



Clitheroe Community Hospital

Type of System: Stormwater Attenuation

Date of installation: November 2013

Tank size: 387.14m³

Site Problem:

Clitheroe Community Hospital needed to put an attenuation system in place in accordance with their new drainage layout for the site. Space was restricted and an irregular shaped tank would be needed. The original plan was to have a 1.2m deep tank, and the site conditions meant that the fill above the tank would be 2.7m of excavated wet clay material – it was crucial that the tank modules could take this loading.

Furthermore, the tank would be installed adjacent a live Community Hospital so installation would need to be economical in order not to cause disturbance to the running of the hospital.

Project Requirements:

The project required an attenuation tank which would be capable of dealing with all stormwater requirements. It also needed to be structurally sound to cope with any potential future loading.



VERSAVOID

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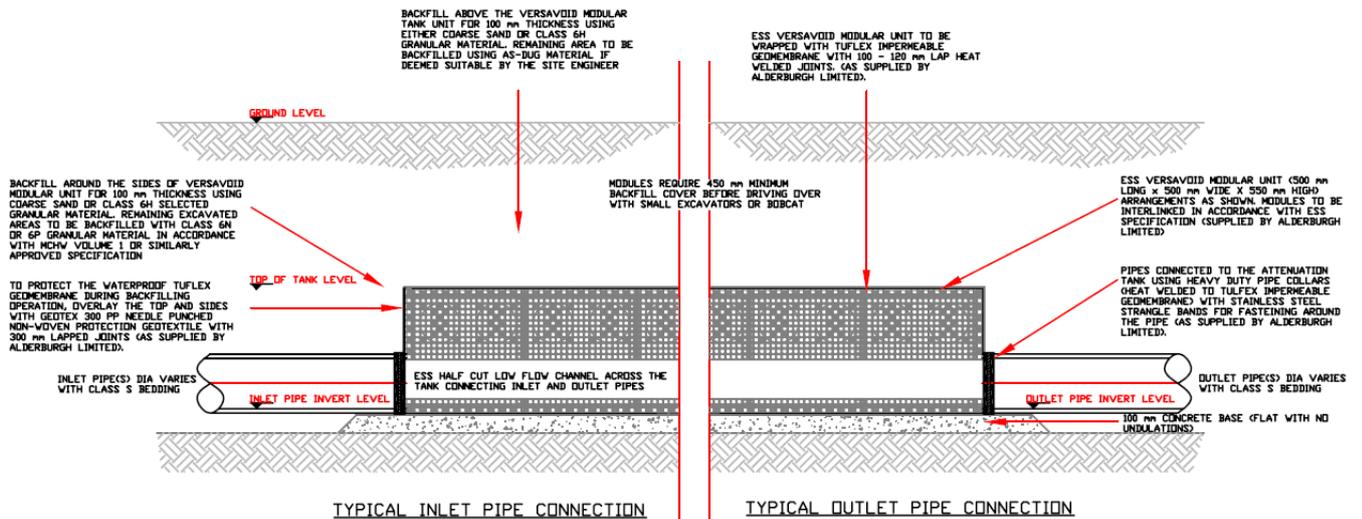
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TYPICAL DETAILS OF ATTENUATION TANK USING VERSAVOID MODULAR UNITS



Clitheroe Community Hospital

ESS Solution:

ESS proposed a modular VersaVoid tank with a void ratio of 96%. At 387.14m³, the VersaVoid tank provided approximately 371.52m³ storage capacity for excess stormwater runoff from the surrounding areas.

Working with the contractor and the engineer, we developed a scheme using 1.8m deep modules, which substantially reduced the footprint.

ESS provided a solution by specifying the VersaVoid modules due to the superb compressive strength they have as a unit. The 320kN/m² loading strength provided by each module gave the tank easily the required structural stability to cope with loading from above. The 120kN/m² lateral strength provided the same capability horizontally allowing the tank to cope with any side loading. Tuflex waterproof liner and a Geotex 300PP protection mat were also supplied by ESS to ensure a full and correct installation of the modules.

Unlike other proposed crate systems, VersaVoid's modular construction provided the required flexibility in installation. VersaVoid's unique clipping configuration meant an unorthodox tank shape was straightforward to create.





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Special Considerations: Tank

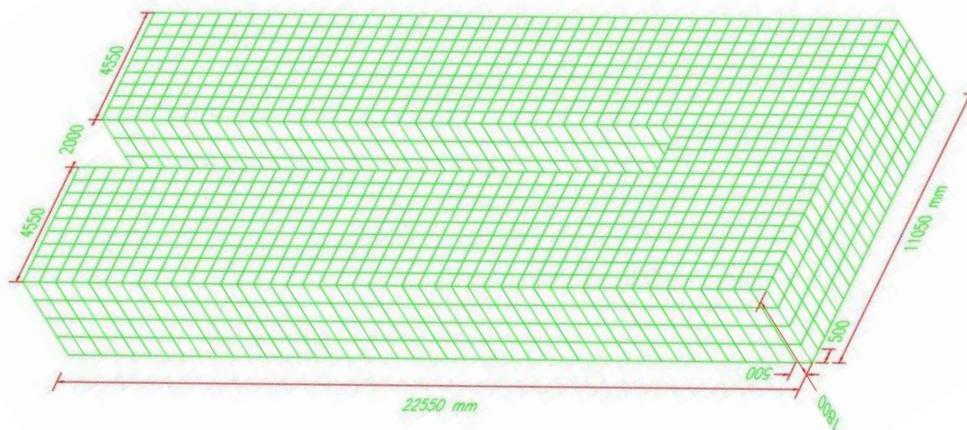
Configuration: 45m x 4.50m x 1.80

364.50m³

5m x 2m x 1.80

18.00m³

= 382.50m³



The unorthodox shape of the attenuation tank at Clitheroe Community Hospital, which due to VersaVoid's flexibility in construction, was simple to assemble and install



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Specialist Considerations: Loading Compliance

Due to VersaVoid being independently tested according to CIRIA guidelines (and by two separate institutions), ESS were able to provide all of the specified test data. The information provided complied with all the necessary documentation such as CIRIA C680, 609 and 697. All tests (including compressive strength, lateral strength and long term creep tests) complied with CIRIA guidelines as outlined in CIRIA C697 and following defined methodology outlined in C680. On top of this, ESS supplied its own in-house test data.



Summary:

- VersaVoid provided a design that met all of the stringent requirements set by the local authority including CIRIA requirements for both loading and access.
- The modular configuration allowed for a flexible, ideal site solution that worked with the new drainage layout, along with other existing infrastructure both above and below ground level.
- VersaVoid's simple modular assembly meant the demands of the unorthodox tank shape were easily met and that the tank was installed swiftly, allowing a much more economical solution to be found and ensuring that the running of the hospital was unaffected.
- The load bearing capabilities and high void ratios of the VersaVoid provided the most efficient solution for a site with a heavy loading potential such as this, and one with restricted space.

