



PermaLawn

The Permanent Lawn People

A Study on Artificial Grass Drainage



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The purpose of this paper is to examine the importance of drainage for artificial lawns. We will look at how natural grass drains, and the difference soil types make in the domestic garden project.

We will examine why it is important to prepare the ground properly before artificial grass installation and how it can be done to make sure drainage is adequate. Some artificial grasses have superior water drainage perforation to others, and we will find out why and how it is done on the best quality matting.

Finally, we will look at when to decide and how to choose a reliable artificial grass installer to ensure the drainage is adequate.

Artificial grass is increasing in popularity across the UK at the current time. With climate change already affecting gardens in the north of England, homeowners looking to alternate garden design ideas to reduce maintenance and garden design making the outside domestic spaces more user-friendly, it is clear to see why synthetic grass is fast-becoming a popular solution.



Use PermaLawn resources to help with the planning of your artificial lawn project.

Find out more at: <https://www.perma-lawn.co.uk/tips-and-advice/square-metre-calculator>

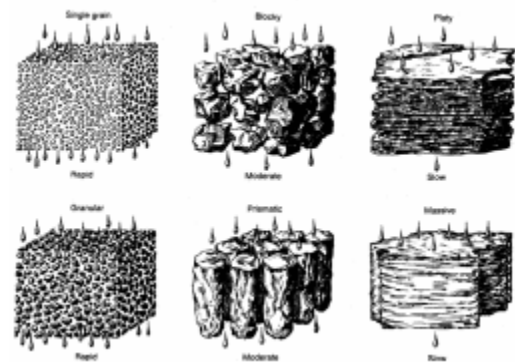
Why is drainage important for artificial grass projects?

When installing artificial grass, homeowners sometimes overlook the importance of drainage. Natural grass at first seems to have a more effective water drainage system, because the rain will soak through the grass and into the soil, away from the surface. However, water drains differently through different soil types and textures, and during heavy rain it can easily become waterlogged and subsequently unusable until it has properly dried out.

Soils are comprised of four elements:

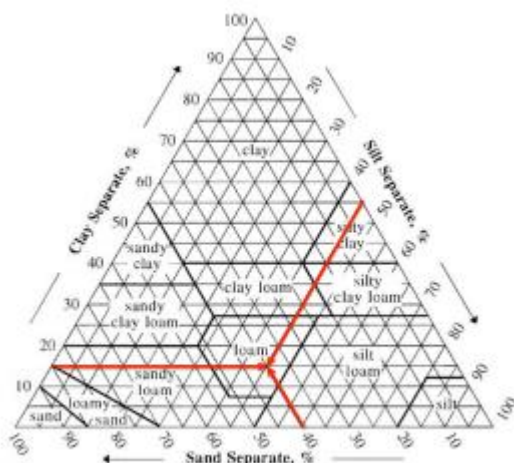
- Mineral solids
- Organic matter solids
- Water
- Air

The solid components are made up of minerals created due to geological weathering, and organic substances containing plants, living organisms and sometimes animal deposits. The spacing between these solid matters is filled with water or air.



Mineral solids typically contain:

- Sand – 0.05-2.00mm
- Silt – 0.002-0.050mm
- Clay – smaller than 0.002mm



The ratio of these elements will determine the soil type and texture. This is the most important element to measure when dealing with rainwater drainage, but it can also be an important metric for susceptibility to erosion.

Natural grass sits on the surface of this soil and assists with the filtering of larger solids too.

When waterlogging occurs on a natural lawn surface, a series of holes are often made across the entire lawn to accelerate the water drainage process. If waterlogging occurs on a regular basis, or after light rain, then further drainage will be considered, such as drainage ditches or French drains.

Sloping surfaces can also be created in poor soil areas to assist with water run-off. Calculating the slope is straightforward:

Each foot of elevation drop over a 100-foot length is 1 percent. Therefore, it takes 2 feet of elevation change over each 100-foot length of a swale to create a 2-percent slope. If the distance is 10 feet, you'll need a fall of 0.2 feet (roughly 2.5 inches) to create a 2-percent slope.

How does artificial grass drain?



The answer to this is to be found during the manufacturing process. Good quality artificial lawn is perforated with holes that are designed to be able to act just as natural lawn would. This means that the rainwater can simply drain through the holes that have been made and away from the surface.

PermaLawn artificial grass matting contains effective drainage levels of 60l per minute per square metre.

As well as this, artificial lawns are also manufactured with a sand and water infill, which will then absorb and hold the water that has come from the surface, just like soil would do.

When combining these qualities with a well-prepared substrate and adequate drainage layering, good quality artificial lawn should drain rainwater much more effectively than a natural one.

Why it is important for artificial lawn to drain?

One of the main reasons drainage is needed in the artificial lawn is because without it there will be pools of water gathering on the surface of the lawn, just as with natural grass. This could happen during heavy rain, or in the worst cases, inadequate drainage can lead to waterlogging issues after a simple domestic task, such as watering plants or washing a patio area, or following children's water play.



Another key reason to have good levels of drainage in an artificial lawn is because inadequate drainage can significantly shorten its lifespan, particularly if the installation is in place in an area that experiences high levels of rainfall. Without drainage, the lawn can lift from the surface of the soil substrate and become uneven and in need of often costly repair.

Drainage of an artificial lawn does not rely wholly on the perforation of the matting, however. Beneath the surface of the lawn, there is an adequately-prepared substrate that includes a compacted gravel layer, and a weed-suppressing membrane. When weeds are allowed to grow beneath the artificial lawn, not only does it push the matting out of shape, but also discourages adequate water drainage as the surface of the soil becomes thicker with weeds and grass regrowth.

Preparation of the substrate is arguably the most important step of artificial grass installation. Often, the thickness and density of the drainage layer will be determined by the soil type. In particularly wet regions with poor soil drainage, additional trenching may be dug, or the soil drilled and perforated to assist with drainage. In such instances, groundworks can be costly and a professional installer is recommended to ensure adequate drainage is installed. Costs will rise over the long-term in repair and maintenance, and in the worst cases replacement of the lawn.

Artificial grass – preparation and substrate



PermaLawn artificial grass consists of high-quality synthetic filaments threaded into a backing layer which allows water to drain through. This backing layer is installed on a drainage layer which is usually comprised of compacted gravel. The artificial grass is then fastened down at any seams and along its perimeter.

After this some homeowners then request an in-fill to be placed into their new artificial grass, perhaps due to poor soil quality or for additional comfort value. This is done with either recycled crumb rubber or kiln dried sand. The added weight of the infill layer helps to keep the grass firmly in place during strong winds.

Here at PermaLawn none of our artificial grass solutions require an in-fill but should you choose to have one, we highly recommend using kiln dried sand at a rate of 5kg per m². Our artificial grass is constructed from either polyethylene, polypropylene or polyamide.

There now follows a step-by-step guide on how PermaLawn recommends you install your artificial grass drainage based on ideal soil conditions.

Adding a drainage layer

PermaLawn recommends using a 6mm to dust granite stone compound that is spread evenly across your project area to a depth of between 20mm and 40mm.

Once you have successfully laid your granite drainage level you can then go over this again with the whacker plate to ensure optimal compaction.



Installing the membrane



The next step is to install a weed membrane, this will ensure that no weeds can grow through your new artificial grass whilst simultaneously allowing water to drain away.

Before you do this, you may want to apply a 25mm layer of sharp sand on top of your drainage layer to aid in creating a perfectly level base, again compact this down using a whacker plate.

Using PermaLawn's 2m wide heavy duty weed membrane, cover the entire surface of the project area ensuring the whole area is covered. If there is a section where two pieces of membrane meet overlap them by 150mm (6inches) to guarantee no sun light can penetrate to the low levels.

Fix through the membrane using PermaLawn's 150mm hot dipped galvanised securing pegs to ensure a firm a solid fixture. Follow this process around the major points of the perimeter and along the joining seams of the membrane.

Do all synthetic grass mats drain the same way?

Some types of synthetic grass do not have a drainage system in-built, but instead rely on cellular mats, which are installed directly underneath the artificial grass. These types of systems transport up to 16 gallons per minute and are typically used on installations over a hard surface, such as concrete. These can be used effectively in ornamental gardens, where foot traffic is minimised.

There are other types of grass matting that rely on drainage ditches to carry water away from the surface. Again, these types are best suited to hard soil and clay areas that receive heavy, consistent use.



They are often used in temporary installations, as they do not typically last as long as self-draining versions.



There are versions of artificial grass that require no drainage, and these are often associated with exhibition and display. These mats are not to be confused with those suitable for garden use, as they are not designed for foot traffic of any kind and will wear very quickly.

PermaLawn artificial grass matting is manufactured to a high standard, with perforations that allow water to pass through at a rate of 60l per minute per square metre. They are suitable for a wide

range of uses and can be further infilled with sand for areas with poor drainage capability or soil type.

What is the recommended perforation level for domestic artificial grass?

The permeability of artificial grass delivers some of its greatest benefits over natural turf. This is achieved through perforation of the backing of the product, and through the drainage layer beneath.



Different artificial grasses have varying levels of water permeability, and often this is overlooked by the consumer. Because perforation occurs during the manufacturing process, and manufacturing processes differ from business to business, there is no current standard recommended perforation level.

PermaLawn grasses are manufactured as standard with a 60l per minute per square metre permeability.

Do sports fields and heavy traffic areas require additional drainage?

Artificial grass is popular in sports fields and is increasing in parks and public spaces. Synthetic grasses are more durable than natural turf for high-impact use and can mean the difference between use and cancelled events.



The same principles apply to drainage in a heavy traffic environment than in a domestic situation. The deciding factor is the soil type, which will dictate the substrate preparation. Then the recommendation is to select a good quality artificial lawn that has high perforation levels to carry any rainwater away.

How to choose an artificial grass installer to ensure adequate drainage

Although many UK homeowners are confident in DIY, there are concerns that the preparation stages and installation of the correct drainage are being overlooked or underestimated. There are resources available from reputable artificial grass suppliers and manufacturers to help both trade and DIY installers to correctly calculate and plan projects.

Should homeowners prefer to bring in a professional artificial grass installer, PermaLawn has a network of fully trained and qualified artificial grass installers that used to this type of work. Our installers have specialised equipment designed for removing turf etc. and will be happy to quote for your new installation.

Contact the PermaLawn teams for further information:

01773 441 950 or email info@perma-lawn.co.uk



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