

CHAPTER 1

INTRODUCTION

1.1 Background of The Study

The bridge is the important public facilities which has many functions such as for people moving, distribution of goods, traveling, etc. Especially on PPTR. PPTR is one of Trans Java Toll Road network which is connected with Kanci-Pejagan Toll Road and Pemalang-Batang Toll Road. The Sidokaton is one of the box pedestrian in Tegal city and it is part of Penjagan-Pemalang toll road with 135,88-meter length. It's located in Mergadana, Tegal City. Before the abutment of slab on pile there is a higher level of the road, that's why the toll road must have a good condition when it passes by vehicles, because it is included on the first class of the road explains that the road must give the vehicles to pass with a high speed until 60 km/hours up to 80 km/hours. It means that the highway condition before reaching to the bridge area, it must have a good condition of the highway especially the land condition. The land condition must give smooth effects and it must give the vehicles on the same speed to go to the bridge in order to keep their speed and safety reasons. The land needs upgrading to higher levels on overseas the bridge area before both of abutments. The landfill process needs to have a long time enough in order to get a good landfill quality and avoiding the land subsidence after upgrading the landfill after. And the premier consolidation needs to have long time enough in order to wait the moisture contents under the soil comes out. After that, the soil conditions will fall back again but not faster enough likes the premier consolidation because there is no moisture content beneath the soil or the base of stiff soils.

On the vertical alignment before reaching the bridge, it has a geotechnics and geotextile concepts in order to fix the land problems from existing soils and giving a great consolidation without waiting too long time. But, it still

needs to have a long time because the landfill process has to do per layers and waiting several days before adding the landfill on the top of landfill before. Besides that, geotechnics and geotextile concepts need to have several days more than landfill consolidation. The other problems like demolishing one house that located on mid of this road before the bridge was delayed before. And it needed to have a long negotiate to demolish it. after the landfill process and premier consolidation were finished and also the pavement was finished, there is a like landslide on the corner of the highways. And it was shown that the landslide looks like go to north. The landslide causes the normal ground level has a quite different with the base ground level from existing level. The bridge also has a slope angle and the girder likes crossing abutments and piers. Actually, the west sides on rise of the road has a landslide as well before landfill was finished and it was hold by making the slab on piles in order to make safety reasons and making it short time to finish it. The west side has a landslide on its south because the road tends to face on southeast with 135 degrees angle. And the east side has a landslide tends to face on northwest. That's why the technics of landfill is needed to modify and decreasing the impact of landslide in order to make it smoothly with no risks.

1.2 Formulation of The Problems

As a background that has gotten from the problems, then it needs to mentions several questions in order to open the case and rolling back of the case history.

- a. How to make the landfill successes with soil improvement
- b. What kind of geotechnical or geosynthetics that will be used to modify the landfill systems.
- c. How to make simulations of this concepts
- d. How the conclusions of the concepts' results.

1.3 Scope and Limitations

Every questions, discussions and answers must have limitations, especially on the paper must have limitations of the problems in order to make it simple and easy to be understood. The limitations are:

- a. Analyzing of the landfill on STA 291+100 only using Limestone, PVD (Prefabricated Vertical Drain), PHD (Prefabricated Horizontal Drain) and Geotextile simulations with Plaxis 8.2 that will help the simulation works to get certainty results.
- b. The simulation will be applied with 2 dimensions of the views with cross sections and long sections.
- c. The simulation only uses the data on east abutment at STA 291+100 with CPT (Cone Penetration Test) data which will convert to value of SPT (Standard Penetration Test).

1.4 Authenticity of The Paper

The authenticity of the paper is really original that this research before was never explored by other researchers but the theory still uses the existing theory in order to keep authenticity the theory, it will give the references of the theory and this is just expansion of the existing theory that will put on history of the case on Sidokaton at STA 291+100.

1.5 Objectives of The Study

The research must have purposes to get final results and getting a goal in order to make relevant between result and purposes. The purposes are:

- a. Identification the landfill with Limestone, PVD, PHD and Geotextile on the cross section and long section model

- b. Identification the settlement which will be happened on the construction execution, finalizing the construction and after the vehicles on traffic is working in several times
- c. Discovering the excess pore pressure results for each step of the simulation
- d. Discovering the safety factor (SF) on the landfill with any conditions due to static loads
- e. Discovering 90% of settlement time (t_{90}) for the models

1.6 Significance of The Study

In order to give advantages to the people, researches and the university, this paper will give the great value to realize this research. The purposes are:

- a. Identification the type of different soils in each level
- b. Identification the quality of landfill that will be passing by the dynamic loads and static loads
- c. Discovering the impact for the landfill by using the Limestone, PVD, PHD and Geotextile
- d. Discovering the time which uses Limestone, PVD, PHD and Geotextile taking shorter than normal consolidation and reducing the land slide caused by high water pressure impact
- e. Discovering the settlement on abutment of slab on pile by long section model.