

New Cable Car System @Genting

The challenges and solutions on New Cable Car System at Genting

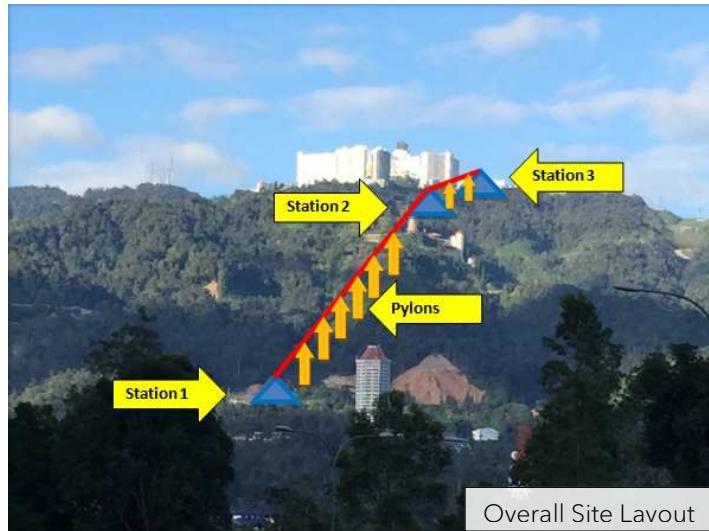
(by Mr.Jeremy Loh Kwan Yew, DGM-Contracts) (2016 Jan-Mar)

Project Introduction

The New Cable Car System is a project that involves the construction of 4 Cable Car Stations and 20 pylons starting from the New Genting Premium Outlet (GPO) in the formerly Sri Layang Cable Car premise in Awana, all the way up to the New Genting Mall at hilltop. This project is in line with the refurbishment of Genting Highlands as a new development to increase their entertainment business footprint which involves the first ever Fox World theme park in Asia. The foundation system for this projects consist of caisson piles for pylons and combination of caisson piles, micro piles, strip footings and footings for the stations.

Site Logistics

The New Cable Car system is approximately 2.8km on plan which stretches over mountains and bridges across valleys and roads. It ascends from Station 1 situated in GPO with 2 intermediate stop-over in Station 2 (adjacent to Chin Swee Temple) and Station 3 (next to Ria Apartment) before finally arriving in the New Genting Mall which houses the Station 4. During the journey, passengers of the New Cable Car will be able to witness the spectacular scene of the breathtaking tropical rain forest on seas of cloud.



Construction Challenges

There are a few challenges to overcome in the execution of this project. For a start, access foot path for construction workers needed to be cleared through the thick and treacherous jungle for alignment surveying works. Setting out the control stations along the cable car line and demarking the pylons locations one after the other proved to be quite a hassle as the works were constantly hindered by bad weather, thick fog and occasionally, some wild animals like snakes and wild boar would join in for some actions in this prestigious project.

It took us a few weeks to get the control station and the alignment right before commencing with the physical site works.

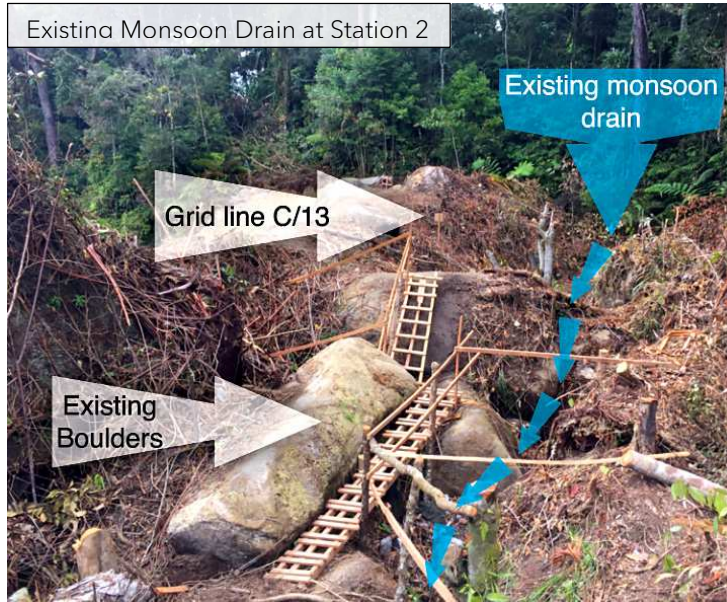


Photo taken during construction stage

Next in our way was the difficult terrain that surrounded us for the construction of the pylons. The pylon locations were not accessible for the use of mobile cranes and other heavy equipments, thus all hoisting and concreting works are carried out by manual labour only. Therefore, temporary pathway and concrete chute were used extensively to facilitate the construction works of the caisson piles for the pylon foundations.



Temporary Concrete Chute



Another challenge that we've encountered in carrying out earthworks in Station 2 was the diversion of a natural water course which was more like a stream formed through decades of rain water gushing and gully through the underlying rocky surface and boulder deposits of valley. It took more than 8 weeks to make progress as the works involved hacking and breaking a large quantum of existing boulders. Besides, there were many voids/cavities needed to

be filled with mass concrete to stabilised the overhanging rocks and the excavation of the trench final levels to receive the new monsoon drains, and mostly all were executed by manual labour as excavators are inaccessible to many parts of the area. It was difficult and challenging as the weather was not on our side when the concreting works began. There were occasions where our effort went futile when fresh placed concrete sections were washed away by 3 consecutive heavy rain-days. The hard works paid off finally, and the permanent monsoon drain worked out fine in a stormy weather 2 days after the last section of the concrete was place.



Excavation of Trench



Completed Trench



Completed Trench

In station 3, the biggest challenge was to build the entire station above the cluster of gigantic boulders sitting directly below it and there were tough times getting over and around to get the sweet spot for the caisson piles to set foot. However, the inevitable is still inevitable as we couldn't blast or break any of the massive boulders which could trigger rock falls thereby endangering the safety of traffic users of the public road below. In view of such circumstances, the Foundation Engineers had decided to accommodate their design in

consideration of such scenario by introducing transfer beams and adjustment of structural frame to achieve the desired building footprint. This would not be achievable without the essential input of survey data and other constructional information flow in order to get the best design solution.



Cluster of Massive Boulder Below Station 3



Station 3 on slope

Apart from the above, breaking and removal of tons and tons of boulders to make way for development was a huge challenge in terms of time and costs as it involved double or triple handling works. Extra than ordinary numbers of plant and machineries were deployed to break down the boulders into smaller fragments before they were practicable to be transported out to designated dump site.



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At the point of writing, this project is still on-going and no doubt there are still numerous challenges ahead of us; nonetheless, we are always prepared to undertake because we have a strong and remarkable team.