ABSTRACT

Rob floods (flooding due to overflowing of sea water) is a common problem in the Port of Tanjung Emas Semarang. Over the years the floodwaters become the main problems that interfere the loading and unloading activities at the port. The very soft soil of subgrade causes settlement that make the sea water level is higher than the mainland port, so the sea water entry to the mainland. Presently, Semarang Container Terminal (TPKS), located at the Port of Tanjung Emas Semarang, will be expanded and reclaimed. In order to overcome the settlement problems on land reclamation, alternatives of soil improvement method are necessary to be carried out.

This final project aims to plan the high initial of embankments due to the soil settlement and soil improvement plans with a combination of preloading systems and PVD to accelerate the consolidation time. Concrete micropile, geotextile, combination of concrete micropile and geotextiles, or steel sheet pile; are used as the soil improvement alternatives for increasing the soil stability.
In the term of soil improvement method by preloading and PVD system combination, the thickness of accumulation for preloading system is 50 cm per week. The PVD is to be driven until 30 m depth with a triangular pattern and spacing 1.3 m. In the PVD installation plan, consolidation time to achieve the degree of consolidation (U) 95% is 24 weeks.

The calculation of soil improvement alternatives using rectangular concrete micropile 25 cm x 25 cm obtains 100 pieces per meter of concrete micropile which single micropile has 27 m length. The calculation of soil improvement alternatives using geotextiles obtains 25 layers of geotextile type Woven High-Strength Polyester PET 600/100. The alternatives combined by concrete micropile and geotextiles obtain 40 pieces per meter of concrete micropile which single micropile has 27 m length and 16 layers of geotextile. And the alternatives using steel sheet pile obtain 5 rows of steel sheet pile.

**Key words:** Semarang, TPKS, settlement, preloading, PVD, concrete micropile, geotextile, steel sheet pile.