Building Durban Point Promenade

Forming part of the redevelopment of the master plan for the entire Durban Point Precinct, the newly developed Durban Point Promenade intends to ensure free and unrestricted access to the beach for all members of the public.

The new Point Promenade extends a total length of 680 m from the end of the existing promenade at uShaka Marine World to the Durban Harbour entrance. Considered the backbone of the entire Durban Point Precinct, it facilitates the high-rise beachfront development and continues the highly successful promenade on the Durban beachfront.

EThekwini Municipality and the Durban Point Development Company (as the implementing agent) appointed NAKO ILISO as the principal agent and civil and structural engineers on the project, together with various other consultants for other workstreams.

The result is a two-level reinforced concrete structure located between the erosion line and the building setback lines. It provides a public landscaped promenade on the upper level with a public car park and public beach amenities, along with the Point Watersports Club and Seinne Netters, housed underneath.

Design and construction highlights

Developing Durban Point Promenade required several innovative construction methods.

Due to the existing sandy-type soils and the absence of bedrock at depths greater than 25 m, Continuous Flight Auger (CFA) type piles were designed as shaft friction piles to varying depths up to 18 m.

The promenade foundations consist of pile caps and ground beams. All pile caps are supported by at least two 600 mm diameter CFA piles, which accommodate the large column loads, while the ground beams are supported by 450 mm diameter CFA piles. Ground beams have been designed to reduce the spans of the lower promenade and to provide lateral bracing to the pile caps.

An important design consideration was the establishment of the level of the lower floor of the promenade infrastructure to deal with the anticipated wave run-up levels identified in the coastal processes study.

The proposed ground-floor level of 3.8 m MSL (mean sea level) will be able to accommodate the 100-year return period storm event with the aid of a vegetated dune buffer on the seaward side of the promenade, except for the northern end where a run-up level of 4.35 MSL is anticipated. In this area, the northern ramp to the promenade will mitigate the anticipated wave run-up levels. Sheet piling will provide further shore protection throughout the lifespan of the structure.

The lower-level slab has been designed as a reinforced concrete suspended slab due to the low bearing capacity and cohesionless sand types that are constantly affected by the fluctuating water table. Conventional permanent formwork has been replaced with a cement-stabilised in-situ material alternative.

The upper level has been designed as a pre-stressed flat slab to accommodate the large spans. The curved profile of the slab edge presented a challenge for the end blocks, instead requiring recessed anchor blocks. The pre-stressing supplier undertook the design, supply and installation of their unique DYWIDAG Bonded Post-Tensioning System.

This system provided for increased spans by reducing the number of columns, thereby creating a larger column-free area, which allows for better manoeuvring of vehicles in the parking areas, as well as better utilisation and unrestricted views within the private facilities. Drop panels have also been designed on the internal spans of the second-level slab to account for punching shear.

With a construction cost of R305 million, Durban Point Promenade has served to reverse the negative perceptions that have plagued the entire Point development, through the provision of well-accepted and significant physical infrastructure that preserves public access to the entire beach. 35