

The Estate @Bangsar South

The Alternative Design of Piling and Retaining Wall and Construction Challenges

(By Mr.Kent Gu, Project Manager and Ms Carmen Ngio, Sr. Design Engineer) (2018 Jan-Mar)



Site Layout

Project Introduction

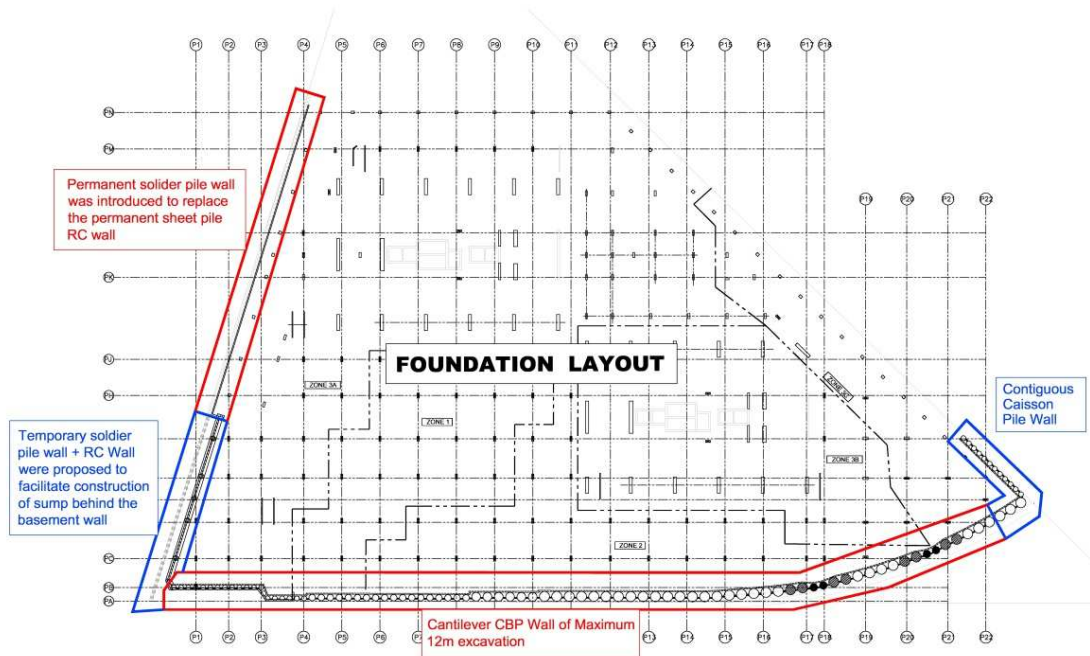
THE ESTATE is a project by Bon Estates Sdn Bhd. The project is located at Bangsar South and the development comprises of 2 blocks luxury condominium with 46 storeys and 4 1/2 storeys podium basement carpark. The foundation and retaining wall is under Contractor's Alternative Design which consists of 272 numbers of bored pile with sizes ranging from 600mm to 2200mm diameter, 59 number of 300mm diameter micropile (mainly located on slope), 98 numbers of contiguous caisson/bored pile ranging from 1000mm to 2000mm diameter. The total construction duration in contract is 14 months which including Site Clearances, Earthworks, Part of Basement 4 Reinforced Concrete Works, Cantilever Caisson/Bored Pile Wall, Capping Beam, Piling and Pilecap Works.

Alternative Design Proposal

The subsurface investigation (S.I) summary shows that soil is mainly consists of sandy silt and underlain by sandstone. For optimum design, the piling layout was divided into 20 zones based on every S.I bored hole influence area and each pile was designed to column loading

checked using PLAXIS. The alternative wall system was successfully installed with the maximum wall deflection of 30mm.

Also, part of the CBP wall was later changed to temporary soldier pile wall and permanent RC wall in order to facilitate the construction of sump behind the basement wall. The original permanent sheet pile wall was changed to permanent soldier pile wall as part of our value engineering practice to provide a cost-effective solution to client.



Wall Layout

Construction Difficulties Encountered

Since the bored piling works is on a hilly terrain, the site logistics and preparing platform for boring machines is a great challenge. The original access is too narrow and steep for heavy vehicles to use, therefore, an alternative access was constructed in addition to the original access to improve the logistics. The logistics become worse when the Section 1 was handed over to main building contractor for tower block construction.



Another construction challenge we faced is to construct the liftcore pilecap and liftpit for Tower B. We need to excavate 6m deep from existing ground level to reach the soffit of liftcore pilecap with temporary sheetpile wall as shoring system. The size of the liftcore pilecap is 33m x 13m x 3m(D) and the liftpit depth is 4.5m from FFL. The liftcore is separated into 2 casting with 1.5m height ($\approx 650\text{m}^3$) each casting due to constraint of working hour and better concrete temperature control (to prevent possible thermal cracks). The total duration from excavation ($\approx 3000\text{m}^3$ earth) until completion of pilecap casting is about 30 days.

