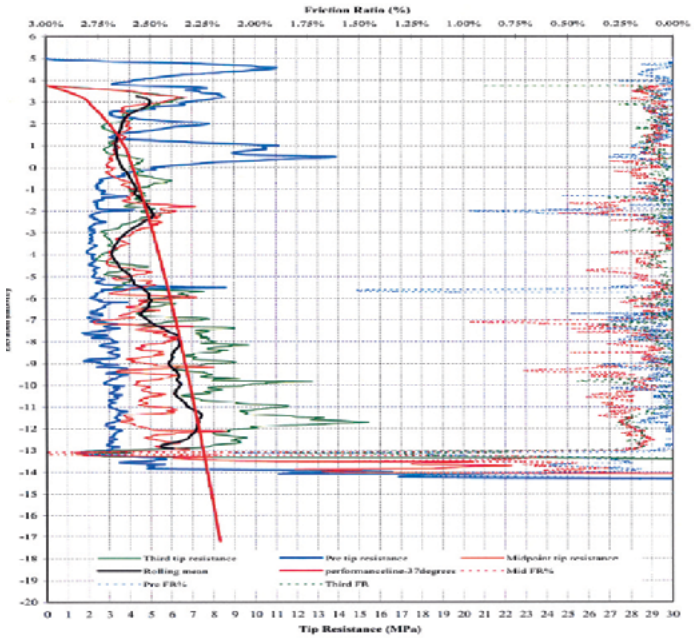

Fig. (1.32): Cone Penetration Test Readings

1.4.3 CALCULATION THEORY:

(Recommended Procedures for Implantation of DMG Special Publication – 117 Guidelines for Analyzing and Mitigating Liquefaction Hazards in California. Implementation Committee, March 1999- "Preliminary screening of Liquefaction"

Calculation of cyclic stress ratio (CSR, earthquake "Load") induced in the soil by earthquake. The ground motion parameters are: UBC zone class: 2A, (Richter Magnitude), M=6.0 & maximum ground acceleration a=0.225g at ground level or 0.15g at cap rock level (Amplification Factor = 1.5).

Calculation of cyclic resistance ratio (CRR, soil "strength") based on in-situ test data from SPT (Seed & Idriss) or CPT method (1996 NCEER workshop on Liquefaction Evaluation).

Evaluation of liquefaction potential by calculating a factor of safety against liquefaction from the earthquake load and soil strength.

(F.S. = CRR / [(1.2-1.5) CSR). There is a potential for liquefaction if

the FOS is less than unity, the layer is susceptible to liquefy and the ground densification or mitigation measures are needed. The accepted factor of safety shall be more than unity.

The GWT level selected for the liquefaction analysis shall represent selected design value by the consultant.

For CPT-Based liquefaction analysis, soil profiling according to Robertson 1996, or similar method shall be performed to highlight localities of high fines content.

Wherever liquefaction analysis is carried out with specialist commercial software, a copy of the valid licence and updated manual shall be submitted to ensure that the used methodology complies with the specifications. Wherever a spread sheet was used, a copy of the spread sheet shall be submitted with verification of its accuracy (e.g solution of published problems, etc...).

Level survey to be submitted before and after improvement.

1.4.4 EVALUATION OF LIKELY LIQUEFACTION INDUCED HAZARDS

"Special Publication 117, GUIDELINES FOR EVALUATING AND MITIGATING SEISMIC HAZARDS IN CALIFORNIA", adopted on March 1997 by the State Mining and Geology Board.

The evaluation of likely liquefaction hazard shall be carried out by competent and qualified geotechnical Engineer. The evaluation shall be based on the results of adequate number of filed tests (preferably CPTU).

Wherever, the analysis indicates significant liquefiable zones, and then the site or part of it shall be recommended for further deep compaction.

Wherever, minor, localized liquefiable zones within limited depth were indicated, and then it is important to assess the likely induced effects such as:

a) Liquefaction induced settlement of surface foun dations,

b) Surface Manifestation,

c) Loss of bearing strength of surface foundations,

d) Loss of lateral stiffness of piles,

e) Effects on life lines,

f) Any other influences...