Johannesburg +2711 922 3300
Pinetown +2731 717 2300
Cape Town +2721 531 8110
East London +2743 727 1055
Port Elizabeth +2741 453 0755
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CASE STUDY

Charlestown Housing Development: Septic Tank Leach field Construction. August 2018

Client: The Newcastle Municipality

Contractor: Pilcon Projects

Consultant: Makhaotse, Narasimulu & Associates

Product: Infiltrator Quick4 Chambers…..3 079
Infiltrator Multiport End Caps.....112

For Kaytech: Yugeshnee Naidoo

Charlestown lies about 45 km from Newcastle and is a small settlement situated at the top of Laing's Nek pass on the edge of the escarpment between Newcastle in KwaZulu-Natal, and Volksrust in Mpumalanga.

A new housing development forms part of the eventual 1 200-unit Charlestown Housing Project in the Newcastle Municipality's Ward 1.

This development, when phase 1 is complete, will comprise of 500 residential units, and will ultimately require an on-site sewage treatment plant which will be considered at a later stage of the project.

Phase 1 however, required a temporary measure to cater for the sewage outflow from the 500 units, as this was already in the construction phase. A septic tank and leach field (french drain) soakaway system were chosen to cater for this.

This required the leachfield system to be coupled to an adequately sized septic tank system. The conventional french drain which usually comprises of stone and pipe in a trench was considered but rejected because of the economic impact of transporting crushed stone to the site from a distant source.

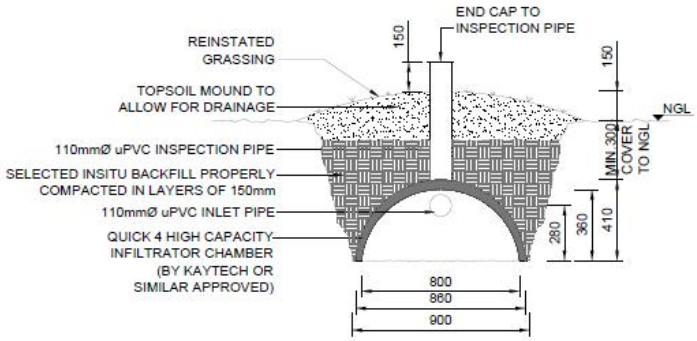
The feasibility of the project required the engineer to find a solution that would perform in the same manner as a conventional french drain, so Kaytech was approached to assist with an alternative.

Conventional French Drain Structure

Kaytech proposed their "Infiltrator™ "chamber system as an alternative to stone-filled trenches for the leach field.

The Infiltrator Chamber is a pre-manufactured open underground system that acts as a void former and direct replacement for crushed stone drainage media in conventional stormwater and wastewater attenuation schemes.

To ensure the system was designed for adequate handling of the volume of leachate estimated, the engineers conducted a series of standard percolation tests and gathered geotechnical information on the allocated area where the leach field system would be placed.



Cross Section through the Alternative Infiltrator™ Chamber Layout

This information was used in conjunction with the allocated outflow per housing unit to design the Infiltrator chamber system as an alternative to the conventional stone drain system incorporating reduction factors per the SABS 10400 – 190 design code.

Kaytech's Infiltrator chambers were installed as the leachfield system. Pilcon Projects installed 3 757m of the system, incorporating 3 079 no. Quick 4 chambers.

Installation was simple with each chamber clipping on to the next and laid into a trench with a 2.5m centre-to-centre spacing between adjacent rows. This meant that the contractor could excavate multiple rows and place the chambers with ease.

At the end of each row of chambers, a Quick4 end cap was fitted to ensure the void space was maintained and not contaminated with soil from either end, thus reducing the efficiency of the drain.

To ensure correct installation, Kaytech's engineer trained the contractor and his team on site in working with the system.

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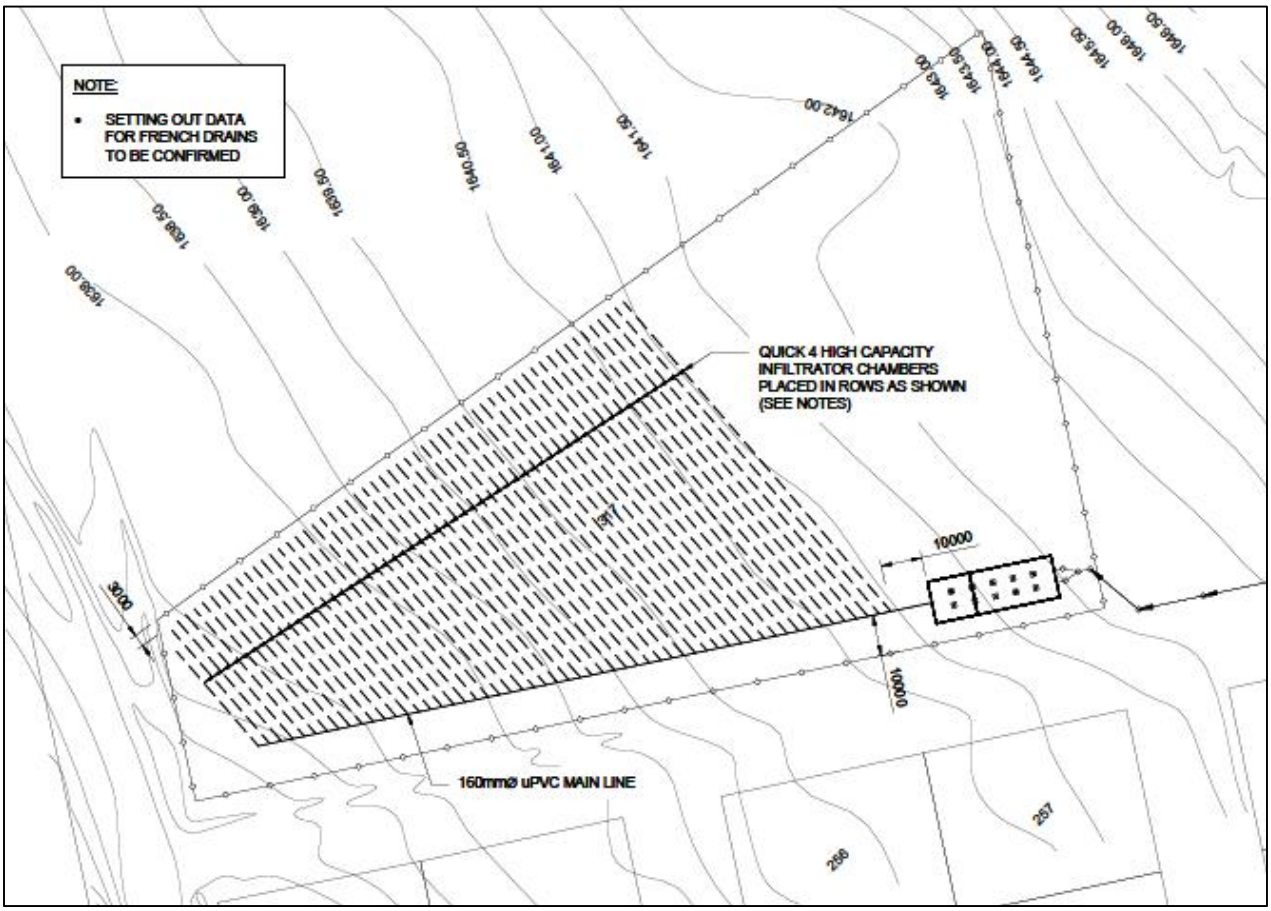
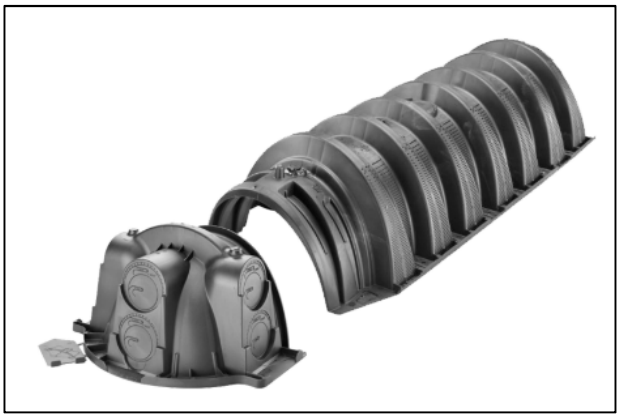


Plan Layout of the 3 079 Infiltrator System Chambers at Charlestown



View of the Infiltrator Quick4 Chamber and End Cap System as Used at Charlestown

The Infiltrator system chosen provided a least-cost solution for handling the volume of wastewater that would be discharged from 520 homes. For more information see http://kaytech.co.za/product/infiltrator/

Typical Infiltrator Trench at Charlestown