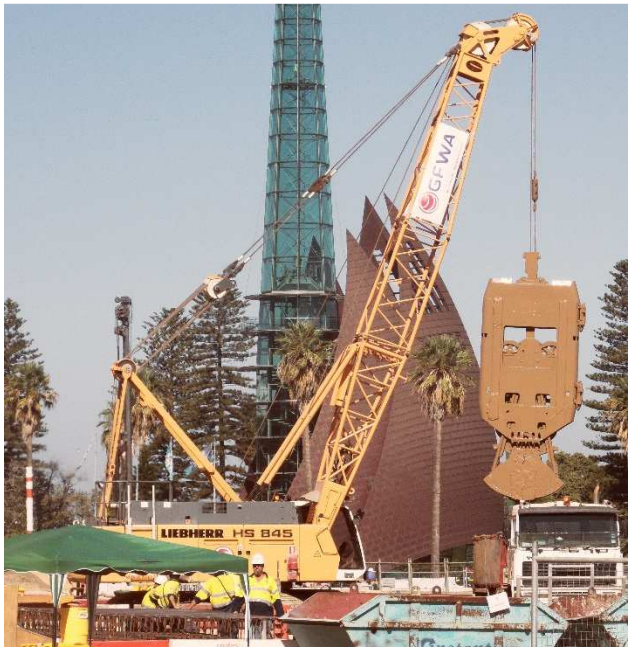
ELIZABETH QUAY INLET WALL

DIAPHRAGM WALLS



Owner: Metropolitan Redevelopment Authority
Managing Contractor: Leighton-Broad

Specialist Contractor: GFWA

THE PROJECT

Elizabeth Quay is a $440 million project that will return the city's focus to the iconic Swan River and enhance Perth's reputation as one of the most liveable cities in the world. It is the centre piece of a bold plan to revitalise central Perth. Delivered by the State Government and supported by the City of Perth, Elizabeth Quay will cover nearly 10 hectares of prime riverfront land in the heart of the city. The project will create a magnificent precinct featuring a 2.7 hectare inlet surrounded by a split level promenade, shops, cafes, restaurants and other entertainment venues.

The promenade will be constructed on an existing old landfill with various thicknesses and heterogeneous materials mixed with sand and land reclaimed from the Swan River. An island that will be connected to the promenade by a pedestrian bridge will also be reclaimed from the River. The uncontrolled fill is overlaid by very soft and highly deformable Swan River Alluvium, and multi layers of the Guilford Formation with various thicknesses and elevations.

The approximately 1 km long inlet wall retains the ground at the promenades and the Island. The astounding and unique architectural geometry and layout of the wall with multiple small radius curvatures ranging from 1.9 m to 3. 3m was a challenge both for design and construction.

THE ROLE OF GFWA

GFWA was awarded the design and construction of the Inlet Wall using cantilevered diaphragm wall technology.

The project's 100 year design life, ground heterogeneity, high groundwater level, presence of large size boulders, stringent design criteria and alignment tolerances, continuous change of wall orientation with small radii, and a tight construction programme all made the project especially challenging.

Diaphragm walls, typically 0.6 m thick and exceptionally 0.8 thick, were installed to depths of up to 19 m to retain, in general, approximately 4 to 4.5 m of ground.

As a corrosion protection measure, in addition to utilising high strength S50 concrete, at locations where the wall surface was not covered by pre-cast fascia panels, the upper portion of the front face of the reinforcement cages were fabricated using glass fibre reinforced polymer bars instead of steel bars.

Installation of diaphragm walls was performed over a period of approximately 5.5 months using two excavation rigs.

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