

C-19: Shot-create tunneling in shallow weathered rock

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This study mainly focuses on a new outfall from existing holding basin to the sea at Thai Oil Refinery Plant, Sriracha, Chonburi. It consists of small shallow shot-create tunnel in a strongly jointed weathered quartzite, named as NOS tunnel. The excavation was carried out by using road header and shot-create as principal support member. It is the first tunnel to be constructed with this technique in Thailand. From Sta. 0+560 to Sta. 0+375 the NOS tunnel consisted of moderately weathered quartzite as full face rock and other parts with mixed face condition having soil and highly to completely weathered quartzite. Slow to fast travelling ground response was observed in mixed face whereas full face rock showed firm ground response. The ground movements drastically increased due to high water pressure which resulted from heavy rain. Full face rock gave rise to lowered surface settlement values while mixed face condition gave comparatively higher values and exceeded allowable settlement value of 2mm. Two problems that occurred during tunnel excavation: a roof collapse due to weak soft strata and face collapse almost along a vertical joint plane which was filled with clay/silt soil.