COMPARATIVE STUDY OF HAMMER ON PILE DRIVABILITY ANALYSIS APPLIED TO OFFSHORE FIXED STRUCTURE "ZORA" JACKET PLATFORM

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ABSTRACT

Modern design of pile is an interactive process that involves consideration of structural, geotechnical and constructability. Pile drivability refers to safety of pile (no damage) and economical (using the proper construction equipment, the selection of hammer to achieve the appropriate depth of penetration and blow count that is not excessive) so that it can support the required bearing capacity. This Final Project objective is to get static soil capacity and during driving, additionally to find the accurate equipment during driving so the pile would not experienced overstress and pile refusal in soil. In this final project, pile drivability analysis was conducted using GRLWEAP2005 against 4 types of hammer MENCK MRBS 1502, MRBS MENCK 3000, MRBS MENCK 4600, and MENCK MRBS 6000 on the condition of plugged and coring by shaft factor 1, 0.9, 0.8 and 0.7. From the analysis of the static soil resistance at 58 m depth of penetration by shaft factor 1 in the plugged condition was 9477.2 kN, while for the coring conditions is 9297.1 kN. For the soil resistance during driving at 58 m depth of penetration by shaft factor 1 for plugged condition is 4652,899 kN, while the coring condition is 4500,578 kN. The pile would not experienced overstress or pile refusal by using hammer with type MENCK MRBS 3000 and MENCK MRBS 4600. Efficient equipment is selected based on two parameters: the cost and time parameter. For the time parameter, it is recommended using a hammer with type MENCK MRBS 4600 by a difference of 49 minutes early for every driving one pile. With total waiting time 900 minutes and will be installed four piles, then estimation of maximum total driving time is 3844 minutes or 64.067 hours. As for the cost parameter, it is recommended to use a hammer with type MRBS MENCK 3000 with lower rated energy, by assuming that hammer rental costs are proportional to the magnitude of the hammer rated energy and counted every 24 hours.

Keywords: Pile Drivability, Soil Resistance, Pile Refusal, Overstress
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