

Galston Primary School

Type of System: Soakaway / Rainwater Harvesting

Date of Installation: 2007

Tank Size: 585m³

Project Requirements:

The new development at Galston Primary School, East Ayrshire, required that stormwater runoff from the roof, and hard standing impermeable areas of the site, be infiltrated prior to entry into the existing nearby stream.

Original Solution:

The original design was to collect stormwater runoff from the roof and hard standing impermeable areas using concrete storage tanks with restricted discharge, using flow control systems.

Engineer Requirements:

The consulting engineers wanted the site to have a zero discharge, to reduce the flow into the stream and thereby easing the pressure from fluctuations in ground water.



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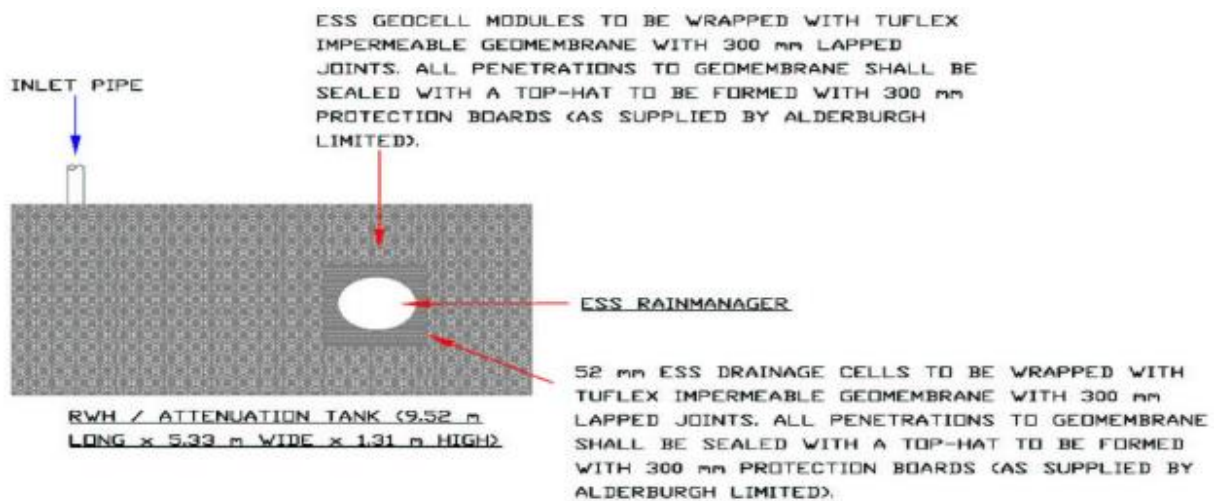
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PLAN SHOWING ESS RAINWATER HARVESTING SYSTEM

Galston Primary School

ESS Solution:

The ESS design team provided the best stormwater management solution by adopting source control technology (zero site discharge). Rainwater was collected at the source and utilised without any discharge leaving the site due to incorporating the soakaway systems, rainwater harvesting and permeable pavements.

Soakaway/Infiltration Trench:

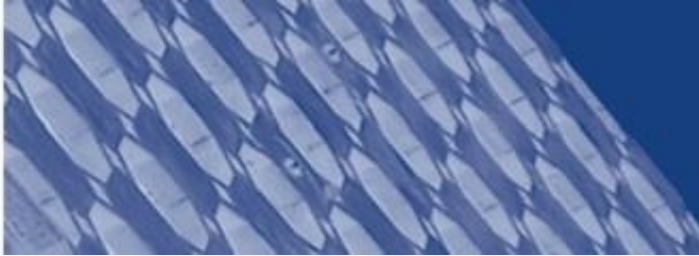
Runoff from the impermeable areas surrounding the school building was collected using permeable pavements, which were constructed by using a layer of permeable pavement blocks and ESS Geocell modules. The collection system is made up of a layer of permeable blocks, followed by 100mm of single sized clean crushed stone, 350mm layer of 40mm single sized crushed rock wrapped in Geotex 225 FF permeable geotextile. The runoff is then collected using the infiltration system, which is constructed using a layer of ESS Geocell modules wrapped with Geotex 225 FF permeable geotextile. To withstand flash floods, the excess runoff from the car park collection system is connected to the soakaway/infiltration system. An oil interceptor is installed at the inlet of the soakaway/infiltration system.



Rainwater Harvesting:

Stormwater from the roof is collected, filtered, stored and used for flushing toilets and urinals, as well as for washing machines and irrigation of the playfield using ESS Rainwater Harvesting (RWH) system. Runoff from the roof is introduced into the tank through ESS filter units for removing grit and debris. The water is then collected in the ESS RWH tank, constructed using Geocell modules. The water is pumped into the school building using C-class rainmanager, which supplies water for reuse inside the building and playfield. Installation of RWH tank reduces the usage of mains water supply considerably.





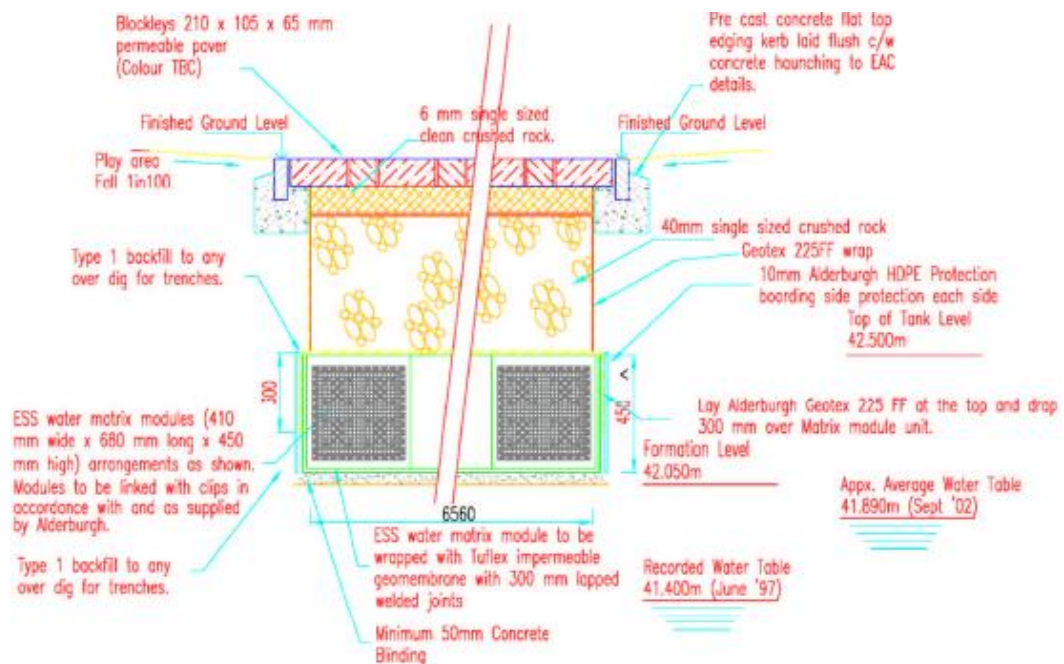
Galston Primary School

Permeable Car Park:

Runoff from the car park was collected using permeable pavements, constructed using a layer of permeable pavement blocks, Ecosoil filtration media, ESS 52mm drainage cells and ESS Geocell modules. The collection system is made up of a layer of permeable blocks, followed by 100mm layer of Ecosoil filter medium (for removal and digestion of hydrocarbons) and ESS 52mm drainage cells, collection/infiltration system wrapped in Geotex 225 FF permeable geotextile. Runoff collected in the 52mm drainage cells is infiltrated into the surrounding soil. The high void ratio of the drainage cells and high permeability of geotextile increased the half drain time of the system to less than 12 hours. To increase the percolation into the ground at certain areas, the infiltration system has a layer of ESS Geocell modules beneath (15 L x 2.5 W x 0.45 D) wrapped with Geotex 225 FF.

Permeable Pedestrian Area:

Runoff from the pedestrian areas was collected using permeable pavements, constructed using layers of permeable pavement blocks and ESS Geocell modules. The collection system is made up of a layer of permeable blocks, followed by 100mm of single sized clean crushed stone, 350mm layer of 40mm single sized crushed rock wrapped in Geotex 225 FF permeable geotextile. To increase the percolation into the ground, infiltration system was constructed using ESS Geocell modules wrapped with Geotex 225 FF below the layer of stone. The high surface void ratio of the matrix modules and high permeability of geotextile increase the half drain time of the tank.



Section B-B
Typical Central Pedestrian Drainage.

Scale NTS



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Summary

- Modular configuration allowed for a flexible, ideal site solution that worked with other existing infrastructure both above and below ground level. The modular assembly further reduced installation times allowing a much more economical solution to be found.
- Load bearing capabilities and high void ratios provided the most efficient solution for a restricted site with loading issues.
- The Geotex 225 FF (filter fabric) allowed for better infiltration.

