

QUEENS RIVERSIDE DEVELOPMENT

CFA Hard-Soft Secant Piles + Anchors



Developer: Frasers Property
Forward Works Contractor: Doric

Main Contractor (Stage 1): Diploma
Specialist Contractor: GFWA

THE PROJECT

Queens Riverside Mixed-Use Development is located on the site of the former East Perth bus depot, bordered by Hay Street and Adelaide Terrace, on the Swan River foreshore.

Four plots of this new development have been sold to Frasers Properties. The Frasers' site includes up to 23 storey developments, incorporating residential, restaurant and retail uses and a hotel.

While original ground level was at about RL +2.7 m, the new development was to include a basement requiring excavation as deep as RL -4.5 m. This level was below groundwater level. Also, the positioning of the site respective to adjacent streets, buildings and infrastructures necessitated the construction a retaining structure for supporting the ground at the periphery of the excavation.

While Stage 1 of Frasers' development included two plots, it was decided to construct the retaining structure of both stages as part of the initial phase.

The geotechnical investigation reported that the ground was composed of multiple layers of clay, sandy clay and clayey sand down to the depth of about 20 m.

THE ROLE OF GFWA

GFWA was awarded the design and build contracts for constructing the retaining structures and installing the temporary wall anchors of the four plots.

The hard-soft pile retaining system was designed and constructed down to a maximum depth of about 11 m from the original ground level. In this secant piling system initially every other pile is installed without reinforcement as a filler element. Then, reinforced piles are bored and installed between the fillers as structural elements.

Two rows of anchors were installed during the bulk excavation works of Stage 1. The anchors were drilled through the soft piles and connected to the wall face by walers. Limitations enforced by council regulations regarding minimum depth of anchors and the minimum clearance required from an adjacent gas pipeline required special design considerations. As the anchors were designed as an active system, each anchor was pre-stressed according to the specification.

This scope of the project included 5,335 m² of hard-soft walls composed of CFA piles with a diameter of 600 mm, and 516 anchors (Stage 1), 9 to 12 m long and 1030 m of walers (Stage 1).