

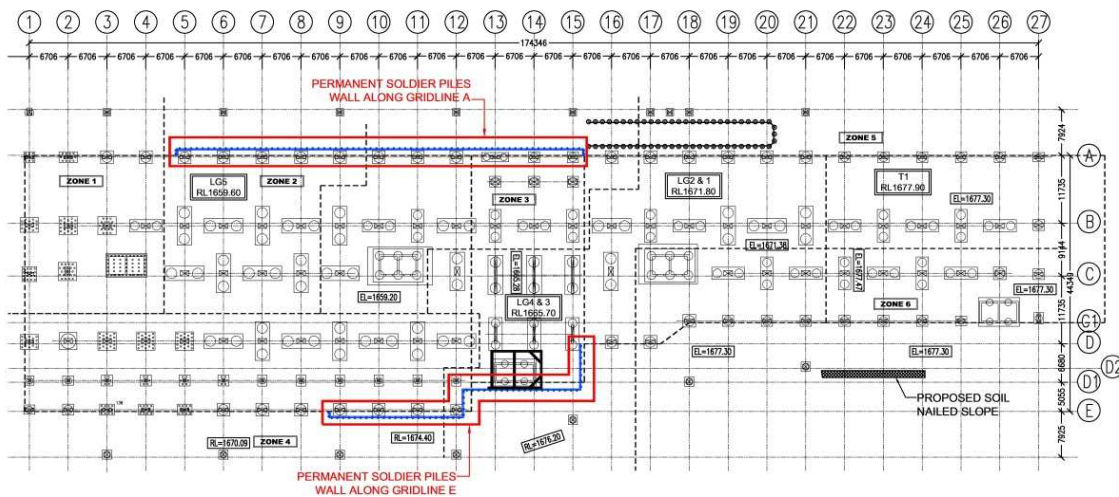
RSC9 @ Genting

Permanent Soldier Pile Wall with Soil Nail Tie Back

(By Ir. Oh Chin Wah, Executive Director and Ms. Carmen Ngio, Design Engineer) (2015 Apr-Jun)

Introduction

This project involves construction of 1 block 27 storey new staff quarter with 4 level of basement. It is located at Genting highland and partially located at sloping terrain. The proposed foundation design includes 169 number of bored pile, 361 number of micropile and 24 number of hand dug caisson on the existing slope. Due to the urgency to the delivery of the project, the total duration for the foundation is only 4.5 months, including the earthwork excavation and construction of 4 level basement wall. The interesting feature of this challenging project is the design and construction of the basement using permanent soldier pile with soil nail tie back to avoid the deep open excavation and under tight working space which is located along the existing busy main road.



Site Layout



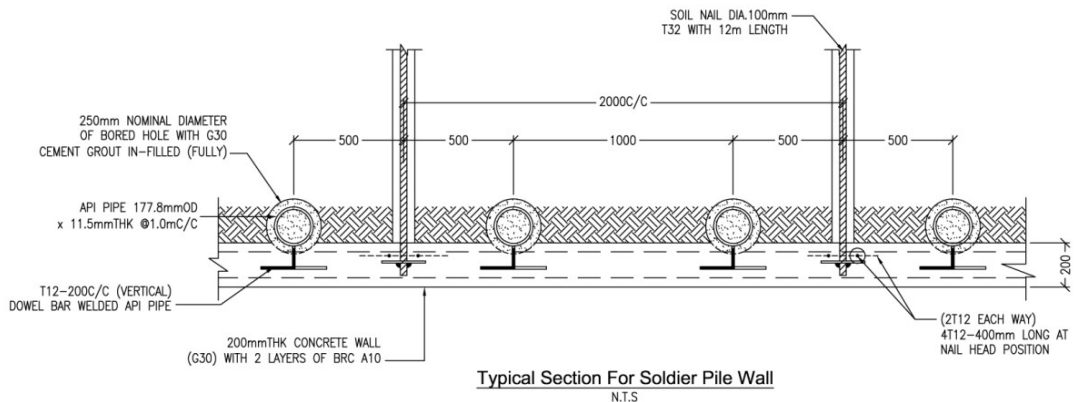
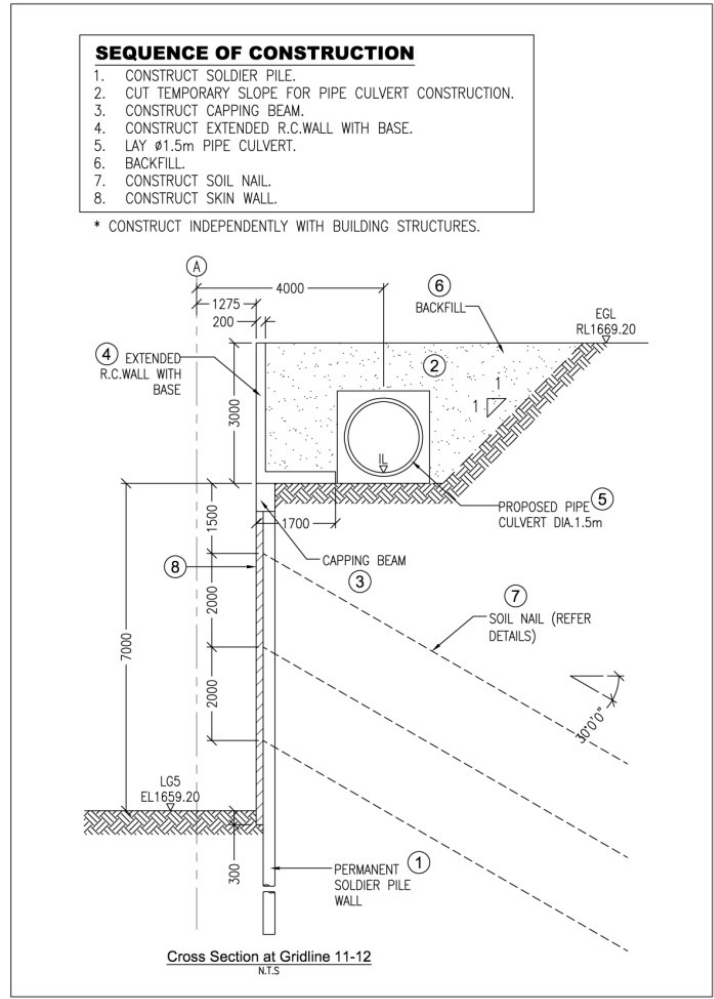
Site Photo



Site Photo

Permanent Soldier Pile Wall with Soil Nail Tie Back along G/L A

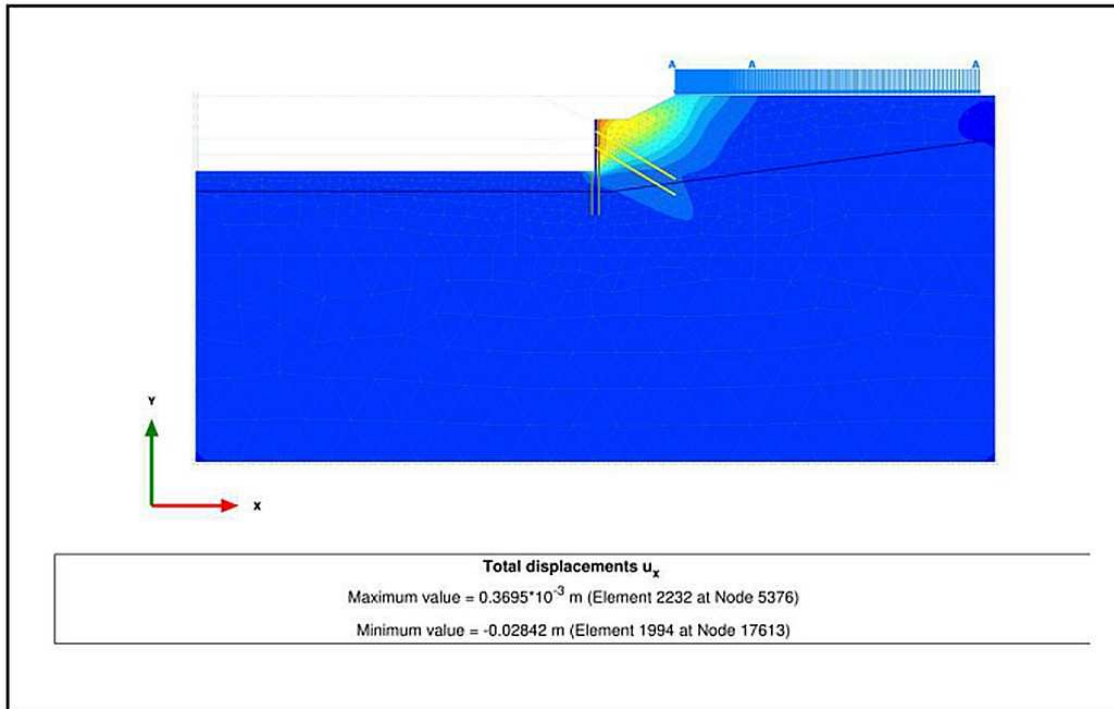
The design of this soldier pile wall is to facilitate the temporary excavation of the drain culvert installation, as well as the basement wall excavation up to maximum height of 10m. The original design of open slope excavation is not applicable in this case because of the close proximity to the main road. In order to overcome the slenderness of the soldier pile and to expedite the excavation work, multilayer soil nail tie back was adopted in this case which act as temporary support of the wall before the final strutting from the floor slab.



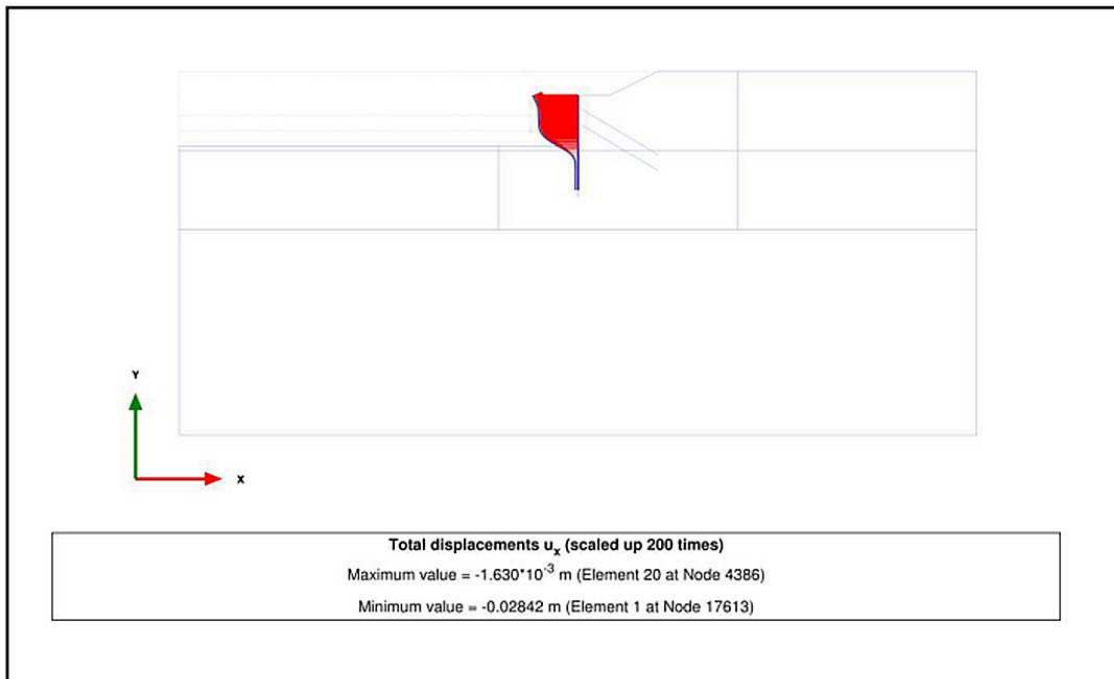
Soil data and wall analysis results using Plaxis and Slope/w

The existing soil profile is typically granitic formation as shown in the SI borehole results. It consists of backfilled soil of loose to medium sandy silt with boulders from existing ground level approximately 6m- 7m below ground. Beyond that, the soil is ranging from medium to stiff sandy silt until reaching to the rock head with sound granite at about 20m - 25m below the EGL.

BHR-8			
1667.2			
Depth (m)			
0	0		S
1.2	43%15%	grey	GN
2.7	11	pale orange	siS
4.2	>300	No Recovery	
5.7	40%33%	light grey	GN
7.2	29%NIL	light grey	GN
7.7	15	light grey	WD
9	14	orangish grey	siS
10.5	16	pale orange	siS
12	120	pale orange	siS
13.5	157	light orange	siS
15	34	pale orange	siS
16.5	32	pale orange	siS
18	157	pale orange	siS
19.5	120	pale orange	siS
21	NIL%NIL	No Recovery	
22	29	pale orange	siS
22.5	62%95%	light grey	GN
24	93%90%	light grey	GN
25.5	100%74%	light grey	GN
27	100%75%	light grey	GN
28.5	END @ 28.5m		



Stability analysis using Slope/W



Stability analysis using Slope/W



Wall in Construction



Completed Wall