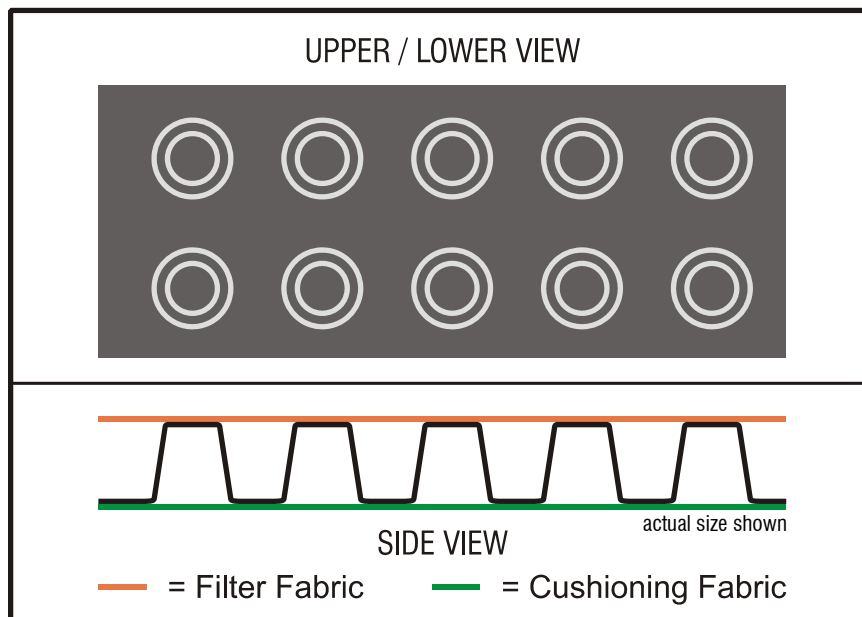


PolyDrain & PolyDrain XL Sheet Drain – Product Information & Installation

General Product Information

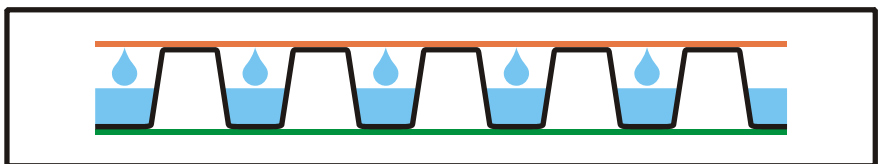
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PolyDrain and PolyDrain XL helps to keep fields, yards and playground areas usable and also aids in eliminating ponding of rainwater, which could otherwise result in potential insect infestation and health hazards – not to mention muddy messes. The high flow capacity of the prefabricated PolyDrain and PolyDrain XL sheet drain products make them ideal for quick drainage where early use after rainfall is desired, and as a simple, reliable and money-saving alternative.



PolyDrain and PolyDrain XL are high compressive strength, moisture conducting, non-absorbent geocomposite sheet drain products made from recycled materials. Both are available from PolyTurf, Inc. and United Sports Surfacing of America, Inc. (WRSG) in standard 4-foot width rolls of 120-foot length. In most applications, this material can be form-fitted by simply trimming to the appropriate size and shape during installation. PolyDrain and PolyDrain XL are a prefabricated three-part system consisting of a formed high-strength polystyrene core (black in color), covered on the top with a non-woven polypropylene filter fabric, and a cushioning fabric on the bottom.

The filter fabric allows water to vertically pass freely into the core, while restricting any movement of rubber or other particles that might clog the core. The cushioning fabric is used for sound-dampening. The core provides a structure that allows water to flow horizontally to designated exits through the path of least resistance (generally a 1% grade is recommended). The use of PolyDrain and PolyDrain XL greatly reduce risk factors associated with poor subsurface soils. Proper installation provides an uninterrupted vertical-to-horizontal flow path for superior rainfall evacuation and enhanced G-max performance without changing the ball action or feel under-foot.



Each drain section terminates in the perimeter curtain drain. PolyDrain and PolyDrain XL rolls can be connected loosely, by simply butting roll sections side-by-side and overlapping the 1-inch top fabric over the fabric on the adjoining roll section, or may also be connected by applying PVC tape to the underside of the core flange along the length of the adjoining roll sections. If there is sufficient existing soil permeability for water absorption, then taping is not necessary. PolyDrain XL has holes in the base of the core which allow seepage of excess water from beneath the PolyDrain XL sheet drain, to avoid pooling of water beneath it and allowing the water to exit. This is especially useful in larger field applications where compacted sub-base of rock is used in conjunction with PolyDrain XL sheet drain. The typical sub-base materials vary depending on existing soil permeability, the surface being installed above the sheet drain and its usage. For example, a large competition soccer or football field would use crushed granite sub-base, where a park area might be able to use a lesser expensive three-quarter-minus, Class-2, crushed aggregate sub-base.

Sheet Drain Pre-Installation Considerations

There are four primary considerations for PolyDrain and PolyDrain XL sheet drain product selection and installation; site location properties, surface material installation, surface material usage, and site drainage system. These will determine which sheet drain product and the method of installation is best suited for your needs.

Site location properties include the surrounding area and soil permeability. In other words, the likelihood of rainwater to collect from surrounding areas, pool in the installation area, then naturally absorb and drain through the soil. For example, a field located with large hillsides surrounding it might be more likely to accumulate water during a rain storm, collecting and sending it into the field area, where it might accumulate much more water than a flat area without hills. This might have a dramatic impact on the drainage system deployed, depending on the soil permeability. In applications where no water should pass beneath the sheet drain material, seaming should be used between the roll sections.

Surface material installation would be the material that is installed on top of the PolyDrain or PolyDrain XL sheet drain; PolyTurf synthetic turf, PolyStar poured-in-place resilient playground safety surfacing, PolyStar rubber mulch, engineered wood chips, etc. Overall, the PolyDrain product should always be placed beneath the surface material on top of a base that is not flexible. In other words, if a soft permeable compressible material is installed under the PolyTurf synthetic turf as under-padding, this would be installed on top of the sheet drain product so that the sheet drain is under the compressible material. It's important to note that installation of anything on top of the sheet drain should be in a manner that doesn't completely coat or otherwise obstruct the upper filter fabric layer's ability for water to pass vertically through it easily to flow out to the drainage system. The method of securing the surface material plays a significant role in the planning for sheet drain layout.

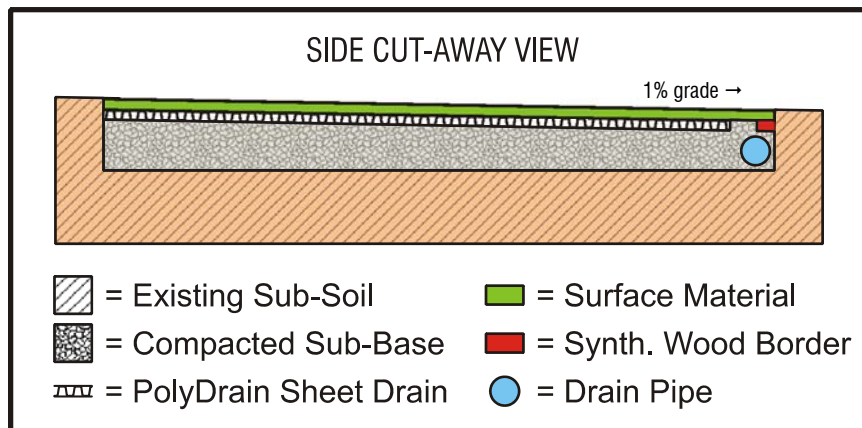
Surface material usage is the intended use for the site after the installation is complete. As previously mentioned, a competition sports field would have different requirements than a residential back yard or play area. Addressed in the surface material installation section above are potential site requirements for a few applications.

The site drainage system plays a pivotal role in the planning for PolyDrain and PolyDrain XL sheet drain installation, and how the sheet drain feeds into the drainage system so that water would be evacuated easily. Some installations might require a sub-base of compacted rock under the sheet drain, and others might allow the placement of the sheet drain directly on top of existing soil or grass. It's important to plan properly so that the water that's running through the sheet drain can flow properly to the perimeter curtain drain or French drain.

Site Drainage System Planning

PolyDrain and PolyDrain XL sheet drain products are an important element in site drainage system planning, because they may be used with or without crushed rock sub-base. However, the use of PolyDrain XL is most effective when used with a crushed rock sub-base to allow excess sub-base water accumulation to flow into the holes in the base of the sheet drain core for evacuation. Allow enough sheet drain material to completely cover the site area and allow trimming.

Typically, a French drain is most cost-effective and typically available from most hardware stores, which is nothing more



than a large diameter PVC drainpipe with holes drilled in the sides spaced along its length so that water can flow through the holes into the pipe and drain down the length of the pipe to the end for evacuation. A French drain is buried horizontally within a bed of compressed rock underneath the level of the sheet drain, so that water flows downward from the edge of the sheet drain, through the compressed rock and into the French drain. In all cases, a 1% grade is recommended for proper

gravity flow of water through the PolyDrain / PolyDrain XL sheet drain, and French drain. When planning for use of a

French drain, allow proper horizontal spacing between the draining edge of the sheet drain and the position of the PVC drainpipe, so that water flowing heavily from the sheet drain can exit freely horizontally and then flow downward. The top of the compacted rock over the French drain should be horizontally level with the top surface of the sheet drain material, so that the total area for application of the surface material is level (excluding the 1% grade).

When using PolyDrain sheet drain directly on top of existing grass or soil, such as in applications for use under PolyStar rubber mulch for playground equipment, it's best to provide a perimeter frame of railroad ties, synthetic lumber, or something similar. Additionally, make sure that the sheet drain sections are connected properly with PVC seam tape so that it acts effectively as a weed blanket to avoid future plant growth upward through the seams, and doesn't allow water to seep downward through the sheet drain seams to the soil.

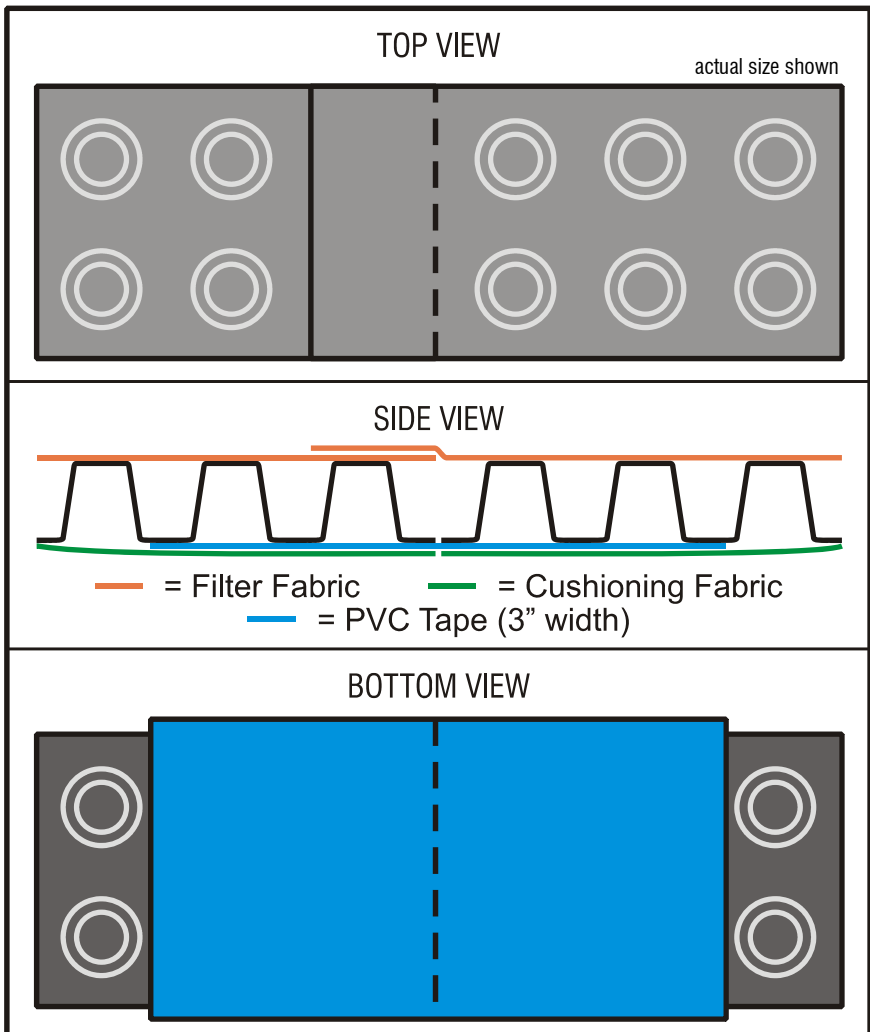
It's most appropriate to consult with experts that are familiar with the engineering necessary for proper site drainage planning, including soil qualities, existing site drainage systems to tap into for water evacuation, local, regional and state codes and regulations, permit requirements, and other related factors. This will assure that your site meets all local and state requirements before you begin your site installation, and that the drainage system will function properly.

Sheet Drain Installation

PolyDrain and PolyDrain XL are both approximately one-half inch thick, and allowance should be made for this when planning your site drainage. Both sheet drain products will conform to sloping areas, provided that the area doesn't have great variations in height, as the sheet drain core isn't easily flexible. Because both PolyDrain and PolyDrain XL sheet drain products are open on all edges, the sheet drain sections can be positioned in any direction that is most efficient, and the edges may be sealed by wrapping 3" wide PVC duct tape along the edge(s) where drainage is not desired. Roll out the sheet drain product over the stable base surface you wish to cover. Plan on stripping away enough of the lower layer of cushioning fabric to allow the application of 3-inch width PVC seam tape to connect the adjoining sections.

If there's sufficient soil permeability to meet the site requirements, seam tape is not required, as a majority of the water will still flow through the path of least resistance to the edge for drainage. A small portion of water may seep through the seams, but shouldn't be a major factor during heavy rainfall water evacuation.

When applying the 3" width PVC duct tape to the seams, make sure that there's a slight gap between the sections to allow for shrinkage and expansion that occurs naturally with temperature fluctuation. If you wish to insure that the sheet drain functions as a weed blanket and doesn't allow drainage along those edges that are sealed, don't leave any gaps in the application of the PVC duct tape and overlap the tape sufficiently where additional pieces are necessary.



Once the overall area is covered with PolyDrain or PolyDrain XL sheet drain, trim away the excess material, allowing for appropriate spacing where the edge for drainage will occur. Additionally, you may choose to terminate the non-draining edges right at the same edge perimeter where the surface material will be positioned, depending on the type of surface material. In an application with PolyTurf synthetic turf, it's recommended that the sheet drain be placed slightly inside the perimeter to allow for proper anchoring of the turf by either spikes or adhesive. However, adhesive may be used on the sheet drain edges as well, to secure it to a solid perimeter edge, such as a concrete mow curb.

In most cases, the weight of the surface material will sufficiently anchor the sheet drain material beneath it, and there are no additional requirements. In rare cases where the sheet drain may be accessible, such as underneath PolyStar rubber mulch, it may be necessary to secure the sheet drain material with metal spikes into the ground, such as 60D 6-inch long nails every foot or two along the perimeter. Another approach for this type of application on top of existing sod or soil might be to anchor the perimeter either under or directly against the material that forms the perimeter edge.

As previously addressed, make sure that the application of the surface material does not seal or otherwise impede the vertical flow of water through the upper layer of filter fabric, as this will prevent the PolyDrain and PolyDrain XL sheet drain from functioning properly. The permeability of the filter fabric far exceeds the flow rate of the sheet drain core by a factor of over 9-to-1. In other words, you could potentially obstruct up to 89% of the filter fabric before it drops below the flow rate of the sheet drain core. The respective flow rates are as follows: Filter Fabric = 150 gpm/ft² flow rate and 0.01 ft/sec for permeability as tested under ASTM D4491 standards; Core = 16 gpm/ft per unit width for flow capacity as tested under ASTM D4716 standards.

General Company Information

We are always available to address your specific requirements, and provide assistance for the selection of the proper material and material quantity required for your site installation by phone, fax or e-mail. WRSO and PolyTurf recommendations do not replace the need for you to obtain professional assistance and consulting for proper planning and installation of PolyDrain and PolyDrain XL sheet drain materials in conjunction with your site requirements.

Please refer to our technical specifications sheets for each respective PolyDrain and PolyDrain XL product for complete product specifications in both US and SI standards and the applicable ASTM testing methods. All information, drawings, and specifications are based upon the latest product information available at the time of printing. Constant improvement and engineering progress make it necessary that we reserve the right to make changes without notice. All physical properties are typical values. Standard variations in mechanical properties of 10% and in hydraulic properties of 20% are normal.