

THE EFFECT OF SOIL IMPROVEMENT ON INTEGRAL-ABUTMENT BRIDGE'S DISPLACEMENT

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Abstract

In this paper, soil improvement works by means of compaction method performed for the soil that have effect in Integral-abutment bridge's displacement .the main issue related to the analysis of this type of bridges is dealing with soil-structure interaction of the abutments and the supporting piles. Various soil constitutive models have been used in studies of soil-structure interaction in this kind of bridges by researchers . Emphasis is placed on integral abutment behavior, since abutments together with piers are the most critical elements in securing the integrity of bridge superstructures . with improving the soil behind of the bridge , the displacement of the bridge can be reduced and it can help the bridge to performs better.

The behaviour of the soil can be studied in PLAXIS since PLAXIS may show the results in many ways such as patterns for displacements, moment- and force distributions, the stresses in the soil.

The purpose of this paper is to investigated the influence of dry density of various soils that be gained from Compaction , in Longitudinal and transverse displacements. The bridge's results that used in this paper are from a skewed PC girder integral-abutment bridge in the State of Iowa were instrumented over a two-year period to measure structural behavior .

Keywords: soil improvement, Integral Abutment Bridges, PLAXIS , dry density, displacement

1.INTRODUCTION:

In earlier days, embankment design and construction were not given adequate attention. Embankments were constructed and left for compaction by natural process. Due to loads imposed by heavier axle loads, very high degree of sub-grade support have become necessary in present scenario which requires fast and heavy compaction by suitable compacting equipments.

The densification of soil mass, commonly known as compaction, results in an improvement of soil properties and its performance as a pavement supporting bed. Many types of compacting equipments are available nowadays for compacting different types of soils to be used in earthwork.

The construction machineries, like backhoe, dozers, graders, scrapers, JCBs and dumpers etc. began to be deployed on road/rail formation and earth dam construction works in order to complete the works in comparatively less time and expenditure.[14] Compaction of embankment soils is a key factor influencing bridge approach settlement. This paper show the results for integral abutment bridge displacement for the compaction level at a certain range of moisture contents and layer thicknesses. soil density or soil moisture values which are the two main parameters to control soil compaction performance. [2] , [3]

The most direct effect of soil compaction is an increase in the bulk density of soil. Bulk density is the mass of oven-dry soil in a standard volume of soil, often given as grams per cubic centimeter (g/cm^3). [5]

2.IMPORTANCE OF ADEQUATE COMPACTION OF EARTHWORK: