

# CAPITAL SQUARE

Cement-Bentonite Cut-off Wall, CFA Piles, Barrettes & Anchors



**Developer: Saville Australia**  
**Main Contractor: John Holland**

**Specialist Contractor: GFWA**

## THE PROJECT

Located on the historic site of the former Emu Brewery at the corner of Mount Street and Spring Street, Capital Square is set to see the creation of a city within a city, a lively residential and commercial hub in the heart of Perth's CBD. Capital Square will see 41 levels of luxury residential apartments, making its mark on the skyline as one of Perth's tallest residential towers.

The geotechnical investigation report indicated that the ground did not have sufficient capacity to support the high point loads of the tower.

To facilitate excavation along Mounts Bay Road and the sloped Spring Street and to cut off the ingress of groundwater from a natural spring into the excavation, specific geotechnical measures were necessary.

Prior to the commencement of foundation works, the main contractor was required to remove more than 70 timber piles that supported the previous structure.

## THE ROLE OF GFWA

GFWA was awarded the design and construct contract for the retaining walls, cut-off wall and bearing system.

A total of 47 barrettes, each 2.8 x 0.8 m, with depths to 26 m were installed to support the tower's very high tower, in excess of 20 MN.

Numerous timber piles were unable to be removed from the Spring Street boundary, as such a bespoke design for the retaining wall was required at this location. GFWA proposed a composite wall of 120 hard-soft secant CFA piles and 6 diaphragm wall panels, with timber piles bored through during installation.

No anchors were used to support the secant pile system in shallow excavations; however up to 3 rows of anchors were implemented in the deep excavation area.

Given the site's proximity to the Swan River, and a natural spring being present on the site, a cut-off against ground water ingress was required. To provide this seal GFWA constructed a 600 mm thick plastic cement-bentonite wall, socketing 1 m into the underlying clay. Testing of samples taken from the wall demonstrated that the wall permeability bettered targets of  $1 \times 10^{-8}$  m/s required by the project specification.