

## Report

Soil investigation at the site for CED Machine Manufacturing unit for HLL Life Care Limited, Akkulam.

### General Description

The site proposed is a level ground adjacent to club building of HLL. The ground was originally a sloping one, which was later on filled up by miscellaneous material. The purpose of investigation was to find the depth of fill and the safe bearing capacity of the soil below the fill. Six bore holes were taken at the site, at location suggested by Engineers Concerned, by auger boring. SPT was conducted at intervals of depth, and soil samples were collected for identification and tests. Bore charts and location plan of bore holes are attached.

### Data and discussion

At the location of BH1, near club building, miscellaneous fill material and concrete waste was found upto 3m depth. Laterite was found below upto the investigated depth of 4.8m. SPT values in it were 18 at 3.8m and 25 at 4.8m depth.

In BH2, fill soil was 4.5m thick. Hard laterite below it, has SPT value 50 at 5m depth.

In BH3, fill soil was 6.5m thick. The soft laterite below it has SPT values 11 at 7.5m and 22 at 9.3m depth. Dense soil containing large quartz grains below it gave SPT value more than 60 at 10.5m depth.

In BH4, fill soil was 3.5m thick. The partially cemented soil below it gave SPT values 10 at 4.5m and 37 at 6m depth.

In BH5, adjacent to BH3 fill soil was 5.7m thick. The weathered soil below gave SPT value 18 at 6m depth. Hard laterite found below, has SPT value 44 at 7.5m depth.

BH6 was taken in between BH2 and compound wall. Fill soil at that location was 2.3m thick. The laterite below it has SPT value 38 at 3m depth.

### **Recommendations**

The depth of fill at locations BH2, BH3, BH4, BH5 and its surroundings is too large, that open excavation may become difficult. Hence piles resting over the hard soil are to be provided. Safe capacity of piles at 5m depth in BH2 10.0m depth in BH3, more than 6m depth in BH4 and 7.5m depth in BH5 are given below.

<b>Piles Size (m)</b>	<b>Safe capacity (t)</b>
0.40	32
0.50	38
0.60	55
0.70	68

Safe bearing capacity of soil at bore hole locations are given below.

<b>Location</b>	<b>Depth (m)</b>	<b>Safe bearing capacity (t/m<sup>2</sup>)</b>
BH1	3.0	25
BH2	4.5	40
BH4	4.0	12
BH6	2.5	40



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PROJECT CED MACHINE MANUFACTURING UNIT, AKKULAM. AUGER BORING  
 HLL LIFECARE LIMITED. Date of Completion: 21.01.16

Description of soil	Depth (m)	Thickness of soil layer	Soil Profile	Standard Penetration Test Data		Lab Test data	Graphical Representation of Penetration Resistance
				Depth	N		
BH No 1							
MISC. FILL MATERIAL	2	2.5		1.5	10		
CONCRETE WASTE FILL	3.0			3.0	-		
LATERITE	4			3.8	18		
	4.8			4.8	25		
BH No 2							
FILL MATERIAL LOOSE	2						
HARD LATERITE	5			5.0	50		
BH No 3							
FILL SOIL	2						
SOFT LATERITE	6.5			7.5	11		
PARTIALLY CEMENTED SOIL	8			9.3	22		
QUARTS GRAINS & SOIL	10.5			10.5	> 60		

BORE HOLE NO. 1, 2 & 3

PROJECT CED, MACHINE MANUFACTURING UNIT, ARKULAM, AUGER BORING  
 HLL LIFE CARE LIMITED. Date of Completion: 21.01.2016

Description of soil	Depth (m)	Thickness of soil layer	Soil Profile	Standard Penetration Test Data		Lab Tes: data	Graphical Representation of Penetration Resistance								
				Depth	N		10	20	30	40	50	60			
<b>BH No 4</b>															
FILL SOIL, LOOSE	2-														
SOFT LATERITE	4-	3.5		4.5	10										
PARTIALLY CEMENTED DENSE SOIL	6-			6.0	37										
<b>BH No 5</b>															
FILL SOIL	2-														
	4-														
WEATHERED SOIL, SOFT	6-	5.7		6.0	18										
LATERITE, HARD	8-			7.5	44										
<b>BH No 6</b>															
FILL SOIL	2-														
LATERITE, HARD	4-	2.3		3.0	38										

BORE HOLE NO. 4, 5 & 6

CED MACHINE MANUFACTURING UNIT, HLL LIFE CARE LIMITED, AKKULAM

LOCATION OF BOREHOLES,

