

How to Install UltraBaseSystems® Panels

Tools



Leather Gloves



Hard Top Knee Pads



Infrared Thermometer

Installation Process

Ground Preparation:

A professional engineer should approve ground preparation prior to installation. Installation on a hard surface such as concrete or asphalt is acceptable.



Earth Subbase



Concrete or Asphalt Subbase

Geosynthetic Stabilization Fabric Installation (Geo Fabric):

(The selected fabric installed under the panels in order to help create a stable base.)

Use of a preferred geosynthetic stabilization fabric is mandatory on all earth installations. A 6-inch overlap between each row of geo fabric is recommended. Several layout options are illustrated below (Figures 1.1 and 1.2). Unroll 15 to 30 feet (4.6 to 9 meters) of fabric at a time and immediately cover with unassembled UltraBaseSystems (UBS) panels to act as ballast to keep the geo fabric from moving. It is recommended that the use of a heavy duty woven geo fabric can be used to act as a sound barrier between UBS panels and concrete or asphalt to prevent any unwanted tapping sound due to inconsistencies between the two surfaces.

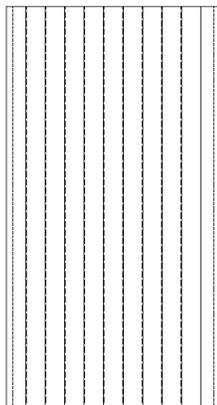


Figure 1.1 End Zone to End Zone Fabric Installation

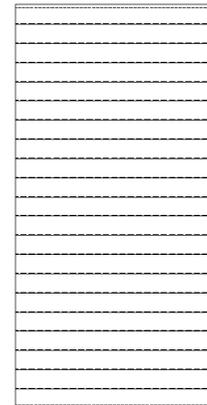


Figure 1.2 Sideline to Sideline Fabric Installation

Site Layout:

UBS panels must be installed in perfectly straight rows in all directions. Creating straight rows is achievable with two tightly stretched string lines intersecting at a perfect 90° angle. Additional string lines should continue to be located in two directions as installation progresses as reference points in order to remain straight. Figures 2.1-2.3

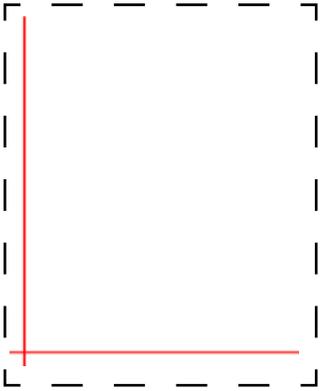


Figure 2.1 Corner Method

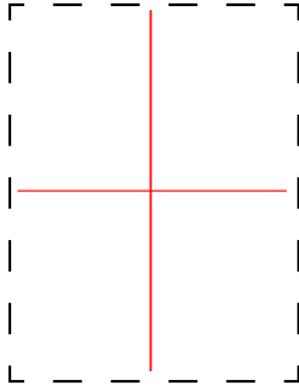


Figure 2.2 Center Method

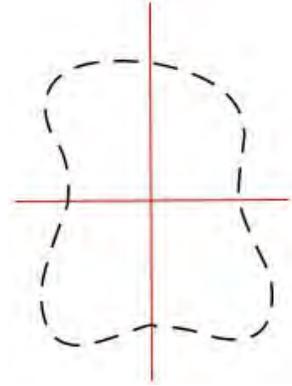


Figure 2.3 Irregular Shape Method

Separating the Panels:

To separate the panels as they are removed from the pallets, or to remove once installed, simply place one hand on Panel 1 and slightly lift Panel 2 and pull to separate.



Step One: Place one hand on Panel 1 and lift Panel 2



Step Two: Pull Panel 2 and panels will separate

Cutting Panels:

Panels can be trimmed straight or cut into any shape utilizing a commercially available Circular Saw, Jigsaw or Table Saw. An aggressive cutting wood blade should be used.



Circular Saw



Jigsaw



Table Saw

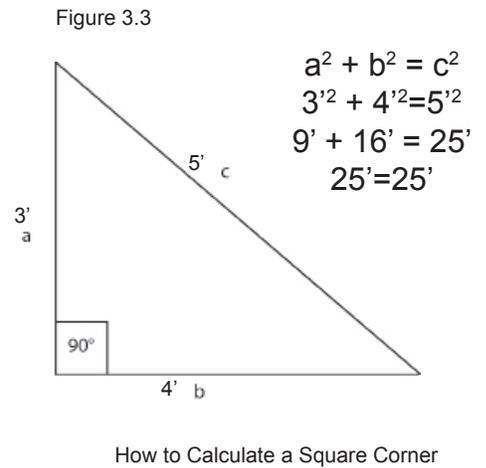
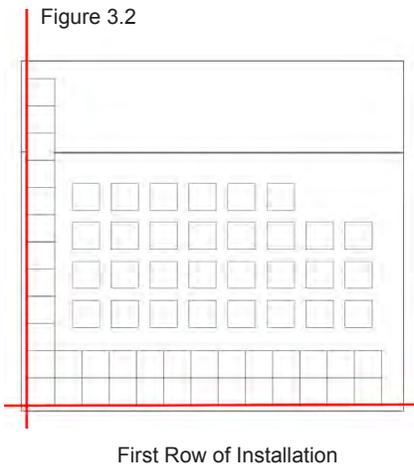
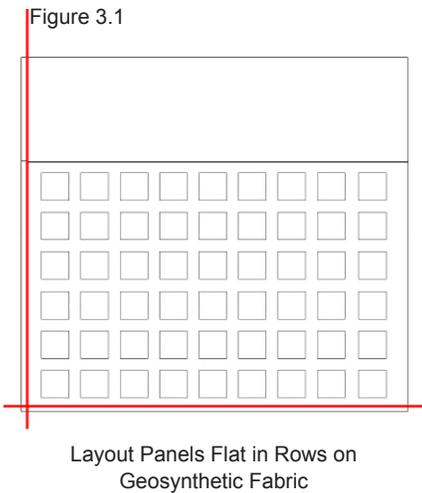
Acclimation and Panel Layout:

(Acclimation is the process of allowing uninstalled panels to raise or lower in temperature to those previously installed.) Individual panels should be laid out neatly with minimal space between each panel. This will help speed up the installation crew during assembly. To avoid distortion of the panels do not allow panels to overlap each other during this preliminary placement (Figure 3.1). Laying all the panels down in neat rows prior to installation allows the panels to achieve the temperature of the surrounding previously installed panels. Allow the panels to acclimate for at least 30 minutes prior to installation. This same acclimation process is standard operating procedure for installing other products such as hard wood flooring and vinyl siding. You can measure the temperature of the installed and ready to install panels by aiming the infrared thermometer at the panel, several inches above the surface of the panel.

*The UBS panels are engineered and designed to flex over uneven terrain such as an athletic field slope, golf contours, or residential landscaping terrain.

Assemble the starting row being certain to remain straight on the string lines in both directions maintaining a 90° corner as shown in Figure 3.2.

Achieving a 90° corner is accomplished by using the simple geometric formula as shown in Figure 3.3. (Also known as the 3,4, 5 Method)



Gapping Panels:

UBS panels are designed to allow for expansion and contraction between the panels during temperature changes. The UBS panels will get larger when temperatures are hot and will get smaller when temperatures are cold. The chart on page four (Figure 4.2) indicates the expansion and contraction rate of the panels depending upon the temperature of the panels. You can easily determine the temperature of the panel using the infrared thermometer.

For example, panels that have a surface temperature of 140°F/60°C will require a 16th of an inch (1.6mm) gap between each assembled panel. A panel with a 50°F/10°C temperature will require a 3/16th inch (4.8mm) gap between the assembled panels. This is done so, when the panels grow in the hot, sun there is room for growth.

Measure the temperature of the panels to be installed and compare to the proper gap settings shown in the chart on page four (Figure 4.2). By identifying the temperature of previously installed panels and the gaps which occur naturally, this will help you determine the gaps of the panels ready to be installed. This trick is appropriate when the panel temperature of the uninstalled panels is similar to the installed panels. It is not necessary to measure the temperature of every panel, you are simply getting a general idea of the overall temperature in an area. For instance, if the entire field was in the full sun then the panels should be approximately the same temperature. So do not think it is necessary to measure every panel.

Gapping Panels Continued:

For Example, if the panels installed earlier in the day are currently at 140°F/60°C with 1/16th of an inch (1.6mm) or less gap between each panel, then new panels ready to be installed that have been acclimating and are the same approximate temperature due to the fact that they all have been sitting with the same level of sun intensity or cloud cover, should be installed with the same amount of gap. Be advised as the sun shifts in the day, or cloud cover occurs, the gap between panels will change, and this change must be identified and duplicated with newly installed panels. You may have a situation where part of the field is in the sun and part of the field is in the shade which will result in different gaps being evident between the panels. Looking at your previously installed work as well as identifying general panel temperatures in an area with your infrared thermometer will help you determine the proper gap. Never install a cold panel next to a hot panel. This is why allowing the panels to acclimate to the temperature surrounding them is so important. By not following this gapping rule, improper expansion and contraction of the UBS panels could occur causing the panels to bind and distort on the ground.

It is important, when installing the panels, that a space of 2 inches (50.8mm) is left between the outer perimeter edge of the installation shape and any immovable object such as a wall, curb, fence post, light pole, goal post etc. Failure to do so could cause panels that have not been properly gapped to not have the room required to adjust themselves.

You will witness Mother Nature in action when you see the panels resting right next to each other in the hot sun, but as the temperature cools at night or each morning, a uniform gap will occur between each panel. This natural movement of panel gaps from small to large will continue to occur everyday making the entire installation work as one perfect unit.

Figure 4.1

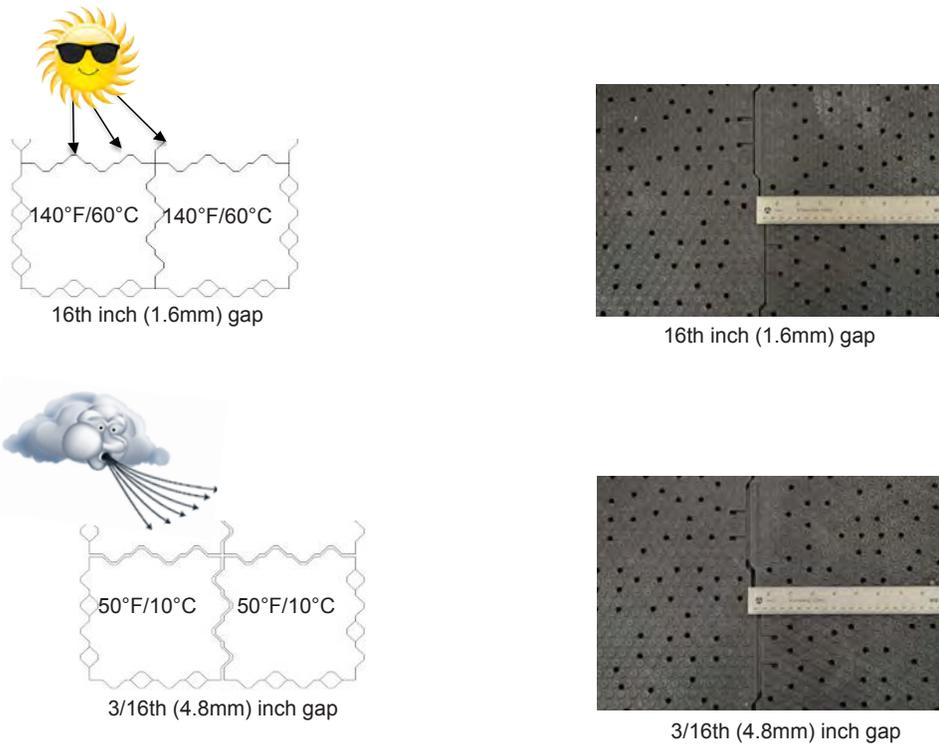


Figure 4.2 This chart shows the gaps needed with a certain panel temperature for each type of panel.

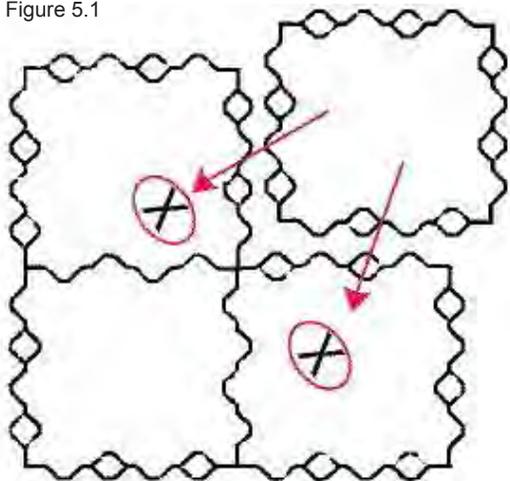
UBS Professional Panel			UBS Champion Panel		
Temperature F/C	Size in/mm	Required Gap	Temperature F/C	Size in/mm	Required Gap
60°F/15.5°C	27 31/32 in./735.8mm	3/16in./4.8mm	60°F/15.5°C	27 31/32 in./735.8mm	3/16in./4.8mm
78°F/25.5°C	27 15/16 in./ 709.6mm	3/16in./4.8mm	78°F/25.5°C	27 31/32 in./735.8mm	3/16in./4.8mm
95°F/35°C	27 31/32 in./735.8mm	3/16in./4.8mm	95°F/35°C	28in./711.2mm	3/16in./4.8mm
110°F/43°C	28in./711.2mm	1/8in./3.2mm	110°F/43°C	28in./711.2mm	1/8in./3.2mm
125°F/ 51.7°C	28 1/32in/735.8mm	1/8in./3.2mm	125°F/ 51.7°C	28 1/32in/735.8mm	1/8in./3.2mm
140°F/60°C	28 1/32in/735.8mm	1/16in/1.6mm	140°F/60°C	28 1/16in/712.8mm	1/16in/1.6mm
155°F/68.3°C	28 1/8in/714.4mm	1/16in/1.6mm	155°F/68.3°C	28 1/32in/735.8mm	1/16in/1.6mm
UP	28 1/8in/714.4mm	1/16in/1.6mm	UP	28 1/8in/714.4mm	1/16in/1.6mm

“Pulling Panels“ Installation Method:

Now that you have multiple rows of panels in position ready to be locked together, start installing panels as shown with the technique below in Figure 5.1. Be sure to wear knee pads and leather gloves during the installation. Be certain that the first row is gapped properly as this will determine the success of the installation moving forward. The technique we have developed is the best way to assemble the panels the fastest and to maintain the gaps that you have already created. Make sure that all the rows are remaining straight in both directions. Do not kick or hammer panels into place as this will alter the proper gapping you have already successfully completed.

Once the first rows are completed, proceed with additional rows as shown. Multiple rows can be assembled at one time as shown in Figure 5.3. It is recommended that a supervisor is overseeing both the gap placement between the panels in each row and that the rows are staying straight in all directions. If a situation occurs that proper gapping was overlooked, sections of panels may be able to be re-spaced by jamming your foot hard on the top surface of the panel in a forward motion in an effort to increase or decrease the gapping between the panels. Continue this process from panel to panel until desired gapping has been achieved. Failure to do so will result in the panels not locking together properly and can cause overcrowding during temperature changes potentially resulting in panels lifting off the ground. Never start a row at both ends to meet in the middle. It will be impossible to interlock the last panel.

Figure 5.1



 Represents Knee Placement on Panels

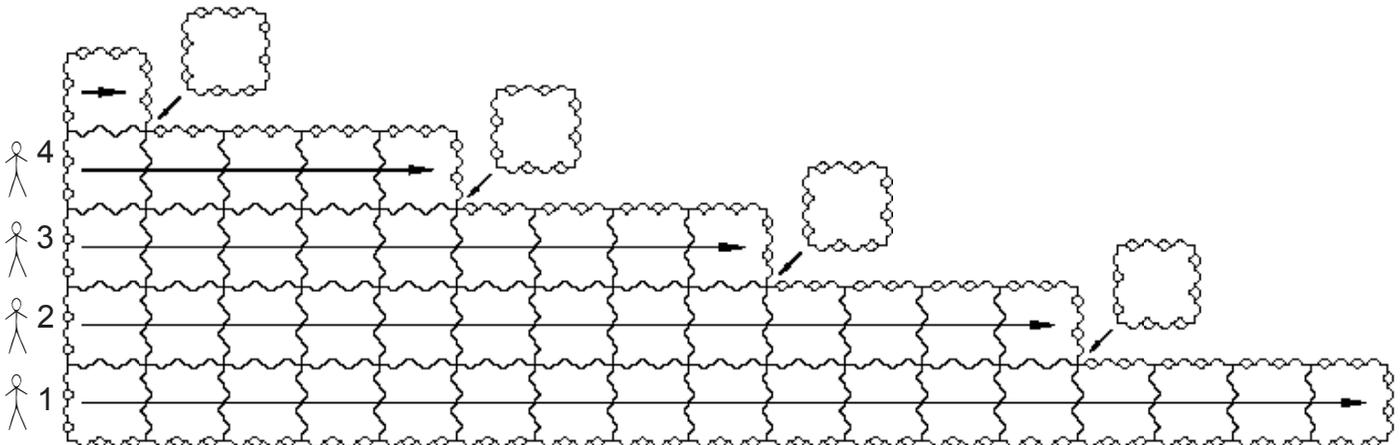
Pulling Panel Assembly Technique

Figure 5.2



Pulling Panel Technique in Action

Figure 5.3 Multiple Rows Being Installed at One Time



UBS “Zipper” Installation Method:

The following installation summary is based on an eight person crew working eight hours per day utilizing two utility vehicles and one soft tire fork lift. Speed of installation will vary depending upon workforce size, hours per day worked and equipment availability.

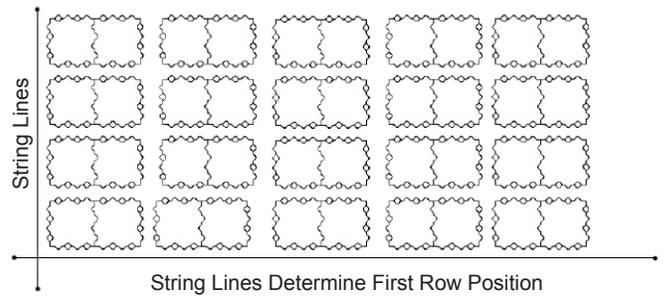


Figure 7.1 Staging and Acclimation

Step 1: Staging and Acclimation

Lay out geo stabilization fabric as specified by field engineer and position UBS panels in pre-assembled sections of two panels side by side and in straight rows leaving no more than 2” between individual rows. See Figure 7.1
Estimated installation area: 1250 sq. ft. per person per hour

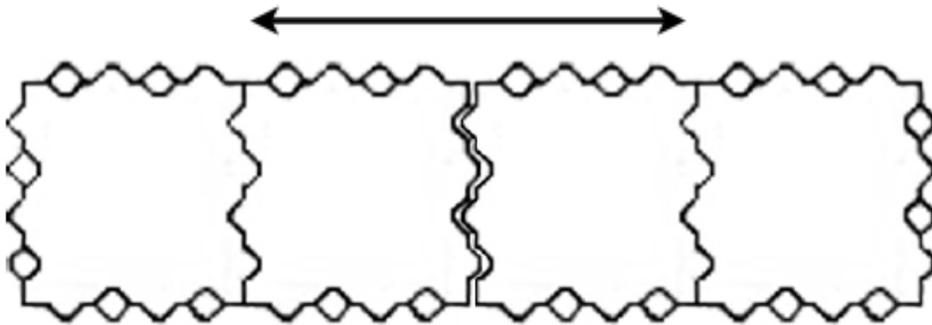


Figure 7.2 Side to Side Gapping

*No more than 12 individual panels per segment.

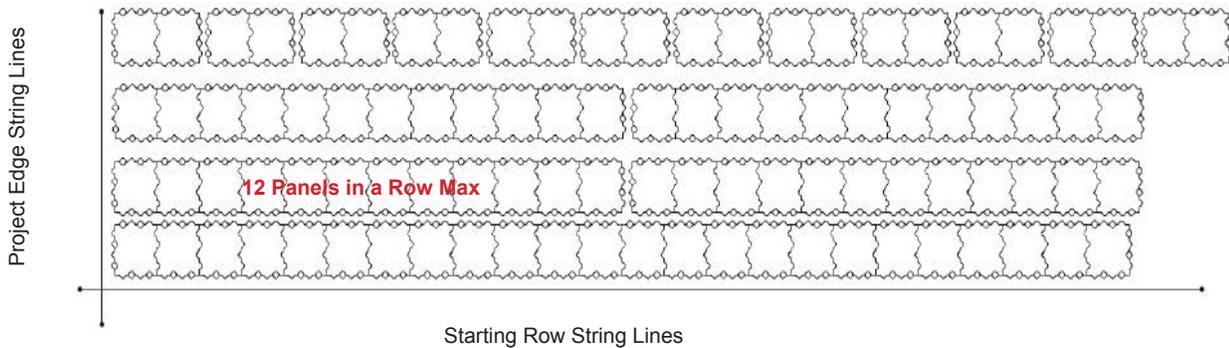


Figure 7.2 Individual Row Assembly

UBS “Zipper” Installation Method Continued:

Step 2: Individual Row Assembly

Assemble and side to side gap the first row of panels along the starting row string lines. The first row will be one continuous row of properly assembled panels. See Figure 7. 2 This step includes workers pre-assembling and properly gapping (side to side) expansion joints between the two panel sections into connected rows not to exceed 12 individual panels in length (6 two-panel sections). The completed row will consist of multiple sections of 12 properly gapped connected panels with no more than a 2” space between the individual sections. Continue this process until you reach the end of the row. Once a pre-assembled row is completed, begin a new row, continuing to pay close attention to proper (side to side) expansion gapping and row position. There should be no more than 2” of space between completed pre-assembled rows making sure they are as straight as possible and individual panels are aligned to adjacent panels.

Estimated installation area:1250 sq. ft. per person per hour



Sliding 2 Panel Sections Together



Pre-assembled Rows of 12 Panel Sections

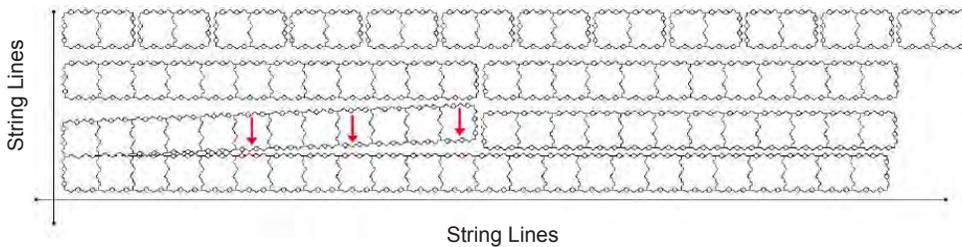


Figure 7.3

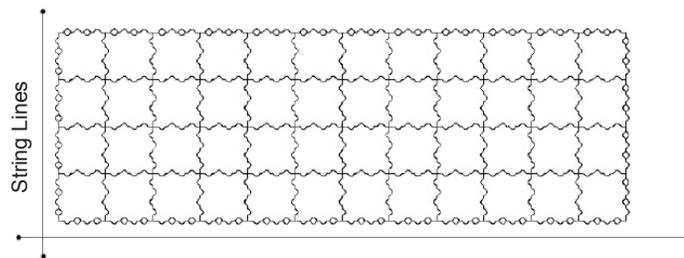


Figure 7.4

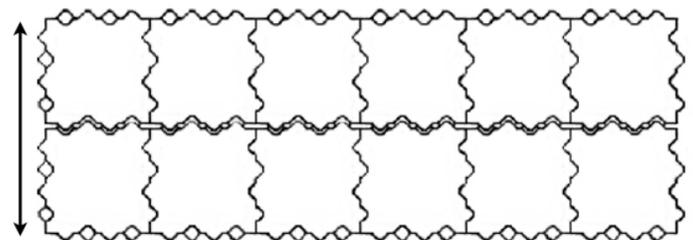


Figure 7.5 Front to Back Gapping

UBS “Zipper” Installation Method Continued:

Step 3: Row to Row Assembly

This step includes carefully “zipping” together and expansion gapping (front to back) the pre-assembled and properly gapped (side to side) rows of UBS panels into a complete panel assembly. See Figure 7.3.

Once certain of proper side to side gapping and perfectly straight with the string line secure the first row with spikes. This row must be perfectly gapped and straight as it is the starting point of the entire area. Consult the panel temperature chart on page 4 for proper gapping.

UBS “Zipper” Installation Method Continued:

In the previous step we assembled the first row of panels on the starting row string lines. Make sure the second row of panels is lined up adjacent to the first row. Starting at one end while kneeling on the previously assembled panels, gently slide the first panel of the second row into the first panel of the first row so the teeth are just starting to engage. Move down the row a few feet and repeat. As the teeth engage, the second row will click into the first. Be sure not to place your knees too far out near the teeth as this could bind the panels and make installation more difficult. Additionally, make sure the teeth are engaging correctly.

You will now understand why we are only assembling 12 panel sections at a time in order to make the position of the zipper row easier to manipulate.



Align the 2nd row in preparation to be zippered



Zipper th 2nd row into the initial string line row



Be sure to adjust installed panel gaps as needed

Teams of two to three workers can line up spaced a few feet apart and perform this action one after the other to “zipper” the second row into the first. The pliability of the Champion panels in 12 panel sections allows for the zipper method to work easily. Once the second row is in, make sure both the side to side and the front to back gaps are correct. The side to side gaps should already be present as they will line up with the first row of secured panels. The front to back gap will now be easy to enlarge or reduce between the panels by gently kicking the panels together or apart to achieve the proper gap requirement according to the panel temperature chart. At this point, you can be certain that the starting row is perfectly aligned with the panel edge string line and the panel edge string line is lined up with each row of assembled panels. Once the panels are properly aligned with the string lines work can begin on the next rows.

Estimated installation area: 625 sq. ft. per person per hour. Eight person crew, eight hours a day, accomplishing a approximately of 40,000 sq. ft. per day

UBS “Zipper” Installation Method Summary:

A conservative estimated time to complete an 80,000 sq. ft. installation using the “zipper” method as described above with an eight person crew working eight hours a day is four days. If volunteer labor (parents, students, athletic team members) can be utilized, Step 1: Staging and Acclimating can be dramatically increased allowing trained workers to concentrate on Steps 2 and 3.



Zipper Assembly Being Completed Row by Row

“Felix Nail” Method:

Once you have installed your first rows of panels with the proper spacing as it pertains to panel temperature, you will want to be sure that all of your hard work of establishing proper gaps is not lost when additional panels are installed. This could happen as a result of sliding the panel in too aggressively, hence jarring the panels directly behind and accidentally losing your established gap. An easy trick is to temporarily nail timber spikes through one of the panel drain holes and in to the sub base. (Figure 6.1 and 6.2) Installing a nails every 5 panels across a row will temporarily keep that row in place. Do this every 5-7 rows to insure proper fit. (Figure 6.3) Remove the nails of previous rows as you move ahead.



Figure 6.1

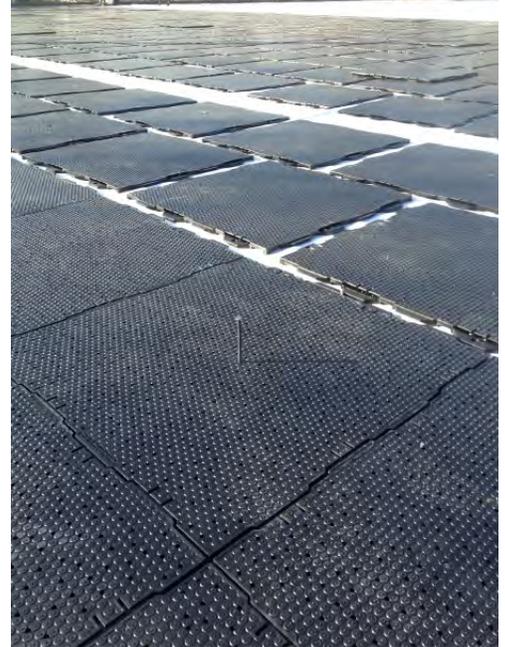


Figure 6.2

*Installing timber spikes every 5 panels in a row be careful not to drive the nail too far so it can be easily removed

“Felix Nail” Method Continued:

Be sure to recheck alignment of your rows by installing additional string lines to insure straight rows are being installed in both directions. (Figure 6.4)



Figure 6.3



Figure 6.4

New String Lines are Stretched Every Ten Rows to Ensure Alignment of the Panels

Continuing Panel Installation:

As panel installation continues, it will become necessary to lay down additional fabric and unassembled panels to allow them to acclimate to the weather conditions as you did previously. Continue this process of acclimation and assembly until the desired dimensions of the field are completed.

*Driving inflatable tire utility vehicles on a properly prepared stabilized base covered with UBS panels is acceptable. This will help move new panels and turf in to position easier.



Geo Fabric Ready for More Panels



Moving New Pallets of Panels on Installed UBS Panels

Completing Panel Installation:

After all UBS panels have been assembled and trimmed to allow for the proper perimeter spacing, the installation is now ready for turf. It is recommended that a leaf blower is used to remove foreign debris from the panels prior to installation of turf. The turf should never be glued or fastened to the panels other than around the outer perimeter edge. The decision to fasten the turf to the panels around the perimeter edge is dependent on the type of turf and infill being used. Every turf expands and contracts at a different rate so prequalify your turf prior to fastening.



Turf Rolls Moved into Position



A Geo Slip Sheet is Temporarily Placed Under the Rubber or Felt Backed Turf to Allow for Positioning



Workers "Pop" the Turf to Allow Air to Flow Under the Turf so it Can Float in to Position

*The patented turf barbs are a great development for helping to keep turf from sliding during installation and ultimately play. To move large pieces of turf it will be necessary to "pop" the turf upwards to create air under the turf to allow for easy movement.

In the case of a rubber backed turf or a felt back turf which will grab the turf barbs like Velcro, a geo fabric slip sheet can be placed under the turf which will prevent the barbs on the panels from touching the turf. Now you can easily slide the felt backed turf in to place. Once happy with alignment, simply slide the geo fabric out from under the turf and move to next piece.

Basic Troubleshooting:

Problem	Solution
After installation, the panels are lifting in high temperatures	If panels have lifted upwards in high temperatures, it is because of improper gapping during installation. In other words, the panels are jammed against each other with no place to go other than up. Check to make sure panels are not touching any perimeter or interior fixed objects. If so, recut panels to allow space. To create more gap between the panels after large areas have been completed is more difficult. Try the feet scuffing technique of moving panels in order to shift panels out to the edge in hopes of gaining some space. Removing an interior panel in the problem area can sometimes help. This panel will have to be reinstalled later by cutting off the teeth and dropping back in to place. The panels will often work themselves flat in time with regular heating and cooling cycles. We have seen bad areas flatten out perfectly in just a few days of heating and cooling, but it is not a guarantee. In order for this to occur, there must be space around the perimeter or any interior fixed objects for the panels to shift and move to.
Rows of panels are not straight	Short of tearing apart your work and starting again, try working row by row out or in by using the feet scuffing technique. Panels really don't like to move once installed so this will take some effort. Staying straight from the start is the key.
UBS panels are installed and it becomes apparent that there is a void or rise in subbase under the panels.	The UBS long version manual shows how to cut out a panel and disassemble an area that is need of ground repair. In short, once one panel is cut out and removed additional panels are easy to disassemble row by row. Make the ground repairs and reinstall the panels row by row. It will take some work to get the last panel of each row back in place. This is shown in detail in the UBS long version manual.
A fixed obstacle is located somewhere in the middle of your installation.	Treat a fixed object in the field as you would treat an obstacle in the perimeter by leaving a 2 inch space around the object; this is achieved by cutting the panels to the proper shape.

*The methods detailed are primarily for exterior installations. Interior installations are essentially done the same way with the exception of the gapping between the panels will be less dramatic. We recommend a gap between 1/16 inch (1.6 mm) and 1/8 inch (3.2 mm) to allow for the potential movement of the panel caused by a hot warehouse environment or sun beating through a glass window. Every indoor installation scenario must be examined to evaluate the extreme temperatures that could be achieved. In most cases, the temperature variation will be minimal and will have no effect on the panels, but be aware of your environment.