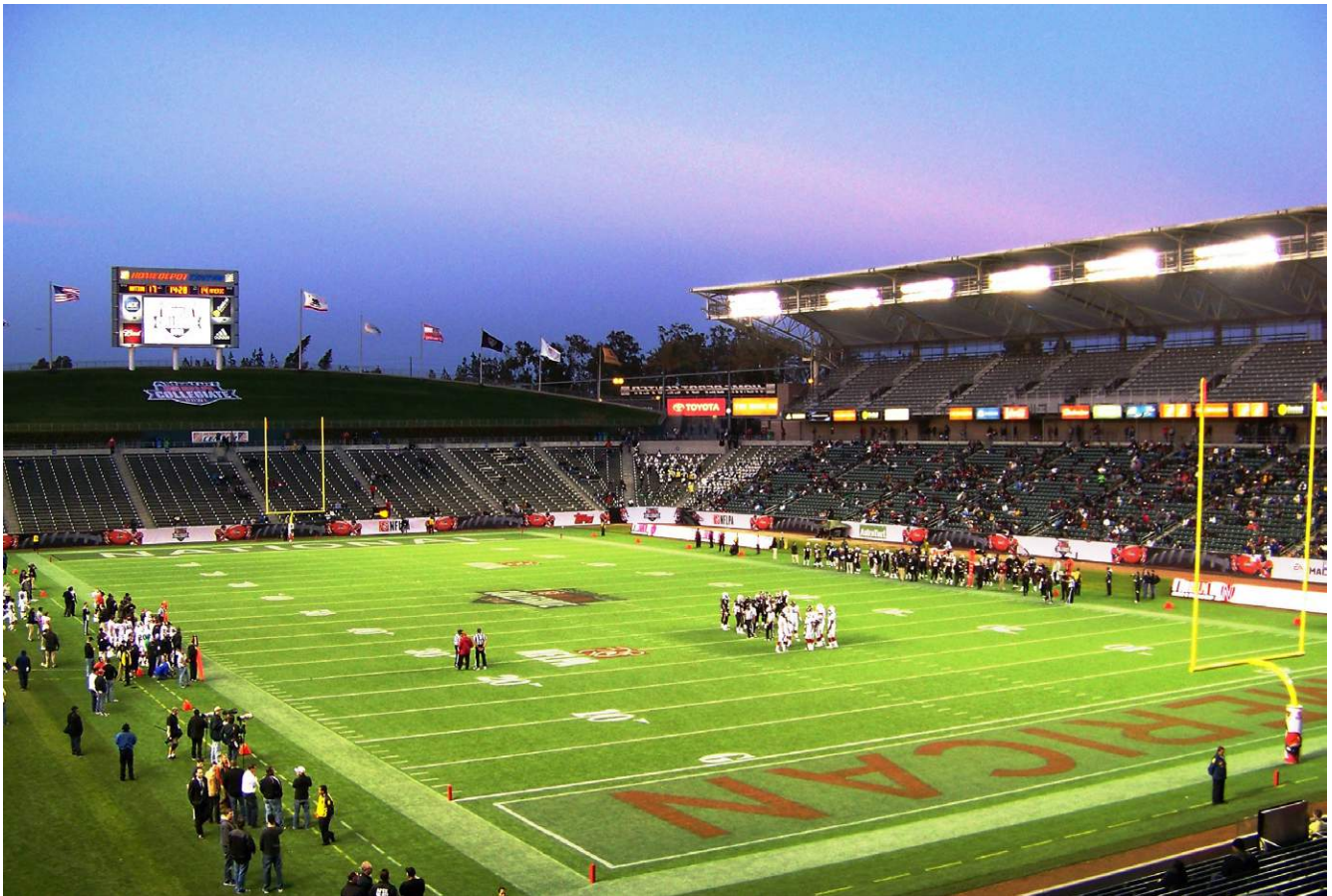
**UltraBaseSystems®**

UltraBaseSystems® is first and foremost a structurally engineered sub base replacement system which successfully addresses the safety, drainage and aesthetic demands of an entire industry. From athletic fields to residential landscaping installations, putting greens to pet areas, concrete paver installations to athletic courts, UltraBaseSystems panels cover all of your base requirements.

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# Athletic Fields



Every so often a product arrives on the scene having the potential to change an industry forever. UltraBaseSystems' panel base technology is that product. The dream of constructing world class sports fields in days, not months, in virtually any location with unsurpassed safety, drainage and playability is finally a reality.

## **Your Field, Reimagined**

From converting existing natural grass fields to virtually maintenance free synthetic turf sports venues, new construction projects, indoor sports facilities, concrete and asphalt synthetic turf conversion to temporary and portable installations, UltraBaseSystems® is the industry's answer to the next generation of sports field construction.

## **Safety + Performance**

Engineered with player safety at the heart of our technology, UBS is delivering unprecedented safety and performance numbers in every category from GMAX impact, foot rotation, ball bounce and roll to our patented anti slip turf design. The revolutionary structural stability of the panel system and superior vertical and horizontal drainage is quickly becoming the favorite of engineers around the globe. Built in a fraction of the time as traditional base methods and able to withstand the heaviest of equipment loads it is no wonder UltraBaseSystems® is being called the next big advancement in synthetic turf athletic field installations.



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# Landscaping



Stop living in the Stone Age. The days of invasively excavating the yard and filling it with dusty stone are gone! UltraBaseSystems makes installing landscaping turf easier and faster than ever before. From custom installations to DIY home projects, owning a no maintenance synthetic turf lawn has never been more practical.

### **Lush Grass For Your Yard**

Gone are the days of removing tons of dirt from your garden or lawn, and replacing the residential or commercial landscaping environment with compacted stone. It just makes no sense! Who wants a yard full of rock?

### **Install the Perfect Landscape**

UBS panels make landscape turf installation easy. Our patented panel design allows for beautiful contours when necessary or create a perfectly flat area ready for the kids to play their favorite ball games. Attaching synthetic turf directly to the our panels is a huge advantage for the installers, insuring the turf stays put once installed even for the smallest pieces of turf around paths or trees.

### **Drains Like Grass**

The rapid drain system assures a dry surface for pedestrians and kids at play. Make your next landscaping project an UltraBaseSystems® success story.



**UltraBaseSystems®**



## Rooftop



With space becoming more and more difficult to locate, the ability of bringing athletic and recreational areas to rooftops is a necessity. The per sq. ft. load rating of under two pounds per sq. ft. for UBS Professional and 1.1 pound per sq. ft. for UBS Champion, coupled with our patented vertical and horizontal drain system, makes our panel system a dream come true for architects and installers alike.

Install directly on the existing roof structure or incorporate a leveling pedestal system or position the panels on support joist. We have done it all! Rooftops across the world are getting a facelift and turning unusable space into structurally sound, safe active sport and entertainment havens.



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# Golf



We should be good at golf! We invented panel base putting greens over a decade ago. It's all about perfect ball, roll and UBS greens deliver perfection with every stroke. Dead flat or contoured to challenge any skill level, UltraBaseSystems® is improving golfers' games on every continent in the world.

### **Global Golf Greens**

Simply stated, no product can compete with the success of UBS and its sister panel, Tour Links®. With over 3 million ft<sup>2</sup> installed in 35 countries on 7 continents you cannot find a more recognized or trusted golf putting green product.

### **The Tour Links® Solution**

From cruise ships to the White House, movie stars homes to thousands of back yards and basements; UBS panel base technology is the leader of the pack. Sold to virtually every major putting green company on the planet, our patented technology elevates the roll of a golf ball to levels rock and stone bases can never achieve. So whether you are building a golf teaching academy, a training center for your college golf team or simply ready to shave strokes off your game, UltraBaseSystems® and TourLinks® panels are the only solution. Thousands of golfers have trusted us to improve their game, shouldn't you?



**UltraBaseSystems®**



# Playgrounds



Kids fall down, that's a fact all parents have come to accept. UltraBaseSystems understands this behavior and is driven to create the safest, easiest to install playground system on the market today. In fact, not a day goes by that we are not asked when the new soft playground panel will be ready—soon, very soon. You demanded it, we are responding.

### **Safety is Essential**

Safety, safety, safety. Nothing is more important than the well being and safety of kids. We recognized early on that by altering the chemical make up of the molded plastic in our panels we would be able to engineer a panel that delivered ease of installation in virtually any terrain and provide superior drainage while providing a safe alternative to traditional playground base solutions.

### **Less Maintenance More Fun**

Installing synthetic turf products on our playground panels or an EPDM pour in place rubber system, is providing playground installers with a smart approach for base construction. Grade your chosen area, compact, lay out the permeable or impermeable geo fabric and simply install our panels. The synthetic turf attaches directly on the rubber blended panels and, in no time at all, the industry standard for fall height can be achieved without all the excavation and mess installers have faced for years. Do you have existing poles and structures to install around? That's no problem with the flexible UBS playground panel. Cutting and installing around support posts is as easy as cutting a hole where necessary and snapping the panel around the obstacle. Install UBS indoors over concrete or place the panels on properly compacted earth base and in no time, you have a safe, well drained playground, bringing years of safety and fun for kids of all ages.



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## Pet Areas



Your dog may love playing in the mud but do you? Solve the problem once and for all with an UltraBaseSystems synthetic turf kennel or dog park. Designed to drain, UBS allows pet waste to quickly wash through the panels and be absorbed in to the ground just like nature intended. If you want to cover that unsightly concrete pet slab and replace it with beautiful, soft turf then look no further. Dogs love UBS and so will you.

### **The Drainage You Need**

Pets and pet owners love UltraBaseSystems®. Engineered with polymers that are not affected by pet waste, UBS panels are the perfect solution for indoor or outdoor kennels, dog runs or pet park areas. Simply hose down the synthetic turf and urine will easily flow through the panels and drain either into the earth below or to an awaiting drain system. Our lock tight turf barbs allow for even the most rambunctious dogs to play safely without turf movement.



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# Athletic Courts



Is basketball your game or a friendly match of bocce with the neighbors more your speed? UBS panels allow for the construction of a home or corporate court where zoning restrictions, lack of accessibility or the need for temporary recreational courts come in to play.

## **Sport Court Solutions**

Once ridiculed as an unnecessary option to poured concrete slabs for construction of athletic tile courts, UltraBaseSystems® is at the forefront of this industry changing advancement. Responsible for installing tile courts on a panel base system nearly 10 years ago UBS continues to work tirelessly to make backyard courts more affordable, environmentally friendly and safer than ever before. Zoning regulations and environmental permeability issues are a thing of the past with UBS. UBS panels work well with all athletic tiles and help deliver a more comfortable court underfoot in far less time and with less hassle.

## **Less Invasive**

Homeowners love our less invasive installation process and our ability to turn any area back to a garden or lawn once the kids have moved away. We have always said, the customer never loses their investment with UltraBaseSystems®. Trust the innovators not the imitators in athletic court base replacement systems.



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# Pavers and Bricks



It's all about the base! If you thought installing concrete or brick pavers was just too labor intense, think again. The structural superiority and drainage properties of every UBS panel far out weighs a foam pad system making installation a snap. Chose a location, remove the existing grass, compact and install the UBS panel system. Now have some fun creating an amazing paver patio with the pride of knowing you did it yourself.

### **A Solid Foundation**

Several years ago, we were told that 70% of all paver installation failures are due to base failure. Base failure is continuing to plague our industry. A house is only as strong as its foundation and UltraBaseSystems® is the ultimate foundation for any paver installation.

### **Get the Paver Look You Want**

Our interlocking tooth design allows for perfect alignment from panel to panel, eliminating elevation change from stone to stone. You simply prepare and compact your base, lay down a geo fabric, and install our panels. Depending on stone type and desired look, you can install directly on our panels that have been covered with a thin geo textile layer to prevent sand wash through or screed a thin leveling course of sand on the geo covered panels to compensate for any stone height variations. What you will achieve is a solid base system with minimal ground excavation capable of supporting the weight of an automobile and the forces of Mother Nature. It just doesn't get any easier for the homeowner or professional alike.



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# Carpet and Flooring Underlayment



When situations arise in locations such as a basement or porch where a moisture barrier between the existing sub floor and the finished decorative covering is required, UBS panels are the perfect solution. Made from a non-moisture absorbing material that won't degrade or warp, simply place the panels on the sub grade and install the finished flooring directly over these interlocking panels.

The space under each panel allows air to flow freely under the UBS system reducing moisture from absorbing into the finished carpet or laminate. At  $\frac{3}{4}$ " tall, the low profile panels provide a separation between the subfloor and the finished flooring layer. Unwanted water from rain seeping into a basement floor or a washing machine overflowing, water will flow under the panels and not on to your new carpeting or laminate flooring. The structural integrity of the UBS panels will allow you to attach tack strips around the room perimeter for carpet installation and our patented turf barbs will provide the grip you need for keeping carpets and laminate floor cushion pads in place.



**UltraBaseSystems®**



# Champion Panel

The industry spoke, we listened creating a new panel with all the engineering accomplishments of the Professional panel but at a new, lower price point. Designed at just  $\frac{3}{4}$  of an inch high, the Champion panel delivers amazing strength underfoot while providing the safety and performance athletes and their moms demand.

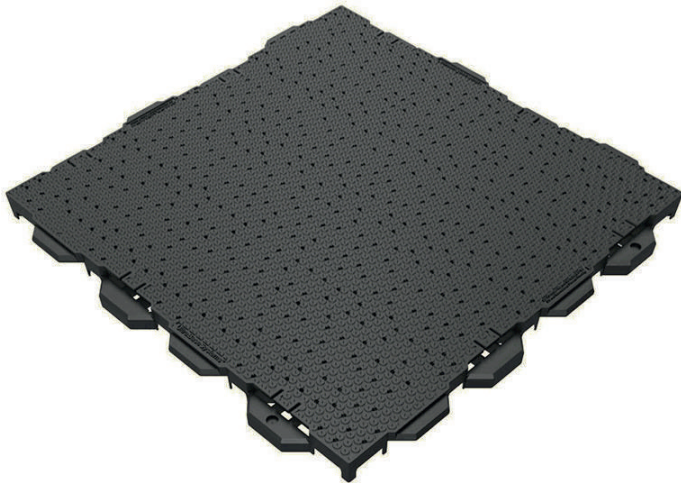
Product Number: UBSCHAMP

**Panel Dimensions:** Actual panel dimension 30" x 30" x .75" / 762mm x 762mm x 19.05 mm  
Square footage area once installed: 28" x 28" x .75" / 711.2mm x 711.2mm x 19.05mm = 5.44 ft.<sup>2</sup> / .505sq m

**Panel Weight:** Average panel weight: 1.03 pounds sq ft/ 4.94 kg per sq m 5.64 lbs per panel / 2.55 kg

US Patent # 7,516,587 | US Patent # 7,930,865 | CA Patent #2,663,050 | RA Patent #2410508  
Additional US and Foreign Patents Pending

## Isometric View, Top of Panel



## Isometric View, Bottom of Panel



The structural superiority of the panel is designed to dramatically reduce the need for extensive site preparation both indoors and outdoors, creating a base structure capable of supporting enormous loads while providing greatly improved GMAX and HIC impact numbers resulting in SAFER and more predictable playing surfaces. Large water flow volumes both vertically and horizontally are achieved with UBS Champion creating a base system capable of rapidly directing rainwater away from the turf and the players. Perfect planarity and the UBS patented non-slip turf barbs all help to create a base unlike anything the market has ever seen.

## Pallet and Box Dimensions and Volumes:

Box of 14: 32"x31"x12" – 80 lbs 81cm x 78 cm x 30 cm 36.28 kg  
Pallet of 62: 58"x3"x29" – 410 lbs 147 cm x 76 cm x 73 cm 186 kg  
Pallet of 116: 58"x30"x52" – 715 lbs 147cm x 76 cm x 132 cm 324 kg

## Truck & Container Volumes:

20 ft. container: 2,416 panels = 13,143 sq. ft./ 1221sq. m. | 40 ft. high cube: 5,504 panels = 29,941 sq. ft. / 2781 sq. m.  
53 ft. truck: 7,590 panels = 41,289 sq. ft./ 3835sq. m. per truck

*\*All Measurements are per truck*



# UltraBaseSystems® Champion Panel At a Glance

## **GMAX**

GMAX rating of 137 achieved with no turf layer. Values ranging from 85-120 depending upon turf systems and sub base.

## **Vertical Deformation**

When paired with the proper synthetic turf and fill requirements, UBS Champion meets the FIFA2\* requirements.

## **Force Reduction**

When paired with the proper synthetic turf and fill requirements, UBS Champion meets the FIFA2\* requirements.

## **Energy Restitution**

When paired with the proper synthetic turf and fill requirements, UBS Champion meets the FIFA2\* requirements.

## **Rotational Resistance**

When paired with the proper synthetic turf and fill requirements, UBS Champion meets the FIFA2\* requirements.

## **Vertical Drainage**

Single panel flow rate 1582 inches per hour (4018 cm/hr).

## **Horizontal Evacuation Rate**

Single panel rain fall evacuation 126 inches per hr (320 cm/hr).

## **Load Capacity**

Static load capacity for the weakest location of the panel is equivalent to 374 psi (26.3 kgf/cm<sup>2</sup>) at 70°F (21°C). Load values when placed over a full descending cellular rib 998 psi (70.17 kgf/cm<sup>2</sup>).

## **Shear Resistance**

UBS patented turf barbs provide 3 x the grip strength for turf stability as compared to a rock base.

## **Vertical Ball Rebound**

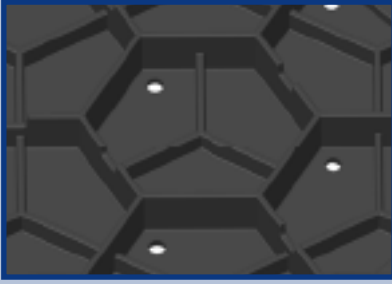
When paired with the proper synthetic turf and fill requirements, UBS Champion meets the FIFA2\* requirements.

## **Storage Capacity**

Single panel fluid storage capacity = 1.85 gallons (7 Liters).

## **Expansion**

IBT patented locking feature allows adequate expansion between panels to prevent panel distortion when properly installed. Expected expansion per panel at 140F degrees (60C) is 3/32" (.24 cm).



#### **Material:**

UBS panels are manufactured from a proprietary blend of recycled post industrial polymeric material. UBS panels can often include a percentage of recycled synthetic grass as part of the proprietary material blend making UBS panels a solution for preventing recycled synthetic grass from entering landfills but instead return as part of a new field construction.

#### **Cell Detail**

#### **GMAX and HIC Safety Testing:**

Extensive testing has occurred both in laboratory settings and actual field installations showing definitively that UBS panels dramatically reduce GMAX and HIC values based on the cellular panel design. GMAX values ranging from the low 90's to 120's on compacted earth are typical with the lower end of the scale being the norm when panels are installed with a 2.25" (5.7 cm) infill turf system. GMAX values ranging from 115-140 can be expected when standard blend panels with minimal to no fill are installed over concrete. However, various blends of polymeric material can be manufactured into the panels increasing resiliency and improving GMAX while maintaining structural firmness underfoot. Our panels test at a GMAX of 121 when tested without turf on a 2" (5.08 cm) layer of compacted #7 and #81 stone with a 1" (2.54 cm) top layer of compacted stone fines. Our panels were placed on the UBS geo stabilizing fabric which covered the compacted stone test plot. Our panels tested at a GMAX of 81 when placed with the fabric over a 3" (7.62 cm) rock base. The results of these tests conclusively show that UltraBaseSystems provided superior GMAX before the turf system is installed.

HIC values have shown drop heights of up to 8' (2.44 m) are achievable when a lower durometer polymeric blend is utilized. Drop heights over 6' (1.83 m) will require, in conjunction with the UBS panels, a foam back turf, infill turf or minimal pour in place EDPM playground system.

Laboratory and field tests also show extremely consistent ball bounce, ball roll and foot rotation readings concluding UBS is the foundation of a SAFER and more predictable playing surface. Test results available upon request.

#### **Displacement:**

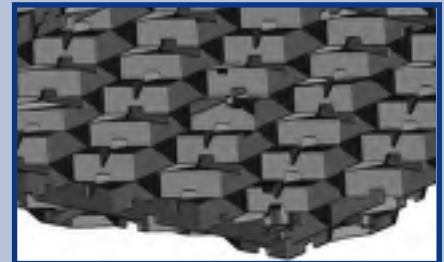
Independent lab results show that UBS panels, when installed over a geo synthetic fabric on 95% compacted earth and repeatedly subjected to a live load equivalent to an ambulance tire load for 2.77 hours, resulted in far less displacement than 6" (15.24 cm) of compacted 1" (2.54 cm) minus stone. The same results were also achieved on 70% compacted earth (although not recommended for real life situations). Conclusion: UBS is a more stable sub base than 6" (15.24 cm) of compacted stone and results in less displacement under load. This test also confirmed a drastic difference in "softness" of the panel as compared to compacted stone. In essence UBS is a better impact absorbing surface yet far more structurally sound than stone, a major advancement.

#### **Vertical Drainage:**

The vertical flow rate of an individual UBS panel without turf is equivalent to 1,582" per hr (4018 cm/hr).

#### **Horizontal Drainage:**

The horizontal flow rate of rainwater exiting from under an individual UBS panel = 126" per hr (320 cm/hr).



**Drain Slots**

#### **Storage Capacity:**

Each UBS panel has the ability to store the equivalent of 1.85 gallons (7 L) of water in the underside cellular structure.

#### **R Factor:**

The R factor value of a UBS panel when covered with a 1.5" (3.8 cm) synthetic grass filled with 1 pound (.5 kg) of sand and one of rubber is equivalent to an R value of 3.4.



### **Load Capacity:**

Designed first and foremost as a structural replacement for compacted rock, asphalt, or concrete, it is imperative that the load capacity of the UBS panel is extremely high. Static load capacity for the weakest location of the panel is equivalent to 374 psi (26.3 kgf/cm<sup>2</sup>) at 70°F (21°C). Load values when placed over a full descending cellular rib are 998 psi (70.17 kgf/cm<sup>2</sup>). Engineered with a 4.25" (10.8 cm) hexagonal cell structure, UBS panels are capable of accepting large static live loads including crowd and vehicle traffic such as utility trucks, gators, soft tire forklifts, and emergency vehicles with minimal deviation when installed as per manufactures specifications on a properly prepared stable sub-base.

### **Planarity:**

The UBS patented over/under locking tooth design creates perfect alignment from panel to panel resulting in a smooth transition across the entire surface of the installation. The planarity created by the design results in a perfectly smooth turf installation which achieves predictable ball roll and bounce and greatly improves the visual appeal of the installation surface. A perfectly flat or contoured surface is easily achieved depending upon base preparation.

### **Expansion:**

The standard field polymeric blend has expansion rate of 3/32" (.24 cm) over the length of the panel at 140° F (60° C). Each UBS panel is designed with a patented expansion joint system which allows all movement to occur within the confines of each panel and not disengage the connection points or affect the overall size of the installation area. In essence, all movement occurs from panel to panel and not at the perimeter. This engineering achievement prevents warping, unwanted surface deviations or panel separation from occurring.



Locking Detail

### **Panel Locking System:**

The patented over/under interlocking tooth system not only ensures perfect planar alignment from panel to panel creating a flat planar top surface which is critical for sports surface applications for ball roll and footing but also ensures the panels stay locked together once a quadrant of nine panels is assembled. This patented locking feature helps prevent panel movement or disengagement due to weather conditions or vehicle traffic.

### **Panel Airflow:**

The void that is created on the underside of the panels is due to the cellular compartment design and water flow openings and has the capability of circulating under the panels.

### **Installing Over Uneven Terrain:**

UBS is designed to follow the contours of uneven terrain making installation over field crowns, uneven ground contours or undulating putting greens easy to accomplish.

### **Panel Cutting:**

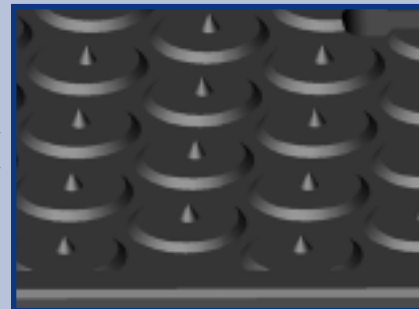
UBS panels are easily cut with any traditional woodworking tools inclusive of table saws, circular saws or a jigsaw.

### **Installation Time:**

Time studies indicate that a crew of 10 laborers can install an average of 5000 ft.<sup>2</sup> (465 m<sup>2</sup>) of UBS panels per hour. These numbers can change due to the qualifications of the crew but are actual numbers that have been achieved on actual field installations.

### **Nonslip Turf System:**

The 3000 patented turf barbs per panel create a very high coefficient of friction which dramatically reduces turf movement issues associated with many other base replacement or stone systems. The turf barbs, when utilized with a felt backed or foam backed turf, will create a totally stationary turf system which will not move or slip on the UBS base system. This technology allows for less infill or a non-slip non filled turf system.



Spike Detail

### **Turf Installation:**

Due to the structural design and polymeric selection of the UBS panel, the need for nailer boards and/or curbs are often times unnecessary given the fact the turf can be easily affixed to the panels on the perimeter edge by use of an industrial stapler. Essentially, each panel becomes its own nailer board eliminating this additional costly expenditure. The instability of the expansion and contraction coefficients of the turf and the selection of infill amounts will play a major role in the decision to add a poured curb or a buried nailer board. General consensus is minimal filled or non filled systems may require some type of turf anchoring system, other than the panels in an effort to help control the wrinkles which could occur with unstable turf. A filled turf system adds ballast to the turf and will counteract the turf movement, hence allowing the turf to be attached directly to the panels. The UBS panels are designed to allow for panel expansion within the confines of the installation area effectively eliminating outward perimeter size variations when installed using proper installation guidelines. Our panels are stable, but turf often is not and this must be taken in to consideration. Stretching the turf on the panels and rolling the turf to help lock the thousands of turf barbs into the turf back will also help reduce wrinkles in the turf by improving lateral stability.

UBS panels can remain uncovered for an indefinite period of time while waiting for synthetic turf to arrive for installation. This gives the installation crew the ability to install the base and return at a later date for turf installation without fear of degrading the panels or panels moving due to weather-related elements.

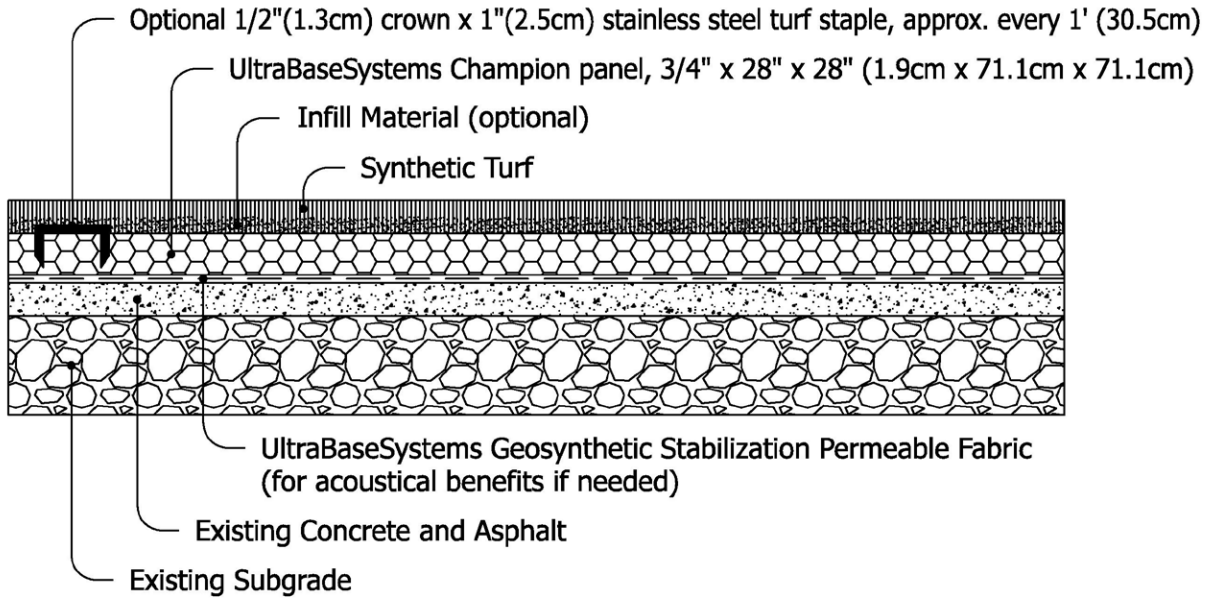
### **Sub Base Preparation:**

The structural integrity of the UBS panels substantially differentiates this system from other shock pad and/or drain systems currently on the market. UBS is a structural base system designed to dramatically reduce or replace the need for compacted rock base systems or concrete and asphalt sub base installations. When installed over a properly prepared earth sub base as approved by a licensed engineer, it is imperative that a proper Geo synthetic fabric or Geo system is utilized with UBS as a stabilizer. There are many geo fabrics that work well with UBS such as a high flow woven poly propylene fabric. In all situations you are looking for a low elongation/high tensile strength product. Depending upon drainage requirements, the use of an impermeable liner underneath the permeable geotextile fabric may be required in order to adequately divert rainwater to engineered storage system. Perhaps the largest problem facing base construction is water. From expansive soils to frost heave water is an issue. Many geo engineers we have consulted believe that the elimination of the water from the soil is the key to ground stability and predictability as it pertains to proper base construction using UBS. Recommendations for fabric types are available from UBS to be presented to the contractor for consideration based on individual sites scenarios.



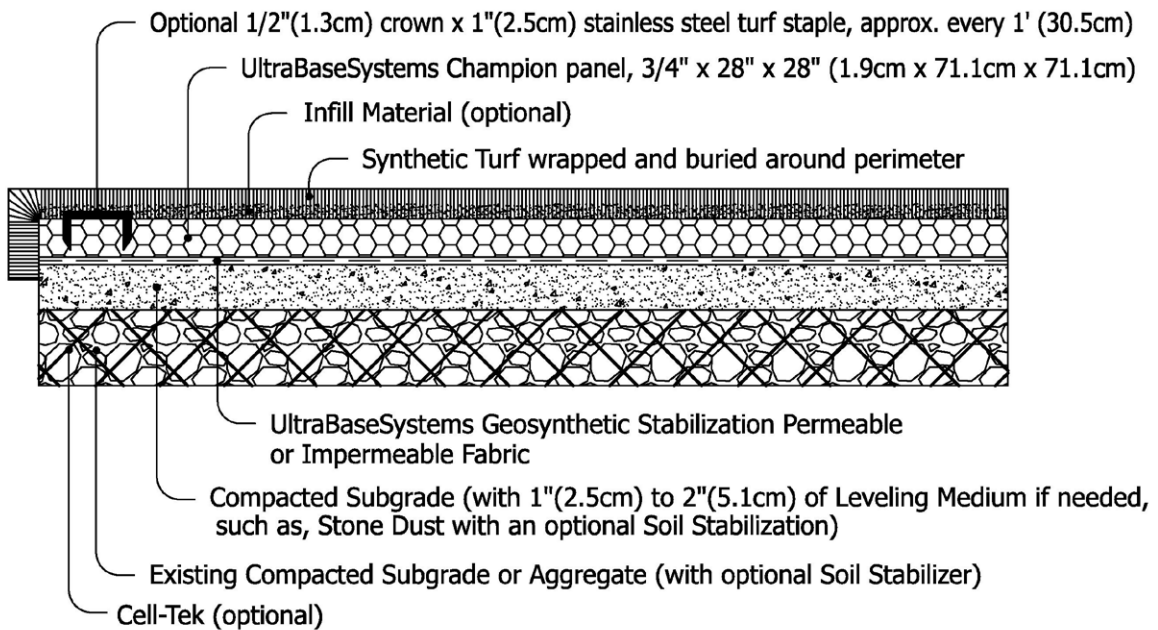
# Technical Drawings

## Installation Profile on Solid Subgrade



Single application of Geo Fabric installed directly under UltraBaseSystems, yet directly over asphalt and/or concrete

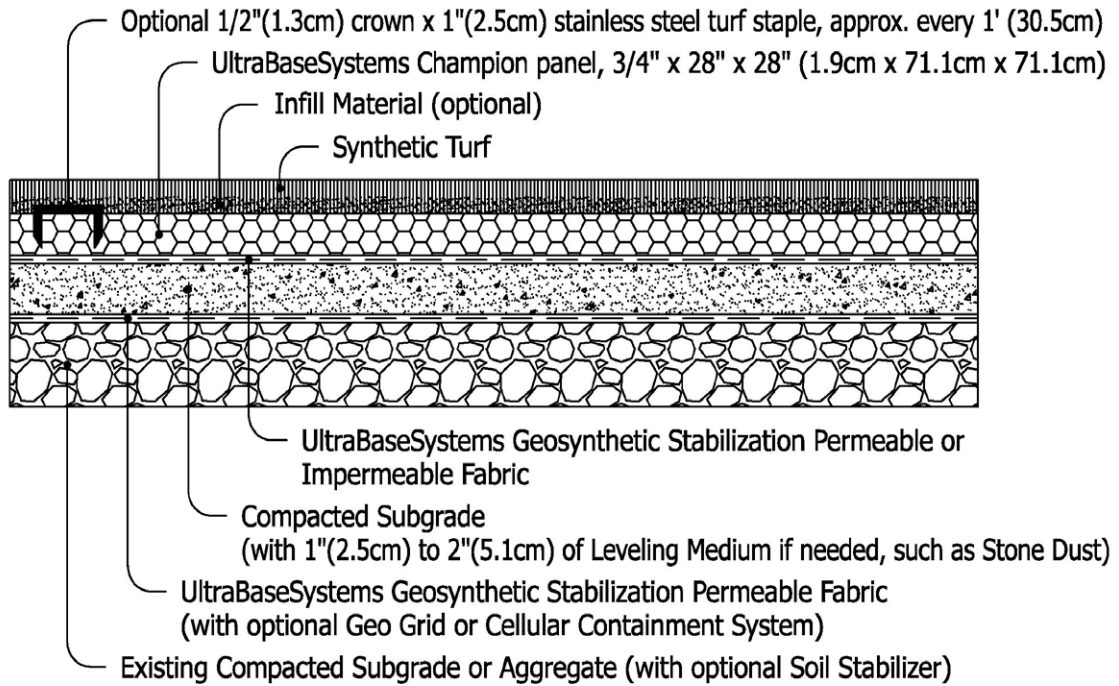
## Installation Profile on Compacted Subgrade



Single application of Geo Fabric installed directly under UltraBaseSystems, yet directly over compacted subgrade

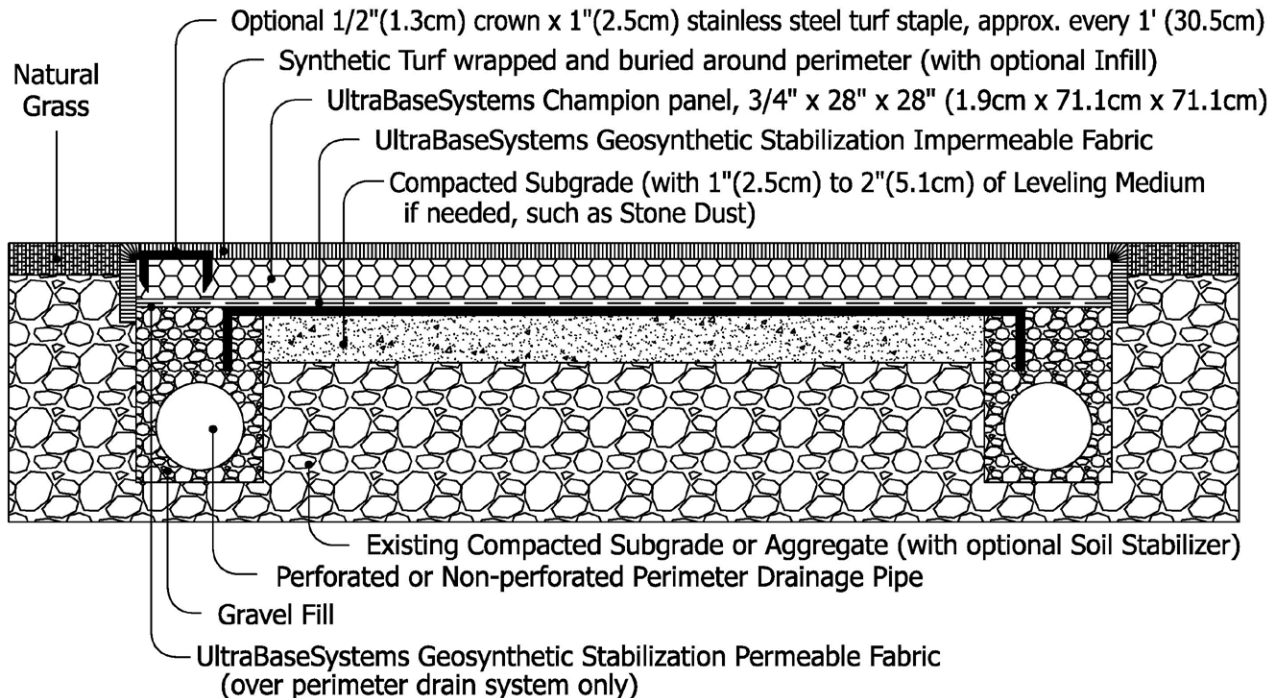
# Technical Drawings

## Installation Profile on Compacted Subgrade with Additional Stone Dust and Geo Grid



Double applications of Geo Fabric with varying depths of clean compacted aggregates

## Installation Profile with Perimeter Drainage System

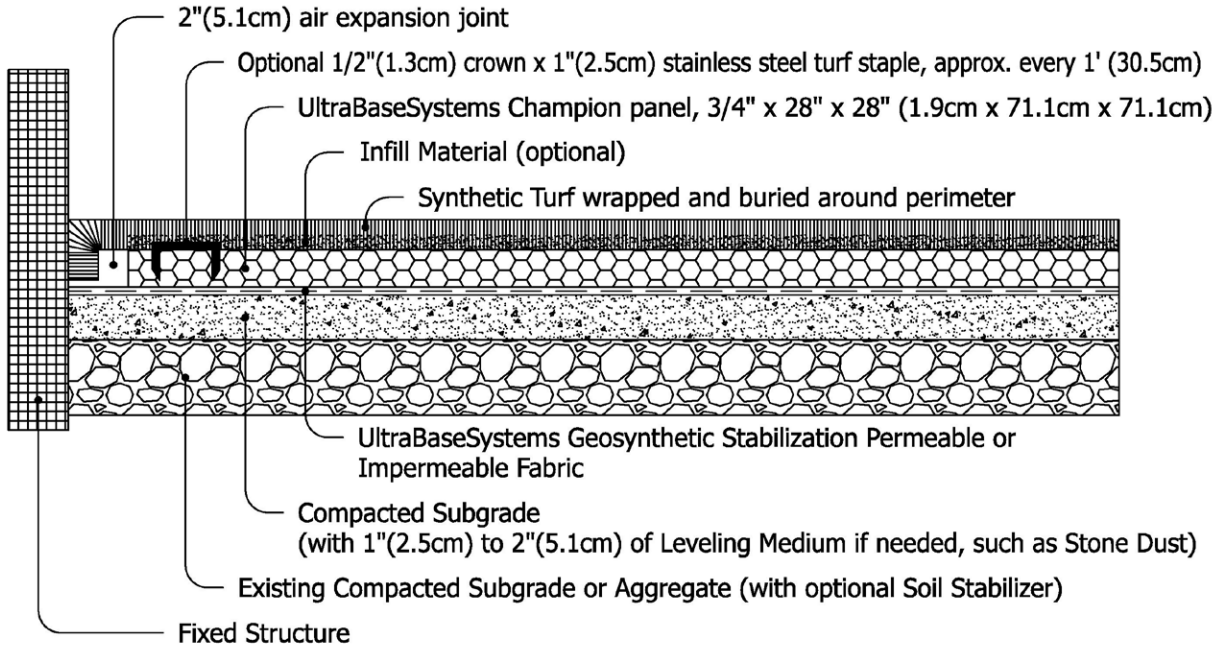


Single application of Geo Fabric installed directly under UltraBaseSystems, yet directly over compacted subgrade



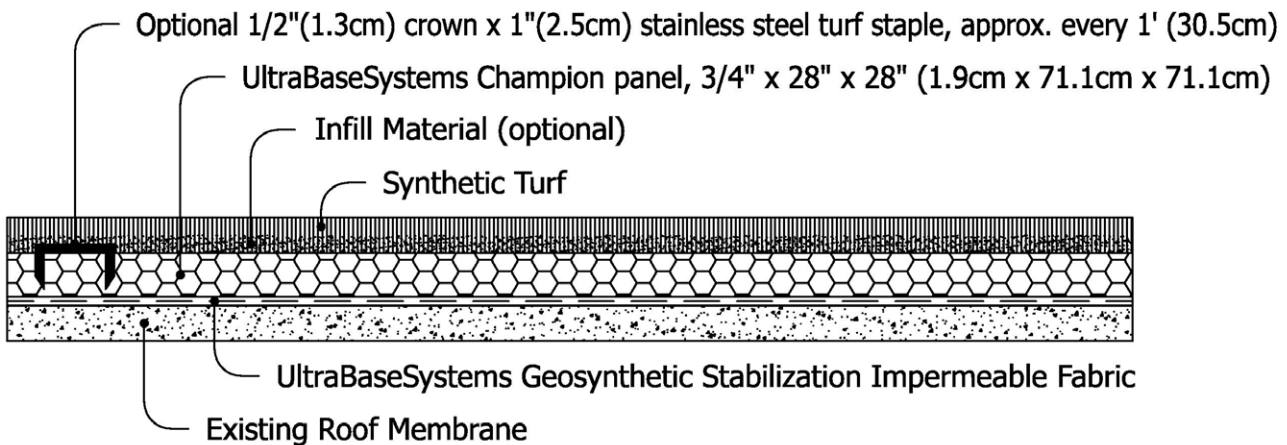
# Technical Drawings

## Installation Profile on Subgrade Boarding Fixed Structure



Single application of Geo Fabric installed directly under UltraBaseSystems, yet directly over compacted subgrade

## Installation Profile for Rooftop Installations



Single application of Geo Fabric installed directly under UltraBaseSystems, yet directly over roof membrane

# Professional Panel

UltraBaseSystems is first and foremost a STRUCTURALLY engineered sub base replacement system which successfully addresses the safety, drainage and aesthetic demands of an entire industry. From athletic fields to residential landscaping installations, putting greens to pet areas, concrete paver installations to athletic courts, UBS Professional Panels cover all of your base requirements.

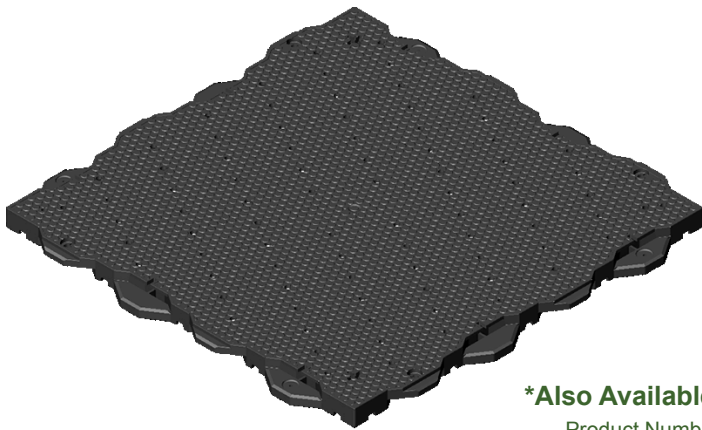
Part Number: UBSPRO

**Panel Dimensions:** Actual panel dimension: 30" x 30" x 1.25"/762mm x 762mm x 31.6mm |  
Square footage area once installed: 28" x 28" x 1.25"/ 711.2mm x 711.2mm x 31.6mm = 5.44 ft.<sup>2</sup>/ .505 sq m

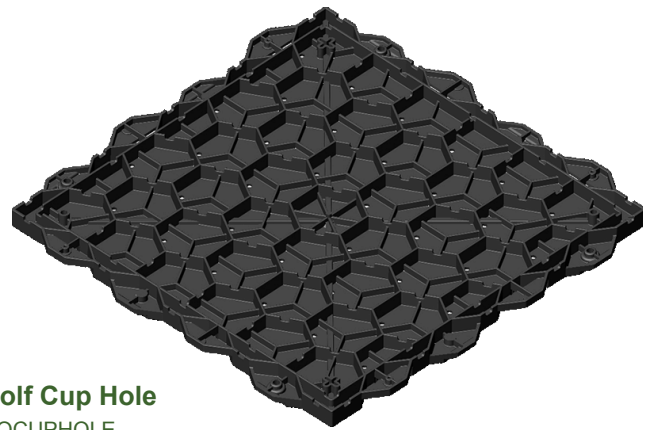
**Panel Weight:** Average panel weight: 1.67 pounds/.748kg per sq ft 9.1 lbs /4.12 kg per panel

US Patent # 7,516,587 | US Patent # 7,930,865 | CA Patent #2,663,050 | RA Patent #2410508  
Additional US and Foreign Patents Pending

Isometric View, Top of Panel



Isometric View, Bottom of Panel



**\*Also Available with Golf Cup Hole**  
Product Number:UBSPROCUPHOLE

## Pallet and Box Dimensions and Volumes:

Box of 8: 32"x31"x29" -- 75lbs 81cm x 78cm x 73cm  
Pallet of 36: 58"x 30"x29" -- 378 lbs 147cm x 76cm x 73cm 171 kg  
Pallet of 70: 58"x30"x52" -- 698 bs 147cm x 76cm x 132 cm 316kg

## Truck & Container Volumes:

20ft. Container: 1,432 panels=7,790 sq ft./723 sq. m. | 40ft. High Cube: 3,316 panels=18,039 sq. ft./1675 sq. m.  
53ft. Truck: 4,560 panels = 24,806 sq. ft./2304 sq. m.

*\*All Measurements are per truck*



# UltraBaseSystems® Professional Panel At a Glance

## **GMAX**

GMAX rating of 121 achieved with no turf layer. Values ranging from 85-120 depending upon turf systems and sub base

## **HIC**

Compliant HIC values are achievable when the UBS Professional panels are manufactured from more resilient and shock absorbing polymeric blends.

## **Vertical Deformation**

The result for all of these tests performed met the requirements for a STC Stadium Field. The requirements for a STC Stadium field are the same as those specified in the FIFA2\* Standard.

## **Force Reduction**

The result for all of these tests performed met the requirements for a STC Stadium Field. The requirements for a STC Stadium field are the same as those specified in the FIFA2\* Standard.

## **Energy Restitution**

The UBS Pro panel is designed to be part of a system consisting of most combinations of turf. When combined with a properly filled turf system, UBS Professional complies with FIFA2\* requirements on shock absorption, energy restitution and vertical deformation.

## **Rotational Resistance**

The result for all of these tests performed met the requirements for a STC Stadium Field. The requirements for a STC Stadium field are the same as those specified in the FIFA2\* Standard.

## **Vertical Drainage**

Single panel flow rate 341 inches per hour (866 cm/hr).

## **Horizontal Evacuation Rate**

Single panel rain fall evacuation 96.4 inches per hr (245 cm/hr).

## **Load Capacity**

Static load capacity for the weakest location of the panel is equivalent to 1335 psi (93.86 kgf/cm<sup>2</sup>) at 70°F (21°C). Load values when placed over a full descending cellular rib 1664 psi (117 kgf/cm<sup>2</sup>).

## **Shear Resistance**

UBS patented turf barbs provide 3x the grip strength for turf stability as compared to a rock base.

## **Vertical Ball Bounce Soccer**

The result for all of these tests performed met the requirements for a STC Stadium Field. The requirements for a STC Stadium field are the same as those specified in the FIFA2\* Standard.

## **Vertical Ball Bounce Baseball**

The average for synthetic grass field was 0.241m (.791ft). The adjacent natural turf field was subject to two drop locations for comparison purposes. The average at each location was 0.223m (.732ft) and 0.23m (.754ft) with an average of 0.227m (.745ft).

## **Ball Roll Test**

The result for all of these tests performed met the requirements for a STC Stadium Field. The requirements for a STC Stadium field are the same as those specified in the FIFA2\* Standard.

## **Storage Capacity**

Single panel fluid storage capacity = 3.58 gallons (13.55 L).

## **Expansion**

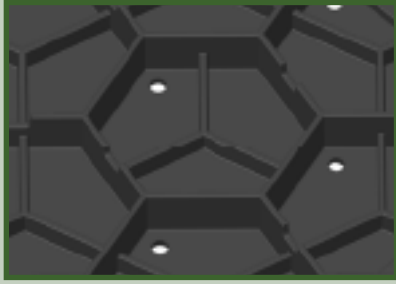
IBT patented locking feature allows adequate expansion between panels to prevent panel distortion when properly installed. Expected expansion per panel at 140°F (60°C) is 3/32" (.24 cm).

## **Displacement**

UBS Pro panel yielded 50-53% less deflection under vehicular load than 6 inches (15.24 cm) of 95% compacted stone.

## **Insulation/R Factor**

Complete UBS System with turf R3.44.



#### Material:

UBS panels are manufactured from a proprietary blend of recycled post industrial polymeric material. UBS panels can often include a percentage of recycled synthetic grass as part of the proprietary material blend making UBS panels a solution for preventing recycled synthetic grass from entering landfills but instead return as part of a new field construction.

#### Cell Detail

#### GMAX and HIC Safety Testing:

Extensive testing has occurred both in laboratory settings and actual field installations showing definitively that UBS panels dramatically reduce GMAX and HIC values based on the cellular panel design. GMAX values ranging from the low 90s to 120's on compacted earth are typical with the lower end of the scale being the norm when panels are installed with a 2.25" (5.7 cm) infill turf system. GMAX values ranging from 115-140 can be expected when standard blend panels with minimal to no fill are installed over concrete. However, various blends of polymeric material can be manufactured into the panels increasing resiliency and improving GMAX while maintaining structural firmness underfoot. Our panels test at a GMAX of 121 when tested without turf on a 2" (5.08 cm) layer of compacted #7 and #81 stone with a 1" (2.54 cm) top layer of compacted stone fines. Our panels were placed on the UBS geo stabilizing fabric which covered the compacted stone test plot. Our panels tested at a GMAX of 81 when placed with the fabric over a 3" (7.62 cm) rock base. The results of these tests conclusively show that UltraBaseSystems provided superior GMAX before the turf system is installed.

HIC values have shown drop heights of up to 8' (2.44 m) are achievable when a lower durometer polymeric blend is utilized. Drop heights over 6' (1.83 m) will require, in conjunction with the UBS panels, a foam back turf, infill turf or minimal pour in place EDPM playground system.

Laboratory and field tests also show extremely consistent ball bounce, ball roll and foot rotation readings concluding UBS is the foundation of a SAFER and more predictable playing surface. Test results available upon request.

#### Displacement:

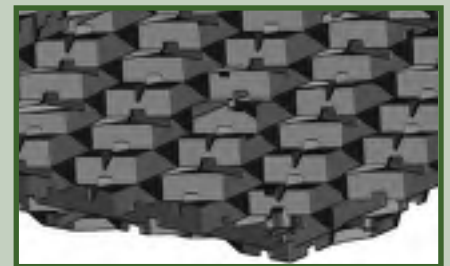
Independent lab results show that UBS panels, when installed over a geo synthetic fabric on 95% compacted earth and repeatedly subjected to a live load equivalent to an ambulance tire load for 2.77 hours, resulted in far less displacement than 6" (15.24 cm) of compacted 1" (2.54 cm) minus stone. The same results were also achieved on 70% compacted earth (although not recommended for real life situations). Conclusion: UBS is a more stable sub base than 6" (15.24 cm) of compacted stone and results in less displacement under load. This test also confirmed a drastic difference in "softness" of the panel as compared to compacted stone. In essence UBS is a better impact absorbing surface yet far more structurally sound than stone, a major advancement.

#### Vertical Drainage:

The vertical flow rate of an individual UBS panels without turf is equivalent to 341" per hr (866 cm/per hr). With 2.25" (5.7 cm) infilled turf with .75" (1.79 cm) exposed turf height = 175" per hr (444.5 cm per hr).

#### Horizontal Drainage:

The horizontal flow rate of rainwater exiting from under an individual UBS panel = 96.4" per hr (245 cm per hour).



Drain Slots

#### Storage Capacity:

Each UBS panel has the ability to store the equivalent of 3.58 gallons (13.55 L) of water in the underside cellular structure.

#### R Factor:

The R factor value of a UBS panel when covered with a 1.5" (3.8 cm) synthetic grass filled with 1 pound (.5 kg) of sand and one of rubber is equivalent to an R value of 3.4.



### **Load Capacity:**

Designed first and foremost as a structural replacement for compacted rock, asphalt, or concrete, it is imperative that the load capacity of the UBS panel is extremely high. Static load capacity for the weakest location of the panel is equivalent to 1335 psi (93.86 kgf/cm<sup>2</sup>) at 70°F (21°C). Load values when placed over a full descending cellular rib are 1664 psi (117 kgf/cm<sup>2</sup>). Engineered with a 4.25" (10.8 cm) hexagonal cell structure, UBS panels are capable of accepting large static live loads including crowd and vehicle traffic such as utility trucks, gators, soft tire forklifts, and emergency vehicles with minimal deviation when installed as per manufacturer's specifications on a properly prepared stable sub-base.

### **Planarity:**

The UBS patented over/under locking tooth design creates perfect alignment from panel to panel resulting in a smooth transition across the entire surface of the installation. The planarity created by the design results in a perfectly smooth turf installation which achieves predictable ball roll and bounce and greatly improves the visual appeal of the installation surface. A perfectly flat or contoured surface is easily achieved depending upon base preparation.

### **Expansion:**

The standard field polymeric blend has expansion rate of 3/32" (.24 cm) over the length of the panel at 140° F (60° C). Each UBS panel is designed with a patented expansion joint system which allows all movement to occur within the confines of each panel and not disengage the connection points or affect the overall size of the installation area. In essence, all movement occurs from panel to panel and not at the perimeter. This engineering achievement prevents warping, unwanted surface deviations or panel separation from occurring.



Locking Detail

### **Panel Locking System:**

The patented over/under interlocking tooth system not only ensures perfect planar alignment from panel to panel creating a flat planar top surface which is critical for sports surface applications for ball roll and footing but also ensures the panels stay locked together once a quadrant of 9 panels is assembled. This patented locking feature helps prevent panel movement or disengagement due to weather conditions or vehicle traffic.

### **Panel Airflow:**

The void that is created on the underside of the panels is due to the cellular compartment design and water flow openings and has the capability of circulating under the panels.

### **Installing Over Uneven Terrain:**

UBS is designed to follow the contours of uneven terrain making installation over field crowns, uneven ground contours or undulating putting greens easy to accomplish.

### **Panel Cutting:**

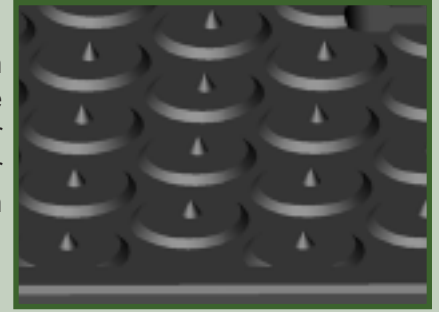
UBS panels are easily cut with any traditional woodworking tools inclusive of table saws, circular saws or a jigsaw.

### **Installation Time:**

Time studies indicate that a crew of 10 laborers can install an average of 5000 ft.<sup>2</sup> (465 m<sup>2</sup>) of UBS panels per hour. These numbers can change due to the qualifications of the crew but are actual numbers that have been achieved on actual field installations.

### **Nonslip Turf System:**

The 3000 patented turf barbs per panel create a very high coefficient of friction which dramatically reduces turf movement issues associated with many other base replacement or stone systems. The turf barbs, when utilized with a felt backed or foam backed turf, will create a totally stationary turf system which will not move or slip on the UBS base system. This technology allows for less infill or a non-slip non filled turf system.



**Spike Detail**

### **Turf Installation:**

Due to the structural design and polymeric selection of the UBS panel, the need for nailer boards and/or curbs are often times unnecessary given the fact the turf can be easily affixed to the panels on the perimeter edge by use of an industrial stapler. Essentially, each panel becomes its own nailer board eliminating this additional costly expenditure. The instability of the expansion and contraction coefficients of the turf and the selection of infill amounts will play a major role in the decision to add a poured curb or a buried nailer board. General consensus is minimal filled or non filled systems may require some type of turf anchoring system, other than the panels in an effort to help control the wrinkles which could occur with unstable turf. A filled turf system adds ballast to the turf and will counteract the turf movement, hence allowing the turf to be attached directly to the panels. The UBS panels are designed to allow for panel expansion within the confines of the installation area effectively eliminating outward perimeter size variations when installed using proper installation guidelines. Our panels are stable, but turf often is not and this must be taken in to consideration. Stretching the turf on the panels and rolling the turf to help lock the thousands of turf barbs into the turf back will also help reduce wrinkles in the turf by improving lateral stability.

UBS panels can remain uncovered for an indefinite period of time while waiting for synthetic turf to arrive for installation. This gives the installation crew the ability to install the base and return at a later date for turf installation without fear of degrading the panels or panels moving due to weather-related elements.

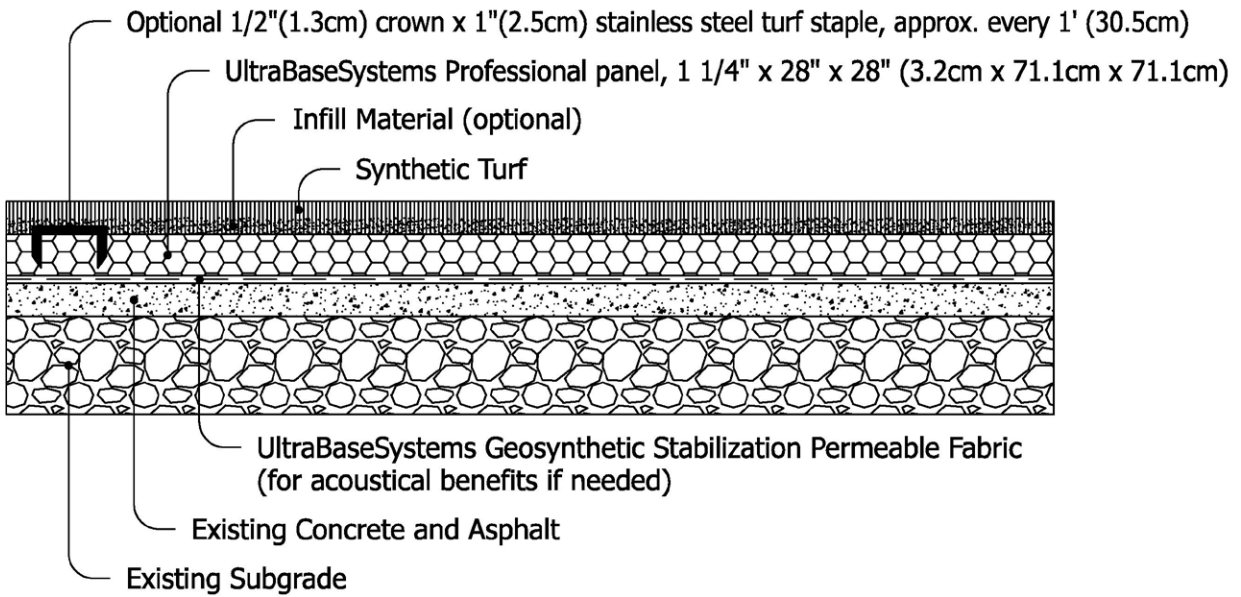
### **Sub Base Preparation:**

The structural integrity of the UBS panels substantially differentiates this system from other shock pad and/or drain systems currently on the market. UBS is a structural base system designed to dramatically reduce or replace the need for compacted rock base systems or concrete and asphalt sub base installations. When installed over a properly prepared earth sub base as approved by a licensed engineer, it is imperative that a proper Geo synthetic fabric or Geo system is utilized with UBS as a stabilizer. There are many geo fabrics that work well with UBS such as a high flow woven poly propylene fabric. In all situations you are looking for a low elongation/high tensile strength product. Depending upon drainage requirements, the use of an impermeable liner underneath the permeable geotextile fabric may be required in order to adequately divert rainwater to engineered storage system. Perhaps the largest problem facing base construction is water. From expansive soils to frost heave water is an issue. Many geo engineers we have consulted believe that the elimination of the water from the soil is the key to ground stability and predictability as it pertains to proper base construction using UBS. Recommendations for fabric types are available from UBS to be presented to the contractor for consideration based on individual sites scenarios.



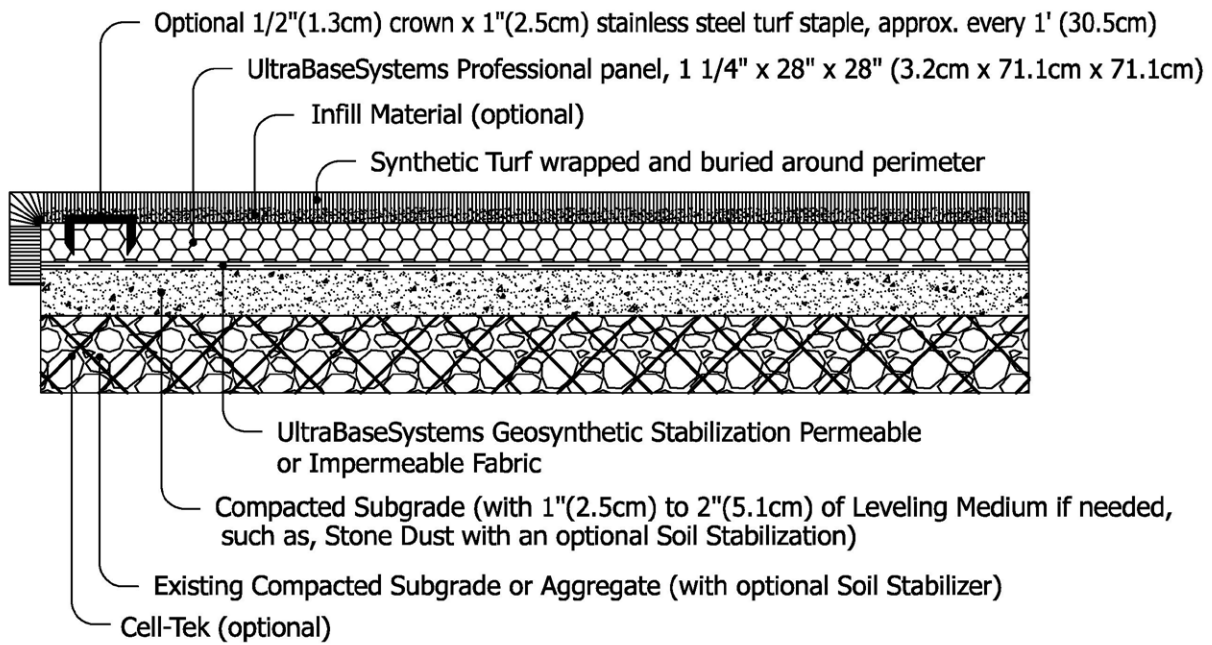
# Technical Drawings

## Installation Profile on Solid Subgrade



Single application of Geo Fabric installed directly under UltraBaseSystems, yet directly over asphalt and/or concrete

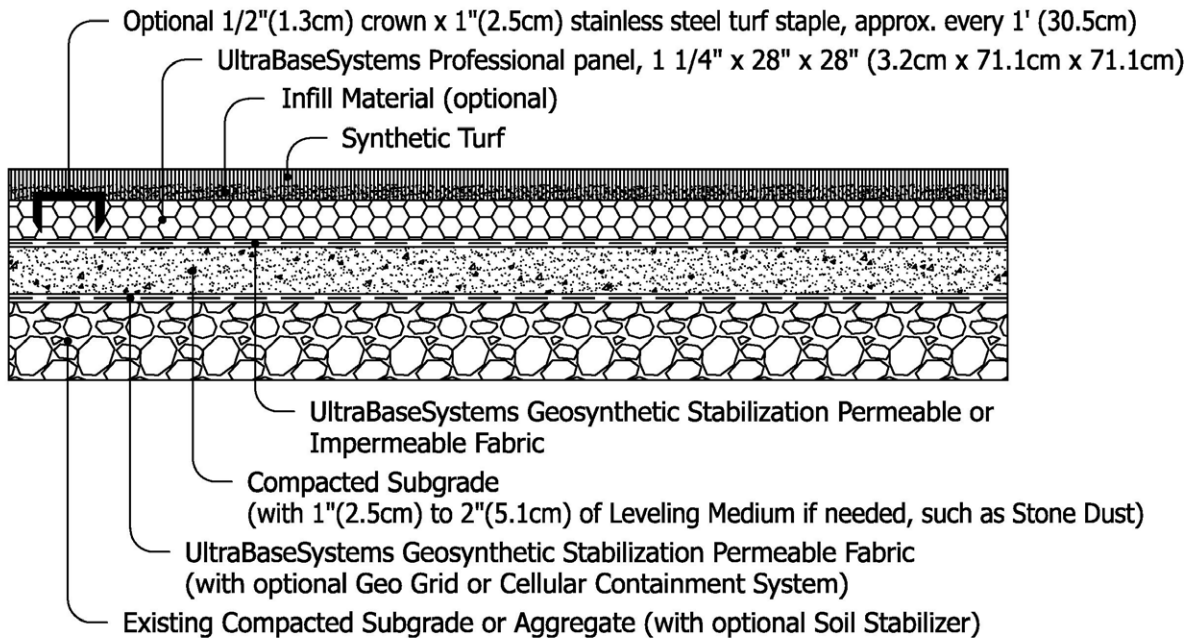
## Installation Profile on Compacted Subgrade



Single application of Geo Fabric installed directly under UltraBaseSystems, yet directly over compacted subgrade

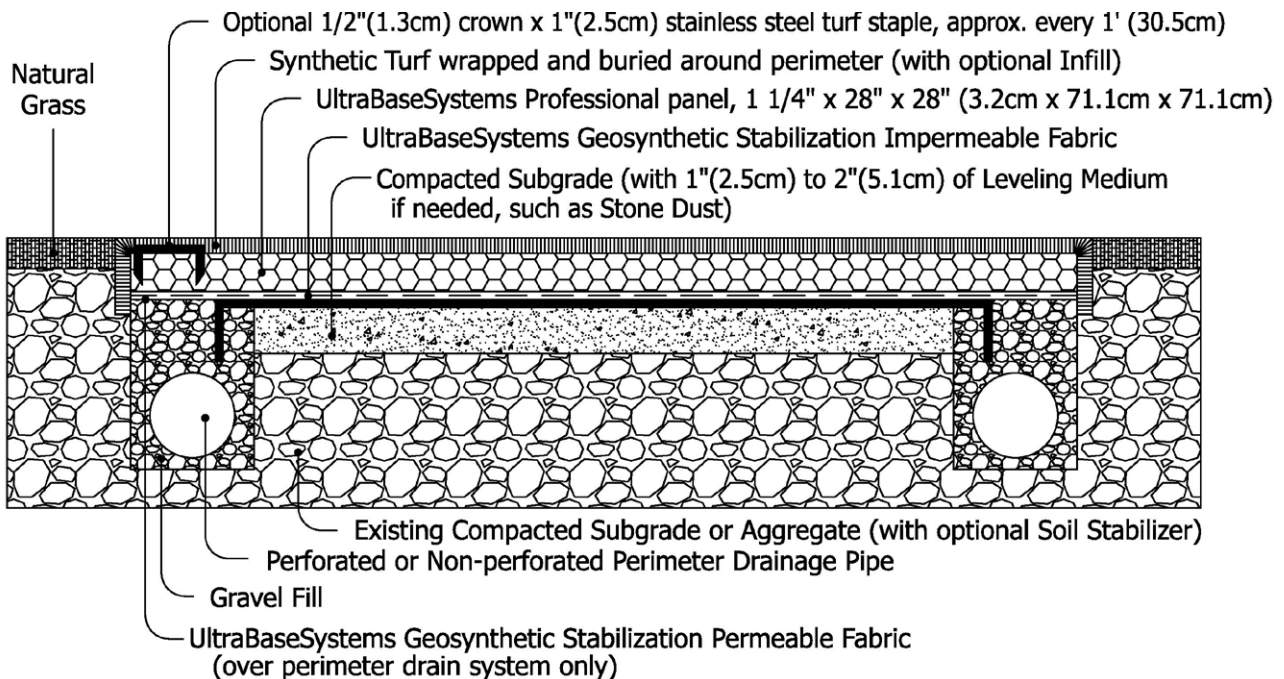
# Technical Drawings

## Installation Profile on Compacted Subgrade with Additional Stone Dust and Geo Grid



Double applications of Geo Fabric with varying depths of clean compacted aggregates

## Installation Profile with Perimeter Drainage System

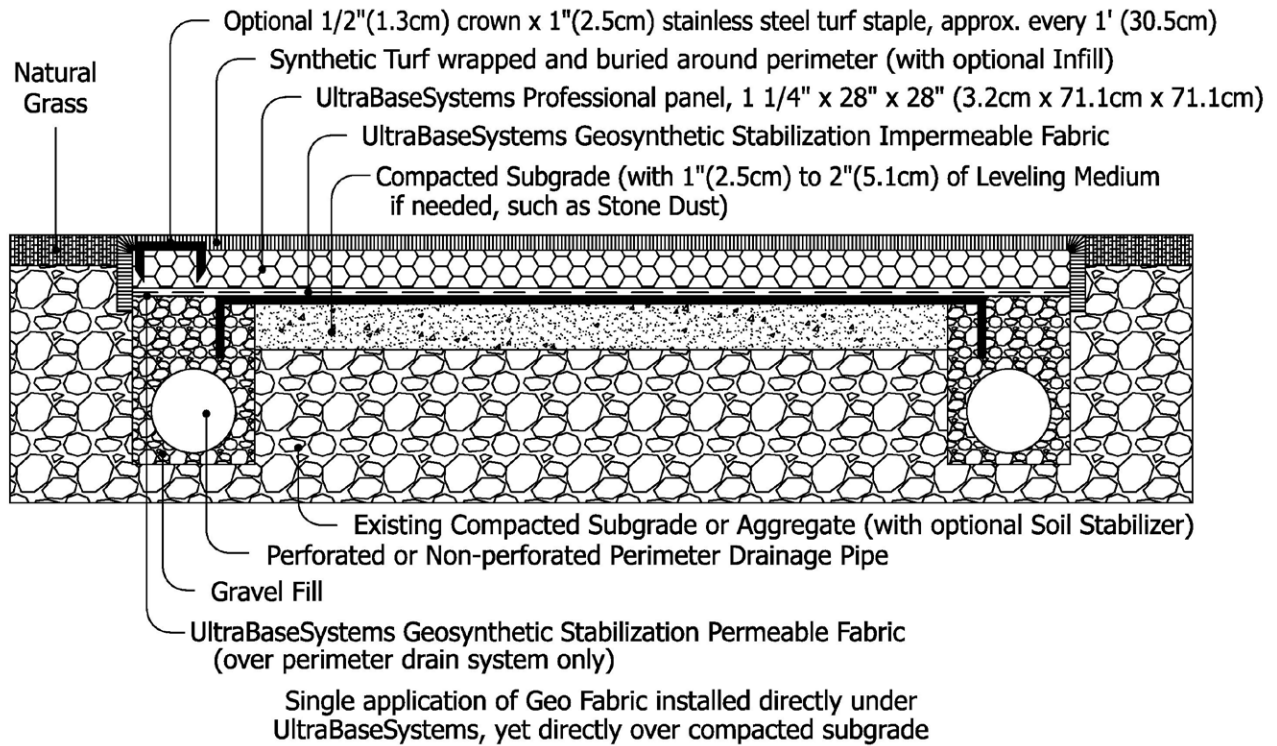


Single application of Geo Fabric installed directly under UltraBaseSystems, yet directly over compacted subgrade

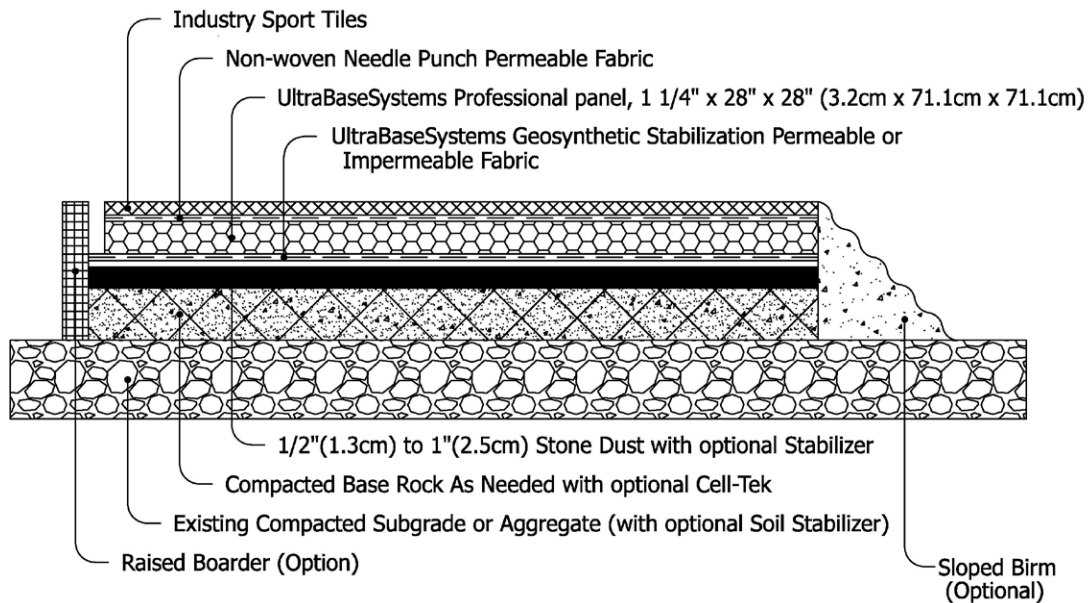


# Technical Drawings

## Court Installation Profile with Perimeter Drainage

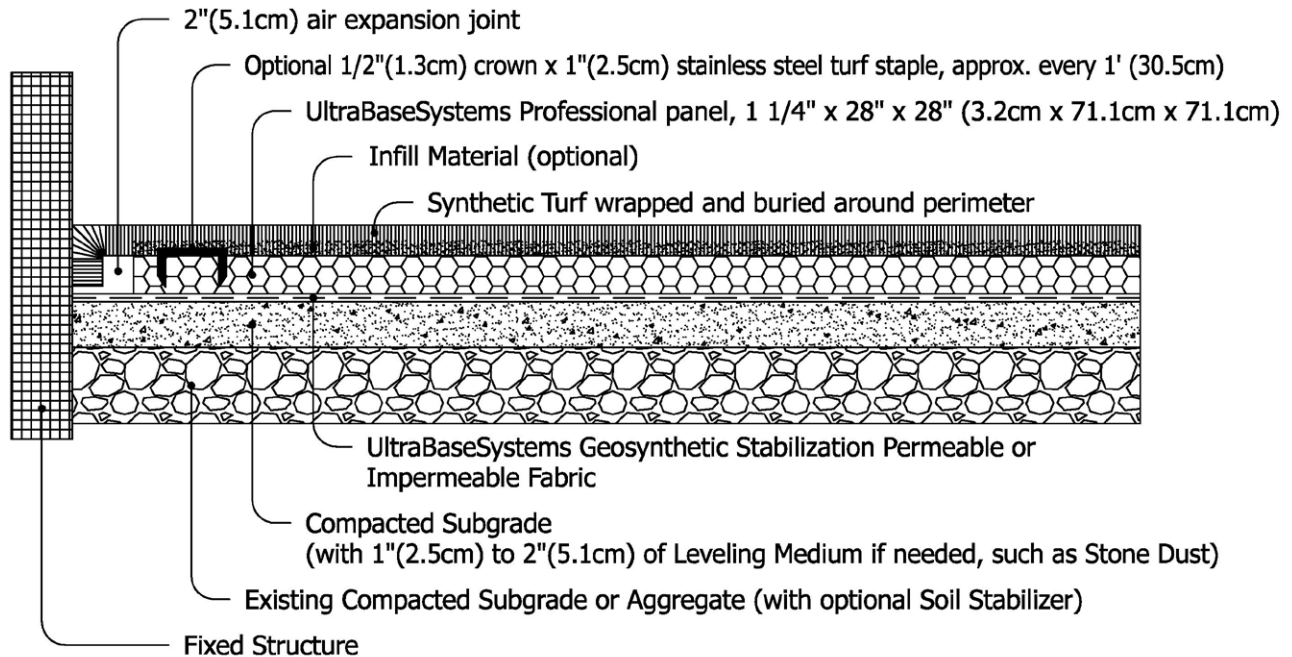


## Court Installation Profile with Raised Border



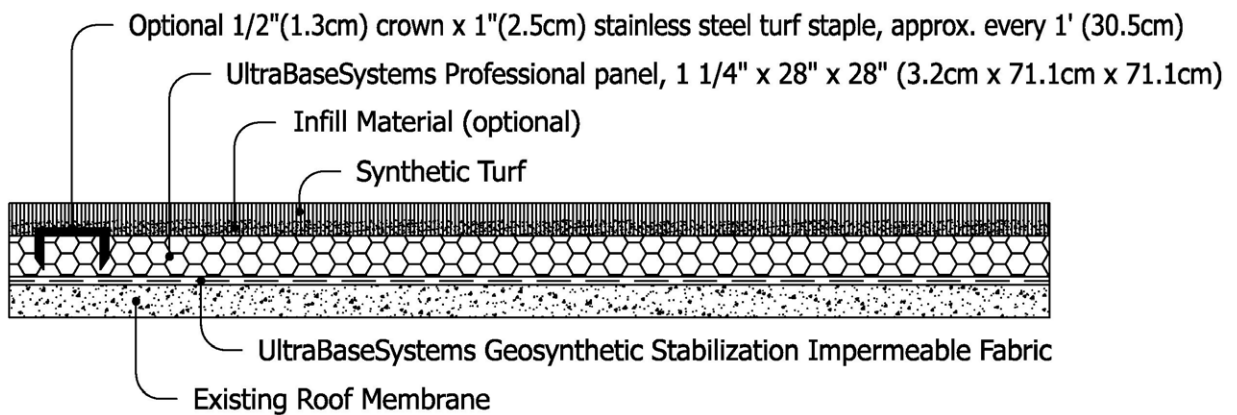
# Technical Drawings

## Installation Profile on Subgrade Boarding Fixed Structure



Single application of Geo Fabric installed directly under UltraBaseSystems, yet directly over compacted subgrade

## Installation Profile for Rooftop Installations

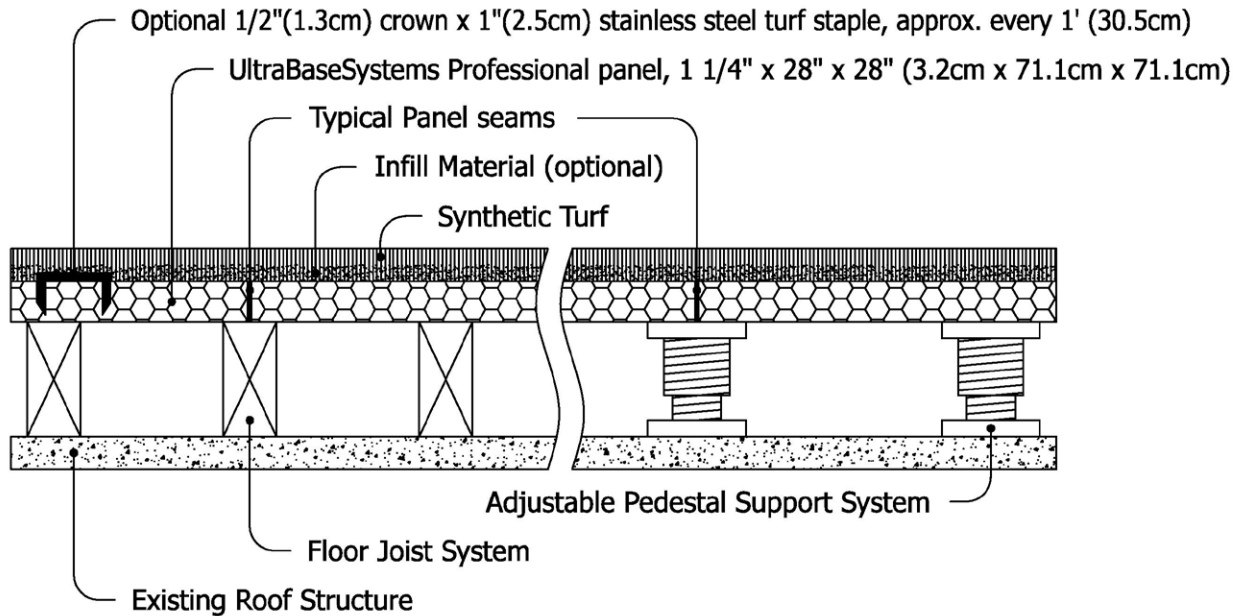


Single application of Geo Fabric installed directly under UltraBaseSystems, yet directly over roof membrane



# Technical Drawings

## Installation Profile for Rooftop Installations



Panel seams must always be supported by Floor Joist/Pedestals, but spacing is dependent upon panel selection and desired rigidity of panel surface

### Test Results provided by:

TSI Testing Services  
Dr. Martyn Shorten, BioMechanica LLC  
ISA Sport USA  
Innovative Base Technologies LLC  
Dison C&S LLC  
Bathhurst, Clarabut Geotechnical Testing, Inc.  
European Turf Group  
The InnovaNet Group  
Dr. Louie C. Elliot University of Tennessee  
R&D Services

All Test results available upon request from Innovative Base Technologies

# Professional Court Base Panel

UltraBaseSystems® is first and foremost a STRUCTURALLY engineered sub base replacement system which successfully addresses the safety, drainage and aesthetic demands of an entire industry. From athletic courts and fields to residential landscaping installations, putting greens to pet areas, concrete paver installations to athletic courts, UltraBaseSystems Professional Court Base Panels cover all of your court requirements.

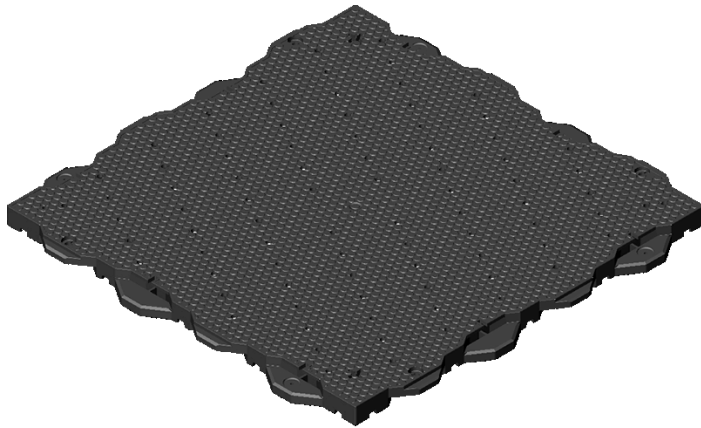
Part Number: UBSCOURTBASE

**Panel Dimensions:** Actual panel dimension: 30" x 30" x 1.25"/762mm x 762mm x 31.6mm |  
Square footage area once installed: 28" x 28" x 1.25"/ 711.2mm x 711.2mm x 31.6mm = 5.44 ft.<sup>2</sup> / .505 sq m

**Panel Weight:** Average panel weight: 2.00 pounds/.90kg per sq ft 10.89 lbs/4.94 kg per panel

US Patent # 7,516,587 | US Patent # 7,930,865 | CA Patent #2,663,050 | RA Patent #2410508 | Additional US and Foreign Patents Pending

Isometric View, Top of Panel



Isometric View, Bottom of Panel



In an industry which has predominantly relied on a concrete base structure, the UltraBaseSystems Professional Court Base panel offers a long overdue economical and ecological advantage. The ever-demanding need to conserve water as well as zone restrictions for impermeable base structures has catapulted UltraBaseSystems Professional Court Base panel to the forefront of the industry. The structural superiority of the panel, its unprecedented vertical and horizontal drainage capacity and the ability to install in virtually any location regardless of site limitations make UltraBaseSystems® the new "go to" product in the court construction industry.

## Pallet and Box Dimensions and Volumes:

Box of 8: 32"x31"x29"--89 lbs 81cm x 78cm x 73cm 40.36kg  
Pallet of 36: 58"x 30"x29" -- 453 lbs 147cm x 76cm x 73cm 205.47kg  
Pallet of 70: 58"x30"x52" -- 822 lbs 147cm x 76cm x 132 cm 372.85kg

## Truck & Container Volumes:

20ft. Container: 1,432 panels=7,790 sq ft./723 sq. m. | 40ft. High Cube: 3,316 panels=18,039 sq. ft./1675 sq. m.  
53ft. Truck: 4,560 panels = 24,806 sq. ft./2304 sq. m.

*\*All Measurements are per truck*



# UltraBaseSystems® Professional Court Base Panel At a Glance

## **Vertical Drainage**

Single panel flow rate 341 inches per hour (866 cm/hr).

## **Horizontal Evacuation Rate**

Single panel rain fall evacuation 96.4 inches per hr (245 cm/hr).

## **Load Capacity**

Static load capacity for the weakest location of the panel is equivalent to 1335 psi (93.86 kgf/cm<sup>2</sup>) at 70°F (21°C). Load values when placed over a full descending cellular rib 1664 psi (117 kgf/cm<sup>2</sup>).

## **Shear Resistance**

UBS patented panel barbs keep sport tiles from sliding during play.

## **Storage Capacity**

Single panel fluid storage capacity = 3.58 gallons (13.55 L).

## **Expansion**

IBT patented locking feature allows adequate expansion between panels to prevent panel distortion when properly installed. Expected expansion per panel at 140°F (60°C) is 3/32" (.24 cm).

## **Displacement**

UBS Pro panel yielded 50-53% less deflection under vehicular load than 6 inches (15.24 cm) of 95% compacted stone.