The Olivedale retirement site is located on a slope and therefore the main aim of the retaining walls was to retain earth embankments and create platforms on which to build the units. EIS worked closely with the professional team to make sure all requirements of the client were met. Not only did the proposed plans fall within the original budget, but it also offered a faster construction time than the original proposals. The facings and precast concrete blocks were chosen carefully to give a friendly and more aesthetically pleasing look and feel to the development.

The initial design was a conventional reinforced concrete retaining wall which is very expensive and time consuming to build. As an alternative we proposed a geosynthetic reinforced soil, InfraBlok™ 350, split face, Multi-blend retaining wall. The maximum height of the wall is 8m, with a face angle of 85°. A blanket drain subsurface drainage system was installed to accommodate the subsurface water. High tenacity polymer coated polyester reinforcement was used as soil reinforcement. A multi story building was constructed 1.8 meters from the top edge of the retaining wall.

Various Terrace Blok® 300, split face, Multi-blend retaining walls, with face angles of 75° were constructed. The open type block allows for plants to flourish when planted, and this gives a softer and greener look and feel to the site. The heights of the walls range from 2m to 7.5m. All the walls have geosynthetic reinforcement.

Except for the tight budget and time constraints, there was another catch. Two houses were already constructed on top of a 3m high embankment and EIS had to come up with a plan to build a retaining wall without causing damage to the existing structures. A 4.5m high retaining wall also needed to be established between the boundary of the estate and a row of houses, which granted limited space to work in. The best suitable solution was a cunning design combination between a concrete reinforced retaining wall and geosynthetic reinforced concrete block retaining wall using Infraset InfraBlok™ 350, split face.
Hannes Hattingh Consulting Engineers approached EIS during the design stage of the project, to construct an 85° concrete block retaining wall. The purpose of the wall was to retain the fill embankment for a Shoprite Checkers which was constructed 1m from the edge, at the highest section of the retaining wall. The height of the retaining wall varies from 1.5m to 6.5m. Infraset InfraBlok™ 350, split face, Sahara was used for the facing. High tenacity polymer coated polyester reinforcement was used as soil reinforcement. EIS worked closely with Infracor to finish the retaining wall at the same time as the platform.

Infraset Terrace Blok® TB300, open face, Grey concrete block walls were constructed at critical sections on the cut embankment face. There was a high amount of subsurface water on the site and water naturally filtered through the embankments. A bidim and stone blanket drain were installed behind the geosynthetic reinforced backfill, to drain the water to subsurface drains in front of the retaining walls.
The property area was very restricted and EIS had to make the most of the available space. An 8m high wall with an 85° face angle was the solution. The embankment was cut back 5m to create space for the geosynthetic reinforcement required. Wickdrains, together with a collector drain was installed against the back face with outlets through the wall face.
The Grove shopping centre on the corner of Lynwood and Simon Vermooten road is a hustle and bustle of activity. The task of building a retaining wall was tricky due to the existing Telkom services that were in close proximity to the wall. Time was also in short supply. The creative solution was to use a Terrace Blok® TB 300 and TB 490 retaining wall with a 70° face angle with heights that vary between 2 and 6.5 metres. The soil was geosynthetic reinforced and a subsoil drain was installed behind the retaining wall face. The purpose of the wall is to retain the pavement that is next to Simon Vermooten drive and access to the parking areas.
During the tender stage of this project, EIS presented an Infraset RidgeBlok™, closed face retaining wall with geosynthetic reinforced soil as an alternative to the conventional concrete retaining wall. This choice of wall is firstly economically more viable and secondly faster to construct. The wall reaches a height of 8.5m and has an 85° face angle. The ultimate goal was to design a wall that could carry the load of a concrete beam for a slab that forms part of the building.

An existing sewer line restricted the construction of a normal geosynthetic reinforced soil concrete block retaining wall, therefore EIS had to come up with another strategy. The result was double skin concrete blocks, with short lengths of geogrid and cement stabilise soil to retain the embankment slope. As the front face, Infraset RidgeBlok™, open face configuration was used.

A 3.5m high Infraset Terrace Blok® TB300 geosynthetic reinforced wall was constructed around the lower level of the site, to retain the fill embankment. A parking area will be built on top of the wall.
For this undertaking an attenuation channel had to be built in a soggy marsh area. The dilemma that EIS faced was that it had to be built during the rainy season within a tight time schedule, as the first phase needed to be signed off before second phase of the project could start. The answer was to divert the marsh water temporarily to drain the work site, while the permanent channel was being built. The eventual channel is 160m long, 1.8m deep and 15 m wide, built with Infraset InfraBlok™ 425, Grey.

During the process unforeseen rock bolder outcrops couldn’t be removed, so the design had to be customized to facilitate this. The foundations of the wall were anchored steel reinforcing bars epoxy into the rock outcrops. Gabions were also installed across the channel to attenuate, or act as energy breakers.

In phase two of the project flexible retaining walls were built instead of solid concrete walls to save costs and time. The walls were constructed with Infraset Terrace Blok® TB 190, rock face, and InfraBlok™ 350, split face, Multi-blend.

It required a great deal of co-ordination for the contractor, plumber, electrician and civil earthworks contractors to work on the site simultaneously to reach targets and in the end the desired result was achieved.
Design and construct stormwater management, retaining walls, erosion protection and repair side slopes around bridge abutments without interrupting the flow of traffic. An additional challenge was that the area was not cordoned off. Stone pitching was done from the engineers design.
Challenge: Time constraint and restricted access to the area to install the Geosynthetic Clay Lining (GCL) during the rainy season.

Scope of works:
Two retention ponds lined with GCL
Flora Clinic Parking Area
Contractor: Tarring Co
Client: Lifemed Clinic
Duration: 1 month
Area: 4000m²
Approximate value: R1.6 million

Challenge: Time constraints and inclement weather.

Scope of works: Construction of Concrete block retaining wall, C4, base, interlocking paving and installation of stormwater system.
Italian Club
Client: ADvTech Group
Contractor: CPMS Construction
Consultant: BMH Africa
Time: 3 months
Total area: 2200m²
Approximate value: R 2.6 million

Access road to parking area including all layer works and surfacing, building of platforms and instalment of bulk services i.e. drainage.
N1 (Le Roux bridge and Nelmapius approach)
Main Contractor: Grinaker LTA
Consultant: BKS
Client: Sanral
Duration: 13 days
Approximate value: R 650 000

Challenges: Time constraint (had to be finished over builders holiday) and inclement weather.

Scope of works: Backfill bridge approaches and construct layer works to join bridge.
**Challenge:** The job had to be done in a shortened time span because it was done in a residential estate and residents then had restricted access to their units.

**Scope of works:** Removal of clay, import layer works, installation of new subsoil or stormwater system.