



## **Failures of Geotechnical Works in Coastal Soft Ground**

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Often the nature presents a much more complicated situation where straight forward solutions are not adequate. Having to overcome a less than ideal subsoil condition along Malaysian coastline is one example confronting a geotechnical engineer.

The evening talk on “Failures of Geotechnical Works in Coastal Soft Ground” was organized by the Geotechnical Engineering Technical Division (GETD) on 9 April 2015. The talk was delivered by Ir. Chen Chean Sin. A total of 39 participants attended the talk.

Ir. Chen gave an introduction on subsoil condition along the coastline in Malaysia. “Generally, the subsoil composed of Quaternary deposits of thick soft clay”, he added. “Geotechnical works are difficult to be carried out in this type of ground and usually pose many problems. Failures are not uncommon especially when the subsoil is very soft and thick.”

He pointed out that failure could happen during the construction stage and after the completion of works. The speaker shared with the audience 4 case histories of geotechnical works failure in coastal soft ground.

### ***Four case histories***

In case 1, there was excessive pile movement for a jetty project during construction stage. The installed piles moved and tilted excessively after completion of the pile installation works.

In case 2, there was failure of a quay wall for a marina project during construction stage. The soft clayey soil was designed to be dredged and replaced by granular soil. The quay wall was founded on the granular material. During backfilling, a stretch of the quay wall moved excessively.

In case 3, there was failure of submerged box culvert for a water intake project a year after the completion of the work. The box culvert was designed to be supported on piles and buried below seabed. Construction and installation of the box culvert was successfully done and

later commissioned. Failure was noticed some 12 months later where a stretch of the box culvert was found missing.

In case 4, there was failure of contiguous bored pile (CBP). A stretch of some 100m long CBP moved excessively during the construction stage.

Ir. Chen offered lessons learned from the above 4 case histories.

Learning from past experience, two types geotechnical problem in very soft clayey deposit were discernible: the instability of the subsoil deposit; and the long term excessive settlement. “These two common problems not only need to be considered during the design stage, but also to be taken care while the construction work is carrying out at site,” he added.

