

SITE ADDRESS: Land off Heron Hill Lane, Culverstone, Meopham

Please see below updated details required for the above application regarding SuDs and foul water:

Foul water

After further investigation, we have found that there is no main drains connection to the site. Therefore, foul water will be dealt with by using a septic tank which is detailed as follows and see attached specification:

Clearwater shallow dig tanks are the perfect choice for when sewage treatment plants, which discharge cleaned effluent into the ground, are suitable. This is the highest capacity tank, and it can store the effluent of up to 47 people, perfect for off-mains domestic properties.

To reduce installation time this tank is shallow dig, meaning you need to excavate less of the ground where it will be installed. This model of tank can be backfilled with pea shingles. There's no need to worry about the durability of this tank with pea shingles or concrete backfill as it's manufactured from strong, chemically resistant, and watertight GRP.

99.7% efficient and approved to EN12566-1, these tanks are the perfect upgrade from traditional cesspools as they tend to last longer, increase hygiene, and have improved efficiency in the treatment of waste.

Clearwater Shallow Dig Tank Specification:

Diameter: 1225mm

Length: 3895mm

Standard Invert Height: 500mm

Litre Capacity: 3800 Litres

Person Capacity: 12 People

The tank also has an extra alarm system so that the occupants can have a warning as to when the tank requires emptying. It is usually once a year for bigger tanks and six monthly for smaller tanks. The tank will be emptied by a professional waste carrier and disposed of securely.

Surface Water

Surface water drainage will also be reduced significantly by using a permeable gravel paving. Ordinarily, gravel can easily be displaced by car tyres, however interlocking permeable paving grids help retain the gravel in the right place, all whilst minimising flooding risk by storing and discharging excess stormwater back into the ground.

Features of gravel permeable paving:

- High load capacity suitable for foot or vehicular traffic - up to 230 tonne per square metre
- Allow rainwater to permeate and infiltrate
- Reduces flooding or pooling of water
- Easy installation thanks to lightweight materials

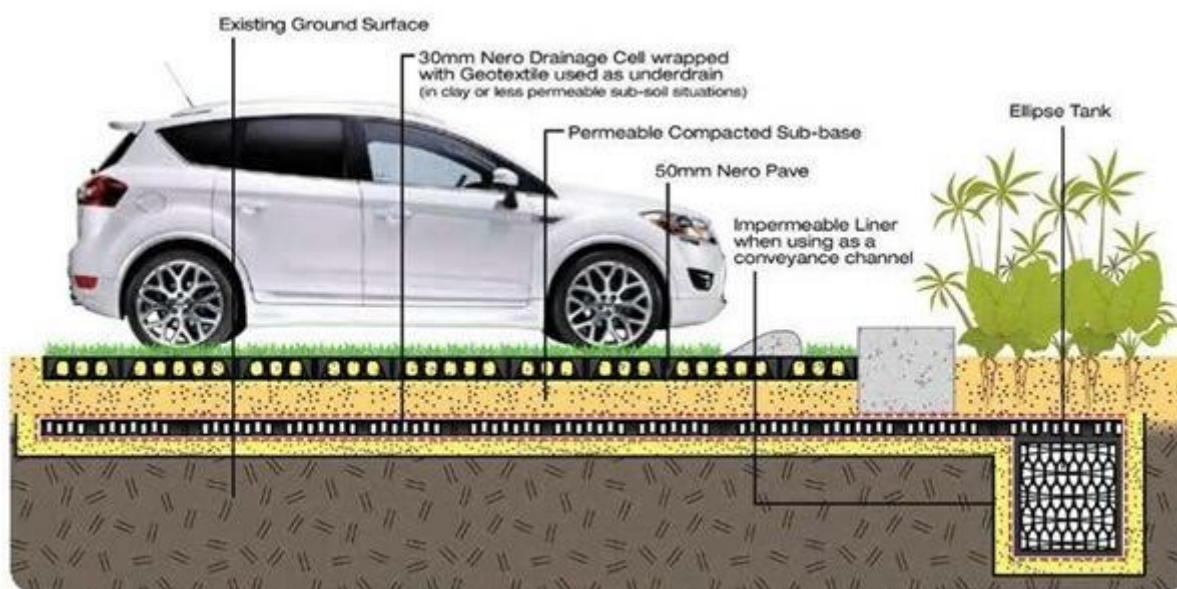
Permeable paving allows for water to seep and infiltrate back into the ground rather than being obstructed by a solid surface and causing flooding. Nero Permeable Paving has a load-bearing capacity of up to 230 tonnes, meaning it can withhold vehicular weight exceptionally.

Compared to the traditional methods of paving such as using concrete slabs, asphalt or stones, Rainsmart Nero Pave has a wide variety of benefits ranging from environmental to the low maintenance of the product. Unlike typical solid paving materials, the Nero Paves recycled polypropylene material can be used to create a permeable paving surface, allowing water or other liquids through to the grass or gravel beneath. This keeps the soil hydrated and healthy, as the Nero Pave provides bioremediation which breaks down pollutants in the soil.

The combination of the plastic material and temporary water storage results in a cooler ground surface and a cooler temperature around nearby buildings when Nero Pave is installed. This is especially useful in the summer heat. The permeable properties of Nero Pave allow for the reuse of stormwater for a variety of different applications. The system on its own allows for stormwater to hydrate soil and grass through infiltration as opposed to channelling it away to a drain.

However, we are also using Nero Drainage Cells which are installed below and are connected to an Ellipse Soakaway Crate which will then lead to an underground Rainwater Harvesting System. This makes the Nero Pave an important piece of a water storage system.

The system is set up with a channel of Nero drainage cells below your Nero Pave feeding soakaway crate at the end of the run of drainage cells. The water will then be stored in the soakaway crate as shown below:



The hexagonal holes in each cell of pave allows for the development and growth of grass roots. This allows for grass to grow and look as it would naturally, masking the pave look entirely once the grass has grown long enough. Once the grass has fully grown, the roots interlock between the holes of the plastic paving and become secure. However, we will also use with a shingle so the shingle will fill the holes providing a compact and level installation.

The cell structure provides protective casing around the grass nodule or shingle which encourages grass regeneration and improves its speed. The high loading capacity also protect the roots from being damaged by compaction as the cell takes all the weight. This creates a natural, healthy look grass surface even in an area of high weight and volume traffic.

The above will be used in conjunction with a Rainsmart Ellipse Soakaway Crates (24.2-tonne vertical load capacity) and sufficient non-woven geotextile membrane to wrap all outward faces of the soakaway including the base. The dimensions of the complete soakaway are 1430mm (L) x 800mm (W) x 860mm (D).

Rainsmart soakaway crates have a void ratio of 95% - this is the amount of free space within the crate structure that can be used for rainwater storage. The capacity of this 1 cubic metre soakaway is 935 Litres.

The vertical crush load capacity of 24.2 tonnes per square metre ensures that the Rainsmart Ellipse crates are safe to be used beneath gardens and pedestrian areas. The lateral crush load of 18 tonnes per square metre is the best of any type of soakaway crate currently available in the UK.

Clips are not required to hold the crates together. No clips on any crate system are structural it is always the side fill on any soakaway installation which adds the stability needed to hold the structure in place. Cable Ties will be used, and these are used purely to hold the crates in place until the gravel side fill has been added.

All outward-facing crate surfaces will be wrapped in a non-woven geotextile membrane, which allows the free passage of water but prevents any soil or sand particles from entering the soakaway, maintaining its long-term efficiency. A 110mm (or 160mm) drainage pipe is fed into the soakaway via one of the four circular 160mm open entry points.

110mm pipes rest on the bottom of this opening and the pipe is then inserted approximately 150mm inside the crate. Geotextile membrane is then installed over the opening first and then a small cross is cut in the membrane at the entry point. We will then peel back the membrane, insert the pipe and clamp the membrane around the outside of the pipe to stop the ingress of any soil particles.

The above will all be linked to a Rainwater Harvesting System. Water conservation and re-use is a hot topic in today's society. With UK rainfall levels fluctuating wildly in recent years it is difficult to argue that there has never been a better time to store and recycle this precious resource. With annual household water bills seeming to rise continually there is also a significant commercial factor – meaningful cost savings can be made by re-using rainwater.

Harvesting systems take rainwater storage on to the next level. Rainwater from the roof is filtered to remove leaves and other debris collected during the rainwater's journey and the resulting "clean" rainwater is stored in a giant underground tank. This water is then pumped back to the house for use in non-drinking applications such as toilet flushing, washing machines, garden watering and car washing. The tank, which is a shallow installation, needs to be situated no more than 40 metres away from the house.

The Floplast system we are going to use, estimate that their technologically advanced StormSaver Rainwater Harvesting System can reduce household water bills by up to 50%, about two-thirds of which comes from the saving made by using rainwater to flush toilets with. It is a quiet low-energy system that still manages to maintain a flow rate of 10 litres per minute, which is roughly the same as mains pressure.

The system will be accessed by a control panel situated in the house, which automatically switches the supply back to mains water in the event of the storage tank running dry. The reusable rainwater will be pumped back into the building's water system and used for the following:

- Flushing toilets
- Washing machines
- Washing vehicles
- Gardening
- Showers
- Sinks
- Baths

Our specific system is a filtered rainwater harvest system which will be installed in the form of an underground tank, which again will be connected to the rainwater system, but filters will collect any debris or leaves. The average roof collects some 85,000 litres of water, which is enough to fill 450 water butts annually, according to EST research. Filtering and reusing this water for gardening, washing clothes, cars and flushing toilets is estimated to cut household bills and water usage by 50%, a huge impact both on the environment and a household's outgoings.