

**OCEANS UMHLANGA MALL
DURBAN, KWA-ZULU NATAL , SOUTH AFRICA**

Vertical Walls with Concrete Facing Panels

Problem

Oceans Umhlanga is one of KZN’s iconic retail parks. The mall development faced significant challenges, including the requirement for well-engineered retaining structures for large cut embankments at the rear of the site. The retaining structure needed to be vertical and form part of the superstructure's final aesthetic. The wall created a platform for a service road above. The design had to consider geotechnical limitations and existing municipal services, whilst the vertical wall had to be constructed within a confined space because the multi-storey building construction was underway. The retaining wall was to be designed to butt against a contiguous piled wall that was already constructed for the superstructure. Standard design codes require a minimum tieback length of 0.7 multiplied by the overall height. This was not achievable and additional measures had to be used in the form of shotcrete and soil nails for embankment stabilisation, thus allowing for the use of shorter tieback lengths without compromising structural stability. Stringent deadlines and rigorous QC & QA procedures demanded exceptional quality from design, manufacture, supply and installation with minimal margins for error.

Solution

After evaluating the geotechnical parameters, loading constraints and required structure geometry, Maccaferri provided a design for a mechanically stabilised earth wall system, Macres®. This system included heights ranging from 5-12 metres, using polymeric reinforcement and concrete panels. Collaborating with the engineers, we designed a 1,235m² structure and supplied prefabricated concrete panels to create the vertical cladding with a high-quality finish. ParaWeb™, a polymeric and inextensible soil reinforcement was selected as the reinforcement of the structural soil body. Due to its characteristics, the reinforcement was an ideal choice for highly corrosive environments. Macres® was an ideal system that offered high load-bearing capacity, long-term durability, efficient installation, and was both economical and aesthetically appealing. Maccaferri's design assistance, draughting competence, and construction supervision made the project effortless and well-engineered.

Client: Oceans Mall - GEPF & Oceans Umhlanga Retail Company (Pty) Ltd

Designer / Consultant: Sutherlands Engineers

Contractor: WK Construction

Products used (Qty.)

- Panels Reinf Panel
679m² & Un
Reinf Panel
545m²
- MonoAxial GeoGrids 24,080lm
Paraweb 2D 50

Date of construction: 03/2022 - 11/2022

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Foundation preparation



First row of panels



First Paraweb layer



Placing and compacting fill



Vertical cladding at completion



Completion