

Forrestfield Tunnel - Cross Passage 10

Perth, WA

Construction of a structural secant wall comprising of partially cased bored piles through variable ground conditions including partially treated soils



The project

The Forrestfield-Airport Link is a A\$1.9B project that will improve rail connections between the centre of Perth and its growing eastern suburbs. As part of this project a number of tunnel cross passage soil blocks were jet grouted by other contractors for subsequent excavation. It was found that the treated soils in the vicinity of Cross Passage 10 were highly permeable (not sufficiently grouted) and would not permit the safe and reliable excavation of the cross passage.

The challenge

The project called for an interlocking piled wall alongside two edges of the jet grouted block in order to mitigate against potential soil and water flows during the excavation of the cross passage. The excavation depth of CP10 was up to 24-25m below the surface level from which the piles were installed, necessitating a strong focus on maintaining pile alignment.

The solution

A 1300mm diameter bored pile solution using segmental casing and polymer fluid was employed with a guide wall installed to further aid pile alignment and positioning. The guide wall and casings provided good control on the initial pile verticality and polymer was successfully implemented to maintain the bore through gravelly layers down to approximately 26m in depth. At the conclusion of the works, the polymer was broken down and discharged into a reservoir, thereby negating the need for the drilling fluid to be trucked off site.

Project facts

Owner(s)

Metronet

Keller business unit(s)

Keller Australia

Main contractor(s)

Salini Impregilo-NRW JV

Solutions

Tunnelling

Markets

Infrastructure

Techniques

Cased bored piles

Secant piled walls