

Project Location:

Safaniyah, Saudi Arabia

Main Contractor:

Larsen & Toubro Saudi Arabia LLC, Al Khobar

Contractor:

Foundations Building Contracting Co. Ltd. (FBCC)

Owner:

ARAMCO

Project period

Dec. 2015

Method Applied:

600 Top Feed (Vibro Replacement) Stone Columns in average 0.80 m diameter installed in a triangular grid of 2.0 m to a maximum depth of 8 m.

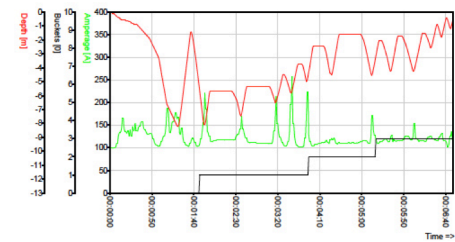
Technical Requirements:

Stone columns to found an electrical substation on a 972 m² raft. Reduce total and differential settlement under a distributed load of 165 kN/m².



View of B27 Top Feed rig.

Vibro Stone Columns Betterground Equipment		
Job Site Data:	Data for Column No: 80	
Project name: saffaniya plant	Date: 12/29/2015	Column length: 8.22 m
Area: fbcc	Start time: 3:55:01 PM	No. of Buckets: 3
Client: fbcc	End time: 4:01:50 PM	Loose Volume: 9.00 m ³
Contractor: L & T Aramco	Total time: 00:06:49	Average Diameter: 120 cm
Machine: RIG 1	Penetration time: 00:01:21	
	Compaction time: 00:05:28	



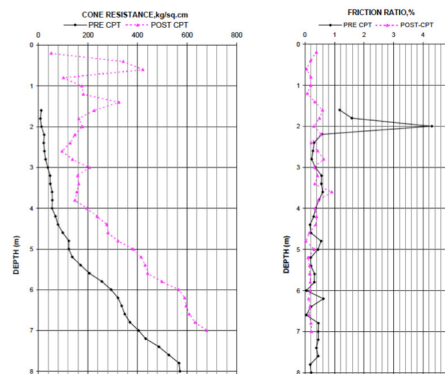
Digital QC data output from rig, showing Depth (red), Amperage (green) and Gravel Batch placement (black step curve).

The above installation protocol shows a custom work method developed to achieve both the feeding of gravel throughout the full length of the column as well as the compaction of all sand layers with lesser fines content than 10 %. Holding of the vibroflot at certain depth intervals helps to achieve optimal compaction of the cleaner sand layers. The here shown method cannot be generalized, but has to be developed specifically for each site. This makes the expertise of Betterground's Vibro Experts so valuable.

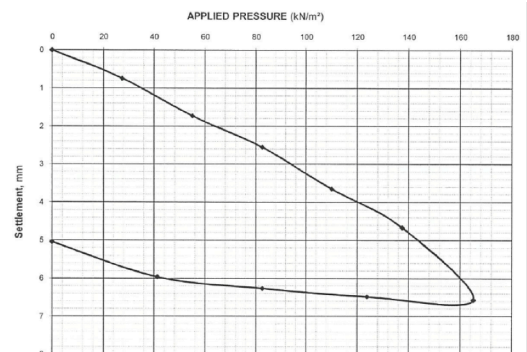
Quality Control Testing:

8 Electronic Cone Penetration Tests (CPTs), supported by digital process data from Vibro rigs.

2 Full Scale Plate Load Tests (BS 1377, Part 9)



Pre (black) and Post (pink) CPTs



Settlement of a 2.0 m x 2.0 m plate under a maximum load of 165 kN/m².

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