

DILATOMETER TESTS IN SAND

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ABSTRACT

The paper presents two applications of the dilatometer test in sands: control of compaction and determination of constrained modulus.

Twelve dilatometer tests were carried out before and after compaction of a 15 m high sand deposit. The tests were run as a method for compaction control and to determine the strength and compressibility characteristics of the sand. The results suggest that the compaction was effective over at least a 14 meter depth. The compaction resulted in increases in in situ horizontal stress, resistance to compression and effective friction angle.

Constrained moduli derived from dilatometer tests on a loose sand compared very well with moduli determined from backcalculations of the settlement of silos and from screw plate tests.

INTRODUCTION

The Marchetti dilatometer, because of its simplicity of operation, test repeatability and its cost-effectiveness, is a promising device provided one can rely on the derived soil parameters. In particular, the dilatometer has shown potential for obtaining the in situ strength and deformation parameters of sand deposits.

The paper gives examples of two applications of the dilatometer test in sands: control of compaction and determination of the modulus used to calculate the settlement of buildings.

CONTROL OF COMPACTION

In cooperation with the geotechnical consulting firm Ottar Kummeneje A/S from Trondheim, the Norwegian Geotechnical Institute carried out dilatometer tests before and after compaction of a sand deposit in Verdal. The dilatometer test program aimed at controlling the effect of vibratory compaction on the strength and deformation characteristics of the sand.

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