The Afghanistan Engineering Support Program assembled this deliverable. It is an approved, official USAID document. Budget information contained herein is for illustrative purposes. All policy, personal, financial, and procurement sensitive information has been removed. Additional information on the report can be obtained from Firouz Rooyani, Tetra Tech Sr. VP International Operations, (703) 387-2151.

Revised Geotechnical Report for

NEW MINISTRY OF PUBLIC HEALTH (MOPH) CAMPUS,

Kabul, Afghanistan

USAID Afghanistan

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Submitted To:

TETRA TECH INC.

TETRA TECH

COMPREHENSIVE REPORT OF

GEOTECHNICAL SITE INVESTIGATION,

FIELD AND LAB SOIL TEST RESULTS &

GEOTECHNICAL FINDINGS

FOR

NEW MINISTRY OF PUBLIC HEALTH (MOPH) CAMPUS

Kabul, Afghanistan

Prepared By:

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1. Project Description and Background

This project consists of the geotechnical investigation of the proposed new Ministry of Public Health (MOPH) Campus located on the western side of the city of Kabul, Afghanistan.

The proposed project includes the construction of five (5) new 2-story buildings and eleven (11) new miscellaneous single-story structures on the MOPH property.

- **USAID - Afghanistan** is the Client for the New Ministry of Public Health (MOPH) Campus Project.
- **TETRA TECH INC.** is the Contractor for the MOPH Campus project.
- **OMRAN GEOTECHNICAL COMPANY (OGC)** is the subcontractor performing the Geotechnical Investigation and providing the Geotechnical Report for this Project.

OGC carried out the field geotechnical investigation during the month of April 2010. The investigation included field testing, engineering observation, borehole drilling, test pit excavation, sample collections and laboratory testing of representative soil samples. Based on the above data a geotechnical report was prepared for the above-referenced project.

This geotechnical report consists of a complete field investigation, subsurface soil description of project area, field and lab test results, engineering evaluation and geotechnical recommendation for foundations and other engineering evaluations and recommendations.

2. Objectives of Geotechnical Investigation

The purpose of this geotechnical exploration was to determine the general subsurface soil and groundwater conditions at the site, evaluate these conditions with respect to the proposed construction, and prepare geotechnical recommendations for site preparation and the design of foundations.

3. Methodology of Geotechnical Investigations

To investigate the subsurface soil conditions at the project area adequately, the boring quantity, locations and laboratory tests were determined by the Contractor's representative (Andrew High) and the OGC Geotechnical engineers.

The scope of work for the field investigation included the following:

- Twenty eight (28) boreholes to a depth of 6.0 meters below ground surface, disturbed and undisturbed soil sampling for required lab soil tests and field SPT testing with rotary geotechnical core drill rig equipped with SPT test apparatus (ASTM D-1586).
- Two (2) deep boreholes to 20.0 meter depth below ground surface. These borings were used to investigate the deeper soils at the project site, and to provide groundwater data. One of the borings encountered groundwater at a depth of 8.1 meters below ground surface. This boring was subsequently transformed into a piezometer to be used for future groundwater monitoring.
- Five (5) tests pit excavations to approximately 1.5 - 2.0 meters depth for the purpose of subsurface soil classification, grab soil sampling, field density testing and lab soil tests.
- Two sets of percolation tests at absorption sites were performed in accordance with the guidelines set forth in the International Private Sewage Disposal Code, section 404.

- Field soil resistivity testing was performed in accordance with ASTM D-57-06 at three locations on the project site (see separate test report for soil resistivity measurement by Wenner Array method, Appendix G).
- Standard Penetration Testing was performed per ASTM D-1586 at 1.5 meter intervals in all boreholes. A split barrel sampler of standard dimensions was driven into the soil from the borehole bottom using a 63.5 kg hammer falling from a height of 76 cm. The SPT hammer was mechanically lifted to the specified height and allowed to fall freely on the anvil, using an auto-trip device, ensuring a consistent application of energy to the driven sampler. The number of blows required to penetrate each 15 cm interval was recorded. The total number of blows required to penetrate the last 30 cm was recorded and is known as the “N-Value” (the the first 15 cm penetration is known as the “seating drive” and is not used for N-value determinations).
- For natural moisture content determination, the weight of soil samples were recorded in the field, using a digital scale. The moisture content was then determined by drying the sample in the lab, using the Oven method (ASTM D-2216).
- Drilling and sampling were performed under the direction of an OGC geotechnical engineering representative who maintained detailed logs of the subsurface materials and conditions encountered during the borings, and collected representative samples.
- Soil samples were examined in the field and logged/stored in sequence. Representative portions were stored in sealed plastic sample tubes after weighing. The remaining soil samples were preserved in specially constructed wooden sample boxes and transported to the OGC laboratory for storage.
- Boreholes log are presented in Appendix B. These logs provide detailed data such as material description lithology, field SPT results (N-Values) at

various depths, soil samples type in different strata and groundwater information.

4. Field and Laboratory Soil Tests

The following geotechnical field and lab tests were performed during this investigation:

A) Field Testing

- Standard Penetration Test (ASTM D-1586)
- Field Density test by Sand Cone Method (ASTM D-1556)
- Percolation tests at absorption sites

See the results of field tests on Appendix D.

B) Laboratory Testing

Disturbed soil samples from boreholes and test pits were collected at the field in wooden boxes. The boxes were checked at the laboratory and representative soil samples were selected for lab tests based on changes in type, gradation, color and other specification of the materials.

According to design requirements and type of soil samples, the following tests were performed on representative soil samples of boreholes and test pits at the Omran Geotechnical Company laboratory:

- Sieve Analysis for Soil Particle Size Distribution (ASTM D422)
- Plasticity Index (PI) Determination, Liquid and Plastic limits (ASTM D4318)
- Particle Size Analysis by Hydrometer (ASTM D-422)
- Soil Engineering Classification by Unified system (ASTM D-2487)
- Moisture Content Determination (ASTM D2216)
- Specific Gravity by Pycnometer (ASTM D854)
- Modified Proctor Test (ASTM D1557)

- Density Of Soil in Place by the Drive Cylinder Method (ASTM D-2937)
- Expansion Index Determination (ASTM D-4829)
- Permeability Test (Constant head) (ASTM D 2434-68)
- Direct Shear Test of Soils Under Consolidated Drained Conditions (ASTM D-3080)
- One-Dimensional Consolidation Properties of Soils Using Incremental Loading (ASTM D-2435)
- pH of Soil
- Sulfate Content of Soil
- Chloride Content of Soil

See results of laboratory tests in Appendices E and F.

5. Findings

5.1. Surface Condition of the Site

The project area is currently occupied by a partially operating pharmacy warehouse and manufacturing facility. There are also some Ocean shipping containers (CONEXs) and old buildings in various states of repair on the project site. A small orchard of fruit-bearing trees is planted in the southern portion of the site, but was in the process of being transplanted at the time of the investigation. For more information, see the topographical map of project area and site photos.

5.2. Subsurface Conditions (soil material at borings)

To investigate the subsurface condition of the project area, the following field work was performed:

- 30 boreholes were drilled (28 to a depth of 6 meters, and 2 to a depth of 20 meters).
- 5 test pits were excavated (each to a depth of 2.0 meters).
- SPT tests were performed at each borehole location at various depths.

The results of the above fieldwork provided the following soil data:

- The primary soil type encountered at this site is classified as ***Silt with Sand and Clay (ML, CL-ML, CL) and, to a lesser extent, Sand with Gravel and Cobbles (SM-SC-SM with Cobbles)*** (Based on the Unified Soil Classification system).
- N-Values ranged between 8 and 30, which equates to a density classification of ***Loose to Medium Dense.***
- According to the field and laboratory results from this investigation, no unsuitable, expansive or wet soils were noted in the project area
- Based on the field observations, the groundwater table during the time of the investigation was approximately 8.0 meters below ground surface, indicating that liquefaction should not be a concern at this site.

5.3. Groundwater Elevation

Groundwater was encountered in only one boring (A30) during the investigation.

Depth to groundwater encountered in Borehole A30 was measured as 8.1 meters below top of casing (TOC) on April 2010.

5.4. Summary Results of laboratory tests

The summary results of laboratory tests on representative soil samples from boreholes and test pits have shown on tables 1 to 7 as below:

Table 1. Summary results of soil classifications of soil samples of boreholes

OMRAN GEOTECHNICAL COMPANY

Soil Sample General Classification

Sample No	Borehole No	Depth(m)	Particle Size Analysis (Standard)			Atterberg Limits (Standard)			Soil Classification
			%Gravel (>4.75 mm)	%Sand (0.075-4.75mm)	%Silt & clay (<0.075mm)	%LL	%PL	%PI	USCS
1	BH # A1	1	19.16%	21.03%	59.81%	Non Plastics			ML
2	BH # A1	2	48.13%	26.91%	24.95%	Non Plastics			SM
3	BH # A1	3	24.34%	24.92%	50.74%	21.37%	17.86%	3.51%	ML
4	BH # A1	4	5.14%	35.00%	59.87%	24.78%	20.37%	4.41%	CL-ML
5	BH # A1	4.5	1.49%	27.23%	71.28%	22.30%	15.38%	6.92%	CL-ML
6	BH # A1	6	6.13%	10.82%	83.05%	21.53%	15.87%	5.66%	CL-ML
7	BH # A2	1	0.08%	7.01%	92.91%	20.74%	15.69%	5.05%	CL-ML
8	BH # A2	3	0.15%	21.65%	78.20%	20.95%	16.13%	4.82%	CL-ML
9	BH # A2	5.5	32.16%	29.17%	38.68%	Non Plastics			SM
10	BH # A2	6	5.38%	24.84%	69.78%	25.49%	20.59%	4.90%	CL-ML
11	BH # A3	1.5	2.57%	14.40%	83.03%	22.67%	17.24%	5.43%	CL-ML
12	BH # A3	2.5	0.00%	11.53%	87.47%	23.70%	18.42%	5.28%	CL-ML
13	BH # A3	3.5	2.79%	15.39%	81.83%	23.35%	18.00%	5.35%	CL-ML
14	BH # A3	5.5	1.83%	13.92%	84.25%	23.68%	18.75%	4.93%	CL-ML
15	BH # A4	2	0.66%	8.65%	90.69%	22.50%	15.91%	6.59%	CL-ML
16	BH # A4	4	0.88%	9.22%	89.91%	24.01%	19.05%	4.96%	CL-ML
17	BH # A4	6	2.40%	16.98%	80.62%	24.63%	20.00%	4.63%	CL-ML
18	BH # A5	1	1.48%	20.98%	77.55%	25.63%	20.00%	5.63%	CL-ML
19	BH # A5	3	3.27%	26.40%	70.32%	22.28%	17.78%	4.50%	CL-ML
20	BH # A5	5	2.23%	19.14%	78.63%	22.77%	18.37%	4.40%	CL-ML
21	BH # A6	1.5	1.65%	22.39%	75.96%	20.26%	16.00%	4.26%	CL-ML
22	BH # A6	4	1.65%	19.05%	79.30%	21.01%	17.07%	3.94%	ML
23	BH # A6	5	0.76%	21.28%	77.96%	21.13%	17.02%	4.11%	CL-ML
24	BH # A6	6	1.65%	19.54%	78.81%	23.23%	19.51%	3.72%	ML
25	BH # A7	2	0.86%	16.73%	82.40%	25.97%	19.44%	6.53%	CL-ML

Continue of Table 1. (Soil Classification Results)

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Soil Sample General Classification

Sample No	Borehole No	Depth(m)	Particle Size Analysis (Standard)			Atterberg Limits (Standard)			Soil Classification
			%Gravel (>4.75 mm)	%Sand (0.075-4.75mm)	%Silt & clay (<0.075mm)	%LL	%PL	%PI	USCS
26	BH # A7	4	0.64%	33.42%	65.93%	21.28%	17.07%	4.21%	CL-ML
27	BH # A7	6	15.19%	11.57%	73.24%	23.96%	17.24%	6.72%	CL-ML
28	BH # A8	2	0.99%	28.68%	70.33%	21.24%	16.67%	4.57%	CL-ML
29	BH # A8	4	0.00%	3.07%	96.93%	18.88%	12.50%	6.38%	CL-ML
30	BH # A8	6	0.62%	2.87%	96.51%	25.41%	16.13%	9.28%	CL
31	BH # A9	2	7.17%	11.97%	80.86%	26.36%	21.82%	4.54%	CL-ML
32	BH # A9	4	4.81%	26.86%	68.33%	21.29%	17.39%	3.90%	ML
33	BH # A9	5	0.23%	9.95%	89.82%	25.01%	18.75%	6.26%	CL-ML
34	BH # A10	0.7	8.14%	38.84%	53.01%	21.82%	17.50%	4.32%	CL-ML
35	BH # A10	2	2.29%	18.71%	79.00%	24.50%	17.78%	6.72%	CL-ML
36	BH # A10	3.5	2.48%	26.35%	71.17%	26.62%	22.22%	4.40%	CL-ML
37	BH # A10	5	0.42%	10.90%	88.68%	34.18%	27.66%	6.52%	CL-ML
38	BH # A11	1.5	0.77%	34.12%	65.11%	Non Plastics			ML
39	BH # A11	4	1.37%	25.31%	73.32%	20.34%	16.33%	4.01%	CL-ML
40	BH # A11	6	0.00%	1.95%	98.05%	20.60%	16.67%	3.93%	ML
41	BH # A12	1.3	1.80%	31.49%	66.71%	Non Plastics			ML
42	BH # A12	3.5	1.40%	9.02%	89.58%	23.94%	18.52%	5.42%	CL-ML
43	BH # A12	4	2.52%	15.84%	81.63%	23.84%	17.78%	6.06%	CL-ML
44	BH # A12	6	0.26%	2.75%	96.98%	25.23%	18.52%	6.71%	CL-ML
45	BH # A13	1.5	0.62%	15.17%	84.21%	24.58%	18.75%	5.83%	CL-ML
46	BH # A13	3.5	0.71%	13.34%	85.95%	23.54%	16.67%	6.87%	CL-ML
47	BH # A13	5.5	0.57%	8.48%	90.95%	19.05%	13.64%	5.41%	CL-ML
48	BH # A14	1.5	18.75%	35.09%	46.15%	Non Plastics			SM
49	BH # A14	3.5	0.11%	9.50%	90.39%	23.76%	19.12%	4.64%	CL-ML
50	BH # A14	6	4.14%	18.82%	77.04%	23.89%	19.23%	4.66%	CL-ML

Continue of Table 1. (Soil Classification Results)

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Soil Sample General Classification

Sample No	Borehole No	Depth(m)	Particle Size Analysis (Standard)			Atterberg Limits (Standard)			Soil Classification
			%Gravel (>4.75 mm)	%Sand (0.075-4.75mm)	%Silt & clay (<0.075mm)	%LL	%PL	%PI	USCS
51	BH # A15	1.5	0.26%	12.57%	87.17%	25.41%	21.28%	4.13%	CL-ML
52	BH # A15	3.5	0.40%	6.74%	92.86%	22.51%	17.65%	4.86%	CL-ML
53	BH # A15	5.5	1.37%	8.63%	90.00%	23.73%	17.24%	6.49%	CL-ML
54	BH # A16	1.5	7.43%	37.90%	54.67%	21.45%	16.07%	5.38%	CL-ML
55	BH # A16	3.5	0.00%	6.29%	93.71%	25.55%	17.65%	7.90%	CL
56	BH # A16	5.5	1.11%	8.54%	90.35%	26.71%	19.05%	7.66%	CL
57	BH # A16	6	1.41%	21.30%	77.28%	23.36%	16.67%	6.69%	CL-ML
58	BH # A17	0.7	54.40%	18.73%	26.87%	23.38%	20.29%	3.09%	GM
59	BH # A17	1.5	1.20%	16.37%	82.43%	24.88%	20.75%	4.13%	CL-ML
60	BH # A17	2.5	0.66%	11.97%	87.37%	24.15%	19.00%	5.15%	CL-ML
61	BH # A17	3.5	0.62%	10.06%	89.32%	25.33%	21.43%	3.90%	ML
62	BH # A17	4.5	0.28%	7.48%	92.24%	21.09%	16.33%	4.76%	CL-ML
63	BH # A17	5.5	0.43%	16.54%	83.03%	21.28%	15.79%	5.49%	CL-ML
64	BH # A18	2.5	0.04%	5.19%	94.77%	26.21%	18.00%	8.21%	CL
65	BH # A18	3.5	0.25%	8.50%	91.25%	25.62%	20.51%	5.11%	CL-ML
66	BH # A18	4.5	0.00%	5.56%	94.44%	24.30%	18.97%	5.33%	CL-ML
67	BH # A18	5.5	0.07%	7.19%	92.75%	24.96%	19.05%	5.91%	CL-ML
68	BH # A19	2	1.32%	30.68%	68.00%	22.75%	18.87%	3.88%	ML
69	BH # A19	3.5	2.99%	54.91%	42.11%	Non Plastics			SM
70	BH # A19	5.5	1.99%	13.06%	84.95%	23.50%	19.15%	4.35%	CL-ML
71	BH # A20	1	0.36%	20.16%	79.49%	24.38%	18.37%	6.01%	CL-ML
72	BH # A20	2.5	5.32%	21.04%	73.64%	23.63%	18.00%	5.63%	CL-ML
73	BH # A20	4	2.23%	8.15%	89.62%	29.72%	23.21%	6.51%	CL-ML
74	BH # A20	5	0.55%	10.30%	89.15%	23.46%	19.30%	4.16%	CL-ML
75	BH # A20	6	0.00%	7.78%	92.23%	30.65%	24.32%	6.33%	CL-ML

Continue of Table 1. (Soil Classification Results)

OMRAN GEOTECHNICAL COMPANY

Soil Sample General Classification

Sample No	Borehole No	Depth(m)	Particle Size Analysis (Standard)			Atterberg Limits (Standard)			Soil Classification
			%Gravel (>4.75 mm)	%Sand (0.075-4.75mm)	%Silt & clay (<0.075mm)	%LL	%PL	%PI	USCS
76	BH # A21	1.5	4.22%	50.16%	45.62%	18.61%	13.73%	4.88%	SC-SM
77	BH # A21	4	0.88%	11.67%	87.46%	26.33%	20.00%	6.33%	CL-ML
78	BH # A21	6	0.51%	3.65%	95.84%	28.15%	18.18%	9.97%	CL
79	BH # A22	1	8.78%	44.62%	46.60%	Non Plastics			SM
80	BH # A22	3.5	5.01%	40.18%	54.81%	25.42%	21.62%	3.80%	ML
81	BH # A22	5.5	0.00%	6.05%	93.95%	22.98%	17.02%	5.96%	CL-ML
82	BH # A23	1	36.13%	45.13%	18.74%	Non Plastics			SM
83	BH # A23	2	50.31%	36.21%	13.48%	Non Plastics			GM
84	BH # A23	4	2.18%	7.87%	89.95%	28.67%	21.74%	6.93%	CL-ML
85	BH # A23	5	21.11%	34.83%	44.07%	Non Plastics			SM
86	BH # A23	7	27.77%	38.97%	33.26%	Non Plastics			SM
87	BH # A23	8	46.17%	26.87%	26.95%	Non Plastics			SM
88	BH # A23	9.5	48.58%	30.13%	21.28%	Non Plastics			SM
89	BH # A23	11	24.38%	31.63%	43.99%	Non Plastics			SM
90	BH # A23	11.5	18.59%	51.81%	29.59%	Non Plastics			SM
91	BH # A23	12.5	26.66%	44.49%	28.85%	Non Plastics			SM
92	BH # A23	14	0.18%	28.02%	71.79%	32.04%	27.59%	4.45%	CL-ML
93	BH # A23	16	2.56%	40.72%	56.72%	22.24%	18.75%	3.49%	ML
94	BH # A23	16.5	6.85%	24.14%	69.01%	36.66%	31.58%	5.08%	CL-ML
95	BH # A23	17.5	0.00%	22.65%	77.35%	33.96%	29.17%	4.79%	CL-ML
96	BH # A23	18.5	0.70%	22.14%	77.16%	29.31%	23.64%	5.67%	CL-ML
97	BH # A24	0.5	34.22%	41.97%	23.81%	Non Plastics			SM
98	BH # A24	2.5	10.23%	22.73%	67.04%	Non Plastics			ML
99	BH # A24	4	39.09%	26.17%	34.74%	Non Plastics			SM
100	BH # A24	5	33.12%	29.60%	37.28%	Non Plastics			SM

Continue of Table 1. (Soil Classification Results)

OMRAN GEOTECHNICAL COMPANY

Soil Sample General Classification

Sample No	Borehole No	Depth(m)	Particle Size Analysis (Standard)			Atterberg Limits (Standard)			Soil Classification
			%Gravel (>4.75 mm)	%Sand (0.075-4.75mm)	%Silt & clay (<0.075mm)	%LL	%PL	%PI	USCS
101	BH # A24	5.5	50.10%	23.16%	26.74%	Non Plastics			GM
102	BH # A25	1	32.19%	25.93%	41.88%	Non Plastics			SM
103	BH # A25	2.2	18.79%	52.38%	28.83%	Non Plastics			SM
104	BH # A25	3	23.36%	46.25%	30.39%	Non Plastics			SM
105	BH # A25	3.6	41.62%	32.96%	25.43%	Non Plastics			SM
106	BH # A25	4.5	46.70%	22.63%	30.68%	28.12%	25.86%	2.26%	SM
107	BH # A25	5.5	42.34%	36.18%	21.48%	Non Plastics			SM
108	BH # A26	1.5	2.31%	23.05%	74.65%	22.20%	16.98%	5.22%	CL-ML
109	BH # A26	3.5	0.25%	9.60%	90.16%	22.49%	15.56%	6.93%	CL-ML
110	BH # A26	5	0.06%	8.97%	90.96%	23.12%	15.56%	7.56%	CL
111	BH # A27	1.5	8.20%	9.57%	82.22%	26.19%	15.63%	10.56%	CL
112	BH # A27	2.5	0.16%	4.18%	95.66%	21.76%	15.69%	6.07%	CL-ML
113	BH # A27	3.5	0.85%	11.29%	87.85%	23.93%	18.60%	5.33%	CL-ML
114	BH # A27	4.5	0.21%	11.50%	88.28%	25.68%	18.87%	6.81%	CL-ML
115	BH # A27	5.5	1.42%	7.08%	91.50%	22.45%	18.42%	4.03%	CL-ML
116	BH # A28	2	4.33%	21.71%	73.96%	26.73%	21.67%	5.06%	CL-ML
117	BH # A28	2.7	0.00%	2.67%	97.33%	23.61%	19.35%	4.26%	CL-ML
118	BH # A28	3.7	0.67%	15.79%	83.54%	26.78%	21.05%	5.73%	CL-ML
119	BH # A28	4.5	0.22%	3.96%	95.82%	24.68%	19.67%	5.01%	CL-ML
120	BH # A28	5.5	0.13%	10.52%	89.35%	23.20%	16.42%	6.78%	CL-ML
121	BH # A29	2.5	0.38%	4.96%	94.65%	23.09%	13.33%	9.76%	CL
122	BH # A29	3.5	0.26%	6.57%	93.17%	25.54%	17.95%	7.59%	CL
123	BH # A29	4.5	0.92%	6.90%	92.18%	24.51%	17.65%	6.86%	CL-ML
124	BH # A29	5.5	0.46%	3.12%	96.42%	24.88%	20.31%	4.57%	CL-ML
125	BH # A30	1.5	9.27%	29.40%	61.34%	23.23%	18.18%	5.05%	CL-ML

Continue of Table 1. (Soil Classification Results)

OMRAN GEOTECHNICAL COMPANY

Soil Sample General Classification

Sample No	Borehole No	Depth(m)	Particle Size Analysis (Standard)			Atterberg Limits (Standard)			Soil Classification
			%Gravel (>4.75 mm)	%Sand (0.075-4.75mm)	%Silt & clay (<0.075mm)	%LL	%PL	%PI	USCS
126	BH # A30	3.5	1.36%	27.28%	71.36%	20.69%	16.67%	4.02%	CL-ML
127	BH # A30	4.5	0.75%	16.80%	82.45%	22.73%	18.92%	3.81%	ML
128	BH # A30	7	34.90%	34.74%	30.31%	Non Plastics			SM
129	BH # A30	9.5	2.09%	10.43%	87.47%	30.49%	24.44%	6.05%	CL-ML
130	BH # A30	11	43.76%	30.61%	25.63%	Non Plastics			SM
131	BH # A30	12.5	2.60%	50.92%	46.49%	28.37%	22.73%	5.64%	SC-SM
132	BH # A30	14	53.71%	32.49%	13.80%	Non Plastics			SM
133	BH # A30	15.5	44.68%	38.47%	16.85%	Non Plastics			SM
134	BH # A30	16.5	48.85%	29.62%	21.53%	Non Plastics			SM
135	BH # A30	18	48.94%	38.62%	12.44%	Non Plastics			SM
136	BH # A30	20	38.25%	45.94%	15.81%	Non Plastics			SM

Table 2.

Summary results of other laboratory soil tests on soil samples of boreholes

OMRAN GEOTECHNICAL COMPANY

Sample No	Borehole No	Depth (m)	Dry Density (Mg/m^3)	Moisture (%)	GS	Expansion Index	Permeability (Cm/sec)	Hydrometer	
								Silt (%)	Clay (%)
1	A1	1	1.422		2.69			67	33
2	A1	3			2.72				
3	A1	4.5		18.78					
4	A1	5		12.64					
5	A2	1		5.16		44.4	1.285×10^{-5}		
6	A2	1.5	1.525						
7	A2	4.5		9.53					
8	A2	5.8		11.28					
9	A2	6		16.65				66	44
10	A3	1.5	1.421			40.4			
11	A4	2	1.49			48.4			
12	A4	5		17.54					
13	A4	6		16.71					
14	A5	0.7	1.566			54.4			
15	A6	1.5		7.32		51.4			
16	A6	2	1.46						
17	A6	3		6.24					

Continue of Table 2 (Lab Test Results)

OMRAN GEOTECHNICAL COMPANY

Sample No	Borehole No	Depth (m)	Dry Density (Mg/m^3)	Moisture (%)	GS	Expansion Index	Permeability (Cm/sec)	Hydrometer	
								Silt (%)	Clay (%)
18	A6	4.5		8.6					
19	A6	6		6.83					
20	A7	1.5	1.456						
21	A7	2			2.75	46.6	3.191×10^{-5}	62	38
22	A8	1.5	1.578	7.04					
23	A8	2			2.68	47.8			
24	A8	3		6.45					
25	A8	4			2.7			68	32
26	A8	4.5		6.27					
27	A8	6		8.24					
28	A9	1	1.716						
29	A10	2	1.523						
30	A11	1.5	1.635						
31	A11	3		7.6					
32	A11	4.5		7.06					
33	A11	6		9.43	2.75			63	37
34	A12	1.3	1.574		2.76				

Continue of Table 2. (Lab Results)

OMRAN GEOTECHNICAL COMPANY

Sample No	Borehole No	Depth (m)	Dry Density (Mg/m^3)	Moisture (%)	GS	Expansion Index	Permeability (Cm/sec)	Hydrometer	
								Silt (%)	Clay (%)
35	A12	1.5		8.52					
36	A12	3		6.04					
37	A12	4			2.75			73	27
38	A12	4.5		7.92			3.01×10^{-5}		
39	A12	6		9.72					
40	A13	1.5	1.424	10.29	2.71	49.6		65	35
41	A13	5.5						66	34
42	A14	1.5	1.64						
43	A14	2			2.68				
44	A14	3.5			2.72			67	33
45	A14	4.5		14.26					
46	A15	1.5	1.47	3.75	2.72	51.2		67	33
47	A15	3.5			2.7			66	34
48	A16	1.3	1.54						
49	A16	3		6.32					
50	A16	3.5			2.69			66	34
51	A17	1.5	1.566			47.2			
52	A17	4.5		8.26					

Continue of Table 2. (Lab Results)

OMRAN GEOTECHNICAL COMPANY

Sample No	Borehole No	Depth (m)	Dry Density (Mg/m^3)	Moisture (%)	GS	Expansion Index	Permeability (Cm/sec)	Hydrometer	
								Silt (%)	Clay (%)
53	A18	2.5	1.42		2.72			62	38
54	A19	2	1.513						
55	A19	3		6.61					
56	A20	1	1.514		2.7			66	34
57	A20	3.5			2.75				
58	A20	4			2.77				
59	A21	1.5	1.552						
60	A21	4			2.7			66	34
61	A21	4.5		7.97					
62	A21	6			2.71			61	39
63	A22	1	1.654						
64	A22	3		1.93					
65	A22	6		7.46					
66	A23	1	1.727	6.38					
67	A23	4		11.03				69	31
68	A23	6		9.9					
69	A23	16.5						67	33
70	A24	8		3.61					

Continue of Table 2. (Lab Results)

OMRAN GEOTECHNICAL COMPANY

Sample No	Borehole No	Depth (m)	Dry Density (Mg/m^3)	Moisture (%)	GS	Expansion Index	Permeability (Cm/sec)	Hydrometer	
								Silt (%)	Clay (%)
71	A23	9		2.38					
72	A23	16.5		24.7	2.67				
73	A23	19.5		18.77					
74	A24	1.5		5.69					
75	A24	2.5	1.605						
76	A24	3		6.47					
77	A25	1	1.713						
78	A26	1.5	1.533						
79	A27	1.5	1.415		2.63				
80	A27	3		16.16					
81	A27	3.5			2.71			69	31
82	A27	6		17.31					
83	A28	2	1.5						
84	A28	3					2.686×10^{-5}		
85	A29	2.5	1.364						
86	A29	4.5		21.28					
87	A29	6		18.1					
88	A30	1.5	1.472						

Continue of Table 2. (Lab Results)

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Sample No	Borehole No	Depth (m)	Dry Density (Mg/m^3)	Moisture (%)	GS	Expansion Index	Permeability (Cm/sec)	Hydrometer	
								Silt (%)	Clay (%)
89	A30	2			2.73				
90	A30	3.5					5.67×10^{-5}		
91	A30	7.5		13.42					
92	A30	9.5			2.75			75	25
93	A30	10.5		18.75					

Table 3. Summary results of soil classifications of soil samples of Test Pits

OMRAN GEOTECHNICAL COMPANY

Soil Sample General Classification

Sample No	Test Pit No	Depth(m)	Particle Size Analysis (Standard)			Atterberg Limits (Standard)			Soil Classification
			%Gravel (>4.75 mm)	%Sand (0.075-4.75mm)	%Silt & clay (<0.075mm)	%LL	%PL	%PI	USCS
1	TP # 01	1.5	0.00%	13.21%	86.79%	23.55%	18.03%	5.52%	CL-ML
2	TP # 02	1.5	0.00%	14.03%	85.97%	24.15%	20.45%	3.70%	ML
3	TP # 03	1.5	2.86%	27.96%	69.18%	21.75%	17.65%	4.10%	CL-ML
4	TP # 04	1.5	0.42%	23.41%	76.17%	24.50%	21.43%	3.07%	ML
5	TP # 05	1.5	6.05%	40.93%	53.02%	22.80%	20.00%	2.80%	ML

Table 4.

Summary results of other laboratory soil tests on soil samples of Test Pits

OMRAN GEOTECHNICAL COMPANY

Sample No	Test Pit No	Depth (m)	Proctor Modified		Proctor Standard	
			M.D.D	O.M.C	M.D.D	O.M.C
1	1	1.5			1.807	11.5
2	2	1.5	1.983	12.8	1.961	13.1
3	3	1.5			1.907	11.75
4	4	1.5			1.906	12.9
5	5	1.5	2.005	11.15	1.959	13

Table 5. Summary results of Direct Shear test results

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Direct Shear Test Results

Sample No	Borehole No	Depth(m)	C (Kg/cm^2)	Min Angle ϕ (Degree)
1	A12	1.3	0	30.34˚
2	A14	1.5	0	34.61˚
3	A18	2.5	0	27.44˚
4	A20	4	0	28.02˚
5	A27	1.5	0	27.58˚

Test did in CU condition and Cohesion (C) =0.

Table 6. Summary results of Consolidation test results

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Consolidation Test Results

Sample No	Borehole No	Depth(m)	Cc	Cr	Pc (Kpa)	Cv (cm^2/ Min)
1	A14	2	0.1548	0.0408	400	0.1411 to 0.4243
2	A20	4	0.2103	0.0444	375	0.1084 to 0.3675
3	A27	1.5	0.2192	0.0424	400	0.1311 to 0.4915

Table 7. Summary results of Chemical Analysis test results on soil samples

Chemicla Analysis

Borehole No	Depth(m)	PH	Sulfate (mg/l)	Chloride(mg/l)
A11	1.5	8.88	1	6.9
A17	1.5	8.65	2	19.2
A29	2	9.22	5	10.1

5.5. Percolation Test Results

Percolation tests were performed at two site location. See Appendix A for specific percolation test locations.

Percolation test results show Percolation Rate Numbers (MPI) between 63.5 and 76.2. For a complete report of percolation tests, see Appendix D.

According to below table 8, [DESIGN REQUIREMENT FOR SANITARY & SEPTIC SYSTEM, FEBRUARY 2008 PUBLISHING], water absorption of soil per m2/Liters/day can find amount 0.031.

Table 8: Soil Treatment Areas in Square Meters
[Design Requirements Reference, 2008]

Percolation Rate, Minutes for Water to Drop 25 mm	Water Absorption of Soil (m^2/liters/day)
Faster than 0.1	Soil too coarse for sewage treatment
0.1 to 5	0.020
6 to 15	0.031
16 to 30	0.041
31 to 45	0.049
46 to 60	0.054
Slower than 60	Soil too fine for sewage treatment

Water Absorption type of the Project Area

5.6. Seismic Soil Site Class

According to table 9 of the IBC (2006), and the site soil properties and N-Values determined in the field, the project is classified as Class E.

Table 9. Site Class Definition, [IBC 2006, Page 303, Table 1613.5.2]

SITE CLASS	SOIL PROFILE NAME	AVERAGE PROPERTIES IN TOP 100 feet, SEE SECTION 1613.5.5		
		Soil shear wave velocity, $\bar{v}_s$, (ft/s)	Standard penetration resistance, $\bar{N}$	Soil undrained shear strength, $\bar{s}_u$, (psf)
A	Hard rock	$\bar{v}_s > 5{,}000$	N/A	N/A
B	Rock	$2{,}500 < \bar{v}_s \leq 5{,}000$	N/A	N/A
C	Very dense soil and soft rock	$1{,}200 < \bar{v}_s \leq 2{,}500$	$\bar{N} > 50$	$\bar{s}_u \geq 2{,}000$
D	Stiff soil profile	$600 \leq \bar{v}_s \leq 1{,}200$	$15 \leq \bar{N} \leq 50$	$1{,}000 \leq \bar{s}_u \leq 2{,}000$
E	Soft soil profile	$\bar{v}_s < 600$	$\bar{N} < 15$	$\bar{s}_u < 1{,}000$
E	—	Any profile with more than 10 feet of soil having the following characteristics: 1. Plasticity index $PI > 20$, 2. Moisture content $w \geq 40\%$, and 3. Undrained shear strength $\bar{s}_u < 500$ psf		
F	—	Any profile containing soils having one or more of the following characteristics: 1. Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils. 2. Peats and/or highly organic clays ($H >$ 10 feet of peat and/or highly organic clay where H = thickness of soil) 3. Very high plasticity clays ($H >$25 feet with plasticity index $PI >$75) 4. Very thick soft/medium stiff clays ($H >$120 feet)		

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2, 1 pound per square foot = 0.0479 kPa. N/A = Not applicable

5.7. Seismic Coefficients

Seismic Coefficients S1 and Ss, can be defined based on the Preliminary Earthquake Hazard Map of Afghanistan (2007 edition) prepared under the auspices of the U.S. Agency for International Development (USAID).

Generally, US Army Corp of engineers suggests below Seismic Coefficients for all projects in Kabul Province, Afghanistan: (See Figure 1)

S1=0.51g and **Ss=1.28g**

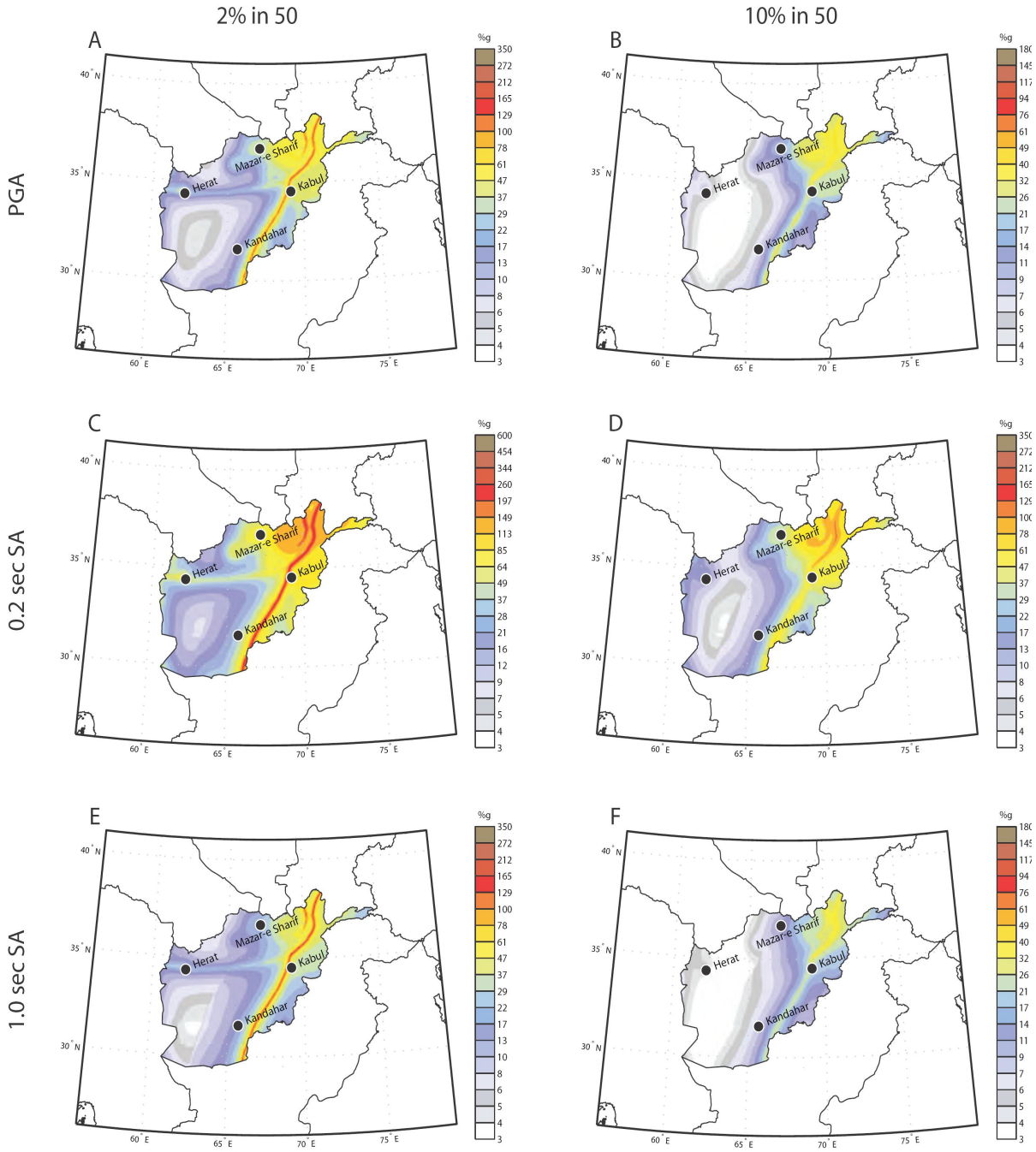


Figure 1. Ground motions for all modeled sources for PGA (A, B), 0.2-second SA (C, D), and 1.0-second SA (E, F) at 2-percent (A, C, E) and 10-percent (B, D, F) probability of exceedance in 50 years. [Reference: Preliminary Earthquake Hazard Map of Afghanistan, 2007 edition, USAID]

5.8. Suggestion for Modulus of Subgrade Reaction of Soil (K-Value)

Based on the results of the investigation, the soil type is classified as generally ***Loose to Medium Dense Clayey Sandy Silt soil types (ML and CL-ML)***. Subgrade Reaction Modulus of the soil can be determined using tables 10 and 11 referenced below:

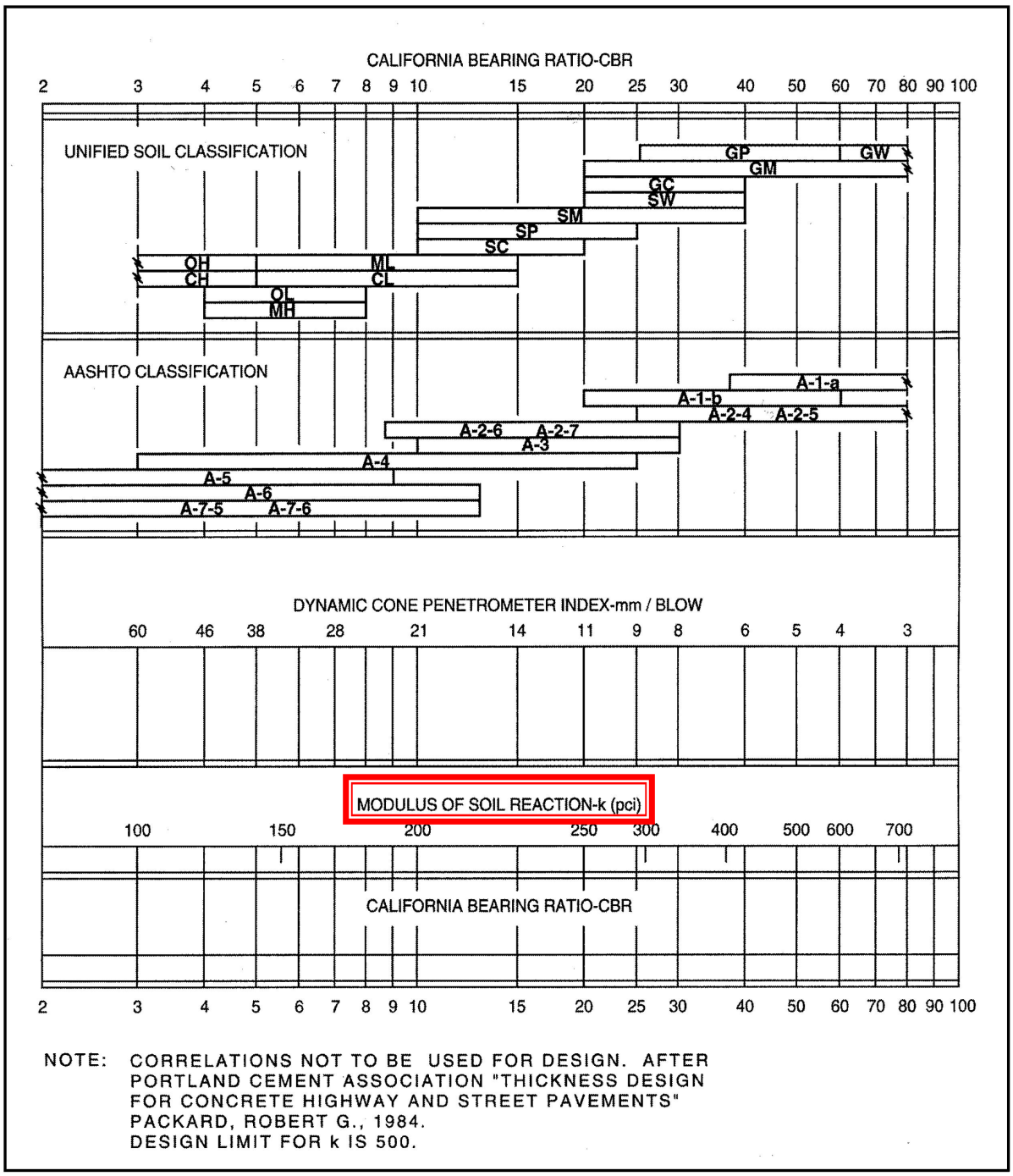
For this site, we recommend a value of 150 pci (Pound per Cubic Inche) be used for the subgrade reaction modulus of soil.

Table 10. Reference Table for recommendation of K-Value
[Reference: UFC 3-220-01N, for Typical Engineering Properties of Compacted Materials, Table 8-3.1]

Group Symbol	Soil Type	Range of Maximum Dry Unit Weight, gm/cm^3 (pcf)	Range of Optimum Water, Content Percent	Typical Value of Compression (Percent of Original Height)		Typical Strength Characteristics			Typical Coefficient of Permeability cm/sec (ft/min)	Range of CBR Values	Range of Subgrade Modulus k kPa/mm (lb/cu in)
				At 138 kPa (20 psi)	At 345 kPa (50 psi)	Cohesion (as compacted) kPa (psf)	Cohesion (saturated) kPa (psf)	Effective Stress Envelope deg			
SM	Silty sands, poorly graded sand-salt mix	1.76-2.00 (110-125)	16-11	0.8	1.6	50 (1050)	20 (420)	34	2.5 x 10^{-5} (5 x 10^{-5})	10-40	21-81 (100-300)
SM-SC	Sand-silt clay mix with slightly plastic fines	1.76-2.08 (110-130)	15-11	0.8	1.4	50 (1050)	14 (300)	33	1 x 10^{-6} (2x10^{-6})	-----	------
SC	Clayey sands, poorly graded sand-clay-mix	1.68-2.00 (105-125)	19-11	1.1	2.2	74 (1550)	11 (230)	31	2.5 x 10^{-7} (5x10^{-7})	5-20	21-81 (100-300)
ML	Inorganic silts and clayey silts	1.52-1.92 (95-120)	24-12	0.9	1.7	67 (1400)	9 (190)	32	5 x 10^{-6} (10^{-5})	15 or <	21-54 (100-200)
ML-CL	Mixture of inorganic silt and clay	1.60-1.92 (100-200)	22-12	1.0	2.2	65 (1350)	22 (460)	32	2.5 x 10^{-5} (5x10^{-5})	-----	21-54 (100-200)

Table 11. Reference Table for recommendation of K-Value
[Reference: UFC 3-260-2, for approximate relationships of soil classification and soil strength, FIGURE 5.3]

UFC 3-260-02
30 June 2001



NOTE: CORRELATIONS NOT TO BE USED FOR DESIGN. AFTER PORTLAND CEMENT ASSOCIATION "THICKNESS DESIGN FOR CONCRETE HIGHWAY AND STREET PAVEMENTS" PACKARD, ROBERT G., 1984.
DESIGN LIMIT FOR k IS 500.

6. Geotechnical Recommendations

6.1. Foundations Evaluations

6.1.1. General

In designing foundations, the engineer must satisfy two independent foundation stability requirements, which must be met simultaneously:

- There should be an adequate safety factor against shear failure within the soil mass. (The working loads should not exceed the allowable bearing capacity of the soil being built upon).
- The probable maximum and differential settlements of the soil under any part of the foundations must be limited to safe and tolerable limits.
- All footings shall be located below the frost line and Top soil depth.

6.1.2. Foundations Level

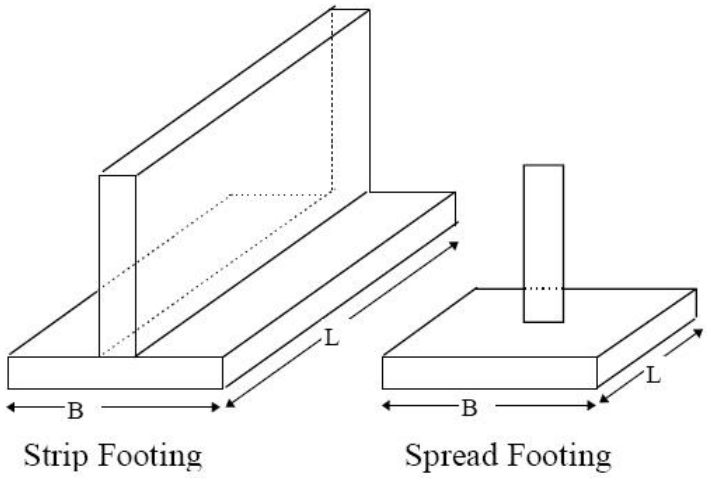
- Based on site investigation and soil test results, all footings shall be located below the frost line at minimum 800 mm.
- Based on the field and laboratory results, topsoil thickness in the project area averages 400 mm in depth.
- **Therefore, minimum foundation level in all area should be located at minimum 800 mm in depth from Finished Grade.**
- **Soil improvement under the subgrade foundation is suggested for this site. Overexcavation of 30 to 45 cm of natural soil in the areas of the foundation are recommended. The overexcavated material should be replaced with engineered fill, compacted to 95 % of the Modified proctor Value (ASTM D-1557)**.

6.1.3. Choice the Type of Foundations

The choice of a particular type of foundation depends upon the character of the soil, the presence of ground water at the site, the magnitude of the imposed loads, and the project characteristics; one has to choose the type of foundation which is not only safe but also economical.

For the type of soils encountered at this site, ultimate and allowable bearing capacities are suggested, in all locations of site, type of soil and relevant bearing capacities are determined, you can use each type of foundations respect to building characteristics with their allowable bearing capacities.

Single or Strip foundation types are recommended for the proposed buildings with combined Reinforced concrete (R.C) with considering the evaluated Allowable Bearing capacity.



6.2. Compaction Requirement

6.2.1. General

The compaction requirements for clean, cohesionless, granular materials will be generally higher than those for cohesive materials, because cohesionless materials readily consolidate, or liquefy, when subjected to vibration. For structures with unusual stability requirements and settlement limitations, the

minimum density requirements indicated in followed table should be increased (See Table 12).

Table 12. Compaction Density as a Percent of ASTM D 1557
[Reference: UFC 3-220-03FA, table 15.2, Page 15.4]

	ASTM D 1557 Maximum Density, in Percentage	
	Cohesive Soils	Cohesionless Soils
Fill/Embankment/Backfill		
Under proposed structures, building Slabs, steps, paved areas	90	95[a]
Under sidewalks and grassed areas	85	90
Sub-grade		
Under building slabs, steps and Paved areas / top 300 mm (12inches)	90	95
Under sidewalks, top 150 mm (6 inches)	85	90

Note: the type of soil in this case is Cohesive.

6.2.2. Compaction Requirement

- All foundation levels after excavations should be compacted to a dry density not less than 95% of the maximum dry density as determined by modified Proctor test (ASTM D-1557).
- Based on this investigation and soil test results, soil improvement under foundations is recommended. Subgrade soils should be over-excavated and replaced with select fill. **An overexcavation depth of 45 cm is recommended for two-stories buildings and 30 cm for one-story buildings.**
- Selected material should be compacted to a dry density not less than 95% of the maximum dry density as obtained by modified proctor test (ASTM D-1557) in each layers with maximum thickness of 150 mm.
- All specification criteria per section “Excavation, Filling and Backfilling for Buildings” of the project specification should be followed.

6.3. Select Material Specification

Exploratory investigations needed to determine the suitable sources of select material. Laboratory tests are needed to determine the suitability of available materials including natural water content, compaction characteristics, grain-size distribution, Atterberg limits, shear strength, and consolidation. The susceptibility to frost action should also be considered in analyzing the potential behavior of fill material. The scope of laboratory testing for soil characterization will depend on the size and cost of the structure, thickness and extent of the fill, and the strength and compressibility of the underlying soils. Coarse-grained soils are preferred for fill; however, most fine-grained soils can be used advantageously if attention is given to drainage, compaction requirements, moisture, and density control.

The Select materials to be used shall be:

- Free of organic matter or other deleterious substances.
- Well graded granular mixture with no particles larger than 75 mm and at least 80% of materials are smaller than 19mm in size.
- Materials passing sieve No.200 shall be less than or equal 20%.
- Plasticity index less than or equal 5.
- Materials under foundations shall be compacted to 95% of maximum dry density as obtained by modified proctor (ASTM 1557).

6.4. Excavations Recommendations

In selecting and designing the excavation system, the primary controlling factors will include:

- soil type and soil strength parameters
- groundwater conditions
- slope protection
- side and bottom stability

- vertical and lateral movements of adjacent areas, and effects on existing structures

General Recommendations for excavations:

- Excavate to dimensions and elevations to given by the foundation designer, allowing additional space as required for construction operations and inspection of foundations.
- Remove building construction and other materials concealed beneath present grade, where required to execute work.
- Properly level the bottom of excavation.
- Do not carry out excavations lower than indicated, except when directed by the geotechnical consultants.
- Hazardous and dangerous conditions shall be prevented and safety of personnel shall be maintained.
- Unauthorized excavations carried below indicated level shall be filled with well graded granular soil and compacted to 95% of maximum dry density as determined by modified proctor (ASTM 1557).
- Excavations can be accomplished without side support where an adequate slope of 35 degrees can be used. Ultimately, hazardous and dangerous conditions shall be prevented and safety of personnel shall be maintained.

6.5. Backfilling Recommendations

6.5.1. Backfill Material Specification

- **Satisfactory Materials**

  Satisfactory materials comprise any materials classified by ASTM D 2487 as GW, GP, GM, SW, SP, SM, SW-SM, SC, SW-SC, SP-SM, SP-SC.

Satisfactory materials for grading comprise stones less than 75 mm, except for fill material for pavement and building areas which comprise stones less than 75 mm in any dimension.

Natural material at site can use for general backfill purposes, when it passes all the material specification requirements.

- **Unsatisfactory Materials**

  Materials which do not comply with the requirements for satisfactory materials are unsatisfactory. Unsatisfactory materials include trash; refuse; man-made fills and backfills containing debris from previous construction; and material classified as satisfactory which contains root and other organic matter or frozen material. Notify the Client immediately when encountering any contaminated materials.
- The materials to be used for general backfilling purposes shall be of selected fill composed of sand and or granular mixture free from organic matter or other deleterious substances, the plasticity index of the backfill material shall not exceed 15 percent. It shall be spread in lifts not exceeding 15cm in compact thickness, moisture conditioned to its optimum moisture content, and compacted to a dry density not less than 90% of the maximum dry density as obtained by modified proctor test (ASTM D-1557).
- All technical requirements for backfill material and limitations should be followed.

6.5.2. General Backfilling Criteria

- Above the foundation level and under slabs on grade, coarse grained soil used for filling shall be clean and free from clay lumps and organic matter.
- Sand and gravel shall be brought from quarries approved by the consultant.

- At least 95% of maximum dry density in accordance with ASTM D1557 standard must be achieved for the Replacement layer.
- Above foundations, place the fill material in 0.3 meters lifts and compact material to average relative density of 95% with no individual test less than 95% maximum density in accordance with ASTM D1557 standard.
- Compact the fill using suitable mechanical tamping equipment (such as steel drum, or rubber-tired rollers) to obtain specified density.
- Perform field density control test for every 150.00 square meters of fill at locations specified by consultant.
- Correct and/or re-compact materials that do not meet specified compaction requirements. Continue corrective measures until required density has been achieved.
- Care shall be taken during filling, so as not to damage concrete surfaces, water proofing materials, joints or membranes that have been applied to concrete surfaces.
- The boundary of any compacted back-fill material shall extend at least 1.00 meters (0.60 meters from each side) beyond the foundation footprint.
- Do not fill against any part of walls, or columns until each part has reached the required design strength and has been approved by the consultant.
- Bring backfill up uniformly around building and individual wall units.
- Do not fill against foundations, walls, footing, and other area until concrete forms have been removed, masonry work has been pointed and protected, and concrete finishing, damp proofing, and waterproofing have been completed and approved.

6.6. Allowable Bearing Capacity of Soil

The ultimate bearing capacity is the loading intensity that causes failure and lateral displacement of foundation materials and rapid settlement. The ultimate bearing capacity depends on the size and shape of the loaded area, the depth of the loaded area below the ground surface, groundwater conditions, the type and strength of foundation materials, and the manner in which the load is applied. The design bearing pressure equals the ultimate bearing capacity divided by a suitable factor of safety.

According to the site investigation and subsequent soil classification, the general soil type for this project is classified as:

CL, ML, CL-ML and SM

To determine the Allowable bearing capacity with respect to the type of soil, we use IBC (2006) reference table 13, which recommends the following bearing pressures:

Table 13. Suggestion for Allowable Foundation Pressure and Lateral Pressure

[Reference: International Building Code (IBC) 2006, section 1804, page 345, Table 1804.2]

ALLOWABLE FOUNDATION AND LATERAL PRESSURE

CLASS OF MATERIALS	ALLOWABLE FOUNDATION PRESSURE (psf)[d]	LATERAL BEARING (psf/f below natural grade)[d]	LATERAL SLIDING	
			Coefficient of friction[a]	Resistance (psf)[b]
1. Crystalline bedrock	12,000	1,200	0.70	—
2. Sedimentary and foliated rock	4,000	400	0.35	—
3. Sandy gravel and/or gravel (GW and GP)	3,000	200	0.35	—
4. Sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM and GC)	2,000	150	0.25	—
5. Clay, sandy clay, silty clay, clayey silt, silt and sandy silt (CL, ML, MH and CH)	1,500[c]	100	—	130

For SI: 1 pound per square foot = 0.0479 kPa, 1 pound per square foot per foot = 0.157 kPa/m.

a. Coefficient to be multiplied by the dead load.

b. Lateral sliding resistance value to be multiplied by the contact area, as limited by Section 1804.3.

c. Where the building official determines that in-place soils with an allowable bearing capacity of less than 1,500 psf are likely to be present at the site, the allowable bearing capacity shall be determined by a soils investigation.

d. An increase of one-third is permitted when using the alternate load combinations in Section 1605.3.2 that include wind or earthquake loads.

- **Results:**
  - Soil types in the project area meets classes 4 and 5 of the referenced table 13, providing an allowable foundation pressure of 1500 to 2000 PSF.
  - Based on item "d" of table 13, which says that we are able to increase by one-third the permitted value for bearing capacity when using the alternate load combination, this is referred in Section 1605.3.2 of International Building Code (IBC) 2006 that include wind or earthquake loads.
  - If we use soil improvement and select materials under the sub grade foundation as suggested for foundation system in this project, we are able to consider the soil's bearing capacity at a higher level.

- **Suggestions:**
  - According to the soil classification and engineering properties of the site soils, an allowable bearing capacity of 2,000 PSF is recommended for foundation design purposes..
  - A lateral bearing pressure value of 150 psf/f below natural grade is recommended .
  - A value of 0.25 is recommended for the coefficient of friction for lateral sliding.

6.7. Settlement Estimation

Table 14 lists conditions that cause settlement which occur during construction and result in only minor problems and post-construction settlements which occur after a structure is completed or after critical features are completed. Differential settlements distort a structure. A structure can generally tolerate large uniform, or nearly uniform, settlements.

Generally, essential conditions for occurrence the consolidated Settlement are:

1. Existence of clay soils
2. Shallow water table level

According to the lab sieve analyses and atterberg limit tests, The soil has the following characteristics:

- General soil types in the project area are Silt and Sand
- The percent of clay materials in the soils is low

Also, no shallow groundwater was noted in the area of the project site.

Based on the available data for the project site, the likelihood of consolidated settlement is low.

Table 14. Causes of Settlements

[Reference: UFC 3-220-03FA, table 5.1, Page 5.2]

Cause	Comment
Compression of foundation soils under static loads.	Soft, normally consolidated clays and peaty soils are most compressible. Loose silts, sands, and gravels are also quite compressible.
Compression of soft clays due to lowering ground-water table.	Increased effective stress causes settlement with no increase in surface load.
Compression of cohesionless soils due to vibrations.	Loose sands and gravels are most susceptible.Settlement can be caused by machine vibrations, earthquakes, and blasts.
Compression of foundation soil due to wetting.	Loose silty sands and gravels are most susceptible.Settlements can be caused by rise in groundwater table or by infiltration.
Shrinkage of cohesive soils caused by drying.	Highly plastic clays are most susceptible.Increase in temperature under buildings containing ovens or furnaces may accelerate drying. Wetting of highly plastic clays can cause swelling and heave of foundations.
Loss of foundation support due to erosion.	Waterfront foundations must extend below maximum erosion depth.
Loss of foundation support due to excavation of adjacent ground.	Most pronounced in soft, saturated clays.
Loss of support due to lateral shifting of the adjacent ground	Lateral shifting may result from landslides, slow downhill creep, or movement of retaining structures.
Loss of support due to formation of sinkhole.	Soils overlying cavernous limestone and broken conduits are susceptible.
Loss of support due to thawing of permafrost.foundation heat.	Permafrost should be insulated from
Loss of support due to partial or complete liquefaction.	Loose, saturated sands are most susceptible.
Downdrag on piles driven through soft clay.	Loading on piles is increased by negative skin friction if soil around upper part of pile settles.

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And immediate settlement has calculated with below equation:

For rigid foundations, Berja. M. Das, 1941 suggests below equation:

$S_e = B\ q / E_s\ (1 - \mu_s^2)\ \alpha_r$

Where:

S_e = Immediate Settlement (m)

B = Width of Footing (m)

q = Allowable Bearing Capacity (KN/ m2)

μ_s = Poisson's Ratio

E_s = Elasticity Modulus (KN/m2)

αr = Coefficient has selected from referenced Figure 2

- **Back to Equation:**

$S_e = B\ q / E_s\ (1 - \mu_s^2)\ \alpha_r$

q = 71.82 KN/m2 (According to suggestion bearing capacity value)

E_s = 3000 KN/m2 (According to Referenced Table, estimated value of E_s for soft silts), see attached Reference table 15.

μ_s = 0.2 (According to Referenced Table, estimated value of μ_s for soft silty sands), see attached Reference table 16.

Now, Immediate Settlement has calculated base on coefficient of B (Wide of foundation) and α_r

$S_e = B \times 71.82 / 3000\ (1-0.2^2) \times \alpha_r$

S_e = 0.0249 B/ α_r → for example for B =1m and **α_r** =1 → **S_e**= 2.49cm

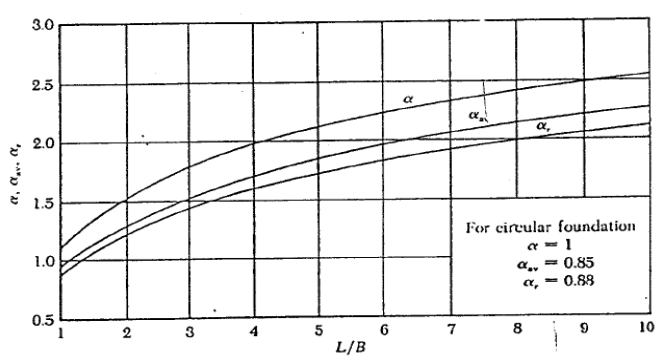


Figure 2. The values of α_r for various types of foundation

[Reverence: Berja. M. Das, 1941]

Table 15. Values of Elasticity Modulus for soils

[Reference: Berja. M. Das, 1941]

Soil Type	**Elasticity Modulus (E_s)**	
	Kg/cm2	**kN/m2**
Soft Silt and clay	17.5-35	3000-4500
Hard clay	60-140	6000-14000
Loose sand	105-280	10500-28000
Dense sand	350-700	35000-70000

Table 16. Values of Poisson's Ratio for soils

[Reference: Berja. M. Das, 1941]

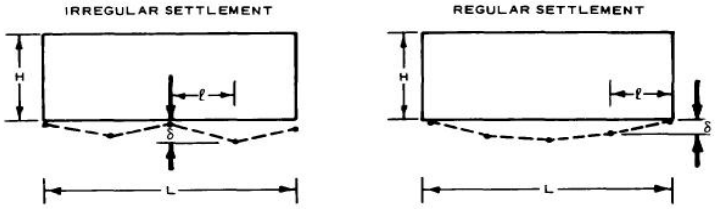
Soil type	Poisson's Ratio (μ_s)
Loose sand	0.2-0.4
Medium dense sand	0.25-0.4
Dense sand	0.3-0.45
Silty sand	0.2-0.4
Soft clay	0.15-0.25
Medium dense clay	0.2-0.5

6.8. Allowable Settlement

Tolerable angular distortions are listed in table 17, and empirical correlations that may be used to estimate probable angular distortions based on calculated maximum settlements are summarized in table 18. Because of the natural variability of soils, differential settlement will occur though total settlements are calculated to be uniform. An indirect means for controlling differential settlement is to limit total settlement to 3 inches for structures on clay and to 1 1/2 inches for structures on sand. [Reference: UFC 3-220-03FA, Chapter 5, Page 5.1]

For the soils encountered at this site, settlement is estimated to be around one inche (25 mm).

Table 17. Value of Angular Distortion (δ/ϑ) That Can Be Tolerated Without Cracking
[Reference: UFC 3-220-03FA, table 5.2, Page 5.3]



Type of Building	L/H	Allowable δ/ϑ
Steel frame with flexible siding	--	0.008
Steel or reinforced concrete frame with insensitive finish such as dry wall, glass, or moveable panels	--	0.002 to 0.003
Steel or reinforced concrete frame with brick, block, plaster, or stucco finish	≥ 5	0.002
	≤ 3	0.001
Load-bearing brick, tile, or concrete block walls	≥ 5	0.0008
	≤ 3	0.0004
Circular steel tanks on flexible base, with fixed top	--	0.008
Circular steel tanks on flexible base, with floating top		0.002 to 0.003
Tall slender structures, such as stacks, silos, and water tanks, with rigid mat foundations	--	0.002

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Table 18. Empirical Correlations between Maximum (Δ) And Angular Distortion (δ/ϑ)

[Reference: UFC 3-220-03FA, table 5.3, Page 5.4]

Type of Foundation	Approximate Value of δ/ϑ for[a] Δ= 1 in.
Mats on sand	1/750(0.0013)
Rectangular mats on varved silt	1/1000 to 1/2000 (0.001 to 0.0005)
Square mats on varved silt (0.0005 to 0.0003)	1/2000 to 1/3000
Mats on clay	1/1250(0.0008)
Spread footings on sand	1/600(0.0017)
Spread footings on varved silt	1/600(0.0017)
Spread footings on clay	1/1000(0.0010)

a δ/ϑ increases roughly in proportion with Δ. For Δ = 2 in., values of δ/ϑ would be about twice as large as shown, for Δ = 3 inches, three times as large, etc.

(Courtesy ofJ. P. Gould and J. D. Parsons, "Long - Term Performance of Tall Buildings of New York City Varied Silts, " Proceedings, International Conference on Planning and Design of Tall Buildings , Lehigh University, Bethlehem, Pa., 1975. Reprinted by permission of American Society of Civil Engineers, New York.)

7. References

- ASTM Standards

- ASTM D-422 - Standard Test Method for Particle-Size Analysis of Soils
- ASTM D-854 - Standard Test Methods for Specific Gravity of Soil Solids by Water Pycnometer
- ASTM D-2216 - Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D-2487 - Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- ASTM D-4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D-1586 - Standard Test Methods for Penetration Test and Split-Barrel Sampling of Soils
- ASTM D-1557- Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)
- ASTM D- 2113- Standard Drilling Methods for Geotechnical Investigation

- UNIFIED FACILITIES CRITERIA (UFC)

- UFC 3-220-03FA, SOILS AND GEOLOGY PROCEDURES FOR FOUNDATION DESIGN OF BUILDING AND OTHER STRUCTURES
- UFC 3-220-01N, Geotechnical Engineering Procedures for Foundation Designs and Structures
- UFC 3-220-03FA, Soils and Geology Procedures for Foundation design Building and other Structures

- INTERNATIONAL BUILDING CODE (IBC)

- International building code 2006, section 1804, page 345, Table 1804.2

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Appendix A

- ***Borehole Location Maps***
- ***Test Pit Location Maps***
- ***Percolation Location Maps***
- ***GPS Coordination Table***

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Appendix A

Borehole Location Maps

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Boreholes Map on Ministry of Public Health (MOPH) Facility, Kabul Province

Deep Boreholes Map (20 m)

Boreholes Map (6 m)

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Appendix A

Test Pit Location Maps

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Test Pits Map on Ministry of Public Health (moph) Facility, Kabul Province

Test Pits Map (01 to 05)

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Appendix A

Percolation Location Maps

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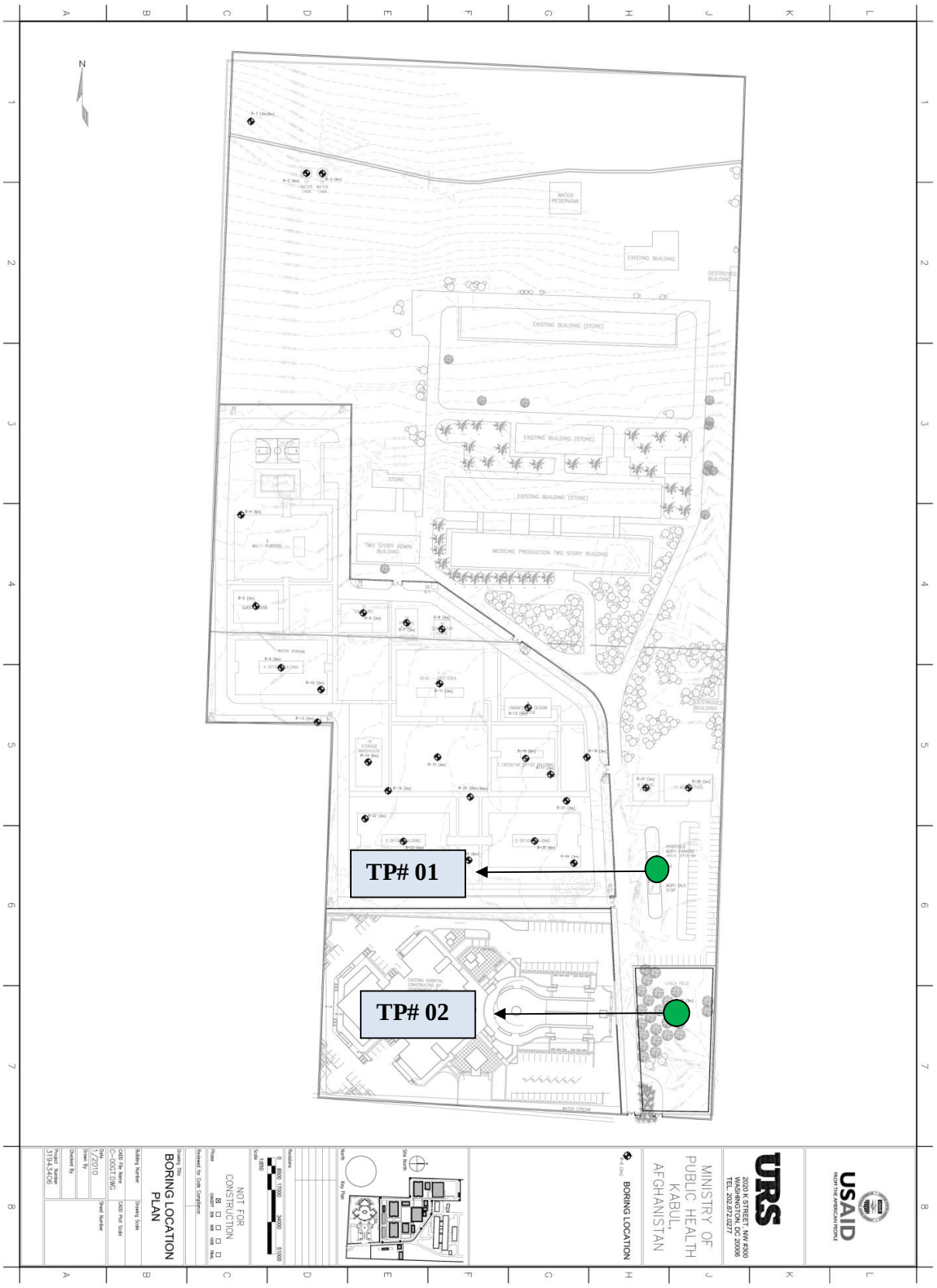
Percolation Test Pits Map on Ministry of Public Health (MPOH) Facility, Kabul Province



Test Pits for Percolation Test (TPs # 01&02) (0.5 m)

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Appendix A

GPS Coordination Table

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MATERIAL TESTING LAB

GPS Coordinates and Specification of Borehole

Client	**USAID**
contractor	**Tetra Tech**
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**
Location	**Kabul Province**

Bohehole No	Depth (m)	GPS Coordinates			Water Table
		Elevation (m)	E	N	
A1	6	1854	69˚, 05´, 316˝	34˚, 32´, 032˝	Dry
A2	6	1856	69˚, 05´, 306˝	34˚, 32´, 065˝	Dry
A3	6	1856	69˚, 05´, 313˝	34˚, 32´, 086˝	Dry
A4	6	1857	69˚, 05´, 301˝	34˚, 32´, 090˝	Dry
A5	6	1848	69˚, 05´, 281˝	34˚, 32´, 099˝	Dry
A6	6	1860	69˚, 05´, 207˝	34˚, 32´, 140˝	Dry
A7	6	1861	69˚, 05´, 226˝	34˚, 32´, 121˝	Dry
A8	6	1860	69˚, 05´, 183˝	34˚, 32´, 125˝	Dry
A9	6	1861	69˚, 05´, 236˝	34˚, 32´, 091˝	Dry
A10	6	1861	69˚, 05´, 232˝	34˚, 32´, 143˝	Dry
A11	6	1866	69˚, 05´, 168˝	34˚, 32´, 143˝	Dry
Checked By:			**Jafari**		

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MATERIAL TESTING LAB

GPS Coordinates and Specification of Borehole

Client	**USAID**
contractor	**Tetra Tech**
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**
Location	**Kabul Province**

Bohehole No	Depth (m)	GPS Coordinates			Water Table
		Elevation (m)	E	N	
A12	6	1858	69˚, 05´, 262˝	34˚, 32´, 111˝	Dry
A13	6	1858	69˚, 05´, 257˝	34˚, 32´, 101˝	Dry
A14	6	1863	69˚, 05´, 232˝	34˚, 32´, 143˝	Dry
A15	6	1857	69˚, 05´, 272˝	34˚, 32´, 091˝	Dry
A16	6	1862	69˚, 05´, 237˝	34˚, 32´, 090˝	Dry
A17	6	1853	69˚, 05´, 213˝	34˚, 32´, 075˝	Dry
A18	6	1857	69˚, 05´, 214˝	34˚, 32´, 076˝	Dry
A19	6	1858	69˚, 05´, 213˝	34˚, 32´, 096˝	Dry
A20	6	1859	69˚, 05´, 198˝	34˚, 32´, 100˝	Dry
A21	6	1856	69˚, 05´, 227˝	34˚, 32´, 100˝	Dry
A22	6	1866	69˚, 05´, 163˝	34˚, 32´, 169˝	Dry
Checked By:			**Jafari**		

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MATERIAL TESTING LAB

GPS Coordinates and Specification of Borehole

Client	**USAID**
contractor	**Tetra Tech**
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**
Location	**Kabul Province**

Bohehole No	Depth (m)	GPS Coordinates			Water Table
		Elevation (m)	E	N	
A23	20	1876	69˚, 05´, 173˝	34˚, 32´, 264˝	Dry
A24	6	1876	69˚, 05´, 187˝	34˚, 32´, 261˝	Dry
A25	6	1871	69˚, 05´, 162˝	34˚, 32´, 283˝	Dry
A26	6	1859	69˚, 05´, 185˝	34˚, 32´, 112˝	Dry
A27	6	1195	070˚, 34´, 382˝	37˚, 07´, 115˝	Dry
A28	6	1856	69˚, 05´, 272˝	34˚, 32´, 069˝	Dry
A29	6	1855	69˚, 05´, 275˝	34˚, 32´, 070˝	Dry
A30	20	1864	69˚, 05´, 261˝	34˚, 32´, 112˝	8.1 m

Checked By:	**Jafari**

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Appendix B

- ***Well Water &Borehole & Test Pit Logs***

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Appendix B

Well Water Log

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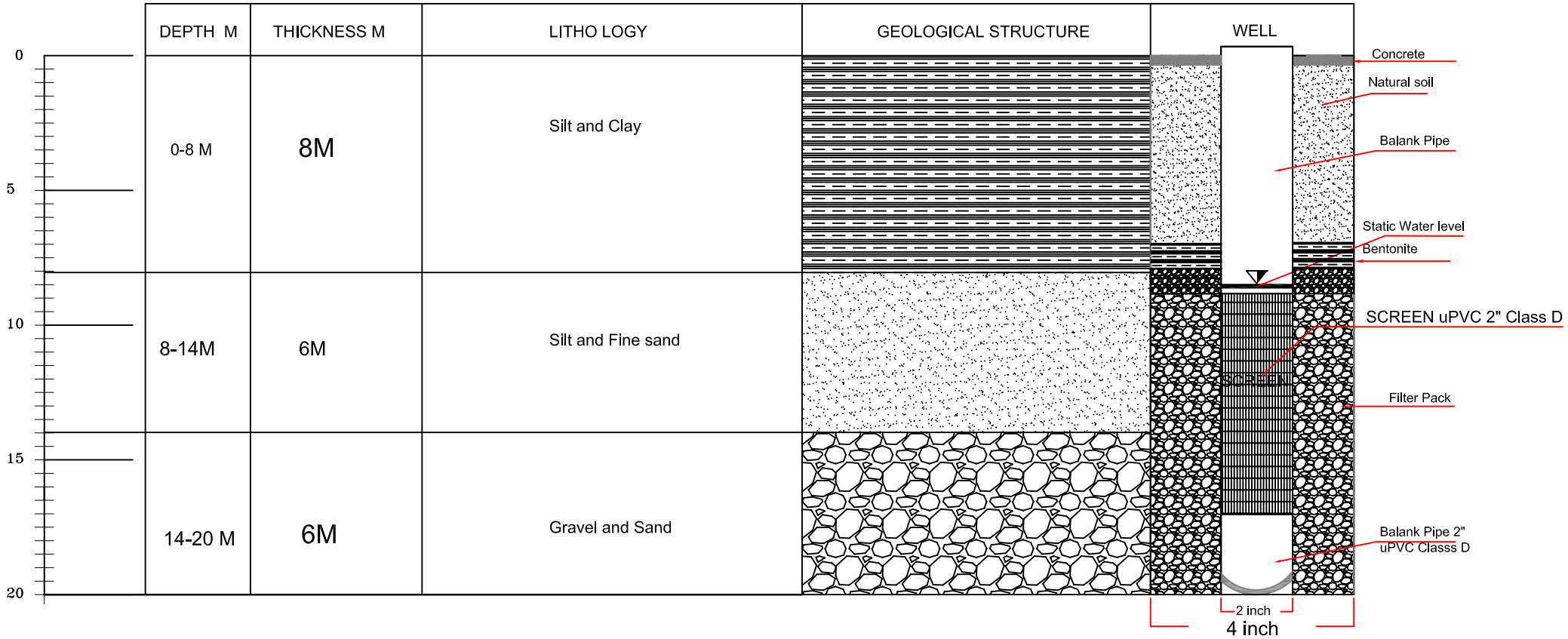
Geologic Log & As-Built Construction Diagram of SPT Boring with 20m depth, MOPH, Kabul Afghanistan

Monitoring Well		Well Depth 20m, Drill Dia:4 inches	OMRAN GEOTECHNIC COMPANY
Location	MOPH,Afshar,Kabul	Casing: uPVC Dia: 2 inches, Class D	
Static Water Level : 8.2m		Slot Size: 1mm	
Cable Tools Method		Filter Gravel Pack Material: 1.5-10 mm	Date :April 2010

DEPTH M	THICKNESS M	LITHO LOGY
0-8 M	8M	Silt and Clay
8-14M	6M	Silt and Fine sand
14-20 M	6M	Gravel and Sand



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Appendix B

Boreholes Log

Professional Geotechnical Services

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ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A1

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A1	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1			100	Sandy Silt With Gravel , Very Dense, Brown	ML	1.5	>50->50->50-(>50)
1.8							
2			100	Silty Sand With Gravel, Very Dense, Brown	SM		
2.7							
3			100	Sandy Silt With Gravel , Hrad, Brown	ML	3	>50->50->50-(>50)
3.8							
4			100	Sandy Silty Clay , Hrad to soft, Brown	CL-ML		
4.4						4.5	2-2-2-(4)
5			100	Silty Clay With Sand, Soft, Brown	CL-ML		
5.4							
6				End of BH # A1 at 6 m		6	1-1-2-(3)

SPT/ (N VALUE): 20, 40, 60, 80

Drilling Started Date :	3/4/2010
Drilling Completed Date :	3/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

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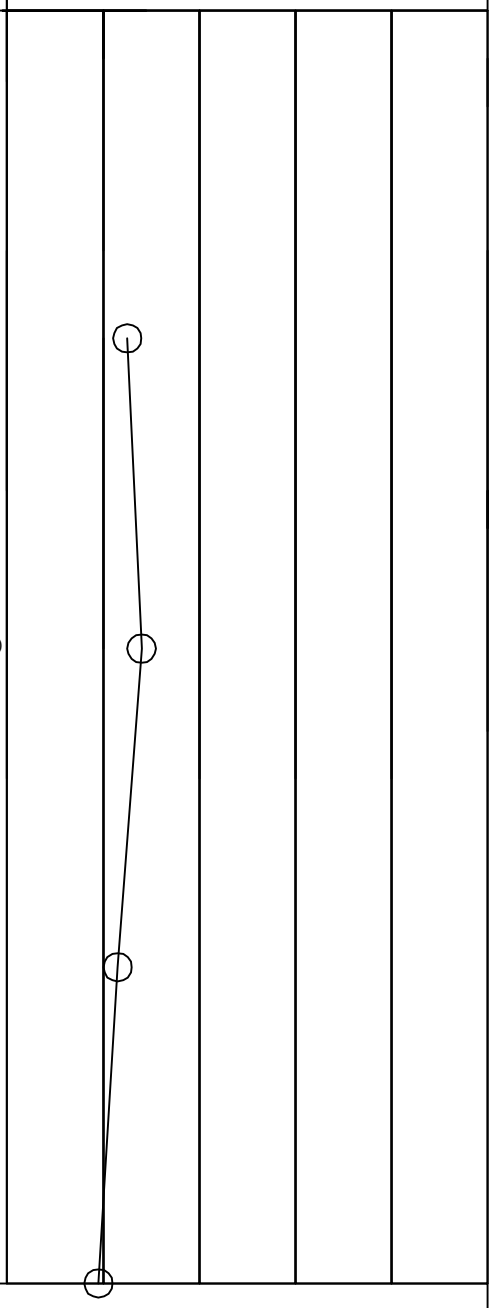
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A2

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A2	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1, 2			100	Silty Clay, Very Stiff, Brown	CL-ML	1.5	9-12-13-(25)
2.7, 3, 4			100	Silty Clay With Sand, Very Stiff, Brown	CL-ML	3	11-14-14-(28)
						4.5	9-11-12-(23)
5			100	Silty Sand With Gravel, Medium,Brown	SM		
5.4			100	Sandy Silty Clay, Very Stiff, Brown	CL-ML		
6				End of BH # A2 at 6 m		6	8-9-10-(19)



Drilling Started Date :	3/4/2010
Drilling Completed Date :	3/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

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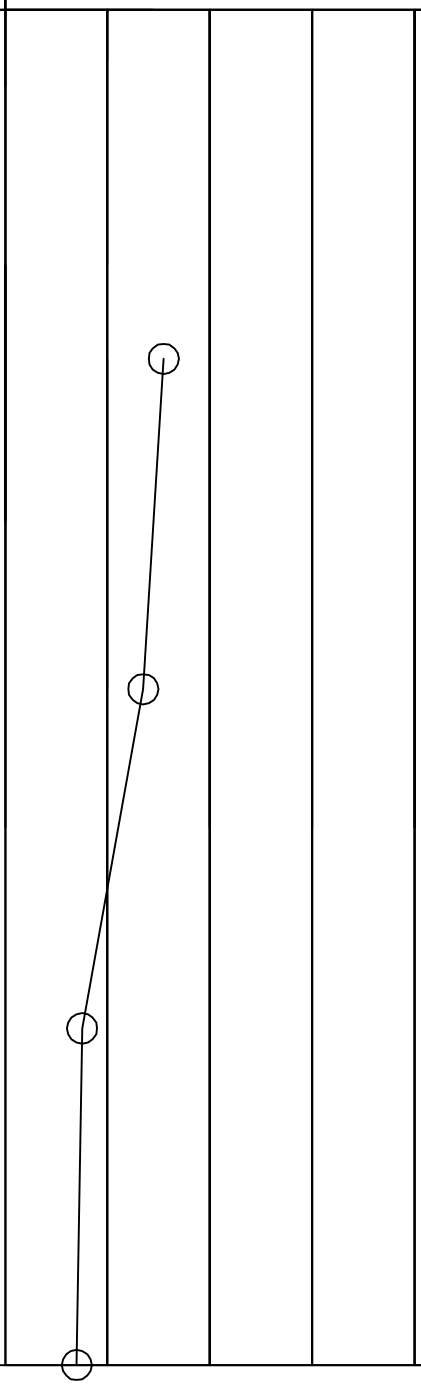
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A3

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A3	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1, 2		SS	100	Silty Clay With Sand, Very Stiff, Brown	CL-ML	1.5	15-16-15-(31)
2.3, 3		SS	100	Silty Clay, Very Stiff, Brown	CL-ML	3	14-13-14-(27)
3.4, 4, 5		SS	100	Silty Clay With Sand, Stiff, Brown	CL-ML	4.5	6-7-8-(15)
6		SS		End of BH # A3 at 6 m		6	4-5-9-(14)



Drilling Started Date :	3/4/2010
Drilling Completed Date :	3/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

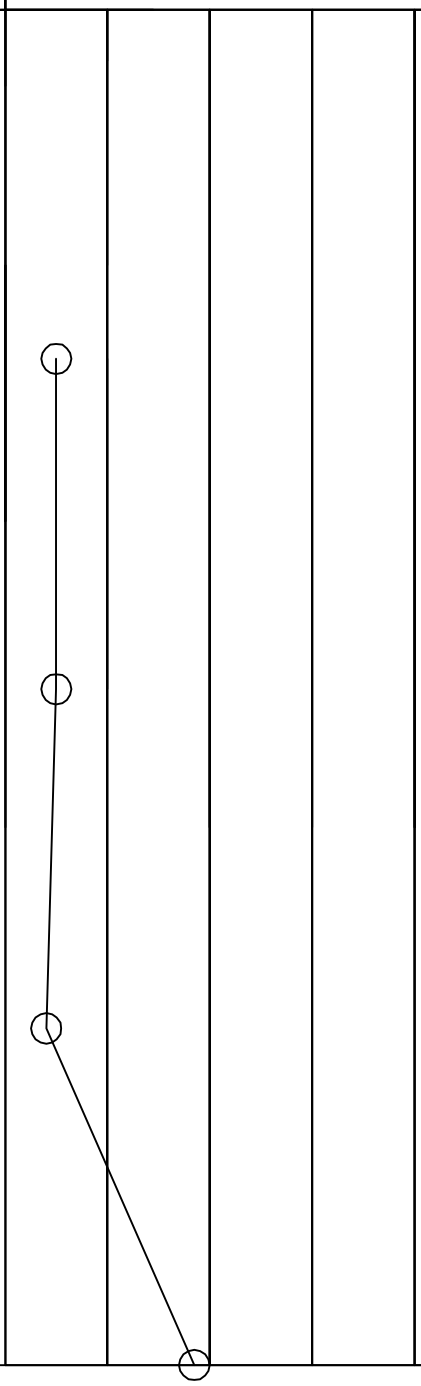
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A4

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A4	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1							
						1.5	3-4-6-(10)
2			100	Silty Clay, Stiff, Brown	CL-ML		
3						3	3-4-6-(10)
4							
						4.5	3-4-4-(8)
4.8							
5			100	Silty Clay With Sand, Hard, Brown	CL-ML		
6				End of BH # A4 at 6 m		6	10-17-20-(37)



Drilling Started Date :	3/4/2010
Drilling Completed Date :	3/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

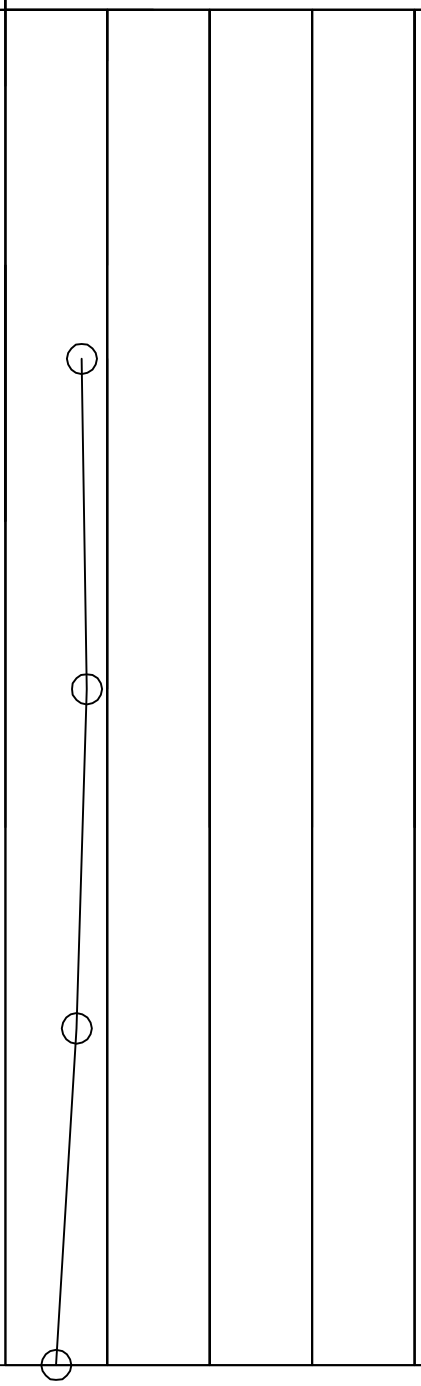
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A5

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A5	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1						1.5	6-7-8-(15)
2							
3			100	Silty Clay With Sand, Stiff, Brown	CL-ML	3	6-7-9-(16)
4						4.5	5-6-8-(14)
5							
6				End of BH # A5 at 6 m		6	4-4-6-(10)



Drilling Started Date :	3/4/2010
Drilling Completed Date :	3/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

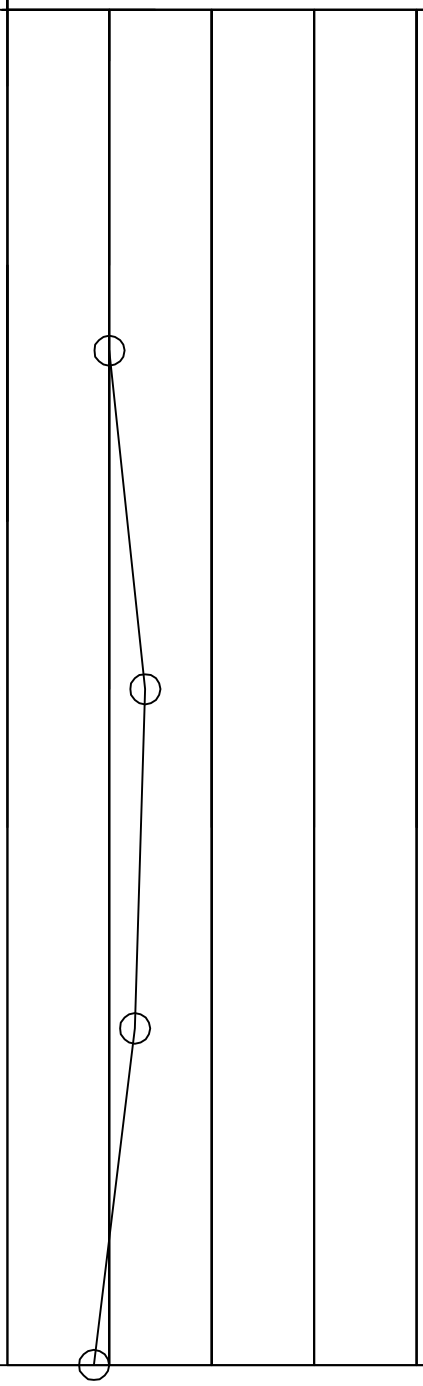
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A6

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A6	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1							
						1.5	7-10-10-(20)
2			100	Silty Clay With Sand, Very Stiff, Brown	CL-ML		
3						3	11-12-15-(27)
3.8							
4			100	Silt With Sand, Very Stiff, Brown	ML		
						4.5	9-12-13-(25)
4.8							
5			100	Silty Clay With Sand, Very Stiff, Brown	CL-ML		
5.4							
			100	Silt With Sand, Very Stiff, Brown	ML		
6				End of BH # A6 at 6 m		6	6-8-9-(17)



Drilling Started Date :	30/3/2010
Drilling Completed Date :	30/3/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

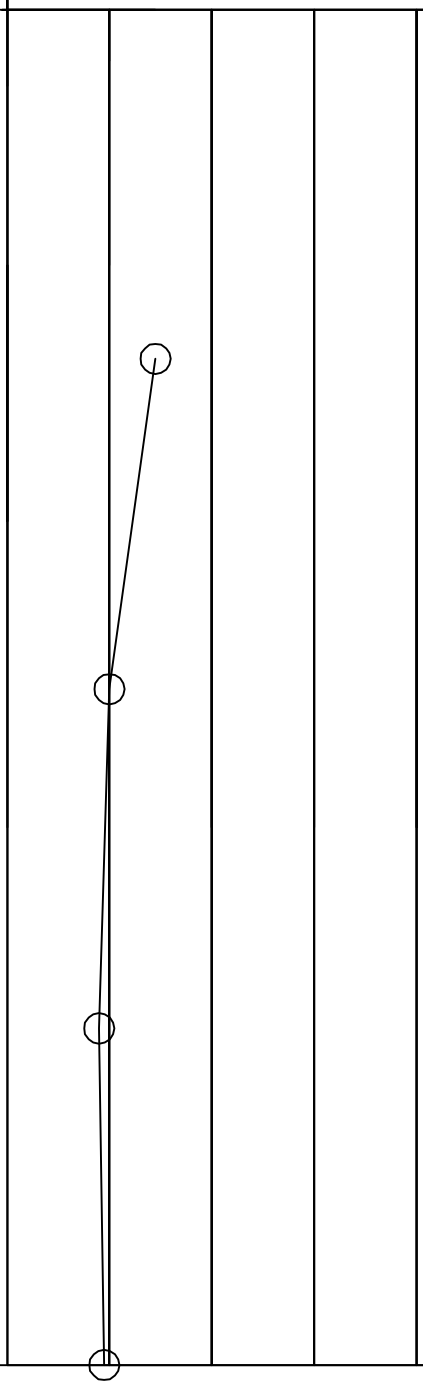
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A7

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A7	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1							
						1.5	8-14-15-(29)
2			100	Silty Clay With Sand, Very Stiff, Brown	CL-ML		
3						3	7-9-11-(20)
3.8							
4							
			100	Sandy Silty Clay, Very Stiff, Brown	CL-ML	4.5	5-9-9-(18)
5							
5.2							
			100	Silty Clay With Gravel, Very Stiff, Brown	CL-ML		
6				End of BH # A7 at 6 m		6	5-8-11-(19)



Drilling Started Date :	1/4/2010
Drilling Completed Date :	1/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A8

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A8	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1							
						1.5	14-25-28-(>50)
2			100	Silty Clay With Sand, Hard, Brown	CL-ML		
3						3	13-18-21-(39)
3.8							
4							
			100	Silty Clay, Hard, Brown	CL-ML	4.5	12-21-27-(48)
5							
5.2			100	Lean Clay, Hard, Brown	CL		
6				End of BH # A8 at 6 m		6	17->50->50-(>50)

SPT/ (N VALUE): 20, 40, 60, 80

Drilling Started Date :	1/4/2010
Drilling Completed Date :	1/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

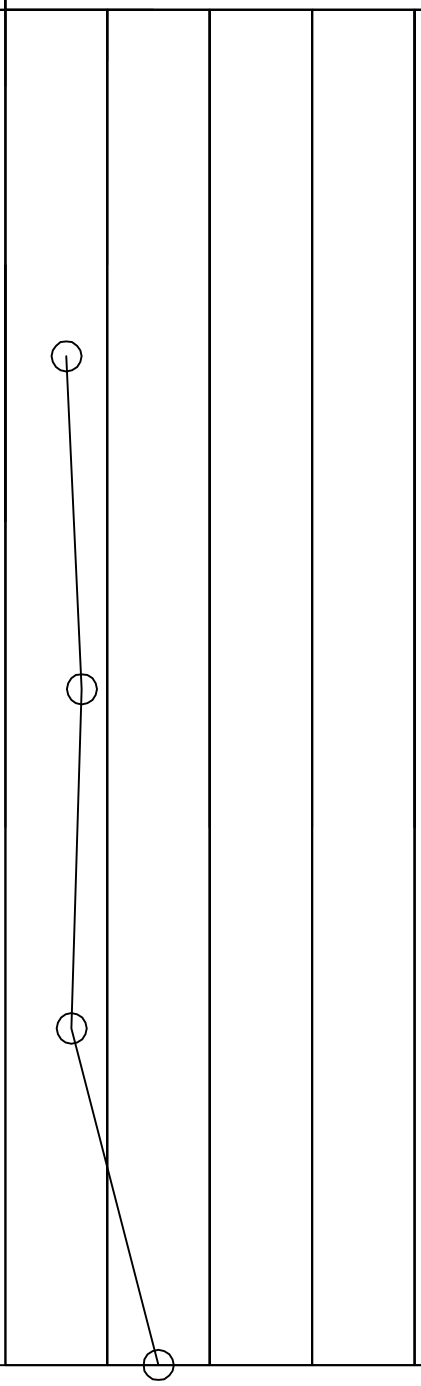
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A9

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A9	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1							
						1.5	6-6-6-(12)
2			100	Silty Clay With Sand, Stiff, Brown	CL-ML		
3						3	6-7-8-(15)
3.8							
4			100	Sandy Silt, Stiff, Brown	ML		
						4.5	6-6-7-(13)
4.8							
5			100	Silty Clay, Very Stiff, Brown	CL-ML		
6				End of BH # A9 at 6 m		6	16-16-14-(30)



Drilling Started Date :	3/4/2010
Drilling Completed Date :	3/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

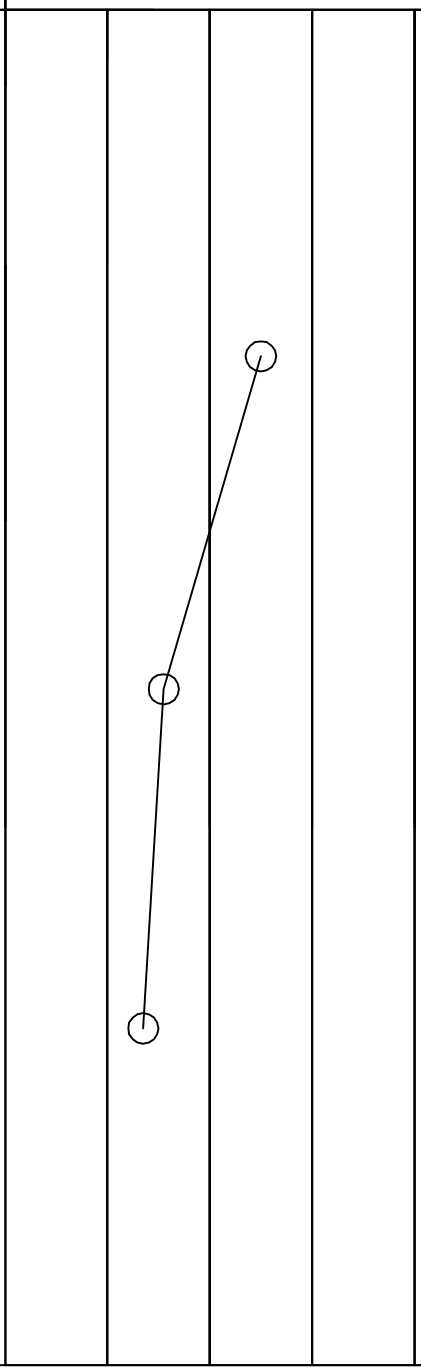
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A10

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A10	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1			100	Sandy Silty Clay, Hard, Brown	CL-ML	1.5	13-25-25-(50)
1.8							
2			100	Silty Clay With Sand,Hard to Very Stiff, Brown	CL-ML		
3						3	10-14-17-(31)
4			100	Sandy Silty Clay, Hard, Brown	CL-ML	4.5	9-12-15-(27)
4.8							
5			100	Silty Clay, Hard, Brown	CL-ML		
6				End of BH # A10 at 6 m		6	20-27-32-(>50)



Drilling Started Date :	3/4/2010
Drilling Completed Date :	3/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

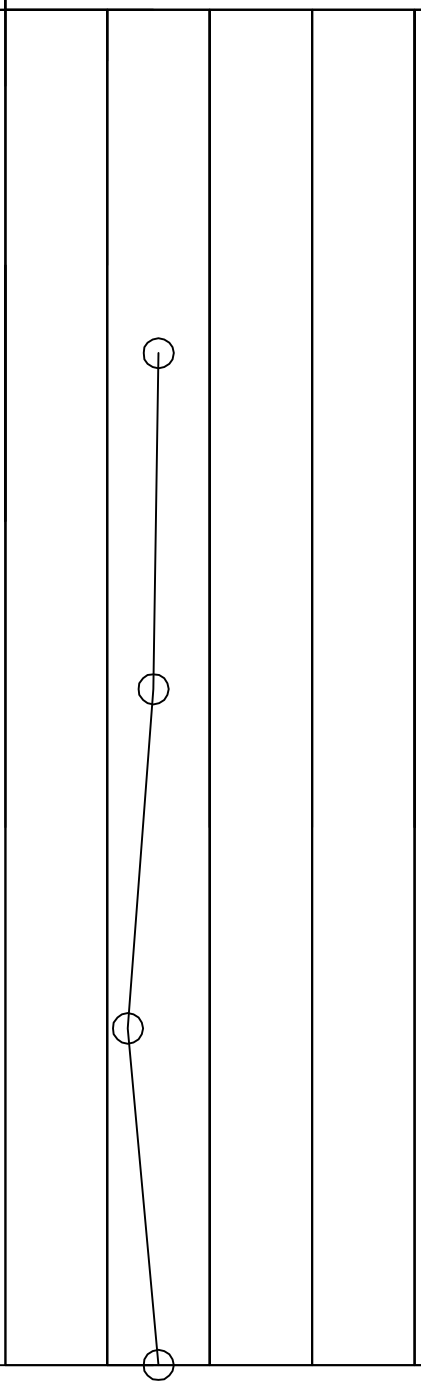
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A11

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A11	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1, 2, 3			100	Sandy Silt, Medium, With Cobble Brown	ML	1.5 3	13-14-16-(30) 8-14-15-(29)
3.8, 4			100	Silty Clay With Sand, Very Stiff, Brown	CL-ML	4.5	8-12-12-(24)
4.8, 5, 6			100	Silt, Very Stiff, Brown End of BH # A11 at 6 m	CL-ML	6	9-14-16-(30)



Drilling Started Date :	1/4/2010
Drilling Completed Date :	1/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Section of Cobble
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

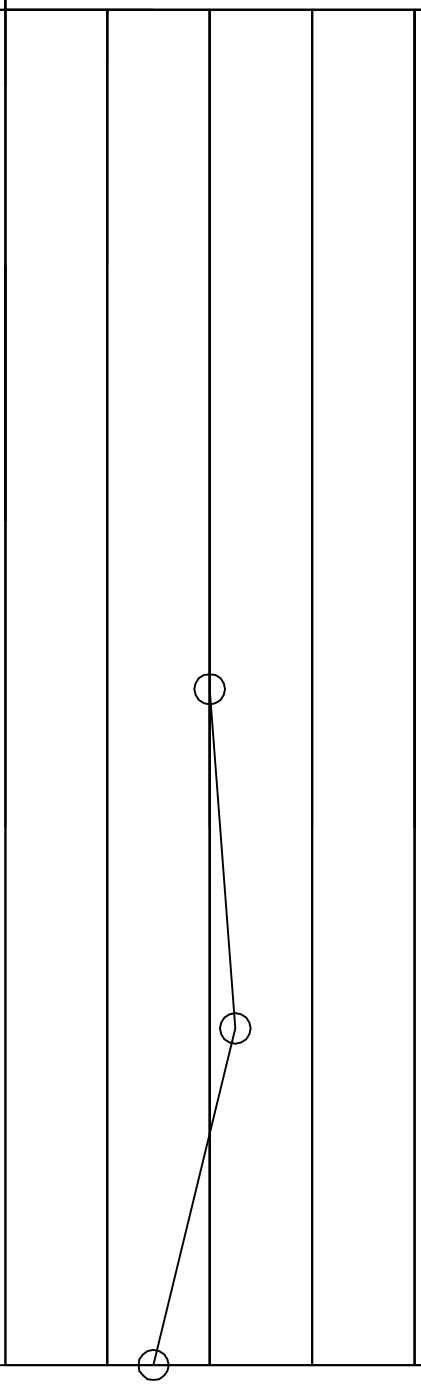
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A12

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A12	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1			100	Sandy Silt, Very Dense to Dense, With Cobble Brown	ML	1.5	11-24-34-(>50)
2							
3						3	10-17-23-(40)
3.3			100	Silty Clay, hard, Brown	CL-ML		
3.8							
4			100	Silty Clay With Sand, Hard, Brown	CL-ML	4.5	14-21-24-(45)
4.8							
5			100	Silty Clay, Very Stiff, Brown	CL-ML		
6				End of BH # A12 at 6 m		6	11-14-15-(29)



Drilling Started Date :	3/4/2010
Drilling Completed Date :	3/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Section of Cobble
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

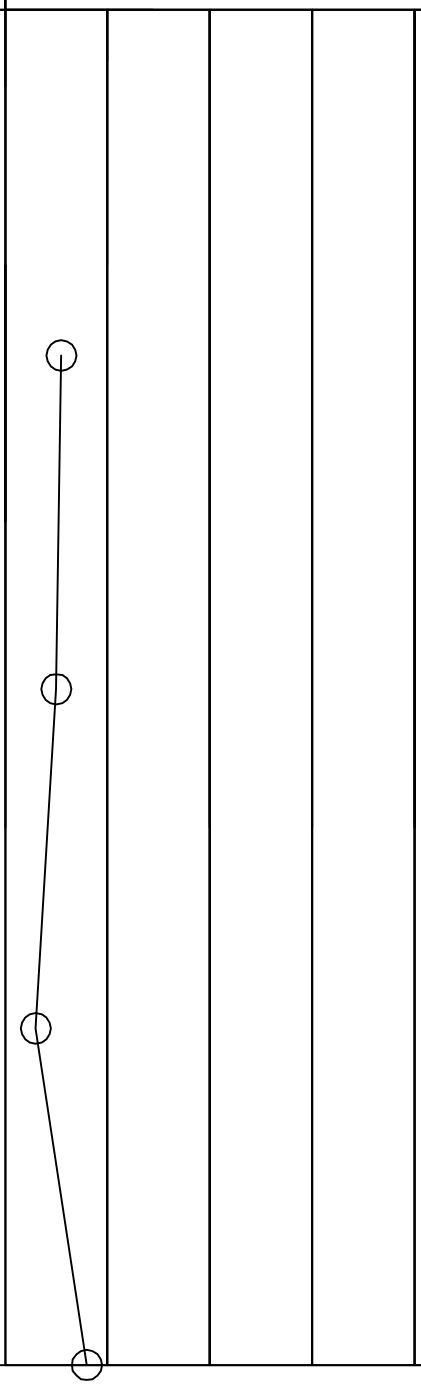
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A13

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A13	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1							
			100	Silty Clay With Sand, Stiff, Brown	CL-ML	1.5	3-5-6-(11)
2							
3						3	3-4-6-(10)
3.3							
4							
			100	Silty Clay, Medium Stiff to Stiff, Brown	CL-ML	4.5	2-2-4-(6)
5							
6				End of BH # A13 at 6 m		6	4-6-10-(16)



Drilling Started Date :	29/3/2010
Drilling Completed Date :	29/3/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

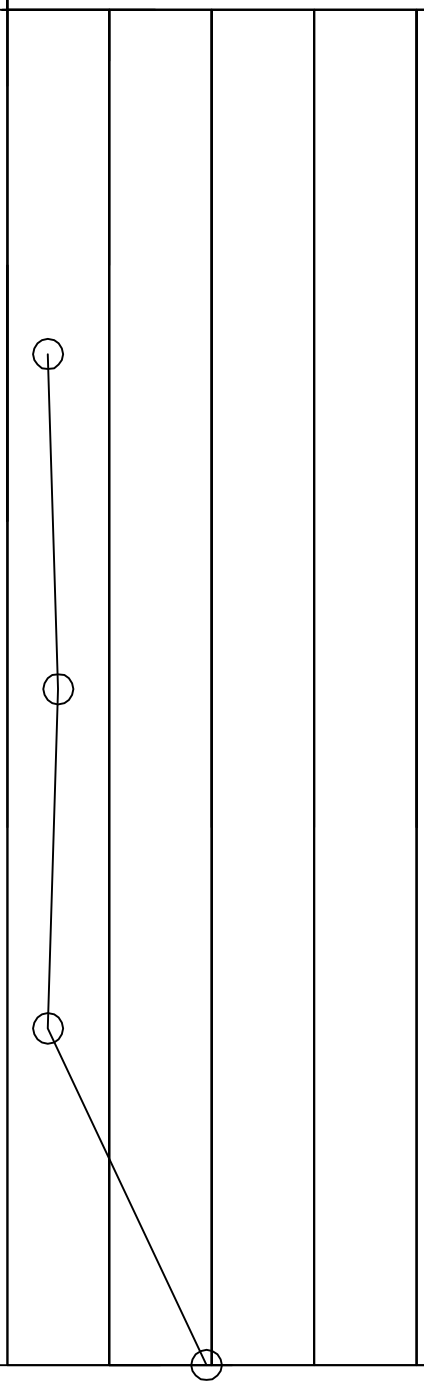
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A14

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A14	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1			100	Silty Sand With Gravel, Loose, Brown	SM	1.5	5-4-4-(8)
2							
3						3	4-4-6-(10)
3.3							
4			100	Silty Clay, Medium Stiff, Brown	CL-ML	4.5	2-3-5-(8)
5							
5.4			100	Silty Clay With Sand,hard, Brown	CL-ML		
6				End of BH # A14 at 6 m		6	10-17-22-(39)



Drilling Started Date :	29/3/2010
Drilling Completed Date :	29/3/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

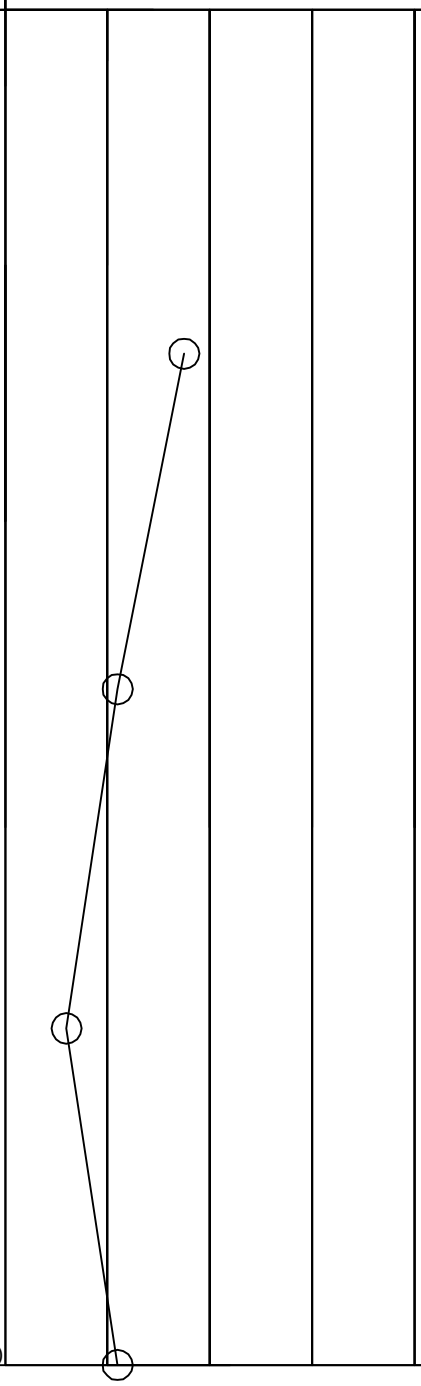
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A15

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A15	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1							
						1.5	12-17-18-(35)
2							
3						3	7-11-11-(22)
			100	Silty Clay, Hard to Very Stiff, Brown	CL-ML		
4							
						4.5	3-6-6-(12)
5							
5.4							
6				End of BH # A15 at 6 m		6	6-9-13-(22)



Drilling Started Date :	29/3/2010
Drilling Completed Date :	29/3/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

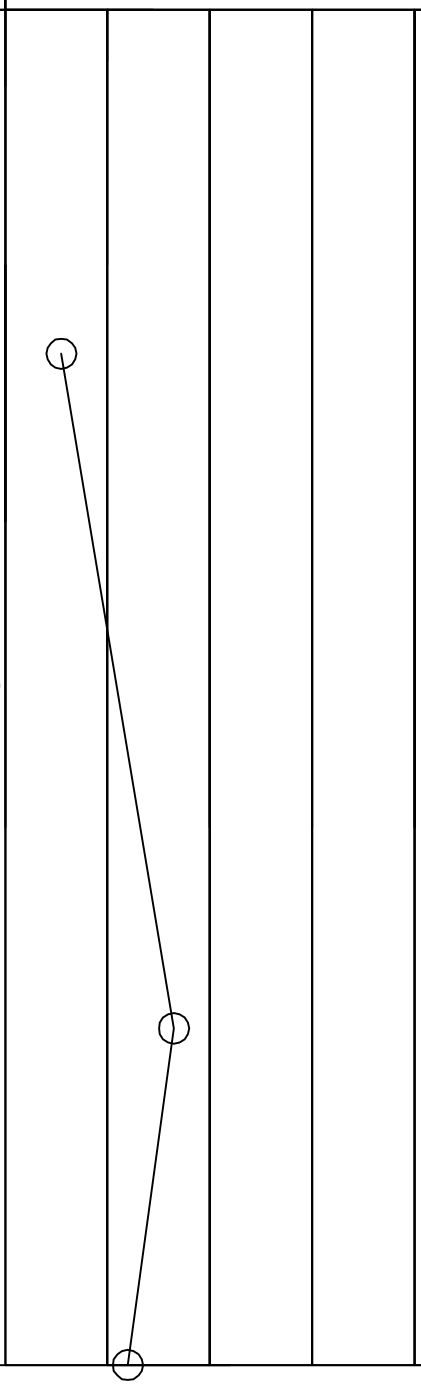
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A16

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A16	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1			100	Sandy Silty Clay,Stiff to Hard, Dark Brown	CL-ML	1.5	4-5-6-(11)
2							
3						3	20-28-32-(>50)
3.2							
4			100	Lean Clay, Hard, Brown	CL	4.5	12-17-16-(33)
5							
5.6			100	Silty Clay With Sand, Very Stiff, Brown	CL-ML		
6				End of BH # A16 at 6 m		6	6-10-14-(24)



Drilling Started Date :	29/3/2010
Drilling Completed Date :	29/3/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

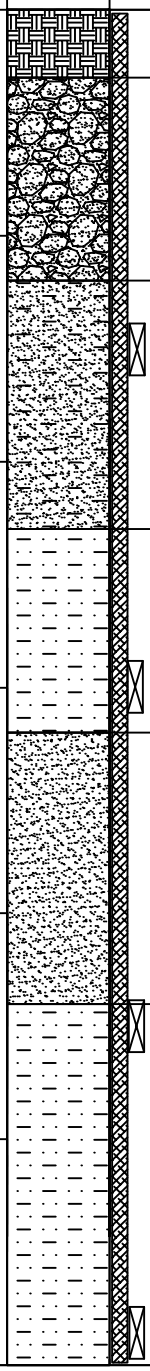
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

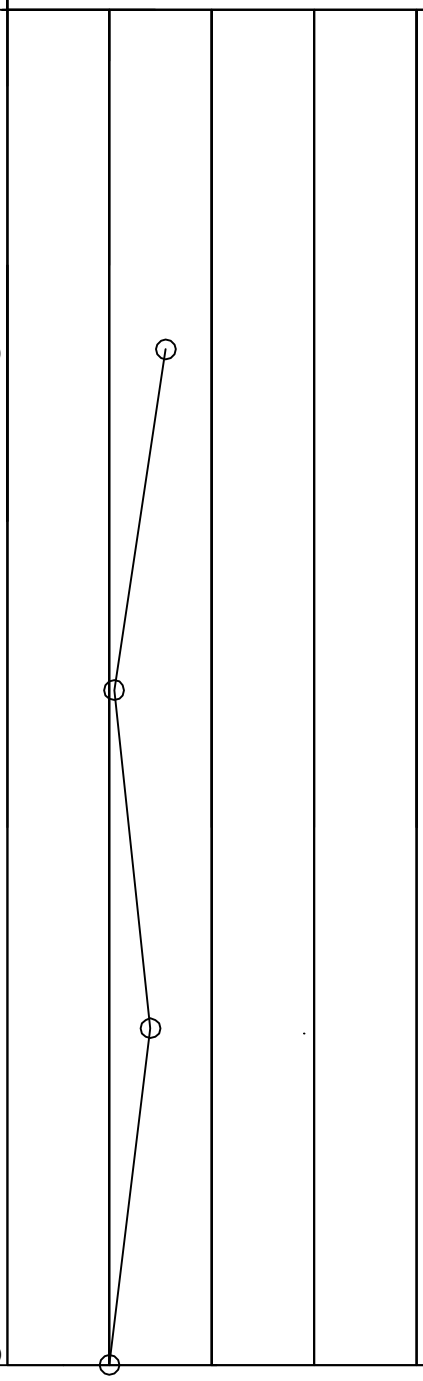
LOG OF BH # A17

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A17	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.3	100	Top Soil (Clay, and Sand and Silt)			
1	100	Silty Gravel With Sand, Stiff to Very Stiff, Brown	GM		
1.2	100	Silty Clay With Sand, Very Stiff, Brown	CL-ML	1.5	12-15-16-(31)
2.3	100	Silty Clay, Very Stiff, Brown	CL-ML	3	7-9-12-(21)
3.2	100	Silt,Very Stiff, Brown	ML	4.5	6-12-16-(28)
4.4	100	Silty Clay, Very Stiff, Brown	CL-ML		
6		End of BH # A17 at 6m		6	6-8-12-(20)





Drilling Started Date :	28/03/2010
Drilling Completed Date :	28/03/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

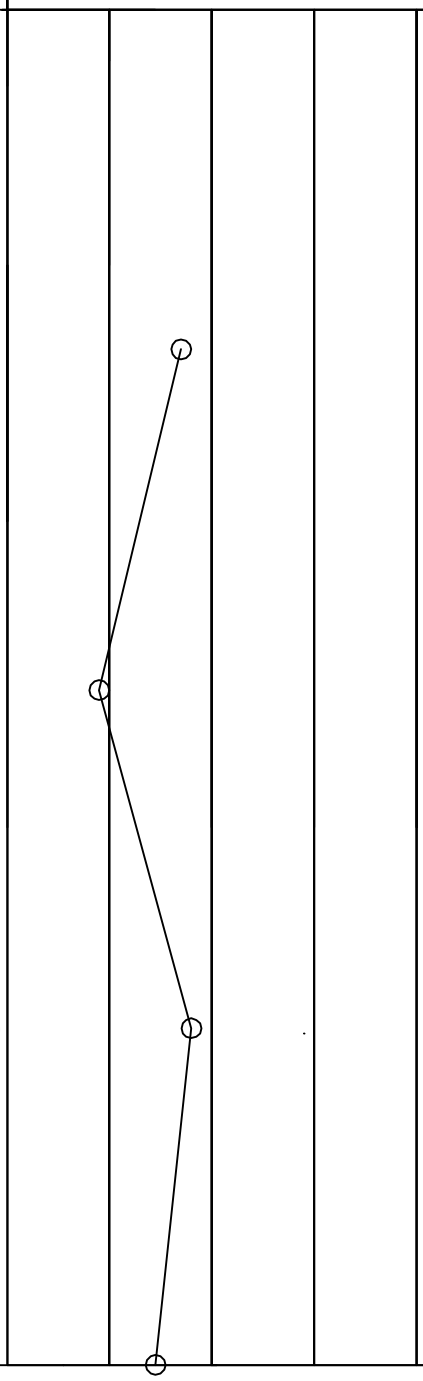
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A18

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A18	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.3			100	Top Soil (Clay, and Sand and Silt)			
1							
						1.5	15-15-19-(34)
2			100	Lean Clay, Hard to very Stiff, Brown	CL		
3						3	8-9-9-(18)
3.2							
4							
			100	Silty Clay, Hard to Very Stiff, Brown	CL-ML	4.5	12-10-26-(36)
5							
6				End of BH # A18 at 6m		6	10-14-15-(29)



Drilling Started Date :	28/03/2010
Drilling Completed Date :	28/03/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

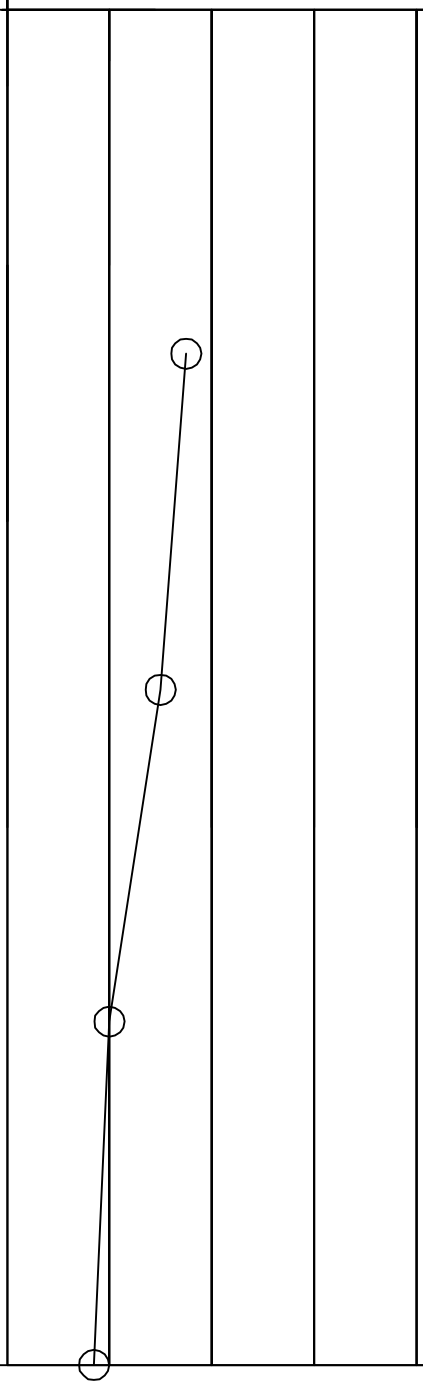
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A19

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A19	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.1			100	Top Soil (Clay, and Silt)			
1			100	Sandy Silt, Hard to Very Stiff, Brown	ML	1.5	12-15-20-(35)
2							
3						3	11-15-15-(30)
3.3							
4			100	Silty Sand, Medium, Brown	SM	4.5	7-10-10-(20)
5							
5.2			100	Silty Clay With Sand,Very Stiff, Brown	CL-ML		
6				End of BH # A19 at 6 m		6	5-7-10-(17)



Drilling Started Date :	28/3/2010
Drilling Completed Date :	28/3/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

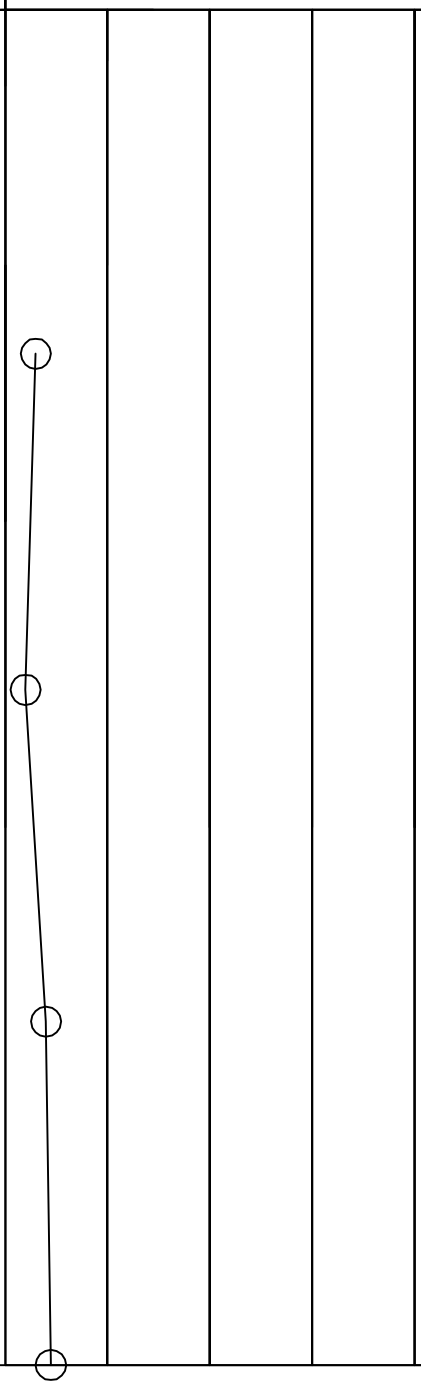
LOG OF BH # A20

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A20	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.3			100	Top Soil (Clay, and Silt)			
1							
						1.5	2-3-3-(6)
2			100	Silty Clay With Sand, Medium Stiff to Soft, Brown	CL-ML		
3						3	2-2-2-(4)
3.8							
4							
						4.5	2-3-5-(8)
5			100	Silty Clay, Medium Stiff to Stiff, Brown	CL-ML		
6				End of BH # A20 at 6 m		6	2-4-5-(9)

SPT/ (N VALUE)



Drilling Started Date :	27/3/2010
Drilling Completed Date :	27/3/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
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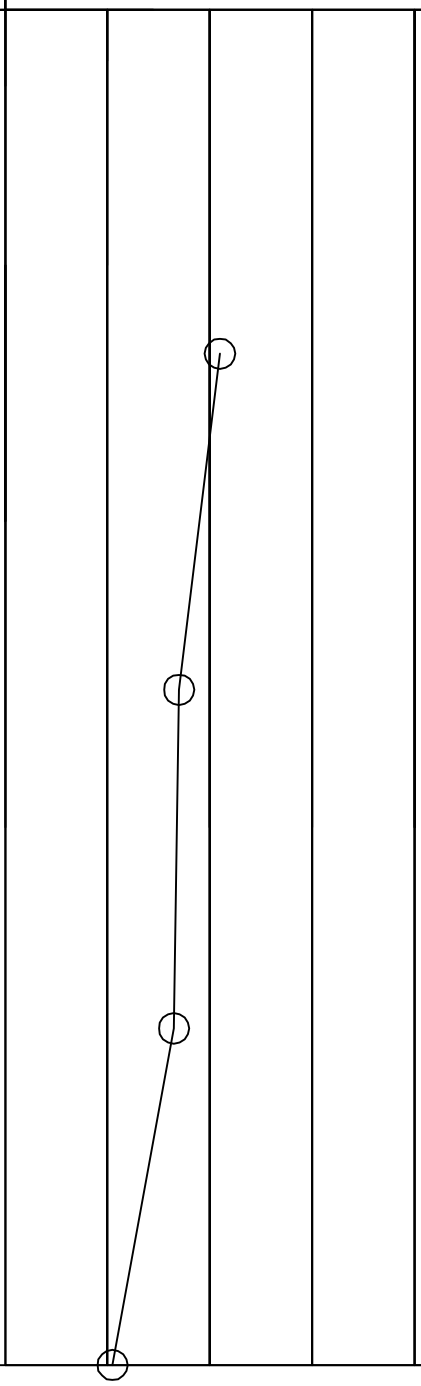
LOG OF BH # A21

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A21	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1			100	Silty, Clayey Sand, Hard Brown	SC-SM	1.5	7-17-25-(42)
2							
3						3	10-16-18-(34)
3.8							
4			100	Silty Clay, Hard, Brown	CL-ML	4.5	12-15-18-(33)
5							
5.4			100	Lean Clay, Very Stiff, Brown	CL		
6				End of BH # A21 at 6 m		6	8-10-11-(21)



Drilling Started Date :	27/3/2010
Drilling Completed Date :	27/3/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
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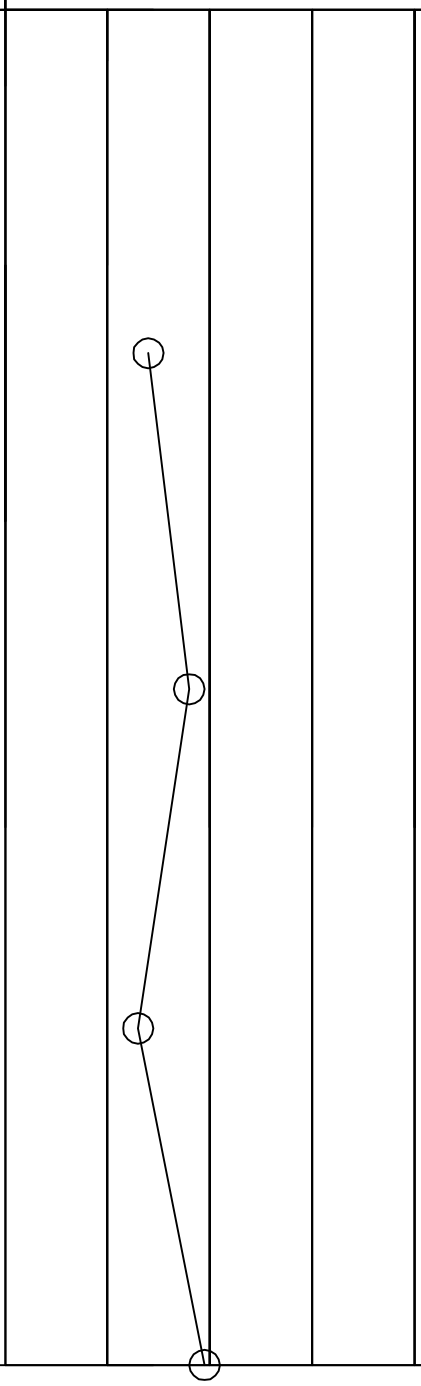
0774291405

LOG OF BH # A22

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A22	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2	100	Top Soil (Clay, and Silt)			
1, 2, 3	100	Silty Sand, Medium to Dense, With Cobble Brown	SM	1.5 3	9-13-15-(28) 12-17-19-(36)
3.3, 4	100	Sandy Silt, Very Stiff, Brown	ML	4.5	10-12-14-(26)
4.8, 5, 6	100	Sily Clay, Hard, Brown End of BH # A22 at 6 m	CL-ML	6	11-19-20-(39)



Drilling Started Date :	30/3/2010
Drilling Completed Date :	30/3/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Section of Cobble
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
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0774291405

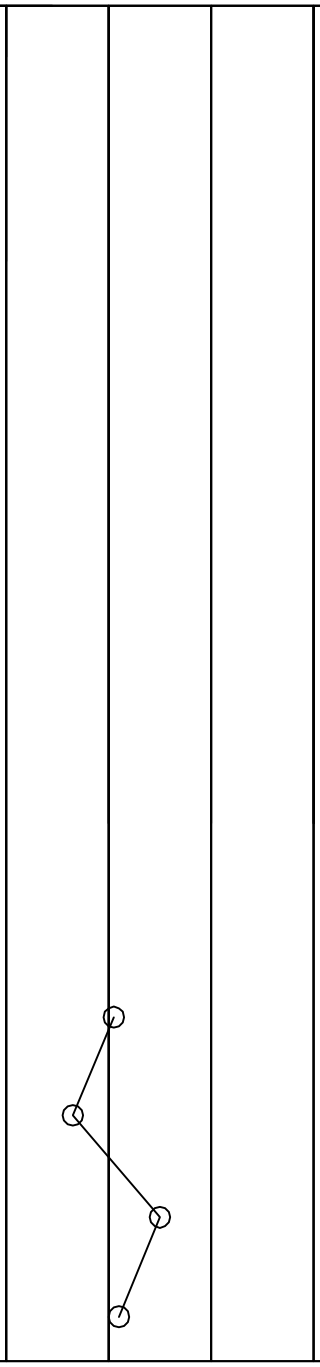
LOG OF BH # A23

(ASTM D-5434)

Client :	USAID	Location:	Kabul Province	Drilling Method :	Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor:	Tetra Tech	Borehole No:	A23	Sampling Method :	Continued Soil Sampling - Split Spoon
Sub-Contractor:	Omran Geotechnical Co.	Depth:	20m	SPT Hammer :	140-lb/30in-Auto Drop
Project:	Ministry of Public Health (MOPH) Facility, Kabul	Water Table:	DRY	SS:	Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.3	100	Top Soil (Clay, and Silt)			
1.8	100	Silty Sand With Gravel, Very Dense, Brown	SM	1.5	>50->50->50-(>50)
3.8	100	Silty Gravel With Sand, With Cobble Brown	GM	3	>50->50->50-(>50)
4.8	100	Silty Clay, Hard, Brown	CL-ML	4.5	16-26->50-(>50)
	100	Silty Sand With Gravel, Very Dense, Brown	SM		
6.1	100	Bubbling With HCL (0.1 mol) White to Creame Clay With Carbonate, Low Compact	MARL	6	19-23->50-(>50)
13.3	100	Silty Sand With Gravel, Dense, With Cobble ,Brown	SM		
	100	Bubbling With HCL (0.1 mol) White to Creame Clay With Carbonate, Low Compact	MARL		
15.8	100	Silty Clay With Sand, Hard, Brown	CL-ML	15	7-19-22-(41)
16.2	100	Silty Clay,Hard, Dark Brown	ML		
17.3	100	Sandy Silty Clay, Hard, Dark Brown	CL-ML	16.5	10-15-18-(33)
	100	Silty Clay With Sand, Brown	CL-ML	18	15-20-30-(50)
				19.5	10-17-25-(42)
20		End of BH # A23 at 20 m			

SPT/ (N VALUE)



Drilling Started Date :	7/4/2010
Drilling Completed Date :	8/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Section of Cobble
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A24

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A24	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1, 2			100	Silty Sand With Gravel,Very Dense, With Cobble , Brown	SM	1.5	27->50->50-(>50)
2.3, 3			100	Sandy Silt, Dense, Brown	ML	3	7-16-26-(42)
3.8, 4, 5			100	Silty Sand With Gravel,Very Dense , With Cobble, Brown	SM	4.5	>50->50->50-(>50)
5.2, 6			100	Silty Gravel With Sand, Very Dense, With Cobble, Brown End of BH # A24 at 6 m	GM	6	>50->50->50-(>50)

SPT/ (N VALUE): 20 40 60 80

Drilling Started Date :	4/4/2010
Drilling Completed Date :	4/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Section of Cobble
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A25

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A25	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)	SPT/ (N VALUE) 20 40 60 80
0.2			100	Top Soil (Clay, and Silt)				
1								
						1.5	14->50->50-(>50)	
2								
3						3	12-19-20-(39)	
			100	Silty Sand With Gravel,Very Dense, With Cobble , Brown	SM			
4								
						4.5	>50->50->50-(>50)	
5								
6				End of BH # A25 at 6 m		6	>50->50->50-(>50)	

Drilling Started Date :	4/4/2010
Drilling Completed Date :	4/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Section of Cobble
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

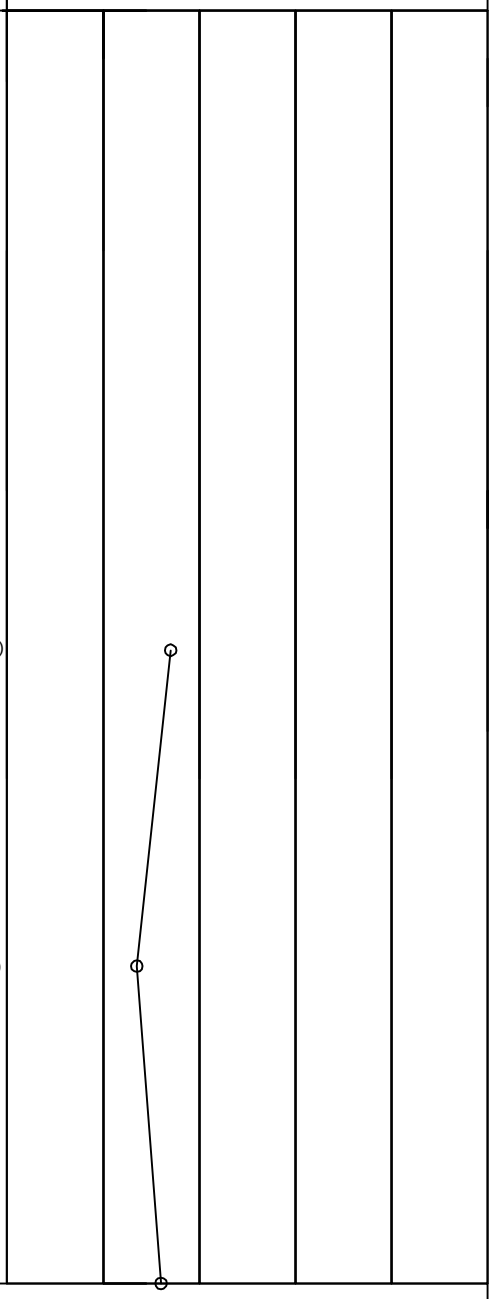
Omran Geotechnic Company
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A26

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A26	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.2			100	Top Soil (Clay, and Silt)			
1			100	Silty Clay With Sand, Hard, Light Brown	CL-ML	1.5	20-33-34-(>50)
2							
3						3	10-16-18-(34)
3.3							
4			100	Silty Clay,Hard to Very Stif, Brown	CL-ML	4.5	10-13-14-(27)
4.8							
5			100	Lean Clay ,Hard, Light Brown	CL		
6				End of BH # A26 at 6 m		6	12-14-18-(32)



Drilling Started Date :	1/4/2010
Drilling Completed Date :	1/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Section of Cobble
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A27

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A27	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.3	100	Top Soil (Clay, and Sand and Silt)			
1	100	Lean Clay With Sand, Stiff, Brown,	CL	1.5	5-6-8-(14)
2					
2.2					
3	100	Silty Clay, Stiff, Brown	CL-ML	3	3-4-7-(11)
4				4.5	4-5-5-(10)
5					
6		End of BH # A27 at 6m		6	3-6-8-(14)

SPT/ (N VALUE): 20, 40, 60, 80

Drilling Started Date :	27/03/2010
Drilling Completed Date :	27/03/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

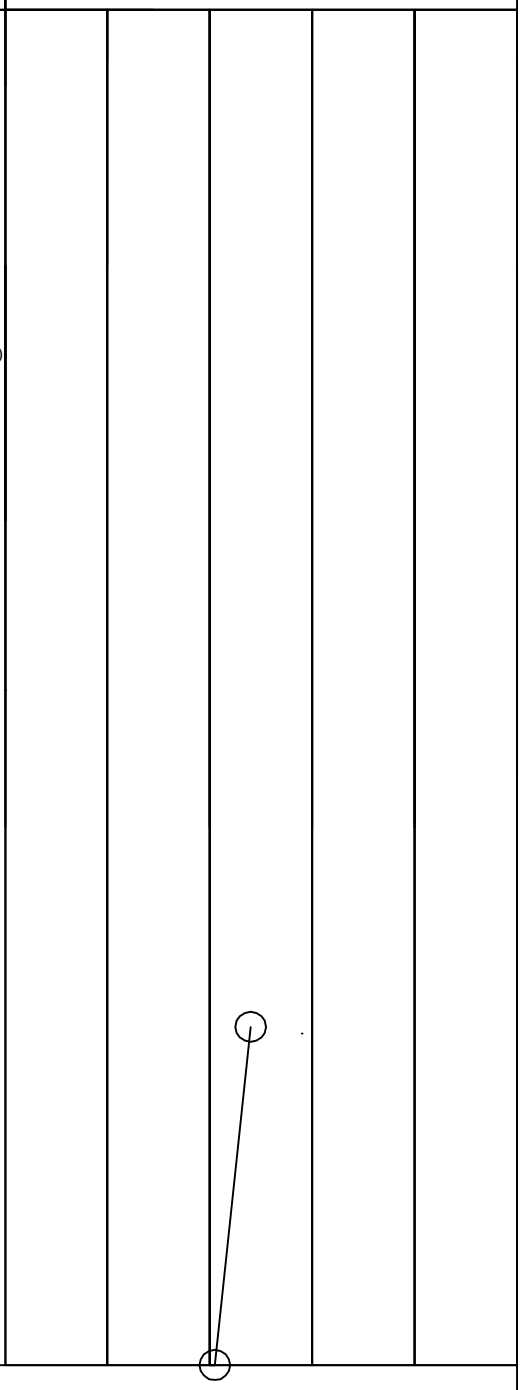
LOG OF BH # A28

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A28	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.3			100	Top Soil (Clay, and Sand and Silt)			
1, 2			100	Silty Clay With Sand, Hard, Brown	CL-ML	1.5	24-30-39-(>50)
2.5, 3			100	Silty Clay, Hard, Brown	CL-ML	3	18-33-33-(>50)
3.5, 4			100	Silty Clay With Sand, Hard, Brown	CL-ML		
4.2, 5			100	Silty Clay, Hard, Brown	CL-ML	4.5	14-23-25-(48)
6				End of BH # A28 at 6m		6	13-20-21-(41)

SPT/ (N VALUE)



Drilling Started Date :	27/03/2010
Drilling Completed Date :	27/03/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

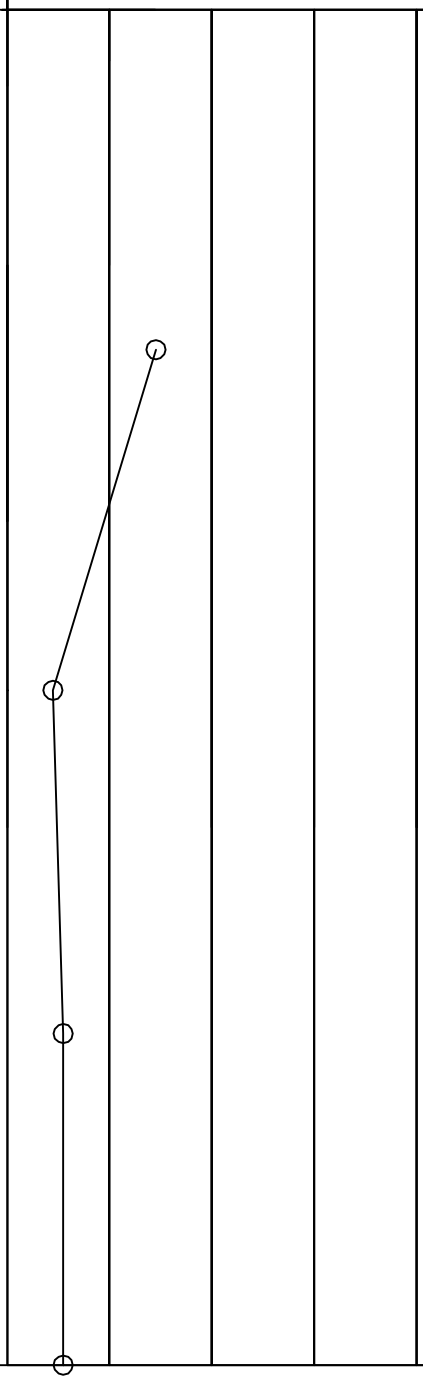
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A29

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A29	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 6m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.3			100	Top Soil (Clay, and Sand and Silt)			
1							
						1.5	12-15-14-(29)
2			100	Lean Clay, Very Stiff to Stiff, Brown	ML		
3						3	5-4-5-(9)
4							
4.2							
						4.5	4-6-5-(11)
5			100	Silty Clay, Stiff, Brown	CL-ML		
6				End of BH # A29 at 6m		6	3-5-6-(11)



Drilling Started Date :	27/03/2010
Drilling Completed Date :	27/03/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnic Company

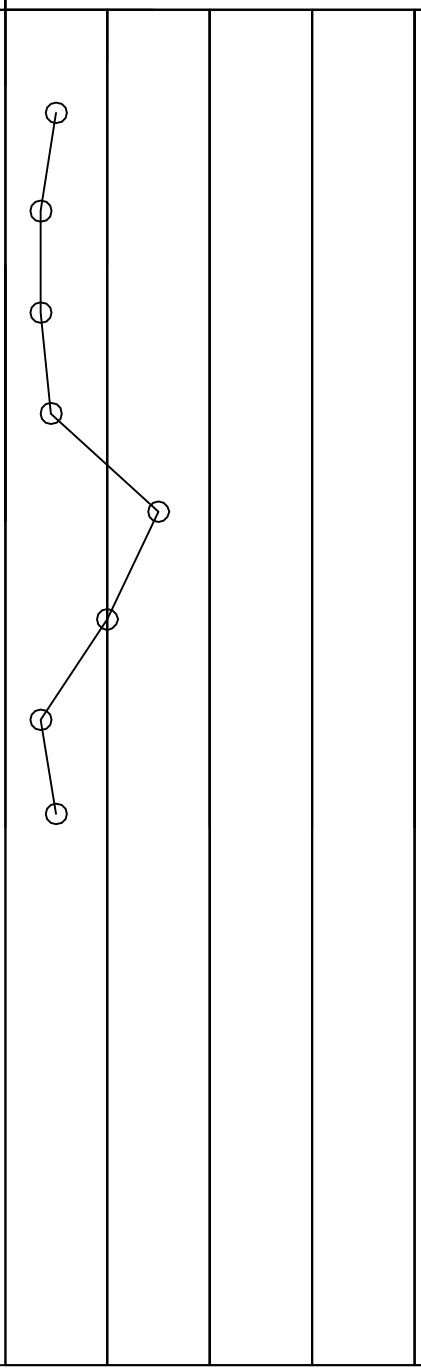
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A30

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A30	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 20m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: 8.1m	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.3	100	Top Soil (Clay, and Silt)			
2	100	Sandy Silty Clay, Medium Stiff to Stiff, Light Brown	CL-ML	1.5	3-5-5-(10)
				3	3-3-4-(7)
3.3	100	Silt Clay With Sand, Medium Stiff, Brown	CL-ML		
4				4.5	2-3-4-(7)
4.3	100	Silt With Sand ,Medium Stiff to Stiff, Brown	ML		
6				6	5-5-4-(9)
6.8	100	Silty Sand With Gravel, Dense, Brown	SM		
7.5	100	Conglomierate With Carbonate Cement — Water Table		7.5	8-14-16-(30)
8					
8.3	100	Silty Sand With Gravel, Dense, Brown	SM		
9.2				9	5-8-12-(20)
10	100	Silty Clay, Very Stiff, Brown	CL-ML		
				10.5	2-2-5-(7)
10.8	100	Silty Sand With Gravel, Dense, Brown	SM		
12				12	2-5-5-(10)
12.2	100	Silty clayey Sand, With Cobble Brown	SC-SM		
13.8					
14	100	Silty Gravel With Sand, With Cobble Brown	GM		
15.3					
16	100	Silty Sand With Gravel With Cobble, Brown	SM		
18					
20		End of BH # A30 at 20 m			



Drilling Started Date :	1/4/2010
Drilling Completed Date :	1/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Section of Cobble
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnical Company

Appendix B

Test Pits Log

Professional Geotechnical Services

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF TP # 01

(ASTM D-5434)

Client : USAID	Location : Kabul Province	Excavation Method : By Excavator Machine
Contractor: Tetra Tech	Test Pit No: 01	Sampling Method : By Hand / Field Technician
Sub-Contractor: Omran Geotechnical Co.	Depth: 2 m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)	SPT/ (N VALUE) 20 40 60 80
0.1			100	Top Soil, (and Clay and silt& sand),Light Brown				
1			100	Silty Clay, Plasticity, Brown	CL-ML			
2				End of Test Pit # 01 at 2 m				

Excavation Started Date :	6/4/2010
Excavation Completed Date :	6/4/2010
Sub-Contractor :	OGC
Name of Feild Technician :	Mohammadi
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- [x] Split-Spoon (SS)
- [ ] By Hand

NOTE

1-PRIMARY LITHOLOGICAL LOG HAS PREPARED BY FIELD SITE ENGINEER.

2-FIELD LITHOLOGICAL LOG HAS COMPLETED AFTER LAB TEST AND CHECKED BY LAB MANAGER.

3-SPT TEST PERFORMED PER ASTM D 1586 IN TEST PIT EVERY 1.5 m ACCORDING TO SOIL TYPES DIDNOT TAKE SPLIT SPOON SAMPLES.

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF TP # 02

(ASTM D-5434)

Client : USAID	Location : Kabul Province	Excavation Method : By Excavator Machine
Contractor: Tetra Tech	Test Pit No: 02	Sampling Method : By Hand / Field Technician
Sub-Contractor: Omran Geotechnical Co.	Depth: 2 m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)	SPT/ (N VALUE) 20 40 60 80
0.1			100	Top Soil, (and Clay and silt& sand),Light Brown				
1			100	Silt, Brown	ML			
2				End of Test Pit # 02 at 2 m				

Excavation Started Date :	6/4/2010
Excavation Completed Date :	6/4/2010
Sub-Contractor :	OGC
Name of Feild Technician :	Mohammadi
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- By Hand

NOTE

1-PRIMARY LITHOLOGICAL LOG HAS PREPARED BY FIELD SITE ENGINEER.

2-FIELD LITHOLOGICAL LOG HAS COMPLETED AFTER LAB TEST AND CHECKED BY LAB MANAGER.

3-SPT TEST PERFORMED PER ASTM D 1586 IN TEST PIT EVERY 1.5 m ACCORDING TO SOIL TYPES DIDNOT TAKE SPLIT SPOON SAMPLES.

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF TP # 03

(ASTM D-5434)

Client : USAID	Location : Kabul Province	Excavation Method : By Excavator Machine
Contractor: Tetra Tech	Test Pit No: 03	Sampling Method : By Hand / Field Technician
Sub-Contractor: Omran Geotechnical Co.	Depth: 2 m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)	SPT/ (N VALUE) 20 40 60 80
0.1			100	Top Soil, (and Clay and silt& sand),Light Brown				
1			100	Sandy Silty Clay, Plasticity, Brown	CL-ML			
2				End of Test Pit # 03 at 2 m				

Excavation Started Date : 6/4/2010

Excavation Completed Date : 6/4/2010

Sub-Contractor : OGC

Name of Feild Technician : Mohammadi

Geotechnical Eng: Eng. G.Nezami

Design By: Eng. Samad Heidari

Sample Types :

Split-Spoon (SS)

By Hand

NOTE

1-PRIMARY LITHOLOGICAL LOG HAS PREPARED BY FIELD SITE ENGINEER.

2-FIELD LITHOLOGICAL LOG HAS COMPLETED AFTER LAB TEST AND CHECKED BY LAB MANAGER.

3-SPT TEST PERFORMED PER ASTM D 1586 IN TEST PIT EVERY 1.5 m ACCORDING TO SOIL TYPES DIDNOT TAKE SPLIT SPOON SAMPLES.

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF TP # 04

(ASTM D-5434)

Client : USAID	Location : Kabul Province	Excavation Method : By Excavator Machine
Contractor: Tetra Tech	Test Pit No: 04	Sampling Method : By Hand / Field Technician
Sub-Contractor: Omran Geotechnical Co.	Depth: 2 m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)	SPT/ (N VALUE) 20 40 60 80
0.1			100	Top Soil, (and Clay and silt& sand),Light Brown				
1			100	Silt With Sand, Plasticity, Brown	ML			
2				End of Test Pit # 04 at 2 m				

Excavation Started Date :	6/4/2010
Excavation Completed Date :	6/4/2010
Sub-Contractor :	OGC
Name of Feild Technician :	Mohammadi
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- By Hand

NOTE

1-PRIMARY LITHOLOGICAL LOG HAS PREPARED BY FIELD SITE ENGINEER.

2-FIELD LITHOLOGICAL LOG HAS COMPLETED AFTER LAB TEST AND CHECKED BY LAB MANAGER.

3-SPT TEST PERFORMED PER ASTM D 1586 IN TEST PIT EVERY 1.5 m ACCORDING TO SOIL TYPES DIDNOT TAKE SPLIT SPOON SAMPLES.

Omran Geotechnic Company

ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF TP # 05

(ASTM D-5434)

Client : USAID	Location : Kabul Province	Excavation Method : By Excavator Machine
Contractor: Tetra Tech	Test Pit No: 05	Sampling Method : By Hand / Field Technician
Sub-Contractor: Omran Geotechnical Co.	Depth: 2 m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health Facility, Kabul	Water Table: DRY	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	GRAPHIC LOG	SAMPLING TYPE	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)	SPT/ (N VALUE) 20 40 60 80
0.1			100	Top Soil, (and Clay and silt& sand),Light Brown				
1			100	Sandy Silt, Plasticity, Brown	ML			
2				End of Test Pit # 05 at 2 m				

Excavation Started Date :	6/4/2010
Excavation Completed Date :	6/4/2010
Sub-Contractor :	OGC
Name of Feild Technician :	Mohammadi
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- By Hand

NOTE

1-PRIMARY LITHOLOGICAL LOG HAS PREPARED BY FIELD SITE ENGINEER.

2-FIELD LITHOLOGICAL LOG HAS COMPLETED AFTER LAB TEST AND CHECKED BY LAB MANAGER.

3-SPT TEST PERFORMED PER ASTM D 1586 IN TEST PIT EVERY 1.5 m ACCORDING TO SOIL TYPES DIDNOT TAKE SPLIT SPOON SAMPLES.

Omran Geotechnical Company

Appendix C

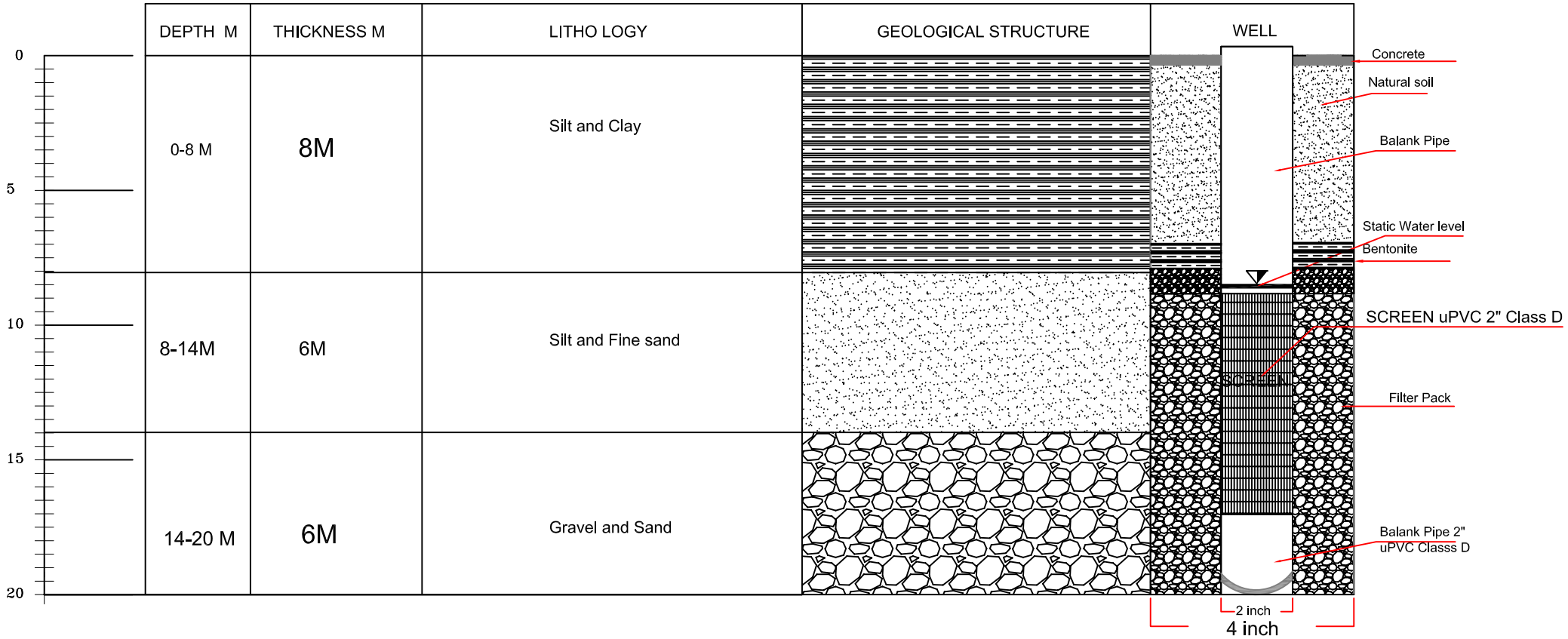
Piezometer Installation in Borehole#A30

Professional Geotechnical Services

Geologic Log & As-Built Construction Diagram of SPT Boring with 20m depth, MOPH, Kabul Afghanistan

Monitoring Well		Well Depth 20m, Drill Dia:4 inches	OMRAN GEOTECHNIC COMPANY
Location	MOPH,Afshar,Kabul	Casing: uPVC Dia: 2 inches, Class D	
Static Water Level : 8.2m		Slot Size: 1mm	
Cable Tools Method		Filter Gravel Pack Material: 1.5-10 mm	Date :April 2010

DEPTH M	THICKNESS M	LITHO LOGY
0-8 M	8M	Silt and Clay
8-14M	6M	Silt and Fine sand
14-20 M	6M	Gravel and Sand



Omran Geotechnic Company

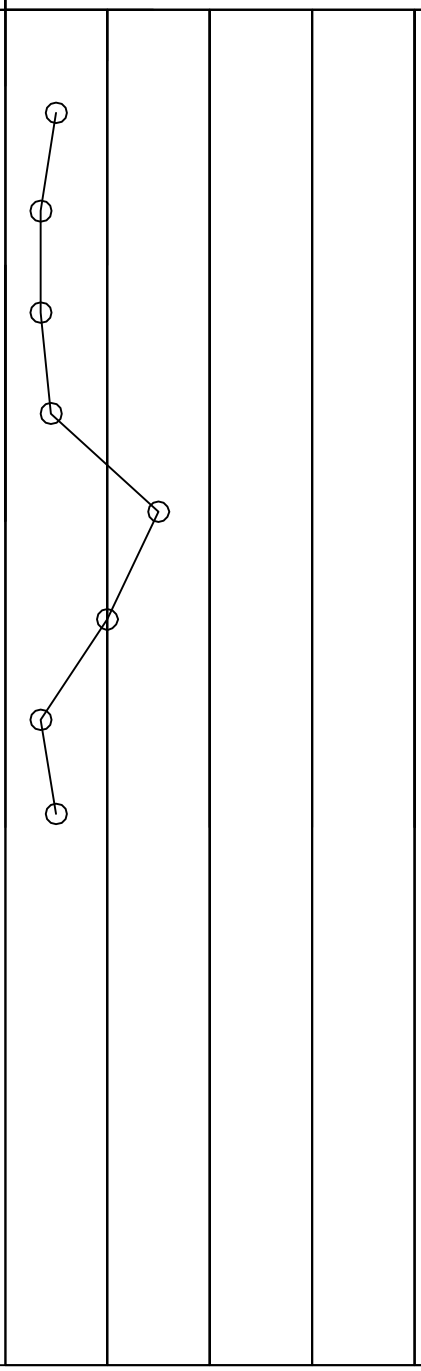
ADD: HOUSE 627, STREET 10
KARTE 3,KABUL, AFGHANISTAN
PH: 0797175746
0774291405

LOG OF BH # A30

(ASTM D-5434)

Client : USAID	Location: Kabul Province	Drilling Method : Geotechnical Rotary Core Drilling (ASTM D-2113)
Contractor: Tetra Tech	Borehole No: A30	Sampling Method : Continued Soil Sampling - Split Spoon
Sub-Contractor: Omran Geotechnical Co.	Depth: 20m	SPT Hammer : 140-lb/30in-Auto Drop
Project: Ministry of Public Health (MOPH) Facility, Kabul	Water Table: 8.1m	SS: Split Spoon soil Sampling (ASTM D-1586)

DEPTH (M)	CORE RECOVERY (%)	MATERIAL DESCRIPTION	USCS CLASSIFICATION	Depth of SPT Test (m)	BLOW COUNTS (N VALUE)
0.3	100	Top Soil (Clay, and Silt)			
2	100	Sandy Silty Clay, Medium Stiff to Stiff, Light Brown	CL-ML	1.5	3-5-5-(10)
				3	3-3-4-(7)
3.3	100	Silt Clay With Sand, Medium Stiff, Brown	CL-ML		
4				4.5	2-3-4-(7)
4.3	100	Silt With Sand ,Medium Stiff to Stiff, Brown	ML		
6				6	5-5-4-(9)
6.8	100	Silty Sand With Gravel, Dense, Brown	SM		
7.5	100	Conglomierate With Carbonate Cement — Water Table		7.5	8-14-16-(30)
8					
8.3	100	Silty Sand With Gravel, Dense, Brown	SM		
9.2				9	5-8-12-(20)
10	100	Silty Clay, Very Stiff, Brown	CL-ML		
				10.5	2-2-5-(7)
10.8	100	Silty Sand With Gravel, Dense, Brown	SM		
12				12	2-5-5-(10)
12.2	100	Silty clayey Sand, With Cobble Brown	SC-SM		
13.8					
14	100	Silty Gravel With Sand, With Cobble Brown	GM		
15.3					
16	100	Silty Sand With Gravel With Cobble, Brown	SM		
18					
20		End of BH # A30 at 20 m			



Drilling Started Date :	1/4/2010
Drilling Completed Date :	1/4/2010
Sub-Contractor :	OGC
Name of Driller :	Gul Nazar
Geotechnical Eng:	Eng. G.Nezami
Design By:	Eng. Samad Heidari

Sample Types :

- Split-Spoon (SS)
- Section of Cobble
- Shelby Tube (SH)
- Continued Core Barrel Samples

NOTE

1-CONTINUED SOIL SAMPLE RECOVER FROM BOREHOLE AND COLLECTED IN WOODEN BOXES.

Omran Geotechnical Company

Appendix D

Field Test Results

- ***SPT Test***
- ***Field Density Test on Test Pit***
- ***Percolation Test***

Professional Geotechnical Services

Omran Geotechnical Company

Appendix D

Field Test Results

- ***SPT Test***

Professional Geotechnical Services

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Omran Geotechnic Company

S P T Test

ASTM D 1586

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility, Kabul Province**
Location	**Kabul Province**

Bore hole No.	Depth (m)	Number of Blows			N-Value
		First 15 cm	Second 15 cm	Third 15 cm	
A1	1.5	>50	>50	>50	>50
	3	>50	>50	>50	>50
	4.5	2	2	2	4
	6	1	1	2	3
A2	1.5	9	12	13	25
	3	11	14	14	28
	4.5	9	11	12	23
	6	8	9	10	19
A3	1.5	15	16	15	31
	3	14	13	14	27
	4.5	6	7	8	15
	6	4	5	9	14
A4	1.5	3	4	6	10
	3	3	4	6	10
	4.5	3	4	4	8
	6	10	17	20	37
A5	1.5	6	7	8	15
	3	6	7	9	16
	4.5	5	6	8	14
	6	4	4	6	10

Remarks:

Tested by	Site Technician
Checked by	Jafari

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

S P T Test

ASTM D 1586

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility, Kabul Province**
Location	**Kabul Province**

Bore hole No.	Depth (m)	Number of Blows			N-Value
		First 15 cm	Second 15 cm	Third 15 cm	
A6	1.5	7	10	10	20
	3	11	12	15	27
	4.5	9	12	13	25
	6	6	8	9	17
A7	1.5	8	14	15	29
	3	7	9	11	20
	4.5	5	9	9	18
	6	5	8	11	19
A8	1.5	14	25	28	>50
	3	13	18	21	39
	4.5	12	21	27	48
	6	17	>50	>50	>50
A9	1.5	6	6	6	12
	3	6	7	8	15
	4.5	6	6	7	13
	6	16	16	14	30

Remarks:

Tested by	Site Technician
Checked by	Jafari

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Omran Geotechnic Company

S P T Test

ASTM D 1586

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility, Kabul Province**
Location	**Kabul Province**

Bore hole No.	Depth (m)	Number of Blows			N-Value
		First 15 cm	Second 15 cm	Third 15 cm	
A10	1.5	13	25	25	50
	3	10	14	17	31
	4.5	9	12	15	27
	6	20	27	32	>50
A11	1.5	13	14	16	30
	3	8	14	15	29
	4.5	8	12	12	24
	6	9	14	16	30
A12	1.5	11	24	34	>50
	3	10	17	23	40
	4.5	14	21	24	45
	6	11	14	15	29

Remarks:

Tested by	Site Technician
Checked by	Jafari

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

S P T Test

ASTM D 1586

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility, Kabul Province**
Location	**Kabul Province**

Bore hole No.	Depth (m)	Number of Blows			N-Value
		First 15 cm	Second 15 cm	Third 15 cm	
A13	1.5	3	5	6	11
	3	3	4	6	10
	4.5	2	2	4	6
	6	4	6	10	16
A14	1.5	5	4	4	8
	3	4	4	6	10
	4.5	2	3	5	8
	6	10	17	22	39
A15	1.5	12	17	18	35
	3	7	11	11	22
	4.5	3	6	6	12
	6	6	9	13	22
A16	1.5	4	5	6	11
	3	20	28	32	>50
	4.5	12	17	16	33
	6	6	10	14	24
A17	1.5	12	15	16	31
	3	7	9	12	21
	4.5	6	12	16	28
	6	6	8	12	20

Remarks:

Tested by	Site Technician
Checked by	Jafari

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

S P T Test

ASTM D 1586

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility, Kabul Province**
Location	**Kabul Province**

Bore hole No.	Depth (m)	Number of Blows			N-Value
		First 15 cm	Second 15 cm	Third 15 cm	
A18	1.5	15	15	19	34
	3	8	9	9	18
	4.5	12	10	26	36
	6	10	14	15	29
A19	1.5	12	15	20	35
	3	11	15	15	30
	4.5	7	10	10	20
	6	5	7	10	17
A20	1.5	2	3	3	6
	3	2	2	2	4
	4.5	2	3	5	8
	6	2	4	5	9
A21	1.5	7	17	25	42
	3	10	16	18	34
	4.5	12	15	18	33
	6	8	10	11	21
A22	1.5	9	13	15	28
	3	12	17	19	36
	4.5	10	12	14	26
	6	11	19	20	39

Remarks:

Tested by	Site Technician
Checked by	Jafari

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

S P T Test

ASTM D 1586

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility, Kabul Province**
Location	**Kabul Province**

Bore hole No.	Depth (m)	Number of Blows			N-Value
		First 15 cm	Second 15 cm	Third 15 cm	
A23	1.5	>50	>50	>50	>50
	3	>50	>50	>50	>50
	4.5	16	26	>50	>50
	6	19	23	>50	>50
	15	7	19	22	41
	16.5	10	15	18	33
	18	15	20	30	50
	19.5	10	17	25	42
A24	1.5	27	>50	>50	>50
	3	7	16	26	42
	4.5	>50	>50	>50	>50
	6	>50	>50	>50	>50
A25	1.5	14	>50	>50	>50
	3	12	19	20	39
	4.5	>50	>50	>50	>50
	6	>50	>50	>50	>50
A26	1.5	20	33	34	>50
	3	10	16	18	34
	4.5	10	13	14	27
	6	12	14	18	32

Remarks:

Tested by	Site Technician
Checked by	Jafari

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

S P T Test

ASTM D 1586

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility, Kabul Province**
Location	**Kabul Province**

Bore hole No.	Depth (m)	Number of Blows			N-Value
		First 15 cm	Second 15 cm	Third 15 cm	
A27	1.5	5	6	8	14
	3	3	4	7	11
	4.5	4	5	5	10
	6	3	6	8	14
A28	1.5	24	30	39	>50
	3	18	33	33	>50
	4.5	14	23	25	48
	6	13	20	21	41
A29	1.5	12	15	14	29
	3	5	4	5	9
	4.5	4	6	5	11
	6	3	5	6	11
A30	1.5	3	5	5	10
	3	3	3	4	7
	4.5	2	3	4	7
	6	5	5	4	9
	7.5	8	14	16	30
	9	5	8	12	20
	10.5	2	2	5	7
	12	2	5	5	10

Remarks:

Tested by	Site Technician
Checked by	Jafari

Omran Geotechnical Company

Appendix D

Field Test Results

Field Density Test on Test Pit

Professional Geotechnical Services

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

ASTM D1556

FIELD DENSITY TEST

Client USAID Date 6/4/2010

Contactor Tetra Tech

Project: Ministry of Public Health Facility

A	Location	Kabul Province	
B	Tested By	Field Technician	

MOISTURE CONTENT

1	CAN NO		1	2	3	4	5	
2	WT OF CAN	gm	56	58	54	55	61	
3	WT OF CAN + WET SOIL	gm	155.6	140.7	171.15	153.7	150.2	
4	WT OF CAN + DRY SOIL	gm	141	128	164	144.1	142.7	
5	WT OF WATER	gm	14.6	12.7	7.15	9.6	7.5	
6	WT OF DRY SOIL	gm	85.00	70.00	110.00	115.00	105.00	
7	% MOISTURE CONTENT	%	17.18	18.14	6.50	8.35	7.14	

FIELD DENSTIY

1	Test No .		1	2	3	4	5	
2	Depth	m	1.5	1.5	1.5	1.5	1.5	
3	WET SOIL	gm	4760	4706	4480	3486	4130	
4	WT OF SAND + CONE	gm	11384	11252	11194	11190	11180	
5	WT OF RESIDUAL SAND	gm	6448	6322	5876	6858	5920	
6	WT OF SAND + HOLE + CONE	gm	4936	4930	5318	4332	5260	
7	WT OF SAND IN CONE	gm	1555	1555	1555	1555	1555	
8	WT OF SAND IN HOLE	gm	3381	3375	3763	2777	3705	
9	UNIT WT OF SAND	gm/cc	1.41	1.41	1.41	1.41	1.41	
10	GROSS VOL OF HOLE	cc	2,397.87	2,393.62	2,668.79	1,969.50	2,627.66	
11	WET DENSITY	gm/cc	1.99	1.97	1.68	1.77	1.57	
12	DRY DENSITY	gm/cc	1.69	1.66	1.58	1.63	1.47	
13	MAX DRY DENSITY	gm/cc						
14	OMC	%						
15	COMPACTION	%						
16	REQUIRED COMPATION	%						
17	RESULT	Pass/Fail						

Checked by Jafari

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Omran Geotechnical Company

Appendix D

Field Test Results

Percolation Test

Professional Geotechnical Services

OMRAN GEOTECHNIC COMPANY

MATERIAL FIELAD TEST

Omran Geotechnic Company

Percolation Test Result

Client :	USAID	**Test Pit No :**	1 (TP# A & B & C)
Project :	Ministry of Public Health (MOPH) Facility	**Material :**	Silty Clay with Organic Material
Location :	Kabul	**Depth (m) :**	0.5 m

TP# 01 A

Time of Reading	Period Time of Reading (min)	Falling of surface water table (mm)	Difference between previous reading (mm)
10:00	0	305.00	-----
10:30	30	317.00	12.00
11:00	30	329.00	12.00
11:30	30	342.00	13.00

TP# 01 B

Time of Reading	Period Time of Reading (min)	Falling of surface water table (mm)	Difference between previous reading (mm)
10:00	0	280.00	-----
10:30	30	290.00	10.00
11:00	30	302.00	12.00
11:30	30	313.00	11.00

TP# 01 C

Time of Reading	Period Time of Reading (min)	Falling of surface water table (mm)	Difference between previous reading (mm)
10:00	0	312.00	-----
10:30	30	324.00	12.00
11:00	30	336.00	12.00
11:30	30	348.00	12.00

FINAL RESULT FOR TP# 01

Time of Reading	Period Time of Reading (min)	Falling of surface water table (mm)	Difference between previous reading (mm)
10:00	0	299.00	-----
10:30	30	310.33	11.33
11:00	30	322.33	12.00
11:30	30	334.33	12.00

Constant Water Fall = (12mm/30 min) or 0.4 mm/min

Percolation Rate in Minute per Inch (MPI) = **63.5** Minutes

Date :	10/4/2010

Refrence : 2000 International Private Sewage Disposal Code

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OMRAN GEOTECHNIC COMPANY

MATERIAL FIELAD TEST

Percolation Test Result

Client :	USAID	**Test Pit No :**	2 (TP# A & B & C)
Project :	Ministry of Public Health (MOPH) Facility	**Material :**	Silty Clay with Organic Material
Location :	Kabul	**Depth (m) :**	0.5 m

TP# 02 A

Time of Reading	Period Time of Reading (min)	Falling of surface water table (mm)	Difference between previous reading (mm)
10:00	0	260.00	-----
10:30	30	270.00	10.00
11:00	30	281.00	11.00
11:30	30	289.00	8.00

TP# 02 B

Time of Reading	Period Time of Reading (min)	Falling of surface water table (mm)	Difference between previous reading (mm)
10:00	0	287.00	-----
10:30	30	298.00	11.00
11:00	30	309.00	11.00
11:30	30	322.00	13.00

TP# 02 C

Time of Reading	Period Time of Reading (min)	Falling of surface water table (mm)	Difference between previous reading (mm)
10:00	0	250.00	-----
10:30	30	262.00	12.00
11:00	30	270.00	8.00
11:30	30	279.00	9.00

FINAL RESULT FOR TP# 02

Time of Reading	Period Time of Reading (min)	Falling of surface water table (mm)	Difference between previous reading (mm)
10:00	0	265.67	-----
10:30	30	276.67	11.00
11:00	30	286.67	10.00
11:30	30	296.67	10.00

Constant Water Fall = (10 mm/ 30 min) or 0.33 mm/min

Percolation Rate in Minute per Inch (MPI) = **76.2** Minutes

Date :	10/4/2010

Refrence : 2000 International Private Sewage Disposal Code

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Omran Geotechnical Company

Appendix E

Lab Test Results of Test Pits

- ***Sieve Analysis Results***
- ***Atterberg Limit Tests***
- ***Soil Engineering Classification***
- ***Proctor Test Results***

Professional Geotechnical Services

Omran Geotechnical Company

Appendix E

Lab Test Results of Test Pits

- ***Sieve Analysis Results***

Professional Geotechnical Services

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry of Public Health Facility, Kabul Province**	**Sample No.**	1

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**Test Pit # 01**			**Sampling Date**	6/4/2010
Weight (gr)	305	**Depth (m)**	1.5	**Testing Date**	7/4/2010

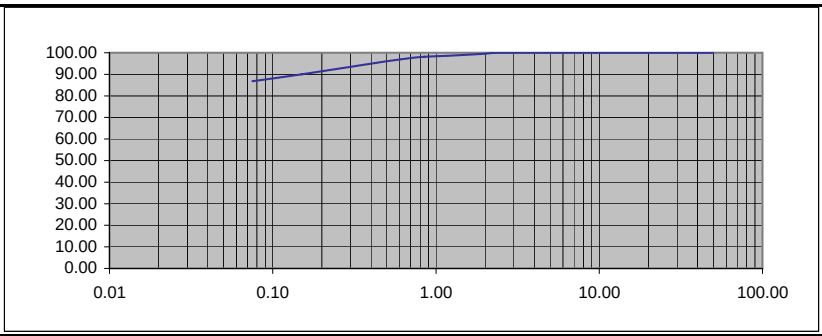
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.00**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.00	0.00	0.00	100.00	
2.36 mm	**No. 8**	0.00	0.00	0.00	100.00	
2.00 mm	**No. 10**	1.40	1.40	0.46	99.54	
1.18 mm	**No. 16**	2.90	4.30	1.41	98.59	
850 µm	**No. 20**	1.30	5.60	1.84	98.16	**13.21**
600 µm	**No. 30**	3.80	9.40	3.08	96.92	
425 µm	**No. 40**	5.10	14.50	4.75	95.25	
150 µm	**No. 100**	16.00	30.50	10.00	90.00	
75 µm	**No. 200**	9.80	40.30	13.21	86.79	**86.79**
Pan		264.70	305.00	100.00	0.00	
TOTAL		**305.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	23.55%	**18.03%**	**5.52%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.00	13.21	86.79

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry of Public Health Facility, Kabul Province**	**Sample No.**	2

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**Test Pit # 02**			**Sampling Date**	6/4/2010
Weight (gr)	313	**Depth (m)**	1.5	**Testing Date**	7/4/2010

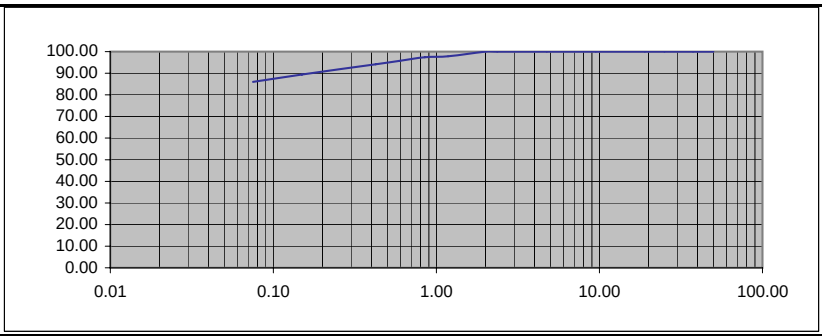
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.00**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.00	0.00	0.00	100.00	
2.36 mm	**No. 8**	0.00	0.00	0.00	100.00	
2.00 mm	**No. 10**	0.00	0.00	0.00	100.00	
1.18 mm	**No. 16**	6.70	6.70	2.14	97.86	
850 µm	**No. 20**	1.50	8.20	2.62	97.38	**14.03**
600 µm	**No. 30**	5.00	13.20	4.22	95.78	
425 µm	**No. 40**	5.20	18.40	5.88	94.12	
150 µm	**No. 100**	14.80	33.20	10.61	89.39	
75 µm	**No. 200**	10.70	43.90	14.03	85.97	**85.97**
Pan		269.10	313.00	100.00	0.00	
TOTAL		**313.00**				

SOIL CLASSIFICATION	**ML**	**SILT**

Atteberg Limits	**LL**	**PL**	**PI**
	24.15%	**20.45%**	**3.70%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.00	14.03	85.97

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry of Public Health Facility, Kabul Province**	**Sample No.**	3

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**Test Pit # 03**			**Sampling Date**	6/4/2010
Weight (gr)	318	**Depth (m)**	1.5	**Testing Date**	7/4/2010

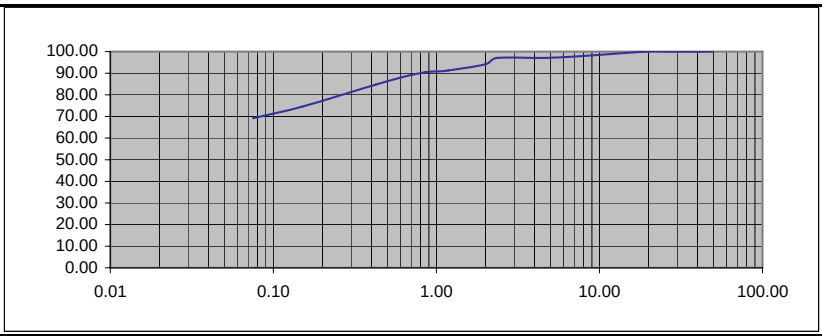
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.86**
9.5 mm	**3/8 in**	5.10	5.10	1.60	98.40	
4.75 mm	**No. 4**	4.00	9.10	2.86	97.14	
2.36 mm	**No. 8**	0.00	9.10	2.86	97.14	
2.00 mm	**No. 10**	9.60	18.70	5.88	94.12	
1.18 mm	**No. 16**	9.00	27.70	8.71	91.29	
850 µm	**No. 20**	2.70	30.40	9.56	90.44	**27.96**
600 µm	**No. 30**	8.00	38.40	12.08	87.92	
425 µm	**No. 40**	10.00	48.40	15.22	84.78	
150 µm	**No. 100**	32.60	81.00	25.47	74.53	
75 µm	**No. 200**	17.00	98.00	30.82	69.18	**69.18**
Pan		220.00	318.00	100.00	0.00	
TOTAL		**318.00**				

SOIL CLASSIFICATION	**CL-ML**	**SANDY SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	21.75%	**17.65%**	**4.10%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.86	27.96	69.18

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry of Public Health Facility, Kabul Province**	**Sample No.**	4

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**Test Pit # 04**			**Sampling Date**	6/4/2010
Weight (gr)	311	**Depth (m)**	1.5	**Testing Date**	7/4/2010

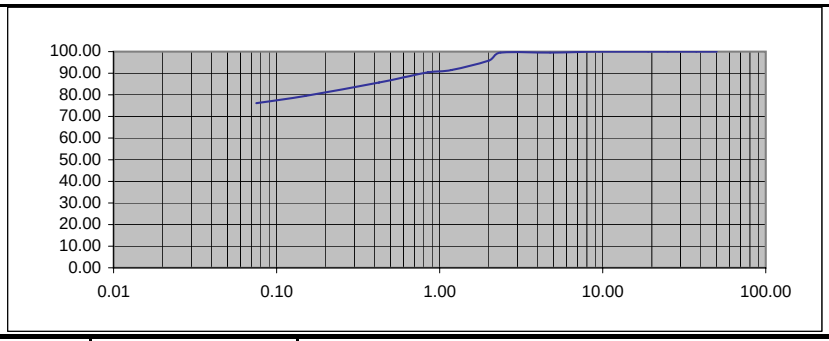
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.42**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	1.30	1.30	0.42	99.58	
2.36 mm	**No. 8**	0.00	1.30	0.42	99.58	
2.00 mm	**No. 10**	11.60	12.90	4.15	95.85	
1.18 mm	**No. 16**	13.60	26.50	8.52	91.48	
850 µm	**No. 20**	3.10	29.60	9.52	90.48	**23.41**
600 µm	**No. 30**	7.40	37.00	11.90	88.10	
425 µm	**No. 40**	7.50	44.50	14.31	85.69	
150 µm	**No. 100**	19.30	63.80	20.51	79.49	
75 µm	**No. 200**	10.30	74.10	23.83	76.17	**76.17**
Pan		236.90	311.00	100.00	0.00	
TOTAL		**311.00**				

SOIL CLASSIFICATION	**ML**	**SILT WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	24.50%	**21.43%**	**3.07%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.42	23.41	76.17

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry of Public Health Facility, Kabul Province**	**Sample No.**	5

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**Test Pit # 05**			**Sampling Date**	6/4/2010
Weight (gr)	311	**Depth (m)**	1.5	**Testing Date**	7/4/2010

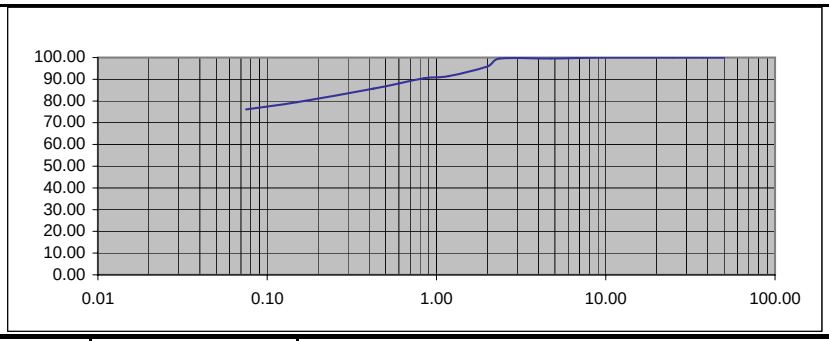
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**6.05**
9.5 mm	**3/8 in**	12.80	12.80	4.12	95.88	
4.75 mm	**No. 4**	6.00	18.80	6.05	93.95	
2.36 mm	**No. 8**	0.00	18.80	6.05	93.95	
2.00 mm	**No. 10**	8.30	27.10	8.71	91.29	
1.18 mm	**No. 16**	10.20	37.30	11.99	88.01	
850 µm	**No. 20**	4.10	41.40	13.31	86.69	**40.93**
600 µm	**No. 30**	14.80	56.20	18.07	81.93	
425 µm	**No. 40**	19.10	75.30	24.21	75.79	
150 µm	**No. 100**	52.30	127.60	41.03	58.97	
75 µm	**No. 200**	18.50	146.10	46.98	53.02	**53.02**
Pan		164.90	311.00	100.00	0.00	
TOTAL		**311.00**				

SOIL CLASSIFICATION	**ML**	**SANDY SILT**

Atteberg Limits	**LL**	**PL**	**PI**
	22.80%	**20.00%**	**2.80%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	6.05	40.93	53.02

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

Omran Geotechnical Company

Appendix E

Lab Test Results of Test Pits

Atterberg Limit Tests

Professional Geotechnical Services

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

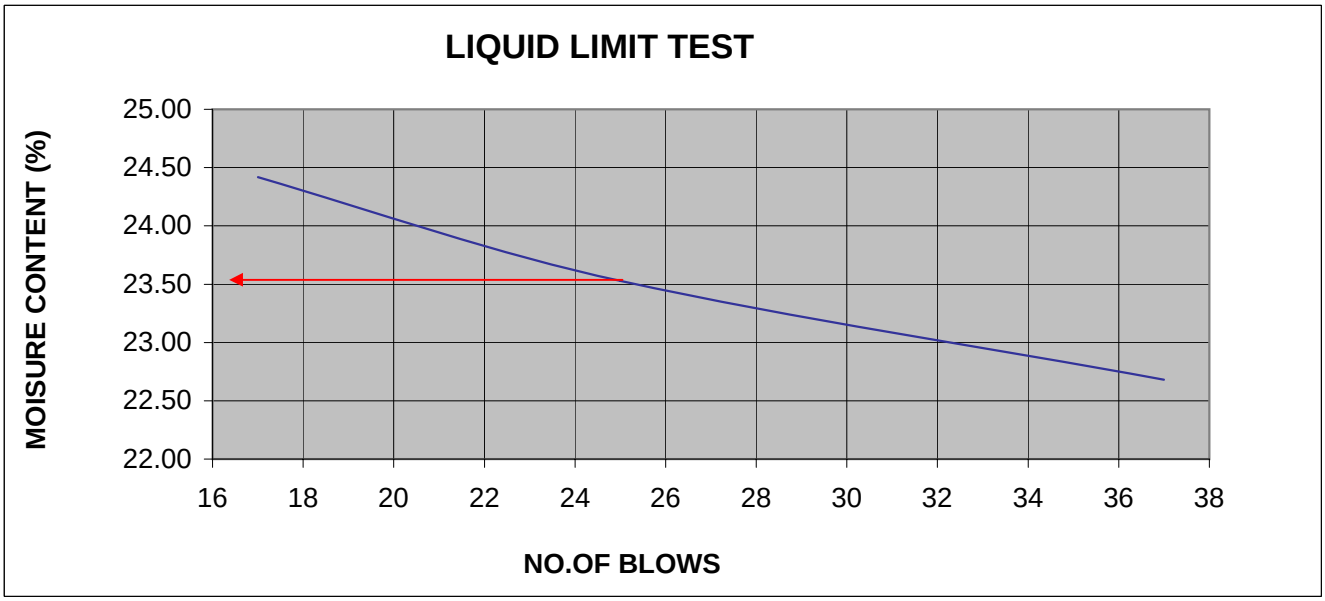
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	1
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	TP # 01	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	25	37	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	27.8	27.2	29.5	21.7
Wt of Dry soil + Container W2 (g)	25.7	25.2	27.3	20.6
Wt of container W3 (g)	17.1	16.7	17.6	14.5
Wt. of water (a) W1 - W2 (g)	2.1	2.0	2.2	1.1
Wt. of Dry soil (b) W2 - W3 (g)	8.6	8.5	9.7	6.1
Moisture Content (w)= a/b x 100 (%)	24.42	23.53	22.68	18.03



LL= 23.55% **PL=** 18.03% **PI=** 5.52%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

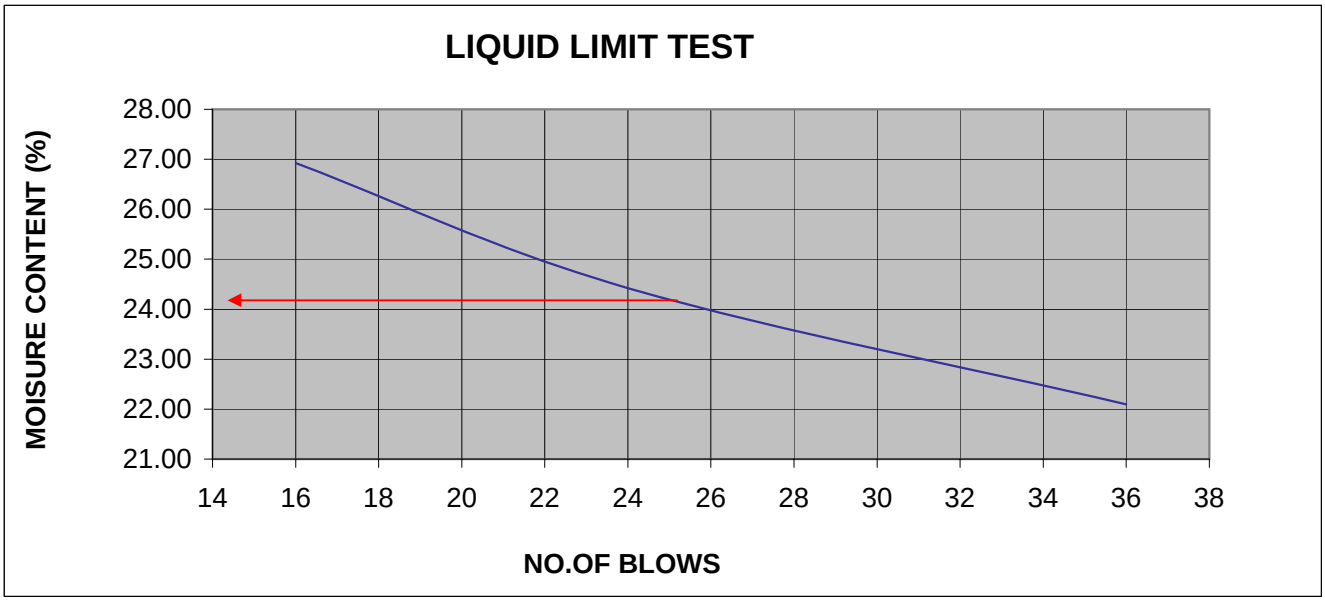
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	2
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	TP # 02	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	24	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	36.3	34.9	34.4	29.1
Wt of Dry soil + Container W2 (g)	33.5	32.8	32.5	28.2
Wt of container W3 (g)	23.1	24.2	23.9	23.8
Wt. of water (a) W1 - W2 (g)	2.8	2.1	1.9	0.9
Wt. of Dry soil (b) W2 - W3 (g)	10.4	8.6	8.6	4.4
Moisture Content (w)= a/b x 100 (%)	26.92	24.42	22.09	20.45



LL= 24.15% **PL=** 20.45% **PI=** 3.70%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

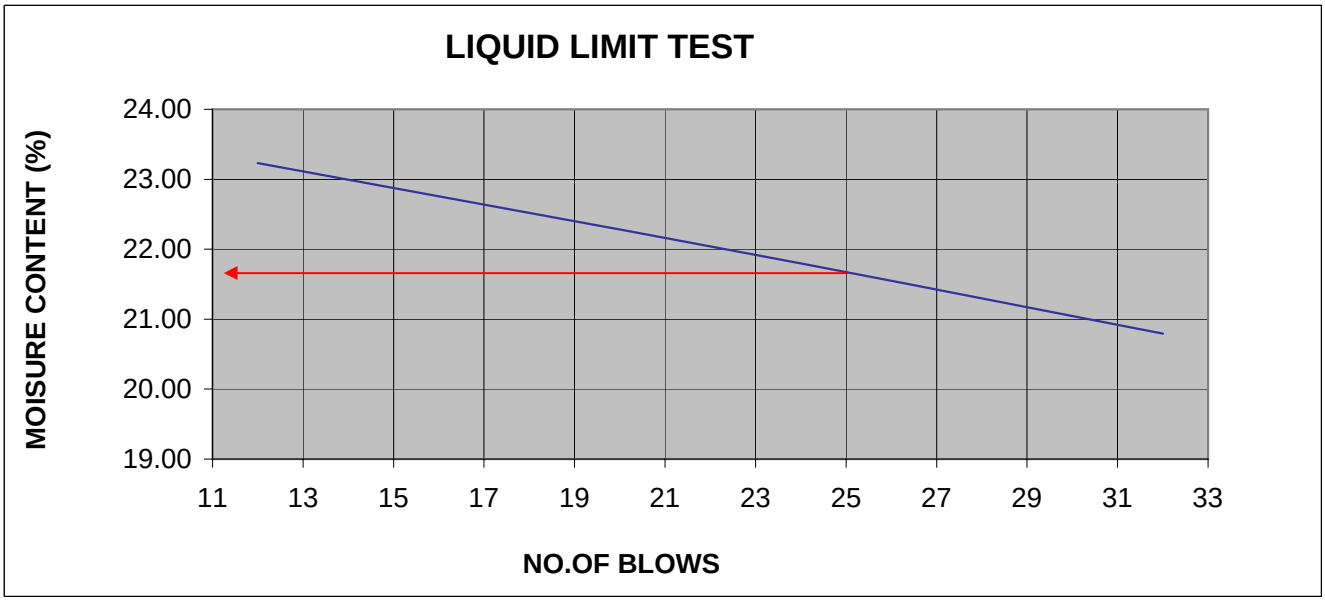
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	3
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	TP # 03	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	12	23	32	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	35.3	32.7	35.6	27.6
Wt of Dry soil + Container W2 (g)	33	31.1	33.5	27
Wt of container W3 (g)	23.1	23.8	23.4	23.6
Wt. of water (a) W1 - W2 (g)	2.3	1.6	2.1	0.6
Wt. of Dry soil (b) W2 - W3 (g)	9.9	7.3	10.1	3.4
Moisture Content (w)= a/b x 100 (%)	23.23	21.92	20.79	17.65



LL= 21.75% **PL=** 17.65% **PI=** 4.10%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

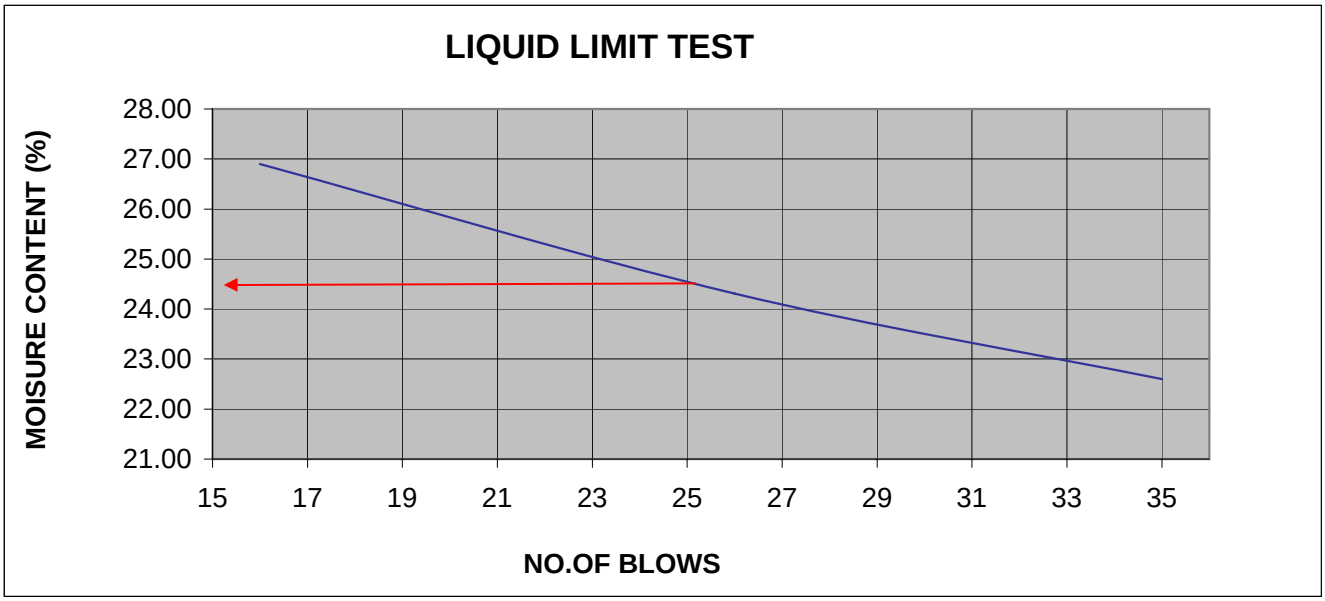
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	4
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	TP # 04	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	26	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	31.9	31.4	30.7	18.5
Wt of Dry soil + Container W2 (g)	28	27.9	27.4	17.6
Wt of container W3 (g)	13.5	13.5	12.8	13.4
Wt. of water (a) W1 - W2 (g)	3.9	3.5	3.3	0.9
Wt. of Dry soil (b) W2 - W3 (g)	14.5	14.4	14.6	4.2
Moisture Content (w)= a/b x 100 (%)	26.90	24.31	22.60	21.43



LL= 24.50% **PL=** 21.43% **PI=** 3.07%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

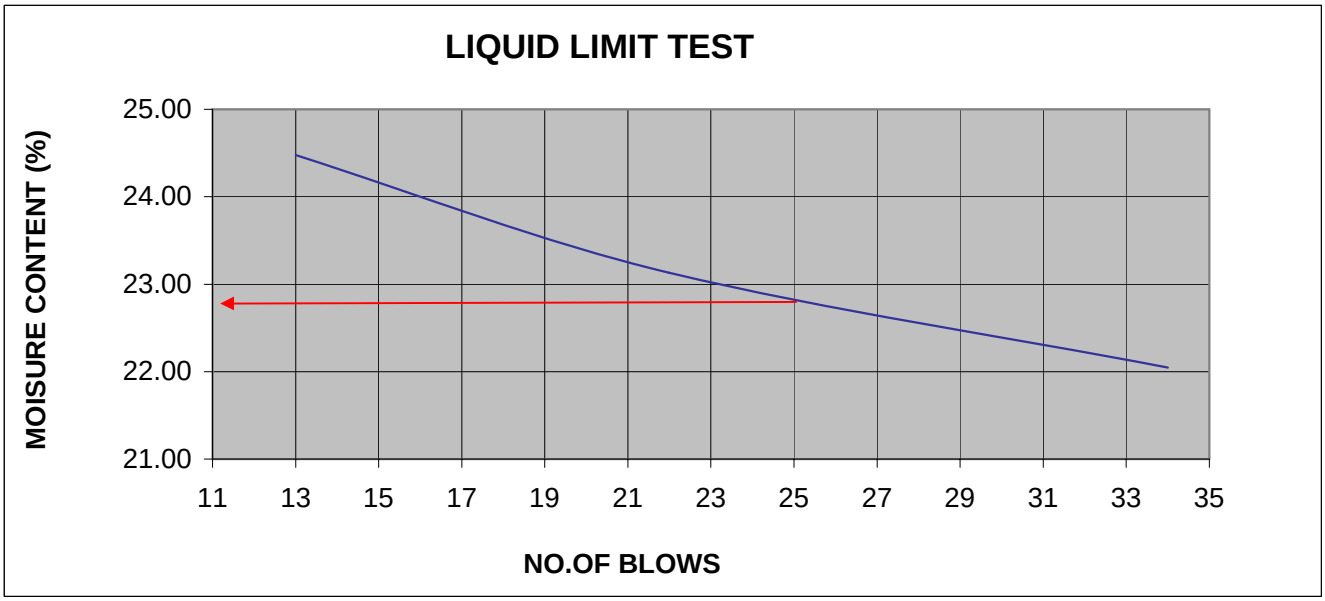
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	5
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	TP # 05	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	13	22	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	41.1	41.6	39.3	31.5
Wt of Dry soil + Container W2 (g)	37.6	38.2	36.5	30.3
Wt of container W3 (g)	23.3	23.5	23.8	24.3
Wt. of water (a) W1 - W2 (g)	3.5	3.4	2.8	1.2
Wt. of Dry soil (b) W2 - W3 (g)	14.3	14.7	12.7	6
Moisture Content (w)= a/b x 100 (%)	24.48	23.13	22.05	20.00



LL= 22.80% **PL=** 20.00% **PI=** 2.80%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

Omran Geotechnical Company

Appendix E

Lab Test Results of Test Pits

- ***Proctor Test Results***

Professional Geotechnical Services

Omran Geotechnical Company

Appendix E

Lab Test Results of Test Pits

- ***Proctor Test Results***

  Modified Proctor

Professional Geotechnical Services

OMRAN GEOTECHNIC COMPANY
MATERIAL TESTING LAB

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility**

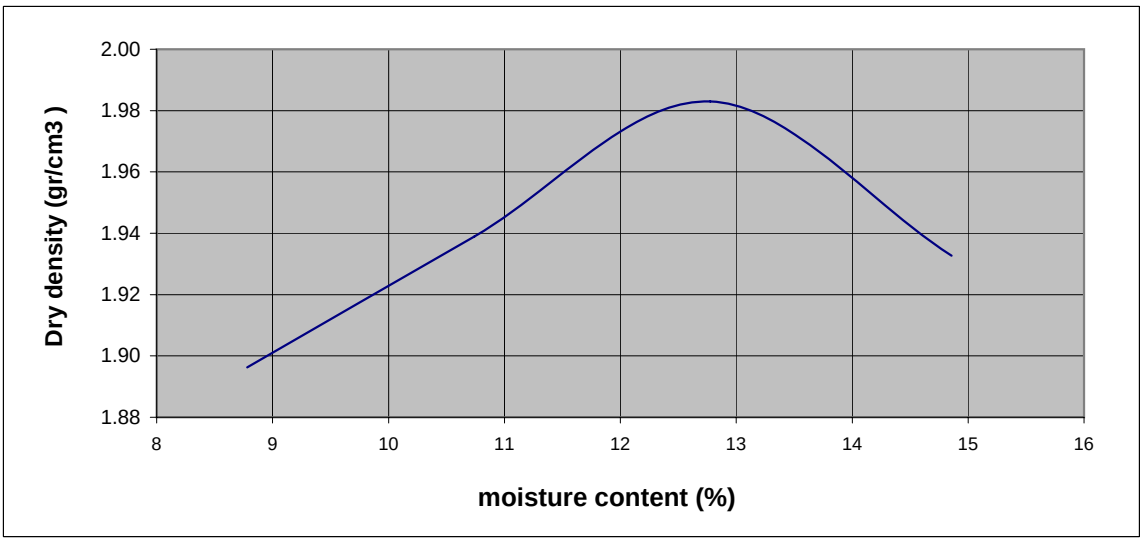
MOISTURE DENSITY RELATION

AASHTO T - 180, ASTM D 1557

Sample No.	1	Location	Test Pit# 02	Date of Sampled:	6/4/2010
Material	Silt	Depth: (m)	1.5	Date of Test:	7/4/2010
Method	Modified	Mould Wt. g	**4960**	Mould vol cm^3	2133

Determination No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Wt. of wet soil + Container g	9360	9540	9730	9695			
Wt. of wet soil g	4400	4580	4770	4735			
Wet density Mg/m^3	2.063	2.147	2.236	2.220			
Dry density (γ) Mg/m^3	1.896	1.939	1.983	1.933			

Moisture Content %							
Container No.	**1**	**2**	**3**	**4**	**5**		
Wt. of container g	40.7	41.5	47	41.4			
Wt. of wet soil + Container g	168.3	174.5	190	179			
Wt. of dry soil + Container g	158	161.6	173.8	161.2			
Wt. of dry soil g	117.3	120.1	126.8	119.8			
Wt. of water g	10.3	12.9	16.2	17.8			
Moisture content %	8.8	10.7	12.8	14.9			



M.D.D (Mg/m^3)	**1.983**	O.M.C (%)	**12.8**

Remarks :	**Checked by :**	**Jafari**
	Omran.geotechnic@yahoo.com	

OMRAN GEOTECHNIC COMPANY
MATERIAL TESTING LAB

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility**

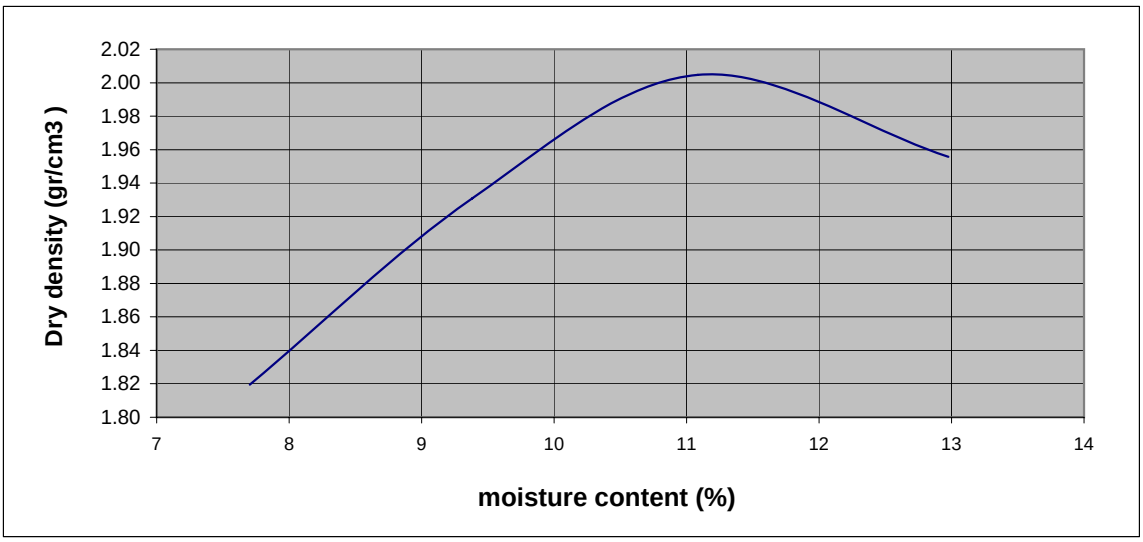
MOISTURE DENSITY RELATION

AASHTO T - 180, ASTM D 1557

Sample No.	2	Location	Test Pit# 05	Date of Sampled:	6/4/2010
Material	Sandy Silt	Depth: (m)	1.5	Date of Test:	7/4/2010
Method	Modified	Mould Wt. g	**4960**	Mould vol cm^3	2133

Determination No.		**1**	**2**	**3**	**4**	**5**	**6**	**7**
Wt. of wet soil + Container	g	9140	9465	9710	9673			
Wt. of wet soil	g	4180	4505	4750	4713			
Wet density	Mg/m^3	1.960	2.112	2.227	2.210			
Dry density (γ)	Mg/m^3	1.820	1.931	2.005	1.956			

Moisture Content %								
Container No.		**1**	**2**	**3**	**4**	**5**		
Wt. of container	g	40.6	41.5	46.9	41.2			
Wt. of wet soil + Container	g	123.1	144.1	142.1	142.2			
Wt. of dry soil + Container	g	117.2	135.3	132.6	130.6			
Wt. of dry soil	g	76.6	93.8	85.7	89.4			
Wt. of water	g	5.9	8.8	9.5	11.6			
Moisture content %		7.7	9.4	11.1	13.0			



M.D.D (Mg/m^3)	**2.005**	O.M.C (%)	**11.15**

Remarks :	**Checked by :**	**Jafari**
	Omran.geotechnic@yahoo.com	

Omran Geotechnical Company

Appendix E

Lab Test Results of Test Pits

- ***Proctor Test Results***

  Standard Proctor

Professional Geotechnical Services

OMRAN GEOTECHNIC COMPANY
MATERIAL TESTING LAB

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility**

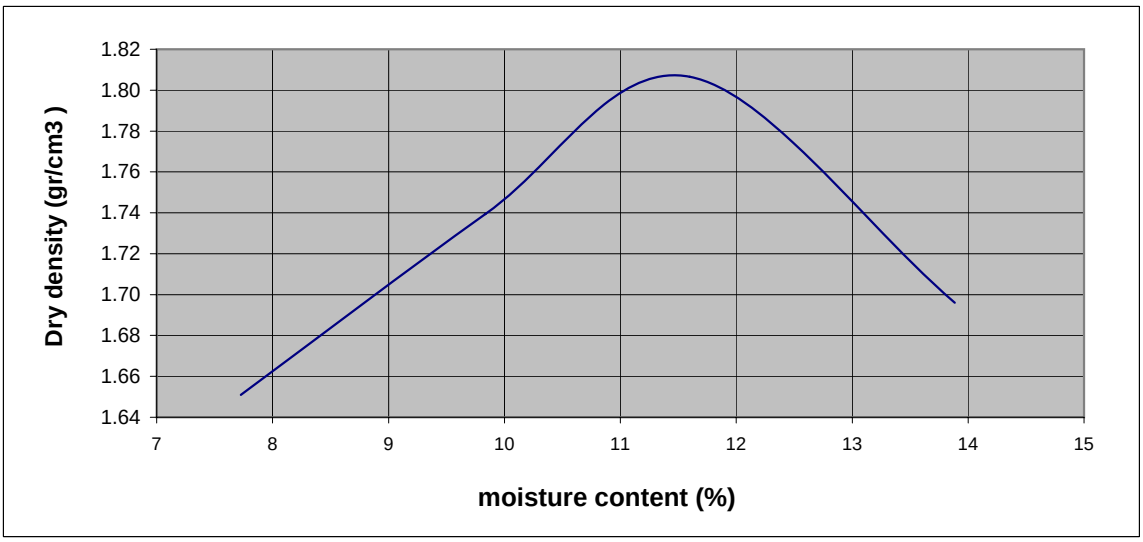
MOISTURE DENSITY RELATION

ASTM - D 698

Sample No.	1	Location	Test Pit# 01	Date of Sampled:	6/4/2010
Material	Silty Clay	Depth: (m)	1.5	Date of Test:	13/4/2010
Method	Modified	Mould Wt. g	**3170**	Mould vol cm^3	947.4

Determination No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Wt. of wet soil + Container g	4855	4980	5080	5000			
Wt. of wet soil g	1685	1810	1910	1830			
Wet density Mg/m^3	1.779	1.910	2.016	1.932			
Dry density (γ) Mg/m^3	1.651	1.739	1.807	1.696			

Moisture Content %							
Container No.	**1**	**2**	**3**	**4**	**5**		
Wt. of container g	68.2	85	81.1	85.3			
Wt. of wet soil + Container g	234.1	243.6	211	264.1			
Wt. of dry soil + Container g	222.2	229.4	197.5	242.3			
Wt. of dry soil g	154.0	144.4	116.4	157.0			
Wt. of water g	11.9	14.2	13.5	21.8			
Moisture content %	7.7	9.8	11.6	13.9			



M.D.D (Mg/m^3)	**1.807**	O.M.C (%)	**11.5**

Remarks :	**Checked by :**	**Jafari**
	Omran.geotechnic@yahoo.com	

OMRAN GEOTECHNIC COMPANY
MATERIAL TESTING LAB

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility**

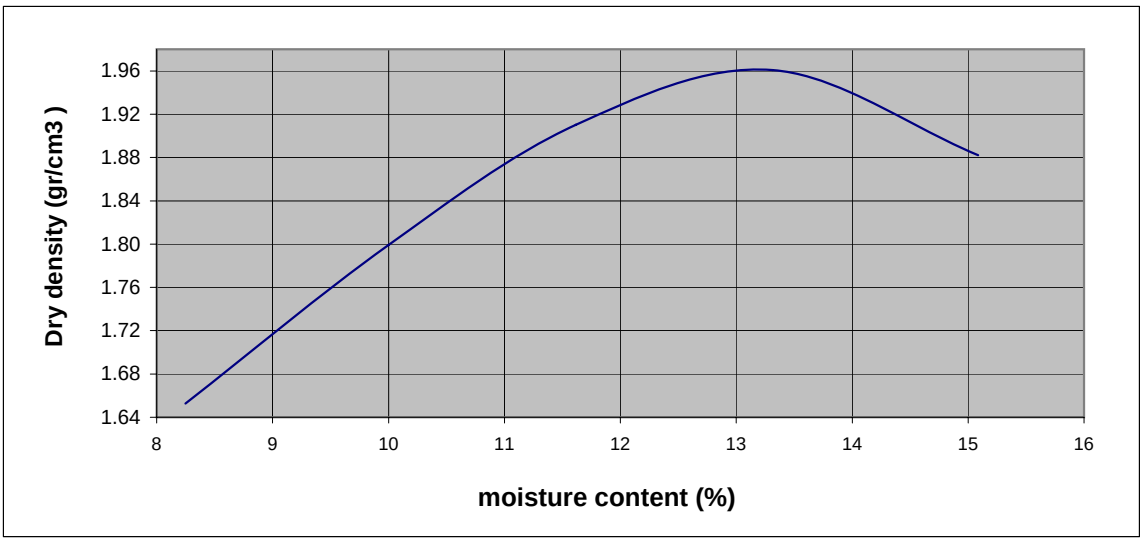
MOISTURE DENSITY RELATION

ASTM - D 698

Sample No.	2	Location	Test Pit# 02	Date of Sampled:	6/4/2010
Material	Silt	Depth: (m)	1.5	Date of Test:	13/4/2010
Method	Modified	Mould Wt. g	**3260**	Mould vol cm^3	947.4

Determination No.		**1**	**2**	**3**	**4**	**5**	**6**	**7**
Wt. of wet soil + Container	g	4955	5135	5280	5365	5312		
Wt. of wet soil	g	1695	1875	2020	2105	2052		
Wet density	Mg/m^3	1.789	1.979	2.132	2.222	2.166		
Dry density (γ)	Mg/m^3	1.653	1.799	1.910	1.961	1.882		

Moisture Content %								
Container No.		**1**	**2**	**3**	**4**	**5**	**6**	
Wt. of container	g	41.3	46.9	42.8	40.5	42.4		
Wt. of wet soil + Container	g	169.9	169	153.3	152	182		
Wt. of dry soil + Container	g	160.1	157.9	141.8	138.9	163.7		
Wt. of dry soil	g	118.8	111.0	99.0	98.4	121.3		
Wt. of water	g	9.8	11.1	11.5	13.1	18.3		
Moisture content %		8.2	10.0	11.6	13.3	15.1		



M.D.D (Mg/m^3)	**1.961**	O.M.C (%)	**13.1**

Remarks :	**Checked by :**	**Jafari**
	Omran.geotechnic@yahoo.com	

OMRAN GEOTECHNIC COMPANY
MATERIAL TESTING LAB

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility**

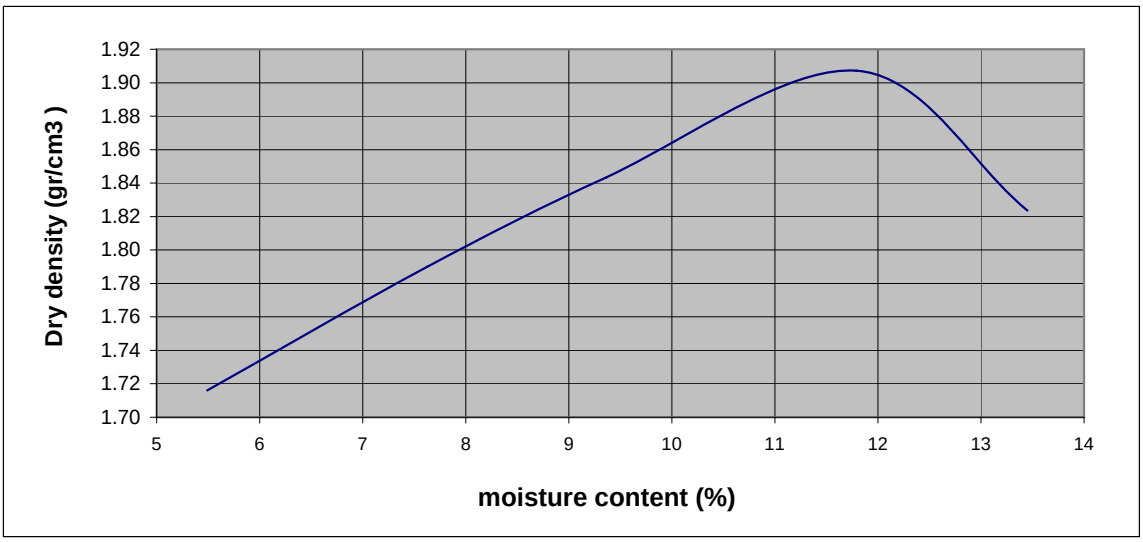
MOISTURE DENSITY RELATION

ASTM - D 698

Sample No.	3	Location	Test Pit# 03	Date of Sampled:	6/4/2010
Material	Sandy Silty Clay	Depth: (m)	1.5	Date of Test:	13/4/2010
Method	Modified	Mould Wt. g	**3170**	Mould vol cm^3	947.4

Determination No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Wt. of wet soil + Container g	4885	4995	5080	5190	5130		
Wt. of wet soil g	1715	1825	1910	2020	1960		
Wet density Mg/m^3	1.810	1.926	2.016	2.132	2.069		
Dry density (γ) Mg/m^3	1.716	1.790	1.843	1.907	1.824		

Moisture Content %							
Container No.	**1**	**2**	**3**	**4**	**5**	**6**	
Wt. of container g	82.2	85	86.1	90.1	85.6		
Wt. of wet soil + Container g	276.3	279.8	284.6	238	229		
Wt. of dry soil + Container g	266.2	266	267.6	222.4	212		
Wt. of dry soil g	184.0	181.0	181.5	132.3	126.4		
Wt. of water g	10.1	13.8	17	15.6	17		
Moisture content %	5.5	7.6	9.4	11.8	13.4		



M.D.D (Mg/m^3)	**1.907**	O.M.C (%)	**11.75**

Remarks :	**Checked by :**	**Jafari**
	Omran.geotechnic@yahoo.com	

OMRAN GEOTECHNIC COMPANY
MATERIAL TESTING LAB

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility**

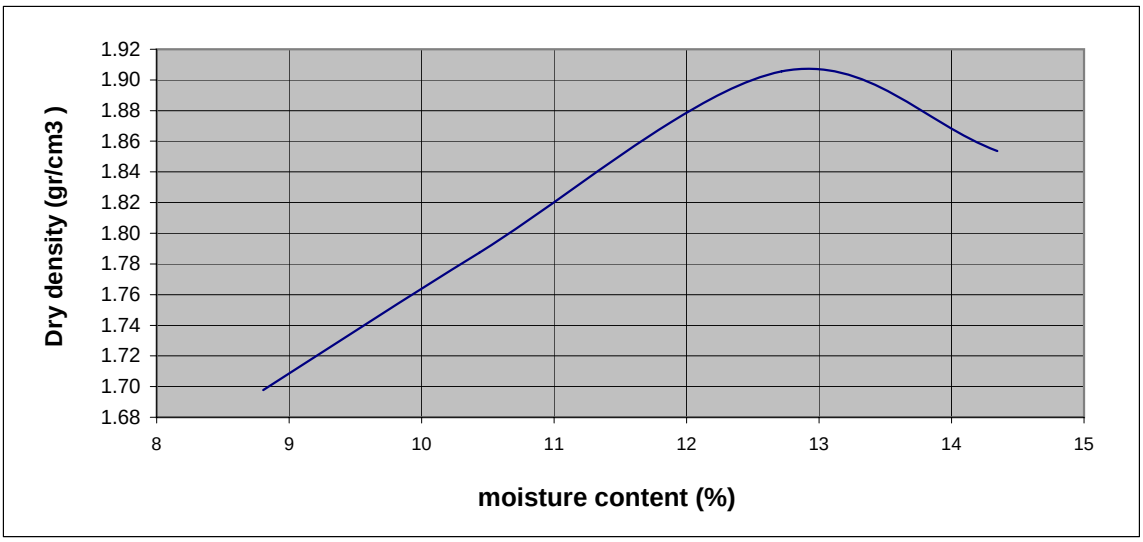
MOISTURE DENSITY RELATION

ASTM - D 698

Sample No.	4	Location	Test Pit# 04	Date of Sampled:	6/4/2010
Material	Silt With Sand	Depth: (m)	1.5	Date of Test:	13/4/2010
Method	Modified	Mould Wt. g	**3260**	Mould vol cm^3	947.4

Determination No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Wt. of wet soil + Container g	5010	5130	5295	5268			
Wt. of wet soil g	1750	1870	2035	2008			
Wet density Mg/m^3	1.847	1.974	2.148	2.119			
Dry density (γ) Mg/m^3	1.698	1.787	1.906	1.854			

Moisture Content %							
Container No.	**1**	**2**	**3**	**4**	**5**	**6**	
Wt. of container g	110.3	105.6	112.4	121.3			
Wt. of wet soil + Container g	341.4	328.9	306.5	342.9			
Wt. of dry soil + Container g	322.7	307.8	284.6	315.1			
Wt. of dry soil g	212.4	202.2	172.2	193.8			
Wt. of water g	18.7	21.1	21.9	27.8			
Moisture content %	8.8	10.4	12.7	14.3			



M.D.D (Mg/m^3)	**1.906**	O.M.C (%)	**12.9**

Remarks :	**Checked by :**	**Jafari**
	Omran.geotechnic@yahoo.com	

OMRAN GEOTECHNIC COMPANY
MATERIAL TESTING LAB

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry of Public Health Facility**

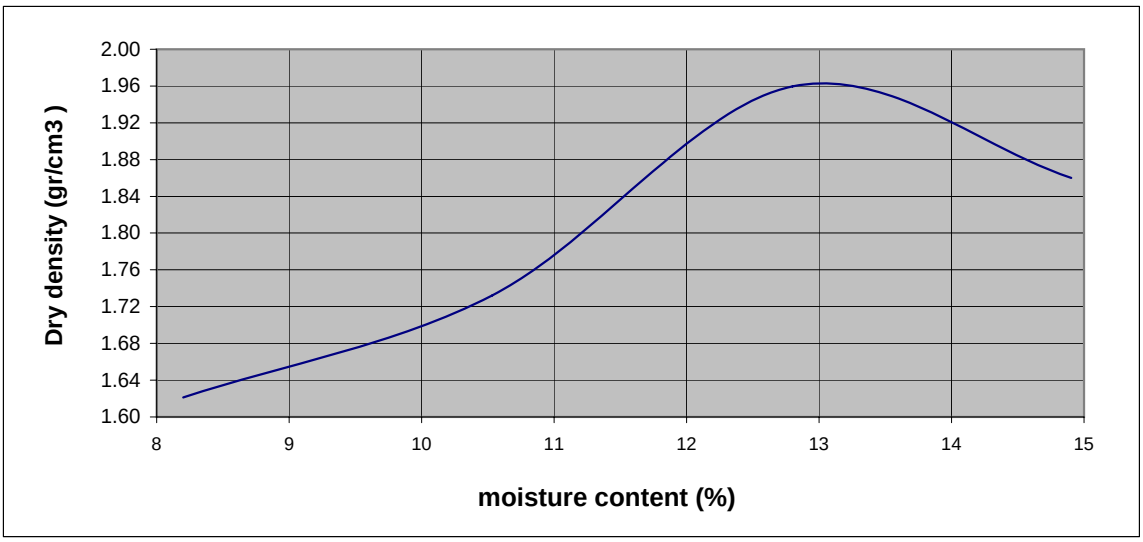
MOISTURE DENSITY RELATION

ASTM - D 698

Sample No.	5	Location	Test Pit# 05	Date of Sampled:	6/4/2010
Material	Sandy Silt	Depth: (m)	1.5	Date of Test:	13/4/2010
Method	Modified	Mould Wt. g	**3260**	Mould vol cm^3	947.4

Determination No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Wt. of wet soil + Container g	4922	5074	5354	5285			
Wt. of wet soil g	1662	1814	2094	2025			
Wet density Mg/m^3	1.754	1.915	2.210	2.137			
Dry density (γ) Mg/m^3	1.621	1.732	1.959	1.860			

Moisture Content %							
Container No.	**1**	**2**	**3**	**4**	**5**	**6**	
Wt. of container g	50.4	62	55.8	61.2			
Wt. of wet soil + Container g	198.31	227.8	219.36	203.68			
Wt. of dry soil + Container g	187.1	212	200.8	185.2			
Wt. of dry soil g	136.7	150.0	145.0	124.0			
Wt. of water g	11.21	15.8	18.56	18.48			
Moisture content %	8.2	10.5	12.8	14.9			



M.D.D (Mg/m^3)	**1.959**	O.M.C (%)	**13**

Remarks :	**Checked by :**	**Jafari**
	Omran.geotechnic@yahoo.com	

Omran Geotechnical Company

Appendix F

Lab Test Results of Boreholes

- ***Sieve Analysis Results***
- ***Atterberg Limits Test Results***
- ***Soil Engineering Classification***
- ***Specific Gravity Test Results***
- ***Consolidation Test Results***
- ***Direct Shear Test Results***
- ***Permeability Test Results***
- ***Hydrometery Test Results***
- ***Expansion Test Results***
- ***Moisture Test Results***
- ***Moisture/Density Test Results***
- ***Chemical Test Results***

Professional Geotechnical Services

Omran Geotechnical Company

Appendix F

Lab Test Results of Boreholes

Sieve Analysis Results

Professional Geotechnical Services

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	1

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A1**			**Sampling Date**	27.03.2010
Weight (gr)	2541	**Depth (m)**	1	**Testing Date**	12.04.2010

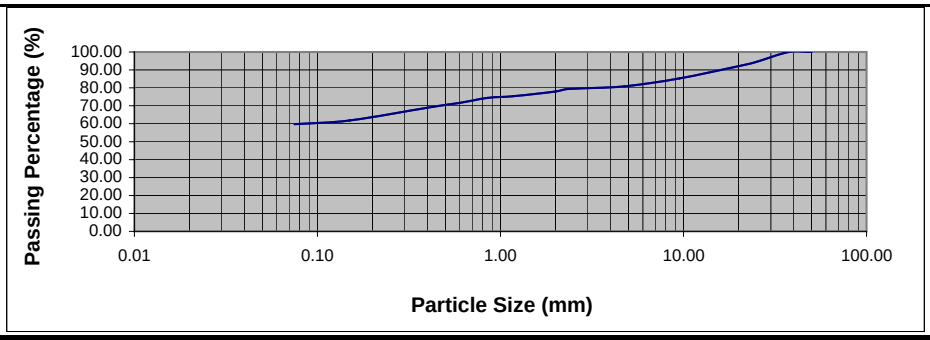
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	141.00	141.00	5.55	94.45	
19.0 mm	**3/4 in**	71.10	212.10	8.35	91.65	**19.16**
9.5 mm	**3/8 in**	161.10	373.20	14.69	85.31	
4.75 mm	**No. 4**	113.70	486.90	19.16	80.84	
2.36 mm	**No. 8**	36.00	522.90	20.58	79.42	
2.00 mm	**No. 10**	37.50	560.40	22.05	77.95	
1.18 mm	**No. 16**	66.30	626.70	24.66	75.34	
850 µm	**No. 20**	24.60	651.30	25.63	74.37	**21.03**
600 µm	**No. 30**	70.50	721.80	28.41	71.59	
425 µm	**No. 40**	56.10	777.90	30.61	69.39	
150 µm	**No. 100**	192.90	970.80	38.21	61.79	
75 µm	**No. 200**	50.40	1021.20	40.19	59.81	**59.81**
Pan		1519.80	2541.00	100.00	0.00	
TOTAL		**2541.00**				

SOIL CLASSIFICATION	**ML**	**SANDY SILT WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	19.16	21.03	59.81

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	2

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A1**			**Sampling Date**	27.03.2010
Weight (gr)	3477.9	**Depth (m)**	2	**Testing Date**	12.04.2010

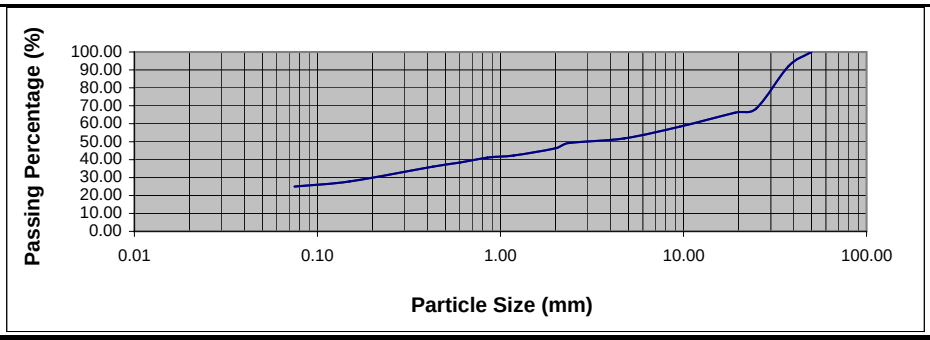
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	273.00	273.00	7.85	92.15	
25.0 mm	**1 in**	822.00	1095.00	31.48	68.52	
19.0 mm	**3/4 in**	84.00	1179.00	33.90	66.10	**48.13**
9.5 mm	**3/8 in**	270.00	1449.00	41.66	58.34	
4.75 mm	**No. 4**	225.00	1674.00	48.13	51.87	
2.36 mm	**No. 8**	90.00	1764.00	50.72	49.28	
2.00 mm	**No. 10**	105.00	1869.00	53.74	46.26	
1.18 mm	**No. 16**	138.00	2007.00	57.71	42.29	
850 µm	**No. 20**	42.00	2049.00	58.91	41.09	**26.91**
600 µm	**No. 30**	96.00	2145.00	61.68	38.32	
425 µm	**No. 40**	78.00	2223.00	63.92	36.08	
150 µm	**No. 100**	288.00	2511.00	72.20	27.80	
75 µm	**No. 200**	99.00	2610.00	75.05	24.95	**24.95**
Pan		867.90	3477.90	100.00	0.00	
TOTAL		**3477.90**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	48.13	26.91	24.95

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	3

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A1**			**Sampling Date**	27.03.2010
Weight (gr)	3423	**Depth (m)**	3	**Testing Date**	12.04.2010

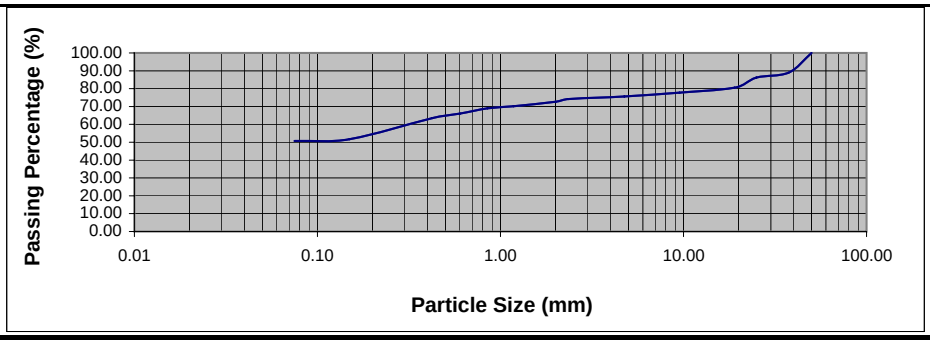
Sieve Size		Mass	Cumulative			Specification
		Retained	Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	378.00	378.00	11.04	88.96	
25.0 mm	1 in	94.50	472.50	13.80	86.20	
19.0 mm	3/4 in	192.50	665.00	19.43	80.57	24.34
9.5 mm	3/8 in	94.50	759.50	22.19	77.81	
4.75 mm	No. 4	73.50	833.00	24.34	75.66	
2.36 mm	No. 8	49.00	882.00	25.77	74.23	
2.00 mm	No. 10	52.50	934.50	27.30	72.70	
1.18 mm	No. 16	87.50	1022.00	29.86	70.14	
850 µm	No. 20	38.50	1060.50	30.98	69.02	24.92
600 µm	No. 30	101.50	1162.00	33.95	66.05	
425 µm	No. 40	87.50	1249.50	36.50	63.50	
150 µm	No. 100	402.50	1652.00	48.26	51.74	
75 µm	No. 200	34.00	1686.00	49.26	50.74	50.74
Pan		1737.00	3423.00	100.00	0.00	
TOTAL		**3423.00**				

SOIL CLASSIFICATION	**ML**	**SANDY SILT WITH GRAVEL**

Atteberg Limits	LL	PL	PI
	21.37%	17.86%	3.51%

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	24.34	24.92	50.74

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	4

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A1**			**Sampling Date**	27.03.2010
Weight (gr)	1513.05	**Depth (m)**	4	**Testing Date**	12.04.2010

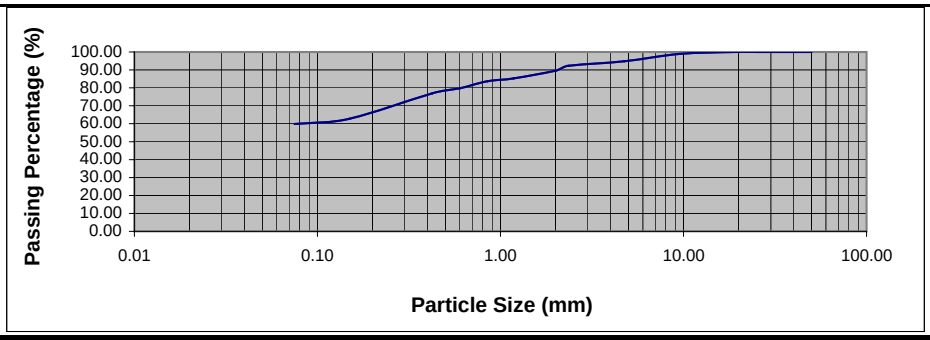
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	0.00	0.00	0.00	100.00	
25.0 mm	1 in	0.00	0.00	0.00	100.00	
19.0 mm	3/4 in	0.00	0.00	0.00	100.00	5.14
9.5 mm	3/8 in	15.75	15.75	1.04	98.96	
4.75 mm	No. 4	61.95	77.70	5.14	94.86	
2.36 mm	No. 8	38.50	116.20	7.68	92.32	
2.00 mm	No. 10	42.00	158.20	10.46	89.54	
1.18 mm	No. 16	65.10	223.30	14.76	85.24	
850 µm	No. 20	23.10	246.40	16.28	83.72	35.00
600 µm	No. 30	59.50	305.90	20.22	79.78	
425 µm	No. 40	42.00	347.90	22.99	77.01	
150 µm	No. 100	214.55	562.45	37.17	62.83	
75 µm	No. 200	44.80	607.25	40.13	59.87	59.87
Pan		905.80	1513.05	100.00	0.00	
TOTAL		**1513.05**				

SOIL CLASSIFICATION	**CL-ML**	**SANDY SILTY CLAY**

Atteberg Limits	LL	PL	PI
	24.78%	**20.37%**	**4.41%**

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	5.14	35.00	59.87

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	5

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A1**			**Sampling Date**	27.03.2010
Weight (gr)	1645	**Depth (m)**	4.5	**Testing Date**	12.04.2010

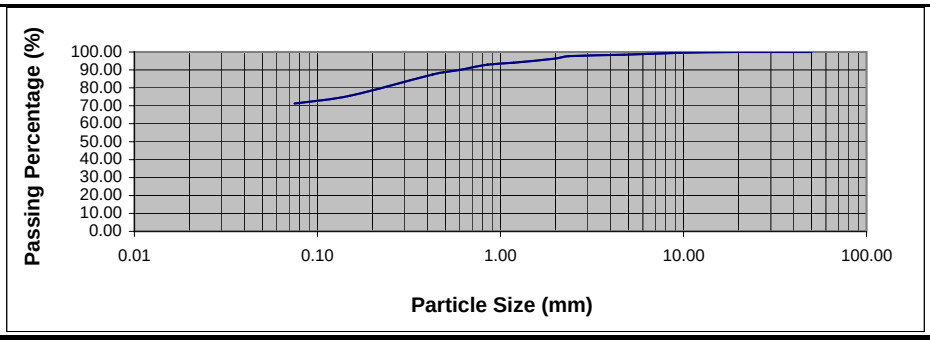
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	**Alternative**	(gr)	Retained (gr)	%	%	%
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.49**
9.5 mm	**3/8 in**	7.00	7.00	0.43	99.57	
4.75 mm	**No. 4**	17.50	24.50	1.49	98.51	
2.36 mm	**No. 8**	14.00	38.50	2.34	97.66	
2.00 mm	**No. 10**	21.00	59.50	3.62	96.38	
1.18 mm	**No. 16**	38.50	98.00	5.96	94.04	
850 µm	**No. 20**	17.50	115.50	7.02	92.98	**27.23**
600 µm	**No. 30**	49.00	164.50	10.00	90.00	
425 µm	**No. 40**	42.00	206.50	12.55	87.45	
150 µm	**No. 100**	196.00	402.50	24.47	75.53	
75 µm	**No. 200**	70.00	472.50	28.72	71.28	**71.28**
Pan		1172.50	1645.00	100.00	0.00	
TOTAL		**1645.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	22.30%	**15.38%**	**6.92%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.49	27.23	71.28

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	6

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A1**			**Sampling Date**	27.03.2010
Weight (gr)	2100	**Depth (m)**	6	**Testing Date**	12.04.2010

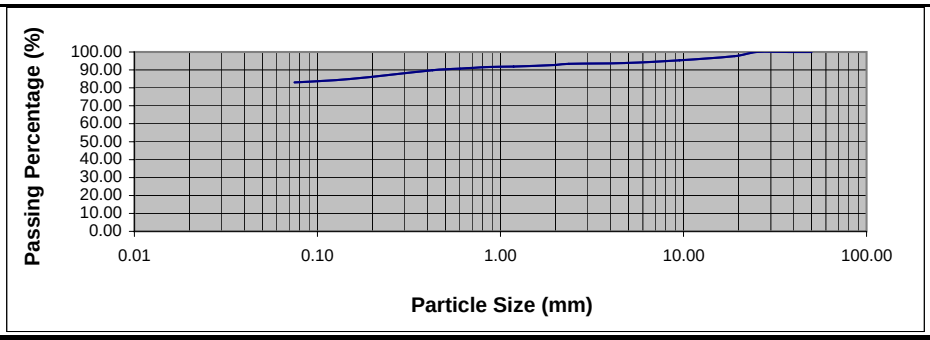
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	0.00	0.00	0.00	100.00	
25.0 mm	1 in	0.00	0.00	0.00	100.00	
19.0 mm	3/4 in	49.00	49.00	2.33	97.67	6.13
9.5 mm	3/8 in	47.95	96.95	4.62	95.38	
4.75 mm	No. 4	31.85	128.80	6.13	93.87	
2.36 mm	No. 8	10.50	139.30	6.63	93.37	
2.00 mm	No. 10	12.60	151.90	7.23	92.77	
1.18 mm	No. 16	17.85	169.75	8.08	91.92	
850 µm	No. 20	7.00	176.75	8.42	91.58	10.82
600 µm	No. 30	17.85	194.60	9.27	90.73	
425 µm	No. 40	19.25	213.85	10.18	89.82	
150 µm	No. 100	103.25	317.10	15.10	84.90	
75 µm	No. 200	38.85	355.95	16.95	83.05	83.05
Pan		1744.05	2100.00	100.00	0.00	
TOTAL		**2100.00**				

SOIL CLASSIFICATION	CL-ML	SILTY CLAY WITH SAND

Atteberg Limits	LL	PL	PI
	21.53%	15.87%	5.66%

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	6.13	10.82	83.05

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	7

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A2**			**Sampling Date**	27.03.2010
Weight (gr)	612	**Depth (m)**	1	**Testing Date**	12.04.2010

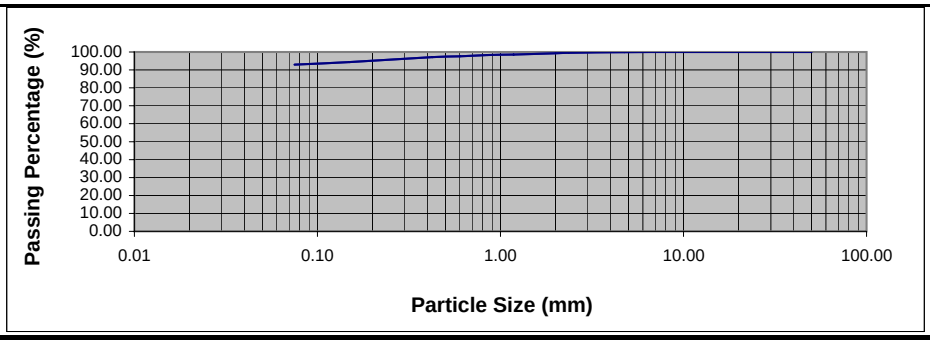
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	**Alternative**	(gr)	Retained (gr)	%	%	%
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.08**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.50	0.50	0.08	99.92	
2.36 mm	**No. 8**	2.00	2.50	0.41	99.59	
2.00 mm	**No. 10**	2.00	4.50	0.74	99.26	
1.18 mm	**No. 16**	4.00	8.50	1.39	98.61	
850 µm	**No. 20**	1.80	10.30	1.68	98.32	**7.01**
600 µm	**No. 30**	4.20	14.50	2.37	97.63	
425 µm	**No. 40**	3.20	17.70	2.89	97.11	
150 µm	**No. 100**	16.60	34.30	5.60	94.40	
75 µm	**No. 200**	9.10	43.40	7.09	92.91	**92.91**
Pan		568.60	612.00	100.00	0.00	
TOTAL		**612.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	20.74%	**15.69%**	**5.05%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.08	7.01	92.91

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	8

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A2**			**Sampling Date**	27.03.2010
Weight (gr)	756	**Depth (m)**	3	**Testing Date**	12.04.2010

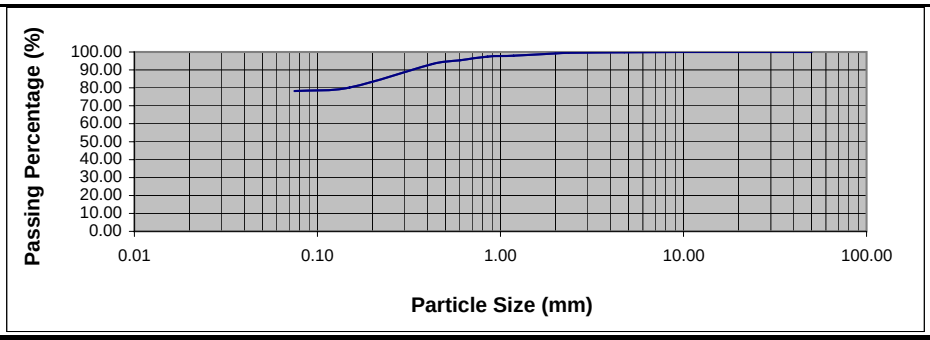
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.15**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	1.10	1.10	0.15	99.85	
2.36 mm	**No. 8**	2.00	3.10	0.41	99.59	
2.00 mm	**No. 10**	2.90	6.00	0.79	99.21	
1.18 mm	**No. 16**	9.40	15.40	2.04	97.96	
850 µm	**No. 20**	4.40	19.80	2.62	97.38	**21.65**
600 µm	**No. 30**	15.00	34.80	4.60	95.40	
425 µm	**No. 40**	16.00	50.80	6.72	93.28	
150 µm	**No. 100**	99.00	149.80	19.81	80.19	
75 µm	**No. 200**	15.00	164.80	21.80	78.20	**78.20**
Pan		591.20	756.00	100.00	0.00	
TOTAL		**756.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	20.95%	**16.13%**	**4.82%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.15	21.65	78.20

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	9

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A2**			**Sampling Date**	27.03.2010
Weight (gr)	3013.5	**Depth (m)**	5.5	**Testing Date**	12.04.2010

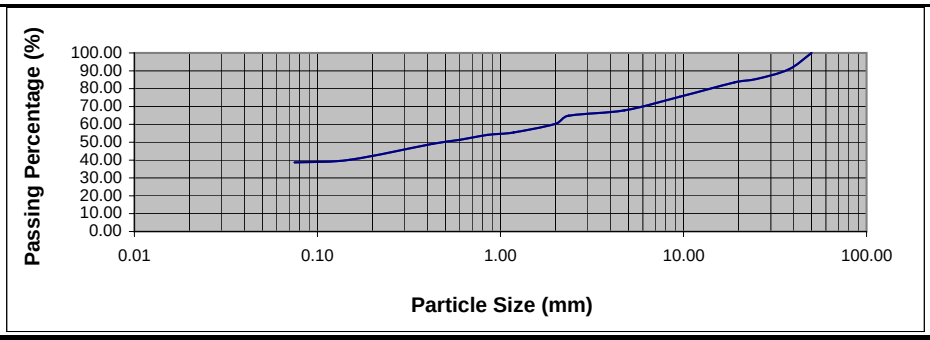
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	279.00	279.00	9.26	90.74	
25.0 mm	**1 in**	162.00	441.00	14.63	85.37	
19.0 mm	**3/4 in**	57.00	498.00	16.53	83.47	**32.16**
9.5 mm	**3/8 in**	243.00	741.00	24.59	75.41	
4.75 mm	**No. 4**	228.00	969.00	32.16	67.84	
2.36 mm	**No. 8**	90.00	1059.00	35.14	64.86	
2.00 mm	**No. 10**	138.00	1197.00	39.72	60.28	
1.18 mm	**No. 16**	144.00	1341.00	44.50	55.50	
850 µm	**No. 20**	42.00	1383.00	45.89	54.11	**29.17**
600 µm	**No. 30**	84.00	1467.00	48.68	51.32	
425 µm	**No. 40**	66.00	1533.00	50.87	49.13	
150 µm	**No. 100**	270.00	1803.00	59.83	40.17	
75 µm	**No. 200**	45.00	1848.00	61.32	38.68	**38.68**
Pan		1165.50	3013.50	100.00	0.00	
TOTAL		**3013.50**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	32.16	29.17	38.68

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	10

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A2**			**Sampling Date**	27.03.2010
Weight (gr)	1950.6	**Depth (m)**	6	**Testing Date**	12.04.2010

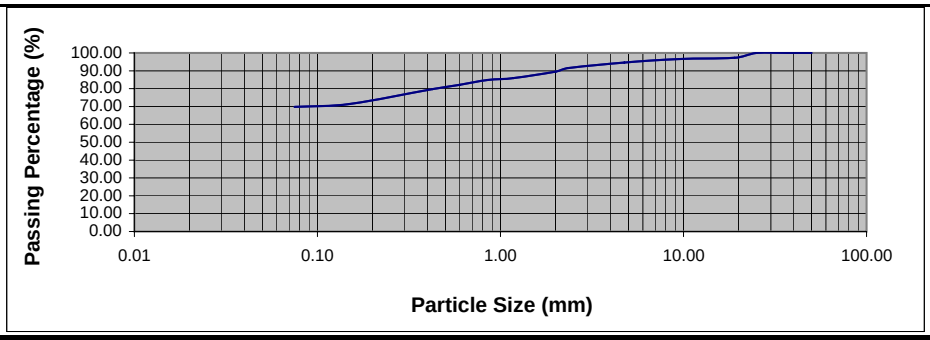
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	0.00	0.00	0.00	100.00	
25.0 mm	1 in	0.00	0.00	0.00	100.00	
19.0 mm	3/4 in	53.10	53.10	2.72	97.28	5.38
9.5 mm	3/8 in	13.50	66.60	3.41	96.59	
4.75 mm	No. 4	38.40	105.00	5.38	94.62	
2.36 mm	No. 8	60.00	165.00	8.46	91.54	
2.00 mm	No. 10	39.90	204.90	10.50	89.50	
1.18 mm	No. 16	69.00	273.90	14.04	85.96	
850 µm	No. 20	21.30	295.20	15.13	84.87	24.84
600 µm	No. 30	51.90	347.10	17.79	82.21	
425 µm	No. 40	47.10	394.20	20.21	79.79	
150 µm	No. 100	162.90	557.10	28.56	71.44	
75 µm	No. 200	32.40	589.50	30.22	69.78	69.78
Pan		1361.10	1950.60	100.00	0.00	
TOTAL		**1950.60**				

SOIL CLASSIFICATION	CL-ML	SANDY SILTY CLAY

Atteberg Limits	LL	PL	PI
	25.49%	20.59%	4.90%

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	5.38	24.84	69.78

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	11

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A3**			**Sampling Date**	27.03.2010
Weight (gr)	505	**Depth (m)**	1.5	**Testing Date**	12.04.2010

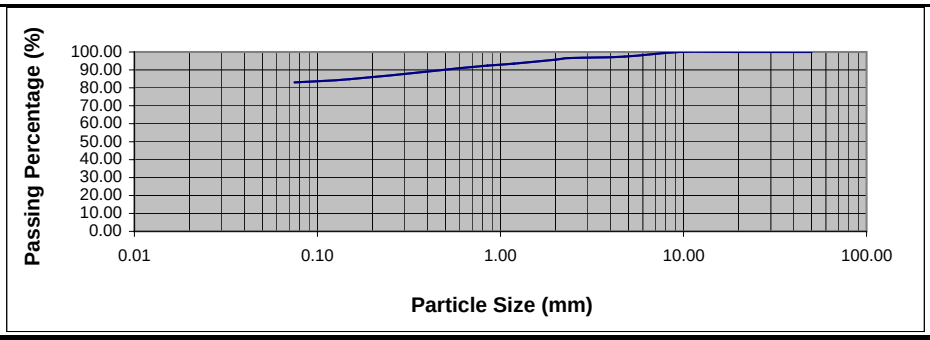
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.57**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	13.00	13.00	2.57	97.43	
2.36 mm	**No. 8**	4.00	17.00	3.37	96.63	
2.00 mm	**No. 10**	4.80	21.80	4.32	95.68	
1.18 mm	**No. 16**	11.20	33.00	6.53	93.47	
850 µm	**No. 20**	5.10	38.10	7.54	92.46	**14.40**
600 µm	**No. 30**	7.50	45.60	9.03	90.97	
425 µm	**No. 40**	7.90	53.50	10.59	89.41	
150 µm	**No. 100**	23.00	76.50	15.15	84.85	
75 µm	**No. 200**	9.20	85.70	16.97	83.03	**83.03**
Pan		419.30	505.00	100.00	0.00	
TOTAL		**505.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	22.67%	**17.24%**	**5.43%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.57	14.40	83.03

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	12

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A3**			**Sampling Date**	27.03.2010
Weight (gr)	467	**Depth (m)**	2.5	**Testing Date**	12.04.2010

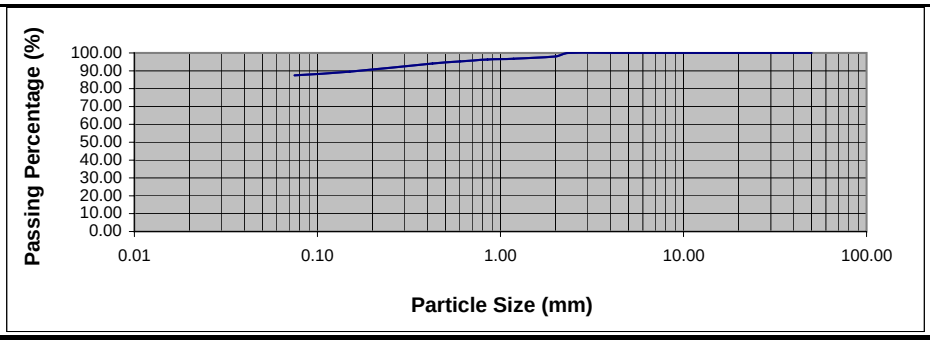
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.00**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.00	0.00	0.00	100.00	
2.36 mm	**No. 8**	0.00	0.00	0.00	100.00	
2.00 mm	**No. 10**	9.20	9.20	1.97	98.03	
1.18 mm	**No. 16**	5.80	15.00	3.21	96.79	
850 µm	**No. 20**	2.00	17.00	3.64	96.36	**12.53**
600 µm	**No. 30**	5.10	22.10	4.73	95.27	
425 µm	**No. 40**	5.50	27.60	5.91	94.09	
150 µm	**No. 100**	21.40	49.00	10.49	89.51	
75 µm	**No. 200**	9.50	58.50	12.53	87.47	**87.47**
Pan		408.50	467.00	100.00	0.00	
TOTAL		**467.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	23.70%	**18.42%**	**5.28%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.00	12.53	87.47

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	13

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A3**			**Sampling Date**	27.03.2010
Weight (gr)	1281	**Depth (m)**	3.5	**Testing Date**	12.04.2010

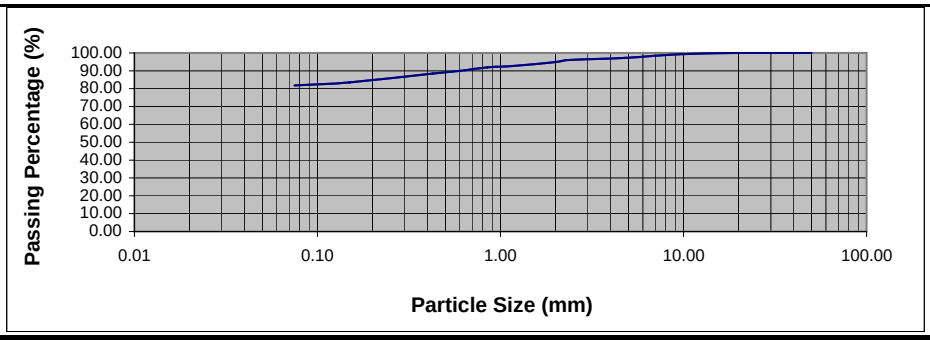
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.79**
9.5 mm	**3/8 in**	9.30	9.30	0.73	99.27	
4.75 mm	**No. 4**	26.40	35.70	2.79	97.21	
2.36 mm	**No. 8**	15.00	50.70	3.96	96.04	
2.00 mm	**No. 10**	14.40	65.10	5.08	94.92	
1.18 mm	**No. 16**	28.20	93.30	7.28	92.72	
850 µm	**No. 20**	10.20	103.50	8.08	91.92	**15.39**
600 µm	**No. 30**	24.90	128.40	10.02	89.98	
425 µm	**No. 40**	20.10	148.50	11.59	88.41	
150 µm	**No. 100**	62.70	211.20	16.49	83.51	
75 µm	**No. 200**	21.60	232.80	18.17	81.83	**81.83**
Pan		1048.20	1281.00	100.00	0.00	
TOTAL		**1281.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	23.35%	**18.00%**	**5.35%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.79	15.39	81.83

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	14

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

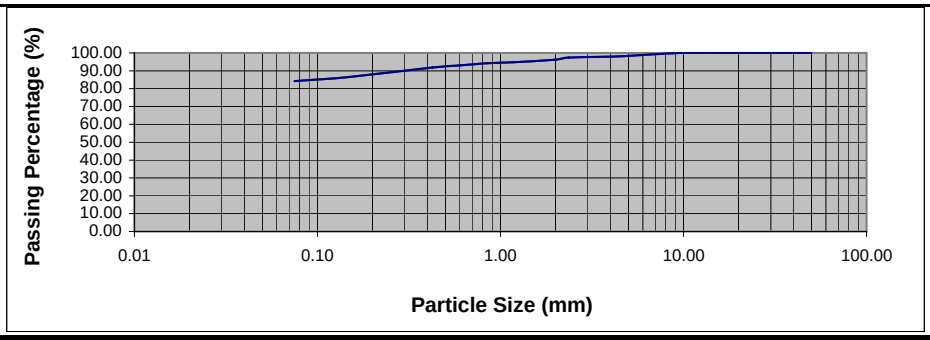
ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A3**			**Sampling Date**	27.03.2010
Weight (gr)	497	**Depth (m)**	5.5	**Testing Date**	12.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.83**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	9.10	9.10	1.83	98.17	
2.36 mm	**No. 8**	4.00	13.10	2.64	97.36	
2.00 mm	**No. 10**	5.70	18.80	3.78	96.22	
1.18 mm	**No. 16**	7.10	25.90	5.21	94.79	
850 µm	**No. 20**	2.70	28.60	5.75	94.25	**13.92**
600 µm	**No. 30**	6.10	34.70	6.98	93.02	
425 µm	**No. 40**	5.70	40.40	8.13	91.87	
150 µm	**No. 100**	26.30	66.70	13.42	86.58	
75 µm	**No. 200**	11.60	78.30	15.75	84.25	**84.25**
Pan		418.70	497.00	100.00	0.00	
TOTAL		**497.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**	
Atteberg Limits	**LL**	**PL**	**PI**
	23.68%	**18.75%**	**4.93%**
Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.83	13.92	84.25

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	15

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A4**			**Sampling Date**	27.03.2010
Weight (gr)	777	**Depth (m)**	2	**Testing Date**	12.04.2010

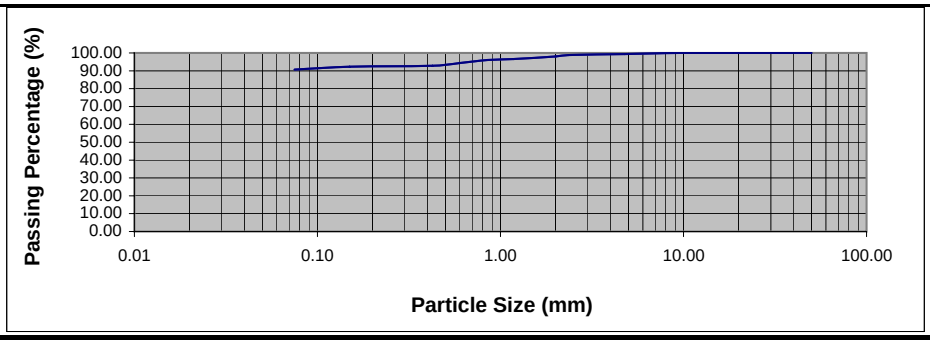
Sieve Size		**Mass Retained**	**Cumulative**			**Specification**
			Mass	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	%
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.66**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	5.10	5.10	0.66	99.34	
2.36 mm	**No. 8**	4.00	9.10	1.17	98.83	
2.00 mm	**No. 10**	6.50	15.60	2.01	97.99	
1.18 mm	**No. 16**	11.10	26.70	3.44	96.56	
850 µm	**No. 20**	4.10	30.80	3.96	96.04	**8.65**
600 µm	**No. 30**	12.90	43.70	5.62	94.38	
425 µm	**No. 40**	12.20	55.90	7.19	92.81	
150 µm	**No. 100**	3.90	59.80	7.70	92.30	
75 µm	**No. 200**	12.50	72.30	9.31	90.69	**90.69**
Pan		704.70	777.00	100.00	0.00	
TOTAL		**777.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	22.50%	**15.91%**	**6.59%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.66	8.65	90.69

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	16

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A4**			**Sampling Date**	27.03.2010
Weight (gr)	422	**Depth (m)**	4	**Testing Date**	12.04.2010

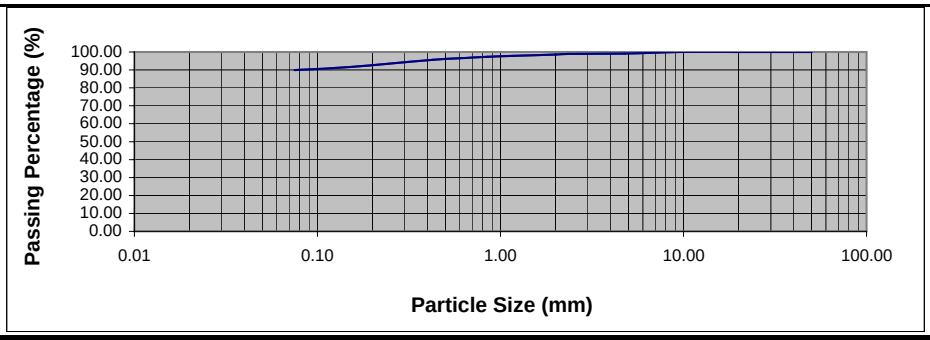
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.88**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	3.70	3.70	0.88	99.12	
2.36 mm	**No. 8**	1.00	4.70	1.11	98.89	
2.00 mm	**No. 10**	1.50	6.20	1.47	98.53	
1.18 mm	**No. 16**	3.00	9.20	2.18	97.82	
850 µm	**No. 20**	2.00	11.20	2.65	97.35	**9.22**
600 µm	**No. 30**	3.30	14.50	3.44	96.56	
425 µm	**No. 40**	4.00	18.50	4.38	95.62	
150 µm	**No. 100**	16.70	35.20	8.34	91.66	
75 µm	**No. 200**	7.40	42.60	10.09	89.91	**89.91**
Pan		379.40	422.00	100.00	0.00	
TOTAL		**422.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	24.01%	**19.05%**	**4.96%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.88	9.22	89.91

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	17

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A4**			**Sampling Date**	27.03.2010
Weight (gr)	500	**Depth (m)**	6	**Testing Date**	12.04.2010

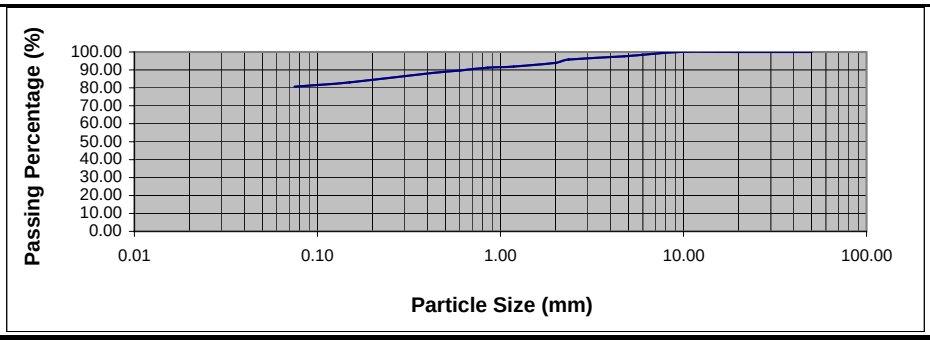
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.40**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	12.00	12.00	2.40	97.60	
2.36 mm	**No. 8**	9.00	21.00	4.20	95.80	
2.00 mm	**No. 10**	9.40	30.40	6.08	93.92	
1.18 mm	**No. 16**	10.10	40.50	8.10	91.90	
850 µm	**No. 20**	3.10	43.60	8.72	91.28	**16.98**
600 µm	**No. 30**	8.00	51.60	10.32	89.68	
425 µm	**No. 40**	7.00	58.60	11.72	88.28	
150 µm	**No. 100**	26.20	84.80	16.96	83.04	
75 µm	**No. 200**	12.10	96.90	19.38	80.62	**80.62**
Pan		403.10	500.00	100.00	0.00	
TOTAL		**500.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	24.63%	**20.00%**	**4.63%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.40	16.98	80.62

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	18

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A5**			**Sampling Date**	27.03.2010
Weight (gr)	583	**Depth (m)**	1	**Testing Date**	12.04.2010

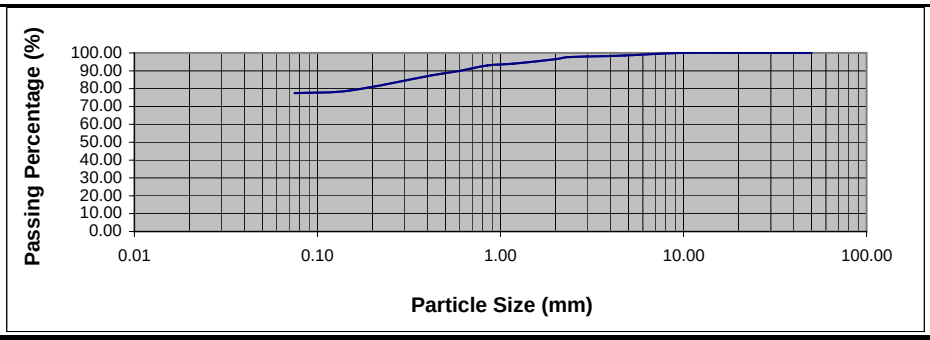
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.48**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	8.60	8.60	1.48	98.52	
2.36 mm	**No. 8**	5.00	13.60	2.33	97.67	
2.00 mm	**No. 10**	7.00	20.60	3.53	96.47	
1.18 mm	**No. 16**	14.50	35.10	6.02	93.98	
850 µm	**No. 20**	5.40	40.50	6.95	93.05	**20.98**
600 µm	**No. 30**	18.10	58.60	10.05	89.95	
425 µm	**No. 40**	13.90	72.50	12.44	87.56	
150 µm	**No. 100**	50.10	122.60	21.03	78.97	
75 µm	**No. 200**	8.30	130.90	22.45	77.55	**77.55**
Pan		452.10	583.00	100.00	0.00	
TOTAL		**583.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	25.63%	**20.00%**	**5.63%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.48	20.98	77.55

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	19

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A5**			**Sampling Date**	27.03.2010
Weight (gr)	620	**Depth (m)**	3	**Testing Date**	12.04.2010

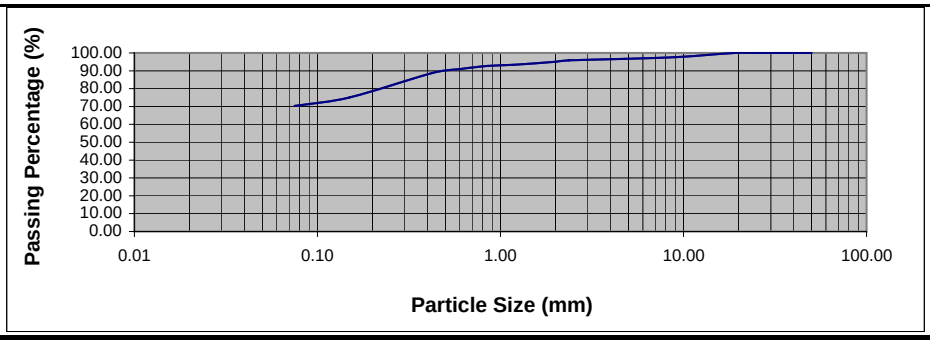
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**3.27**
9.5 mm	**3/8 in**	14.00	14.00	2.26	97.74	
4.75 mm	**No. 4**	6.30	20.30	3.27	96.73	
2.36 mm	**No. 8**	5.00	25.30	4.08	95.92	
2.00 mm	**No. 10**	5.40	30.70	4.95	95.05	
1.18 mm	**No. 16**	10.40	41.10	6.63	93.37	
850 µm	**No. 20**	3.70	44.80	7.23	92.77	**26.40**
600 µm	**No. 30**	11.40	56.20	9.06	90.94	
425 µm	**No. 40**	13.00	69.20	11.16	88.84	
150 µm	**No. 100**	85.30	154.50	24.92	75.08	
75 µm	**No. 200**	29.50	184.00	29.68	70.32	**70.32**
Pan		436.00	620.00	100.00	0.00	
TOTAL		**620.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	22.28%	**17.78%**	**4.50%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	3.27	26.40	70.32

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	20

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A5**			**Sampling Date**	27.03.2010
Weight (gr)	838	**Depth (m)**	5	**Testing Date**	12.04.2010

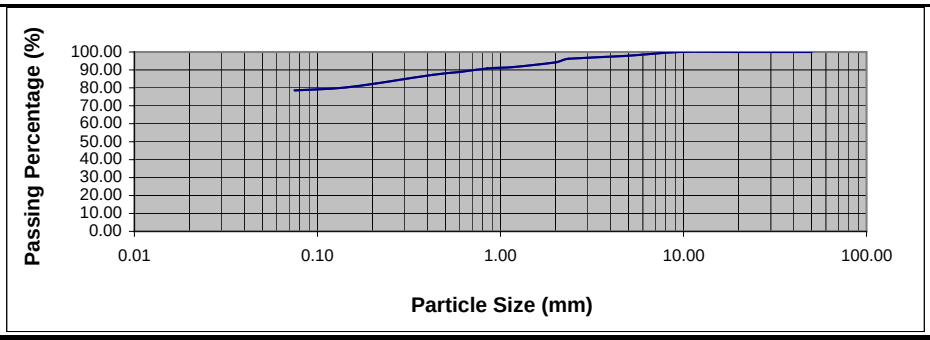
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.23**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	18.70	18.70	2.23	97.77	
2.36 mm	**No. 8**	13.00	31.70	3.78	96.22	
2.00 mm	**No. 10**	16.70	48.40	5.78	94.22	
1.18 mm	**No. 16**	21.50	69.90	8.34	91.66	
850 µm	**No. 20**	7.20	77.10	9.20	90.80	**19.14**
600 µm	**No. 30**	16.70	93.80	11.19	88.81	
425 µm	**No. 40**	13.40	107.20	12.79	87.21	
150 µm	**No. 100**	56.20	163.40	19.50	80.50	
75 µm	**No. 200**	15.70	179.10	21.37	78.63	**78.63**
Pan		658.90	838.00	100.00	0.00	
TOTAL		**838.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	22.77%	**18.37%**	**4.40%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.23	19.14	78.63

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	21

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A6**			**Sampling Date**	27.03.2010
Weight (gr)	589	**Depth (m)**	1.5	**Testing Date**	7.04.2010

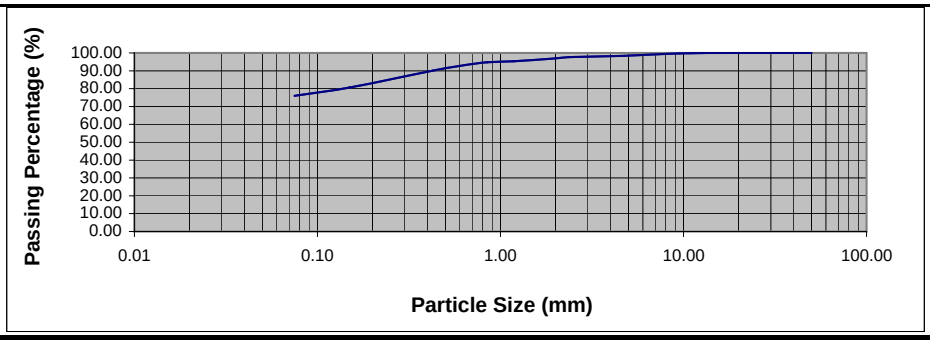
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.65**
9.5 mm	**3/8 in**	1.60	1.60	0.27	99.73	
4.75 mm	**No. 4**	8.10	9.70	1.65	98.35	
2.36 mm	**No. 8**	4.00	13.70	2.33	97.67	
2.00 mm	**No. 10**	4.10	17.80	3.02	96.98	
1.18 mm	**No. 16**	9.80	27.60	4.69	95.31	
850 µm	**No. 20**	3.10	30.70	5.21	94.79	**22.39**
600 µm	**No. 30**	12.00	42.70	7.25	92.75	
425 µm	**No. 40**	16.10	58.80	9.98	90.02	
150 µm	**No. 100**	55.20	114.00	19.35	80.65	
75 µm	**No. 200**	27.60	141.60	24.04	75.96	**75.96**
Pan		447.40	589.00	100.00	0.00	
TOTAL		**589.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	20.26%	**16.00%**	**4.26%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.65	22.39	75.96

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	22

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A6**			**Sampling Date**	27.03.2010
Weight (gr)	611	**Depth (m)**	4	**Testing Date**	7.04.2010

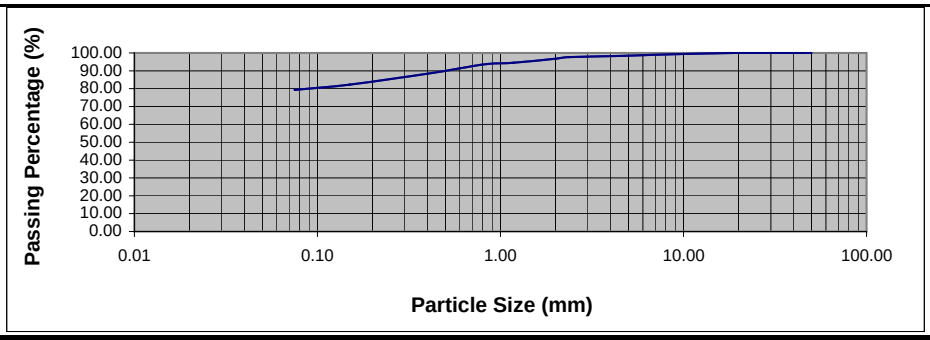
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.65**
9.5 mm	**3/8 in**	3.60	3.60	0.59	99.41	
4.75 mm	**No. 4**	6.50	10.10	1.65	98.35	
2.36 mm	**No. 8**	4.00	14.10	2.31	97.69	
2.00 mm	**No. 10**	5.80	19.90	3.26	96.74	
1.18 mm	**No. 16**	13.50	33.40	5.47	94.53	
850 µm	**No. 20**	4.30	37.70	6.17	93.83	**19.05**
600 µm	**No. 30**	15.10	52.80	8.64	91.36	
425 µm	**No. 40**	15.50	68.30	11.18	88.82	
150 µm	**No. 100**	40.00	108.30	17.73	82.27	
75 µm	**No. 200**	18.20	126.50	20.70	79.30	**79.30**
Pan		484.50	611.00	100.00	0.00	
TOTAL		**611.00**				

SOIL CLASSIFICATION	**ML**	**SILT WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	21.01%	**17.07%**	**3.94%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.65	19.05	79.30

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	23

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A6**			**Sampling Date**	27.03.2010
Weight (gr)	592	**Depth (m)**	5	**Testing Date**	7.04.2010

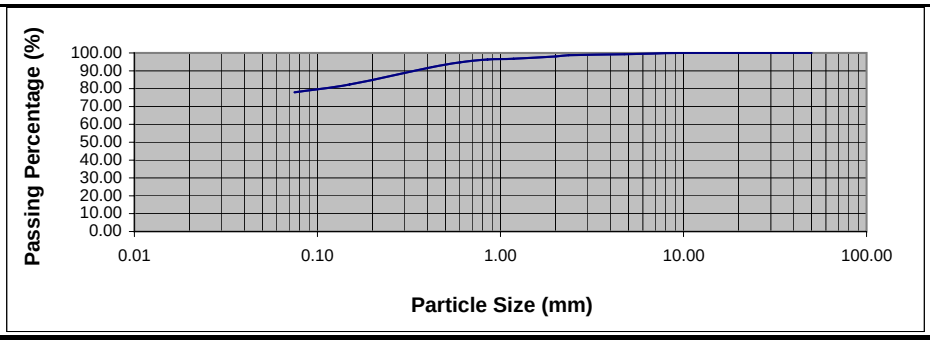
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.76**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	4.50	4.50	0.76	99.24	
2.36 mm	**No. 8**	3.00	7.50	1.27	98.73	
2.00 mm	**No. 10**	4.00	11.50	1.94	98.06	
1.18 mm	**No. 16**	7.50	19.00	3.21	96.79	
850 µm	**No. 20**	3.00	22.00	3.72	96.28	**21.28**
600 µm	**No. 30**	9.50	31.50	5.32	94.68	
425 µm	**No. 40**	15.00	46.50	7.85	92.15	
150 µm	**No. 100**	58.00	104.50	17.65	82.35	
75 µm	**No. 200**	26.00	130.50	22.04	77.96	**77.96**
Pan		461.50	592.00	100.00	0.00	
TOTAL		**592.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	21.13%	**17.02%**	**4.11%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.76	21.28	77.96

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	24

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A6**			**Sampling Date**	27.03.2010
Weight (gr)	520	**Depth (m)**	6	**Testing Date**	7.04.2010

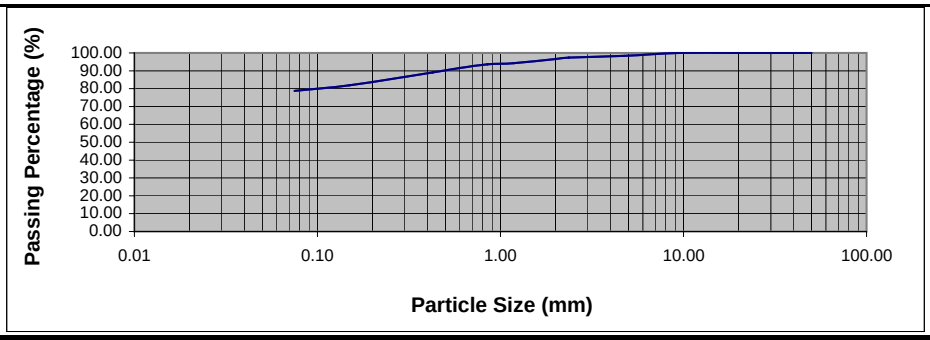
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.65**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	8.60	8.60	1.65	98.35	
2.36 mm	**No. 8**	5.00	13.60	2.62	97.38	
2.00 mm	**No. 10**	4.20	17.80	3.42	96.58	
1.18 mm	**No. 16**	12.00	29.80	5.73	94.27	
850 µm	**No. 20**	3.30	33.10	6.37	93.63	**19.54**
600 µm	**No. 30**	10.90	44.00	8.46	91.54	
425 µm	**No. 40**	12.80	56.80	10.92	89.08	
150 µm	**No. 100**	37.30	94.10	18.10	81.90	
75 µm	**No. 200**	16.10	110.20	21.19	78.81	**78.81**
Pan		409.80	520.00	100.00	0.00	
TOTAL		**520.00**				

SOIL CLASSIFICATION	**ML**	**SILT WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	23.23%	**19.51%**	**3.72%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.65	19.54	78.81

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	25

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A7**			**Sampling Date**	27.03.2010
Weight (gr)	441	**Depth (m)**	2	**Testing Date**	7.04.2010

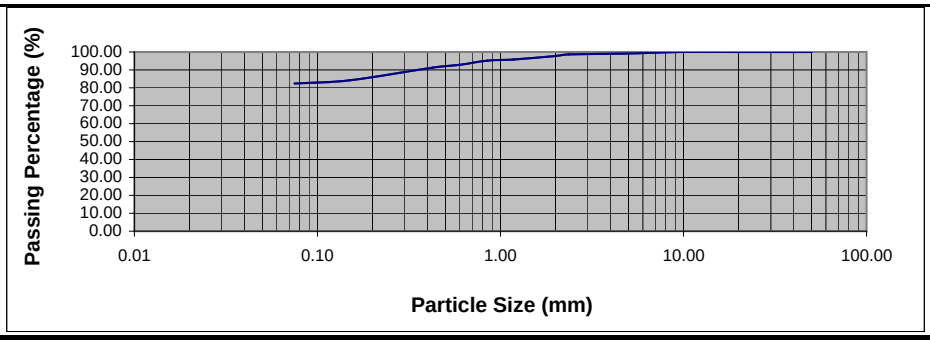
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.86**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	3.80	3.80	0.86	99.14	
2.36 mm	**No. 8**	2.00	5.80	1.32	98.68	
2.00 mm	**No. 10**	4.00	9.80	2.22	97.78	
1.18 mm	**No. 16**	8.80	18.60	4.22	95.78	
850 µm	**No. 20**	2.80	21.40	4.85	95.15	**16.73**
600 µm	**No. 30**	10.00	31.40	7.12	92.88	
425 µm	**No. 40**	7.00	38.40	8.71	91.29	
150 µm	**No. 100**	31.40	69.80	15.83	84.17	
75 µm	**No. 200**	7.80	77.60	17.60	82.40	**82.40**
Pan		363.40	441.00	100.00	0.00	
TOTAL		**441.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	25.97%	**19.44%**	**6.53%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.86	16.73	82.40

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	26

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A7**			**Sampling Date**	27.03.2010
Weight (gr)	482	**Depth (m)**	4	**Testing Date**	7.04.2010

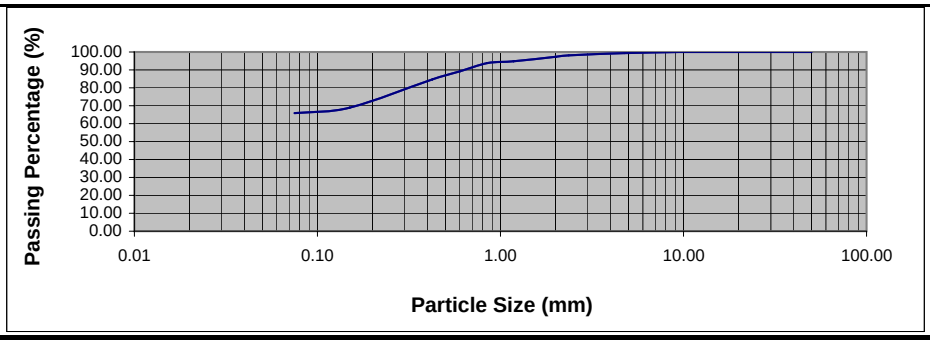
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.64**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	3.10	3.10	0.64	99.36	
2.36 mm	**No. 8**	6.00	9.10	1.89	98.11	
2.00 mm	**No. 10**	3.60	12.70	2.63	97.37	
1.18 mm	**No. 16**	12.20	24.90	5.17	94.83	
850 µm	**No. 20**	4.70	29.60	6.14	93.86	**33.42**
600 µm	**No. 30**	22.40	52.00	10.79	89.21	
425 µm	**No. 40**	21.60	73.60	15.27	84.73	
150 µm	**No. 100**	76.00	149.60	31.04	68.96	
75 µm	**No. 200**	14.60	164.20	34.07	65.93	**65.93**
Pan		317.80	482.00	100.00	0.00	
TOTAL		**482.00**				

SOIL CLASSIFICATION	**CL-ML**	**SANDY SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	21.28%	**17.07%**	**4.21%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.64	33.42	65.93

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	27

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A7**			**Sampling Date**	27.03.2010
Weight (gr)	3511.8	**Depth (m)**	6	**Testing Date**	7.04.2010

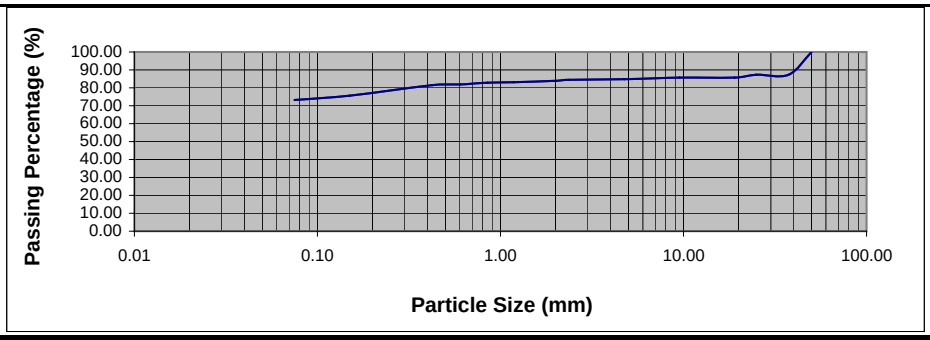
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	446.40	446.40	12.71	87.29	
25.0 mm	**1 in**	0.00	446.40	12.71	87.29	
19.0 mm	**3/4 in**	54.00	500.40	14.25	85.75	**15.19**
9.5 mm	**3/8 in**	0.00	500.40	14.25	85.75	
4.75 mm	**No. 4**	33.00	533.40	15.19	84.81	
2.36 mm	**No. 8**	12.00	545.40	15.53	84.47	
2.00 mm	**No. 10**	20.40	565.80	16.11	83.89	
1.18 mm	**No. 16**	25.80	591.60	16.85	83.15	
850 µm	**No. 20**	9.00	600.60	17.10	82.90	**11.57**
600 µm	**No. 30**	37.20	637.80	18.16	81.84	
425 µm	**No. 40**	12.00	649.80	18.50	81.50	
150 µm	**No. 100**	207.00	856.80	24.40	75.60	
75 µm	**No. 200**	82.80	939.60	26.76	73.24	**73.24**
Pan		2572.20	3511.80	100.00	0.00	
TOTAL		**3511.80**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	23.96%	**17.24%**	**6.72%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	15.19	11.57	73.24

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	28

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A8**			**Sampling Date**	27.03.2010
Weight (gr)	445.3	**Depth (m)**	2	**Testing Date**	7.04.2010

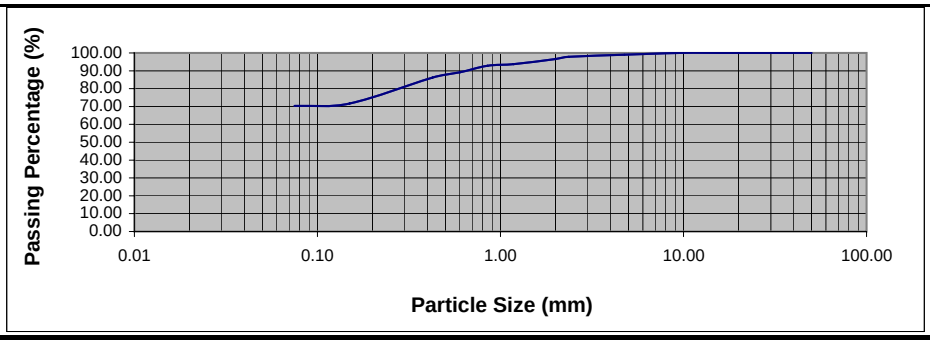
Sieve Size		**Mass Retained**	**Cumulative**			**Specification**
			Mass	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	%
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.99**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	4.40	4.40	0.99	99.01	
2.36 mm	**No. 8**	5.00	9.40	2.11	97.89	
2.00 mm	**No. 10**	5.80	15.20	3.41	96.59	
1.18 mm	**No. 16**	12.80	28.00	6.29	93.71	
850 µm	**No. 20**	4.00	32.00	7.19	92.81	**28.68**
600 µm	**No. 30**	16.30	48.30	10.85	89.15	
425 µm	**No. 40**	13.30	61.60	13.83	86.17	
150 µm	**No. 100**	64.40	126.00	28.30	71.70	
75 µm	**No. 200**	6.10	132.10	29.67	70.33	**70.33**
Pan		313.20	445.30	100.00	0.00	
TOTAL		**445.30**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	21.24%	**16.67%**	**4.57%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.99	28.68	70.33

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	29

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A8**			**Sampling Date**	27.03.2010
Weight (gr)	479	**Depth (m)**	4	**Testing Date**	7.04.2010

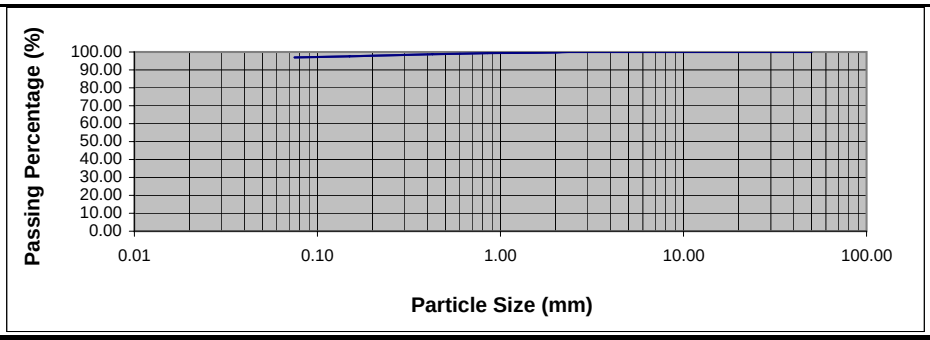
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.00**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.00	0.00	0.00	100.00	
2.36 mm	**No. 8**	0.00	0.00	0.00	100.00	
2.00 mm	**No. 10**	1.20	1.20	0.25	99.75	
1.18 mm	**No. 16**	1.50	2.70	0.56	99.44	
850 µm	**No. 20**	0.50	3.20	0.67	99.33	**3.07**
600 µm	**No. 30**	1.50	4.70	0.98	99.02	
425 µm	**No. 40**	1.30	6.00	1.25	98.75	
150 µm	**No. 100**	5.70	11.70	2.44	97.56	
75 µm	**No. 200**	3.00	14.70	3.07	96.93	**96.93**
Pan		464.30	479.00	100.00	0.00	
TOTAL		**479.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	18.88%	**12.50%**	**6.38%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.00	3.07	96.93

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	30

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A8**			**Sampling Date**	27.03.2010
Weight (gr)	484	**Depth (m)**	6	**Testing Date**	7.04.2010

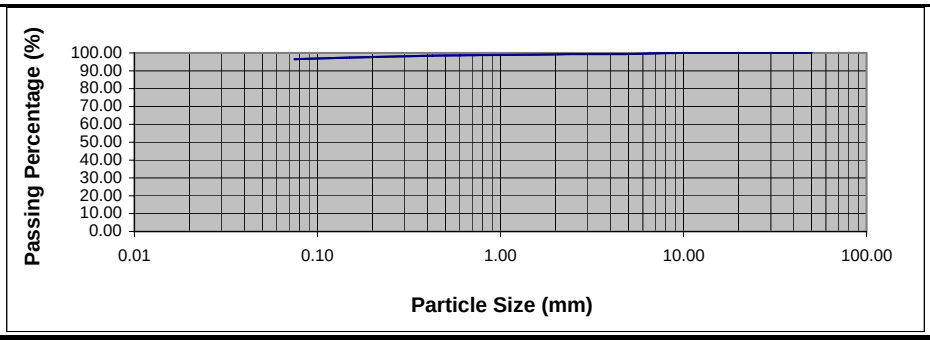
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.62**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	3.00	3.00	0.62	99.38	
2.36 mm	**No. 8**	0.20	3.20	0.66	99.34	
2.00 mm	**No. 10**	0.80	4.00	0.83	99.17	
1.18 mm	**No. 16**	1.00	5.00	1.03	98.97	
850 µm	**No. 20**	0.50	5.50	1.14	98.86	**2.87**
600 µm	**No. 30**	1.00	6.50	1.34	98.66	
425 µm	**No. 40**	1.00	7.50	1.55	98.45	
150 µm	**No. 100**	5.00	12.50	2.58	97.42	
75 µm	**No. 200**	4.40	16.90	3.49	96.51	**96.51**
Pan		467.10	484.00	100.00	0.00	
TOTAL		**484.00**				

SOIL CLASSIFICATION	**CL**	**LEAN CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	25.41%	**16.13%**	**9.28%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.62	2.87	96.51

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	31

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A9**			**Sampling Date**	27.03.2010
Weight (gr)	2580	**Depth (m)**	2	**Testing Date**	12.04.2010

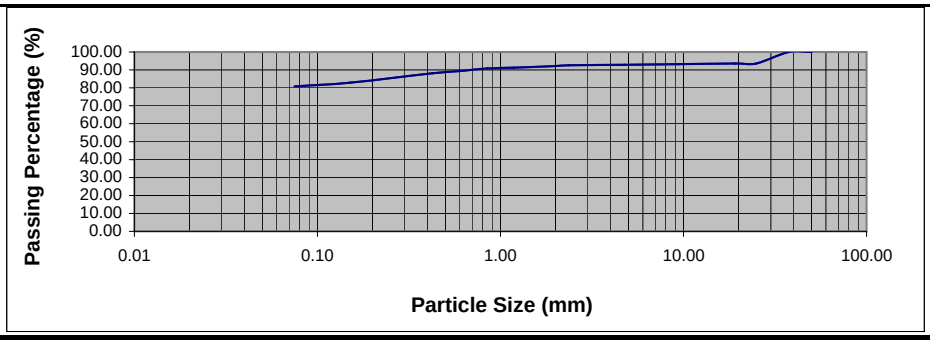
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	165.00	165.00	6.40	93.60	
19.0 mm	**3/4 in**	0.00	165.00	6.40	93.60	**7.17**
9.5 mm	**3/8 in**	10.50	175.50	6.80	93.20	
4.75 mm	**No. 4**	9.60	185.10	7.17	92.83	
2.36 mm	**No. 8**	6.00	191.10	7.41	92.59	
2.00 mm	**No. 10**	11.70	202.80	7.86	92.14	
1.18 mm	**No. 16**	21.60	224.40	8.70	91.30	
850 µm	**No. 20**	12.00	236.40	9.16	90.84	**11.97**
600 µm	**No. 30**	37.50	273.90	10.62	89.38	
425 µm	**No. 40**	33.00	306.90	11.90	88.10	
150 µm	**No. 100**	134.10	441.00	17.09	82.91	
75 µm	**No. 200**	52.80	493.80	19.14	80.86	**80.86**
Pan		2086.20	2580.00	100.00	0.00	
TOTAL		**2580.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	26.36%	**21.82%**	**4.54%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	7.17	11.97	80.86

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	32

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A9**			**Sampling Date**	27.03.2010
Weight (gr)	2046	**Depth (m)**	4	**Testing Date**	12.04.2010

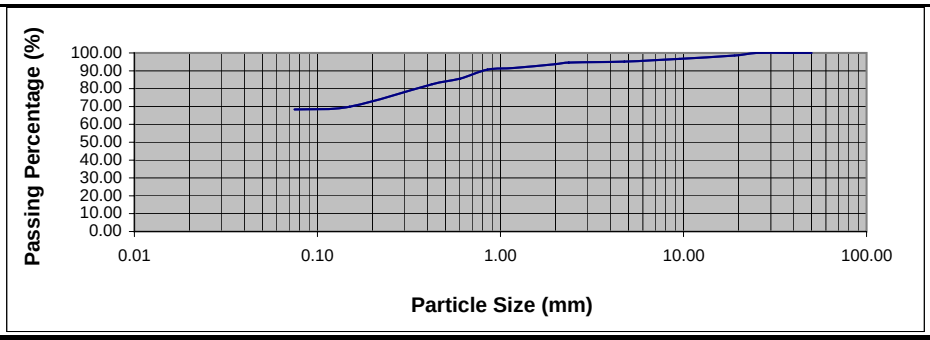
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	0.00	0.00	0.00	100.00	
25.0 mm	1 in	0.00	0.00	0.00	100.00	
19.0 mm	3/4 in	29.70	29.70	1.45	98.55	4.81
9.5 mm	3/8 in	39.00	68.70	3.36	96.64	
4.75 mm	No. 4	29.70	98.40	4.81	95.19	
2.36 mm	No. 8	12.00	110.40	5.40	94.60	
2.00 mm	No. 10	17.10	127.50	6.23	93.77	
1.18 mm	No. 16	44.40	171.90	8.40	91.60	
850 µm	No. 20	19.50	191.40	9.35	90.65	26.86
600 µm	No. 30	102.90	294.30	14.38	85.62	
425 µm	No. 40	63.30	357.60	17.48	82.52	
150 µm	No. 100	259.20	616.80	30.15	69.85	
75 µm	No. 200	31.20	648.00	31.67	68.33	68.33
Pan		1398.00	2046.00	100.00	0.00	
TOTAL		2046.00				

SOIL CLASSIFICATION	ML	SANDY SILT

Atteberg Limits	LL	PL	PI
	21.29%	17.39%	3.90%

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	4.81	26.86	68.33

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	33

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A9**			**Sampling Date**	27.03.2010
Weight (gr)	666	**Depth (m)**	5	**Testing Date**	12.04.2010

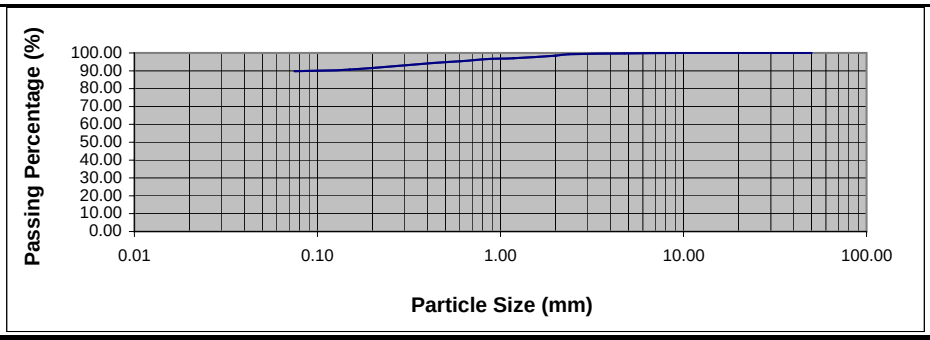
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.23**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	1.50	1.50	0.23	99.77	
2.36 mm	**No. 8**	3.00	4.50	0.68	99.32	
2.00 mm	**No. 10**	5.50	10.00	1.50	98.50	
1.18 mm	**No. 16**	9.50	19.50	2.93	97.07	
850 µm	**No. 20**	3.40	22.90	3.44	96.56	**9.95**
600 µm	**No. 30**	8.30	31.20	4.68	95.32	
425 µm	**No. 40**	6.40	37.60	5.65	94.35	
150 µm	**No. 100**	24.50	62.10	9.32	90.68	
75 µm	**No. 200**	5.70	67.80	10.18	89.82	**89.82**
Pan		598.20	666.00	100.00	0.00	
TOTAL		**666.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	25.01%	**18.75%**	**6.26%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.23	9.95	89.82

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	34

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

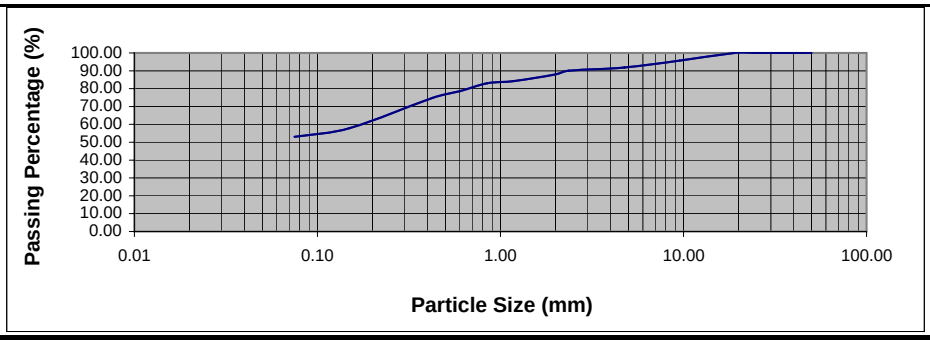
ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A10**			**Sampling Date**	27.03.2010
Weight (gr)	787	**Depth (m)**	0.7	**Testing Date**	12.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**8.14**
9.5 mm	**3/8 in**	34.00	34.00	4.32	95.68	
4.75 mm	**No. 4**	30.10	64.10	8.14	91.86	
2.36 mm	**No. 8**	14.00	78.10	9.92	90.08	
2.00 mm	**No. 10**	16.30	94.40	11.99	88.01	
1.18 mm	**No. 16**	29.40	123.80	15.73	84.27	
850 µm	**No. 20**	9.70	133.50	16.96	83.04	**38.84**
600 µm	**No. 30**	35.30	168.80	21.45	78.55	
425 µm	**No. 40**	29.50	198.30	25.20	74.80	
150 µm	**No. 100**	133.30	331.60	42.13	57.87	
75 µm	**No. 200**	38.20	369.80	46.99	53.01	**53.01**
Pan		417.20	787.00	100.00	0.00	
TOTAL		**787.00**				

SOIL CLASSIFICATION	**CL-ML**	**SANDY SILTY CLAY**	
Atteberg Limits	**LL**	**PL**	**PI**
	21.82%	**17.50%**	**4.32%**
Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	8.14	38.84	53.01

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	35

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A10**			**Sampling Date**	27.03.2010
Weight (gr)	519	**Depth (m)**	2	**Testing Date**	12.04.2010

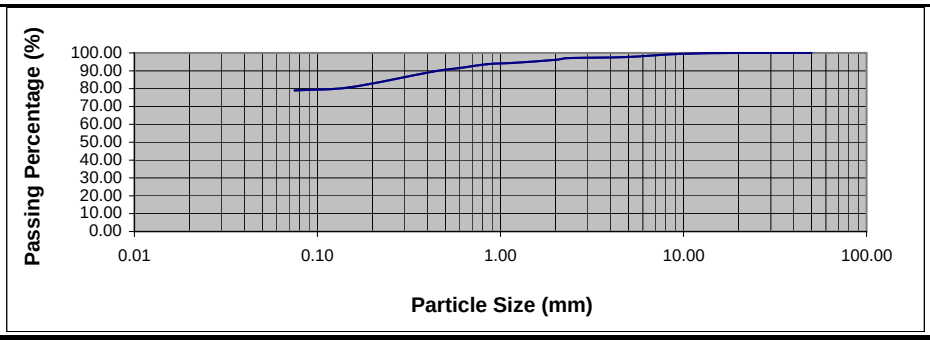
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.29**
9.5 mm	**3/8 in**	2.90	2.90	0.56	99.44	
4.75 mm	**No. 4**	9.00	11.90	2.29	97.71	
2.36 mm	**No. 8**	3.00	14.90	2.87	97.13	
2.00 mm	**No. 10**	5.30	20.20	3.89	96.11	
1.18 mm	**No. 16**	8.80	29.00	5.59	94.41	
850 µm	**No. 20**	3.60	32.60	6.28	93.72	**18.71**
600 µm	**No. 30**	11.10	43.70	8.42	91.58	
425 µm	**No. 40**	10.80	54.50	10.50	89.50	
150 µm	**No. 100**	45.70	100.20	19.31	80.69	
75 µm	**No. 200**	8.80	109.00	21.00	79.00	**79.00**
Pan		410.00	519.00	100.00	0.00	
TOTAL		**519.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	24.50%	**17.78%**	**6.72%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.29	18.71	79.00

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	36

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A10**			**Sampling Date**	27.03.2010
Weight (gr)	715	**Depth (m)**	3.5	**Testing Date**	12.04.2010

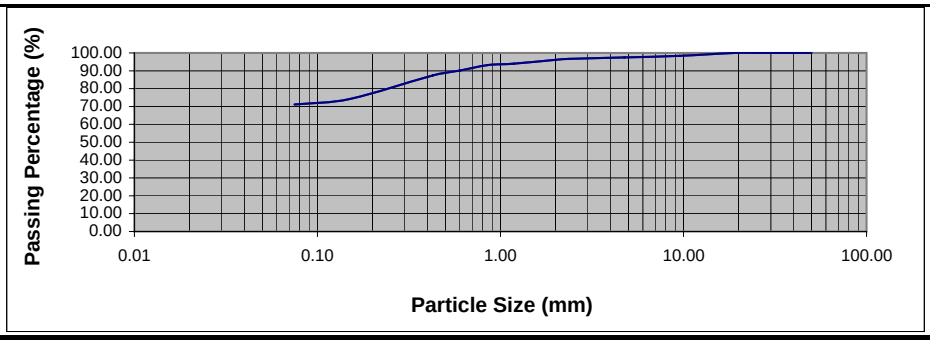
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.48**
9.5 mm	**3/8 in**	11.70	11.70	1.64	98.36	
4.75 mm	**No. 4**	6.00	17.70	2.48	97.52	
2.36 mm	**No. 8**	6.00	23.70	3.31	96.69	
2.00 mm	**No. 10**	4.00	27.70	3.87	96.13	
1.18 mm	**No. 16**	15.00	42.70	5.97	94.03	
850 µm	**No. 20**	6.30	49.00	6.85	93.15	**26.35**
600 µm	**No. 30**	21.70	70.70	9.89	90.11	
425 µm	**No. 40**	19.40	90.10	12.60	87.40	
150 µm	**No. 100**	94.30	184.40	25.79	74.21	
75 µm	**No. 200**	21.70	206.10	28.83	71.17	**71.17**
Pan		508.90	715.00	100.00	0.00	
TOTAL		**715.00**				

SOIL CLASSIFICATION	**CL-ML**	**SANDY SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	26.62%	**22.22%**	**4.40%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.48	26.35	71.17

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	37

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A10**			**Sampling Date**	27.03.2010
Weight (gr)	522	**Depth (m)**	5	**Testing Date**	12.04.2010

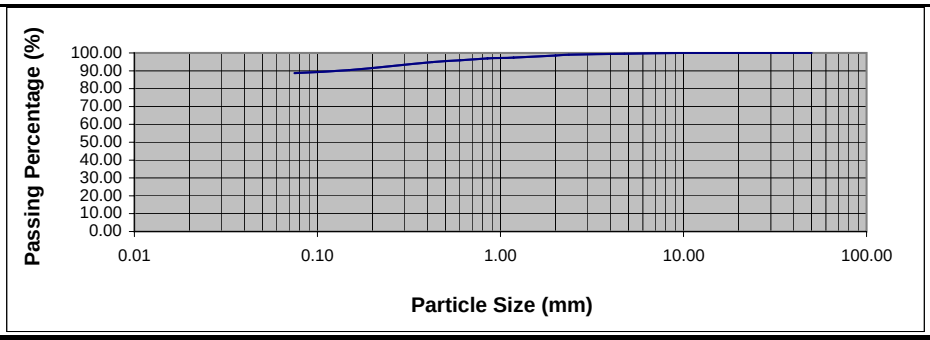
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.42**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	2.20	2.20	0.42	99.58	
2.36 mm	**No. 8**	3.00	5.20	1.00	99.00	
2.00 mm	**No. 10**	2.50	7.70	1.48	98.52	
1.18 mm	**No. 16**	6.00	13.70	2.62	97.38	
850 µm	**No. 20**	2.20	15.90	3.05	96.95	**10.90**
600 µm	**No. 30**	5.60	21.50	4.12	95.88	
425 µm	**No. 40**	5.20	26.70	5.11	94.89	
150 µm	**No. 100**	23.40	50.10	9.60	90.40	
75 µm	**No. 200**	9.00	59.10	11.32	88.68	**88.68**
Pan		462.90	522.00	100.00	0.00	
TOTAL		**522.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	34.18%	**27.66%**	**6.52%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.42	10.90	88.68

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	38

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A11**			**Sampling Date**	27.03.2010
Weight (gr)	650	**Depth (m)**	1.5	**Testing Date**	7.04.2010

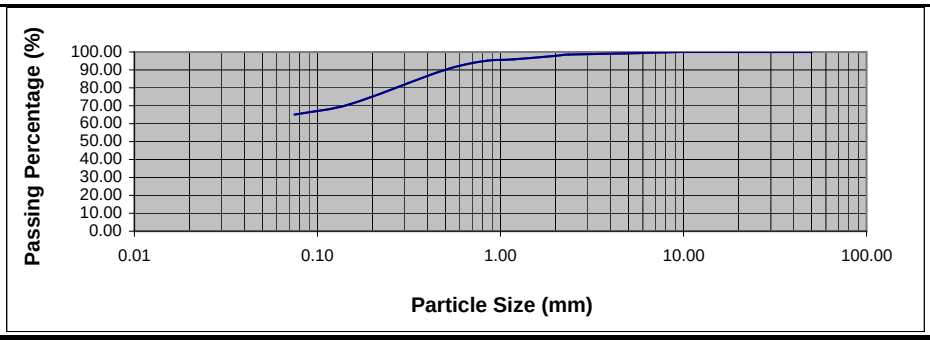
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.77**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	5.00	5.00	0.77	99.23	
2.36 mm	**No. 8**	4.00	9.00	1.38	98.62	
2.00 mm	**No. 10**	4.70	13.70	2.11	97.89	
1.18 mm	**No. 16**	13.00	26.70	4.11	95.89	
850 µm	**No. 20**	4.80	31.50	4.85	95.15	**34.12**
600 µm	**No. 30**	18.60	50.10	7.71	92.29	
425 µm	**No. 40**	30.20	80.30	12.35	87.65	
150 µm	**No. 100**	109.20	189.50	29.15	70.85	
75 µm	**No. 200**	37.30	226.80	34.89	65.11	**65.11**
Pan		423.20	650.00	100.00	0.00	
TOTAL		**650.00**				

SOIL CLASSIFICATION	**ML**	**SANDY SILT**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.77	34.12	65.11

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	39

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A11**			**Sampling Date**	27.03.2010
Weight (gr)	636	**Depth (m)**	4	**Testing Date**	7.04.2010

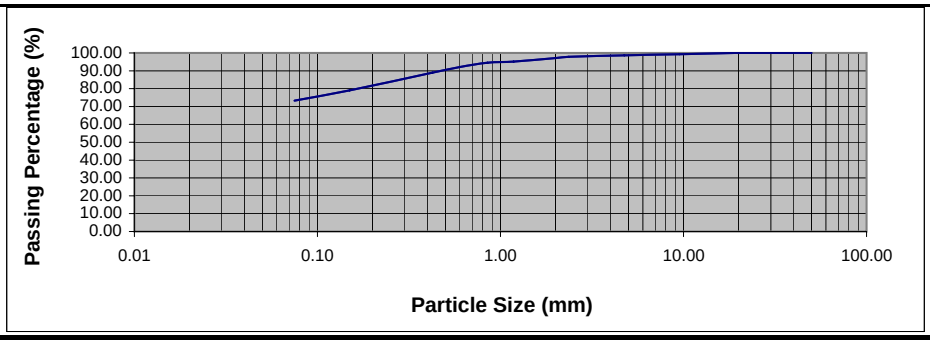
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.37**
9.5 mm	**3/8 in**	4.30	4.30	0.68	99.32	
4.75 mm	**No. 4**	4.40	8.70	1.37	98.63	
2.36 mm	**No. 8**	5.00	13.70	2.15	97.85	
2.00 mm	**No. 10**	4.80	18.50	2.91	97.09	
1.18 mm	**No. 16**	12.30	30.80	4.84	95.16	
850 µm	**No. 20**	4.20	35.00	5.50	94.50	**25.31**
600 µm	**No. 30**	15.20	50.20	7.89	92.11	
425 µm	**No. 40**	19.70	69.90	10.99	89.01	
150 µm	**No. 100**	63.60	133.50	20.99	79.01	
75 µm	**No. 200**	36.20	169.70	26.68	73.32	**73.32**
Pan		466.30	636.00	100.00	0.00	
TOTAL		**636.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	20.34%	**16.33%**	**4.01%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.37	25.31	73.32

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	40

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

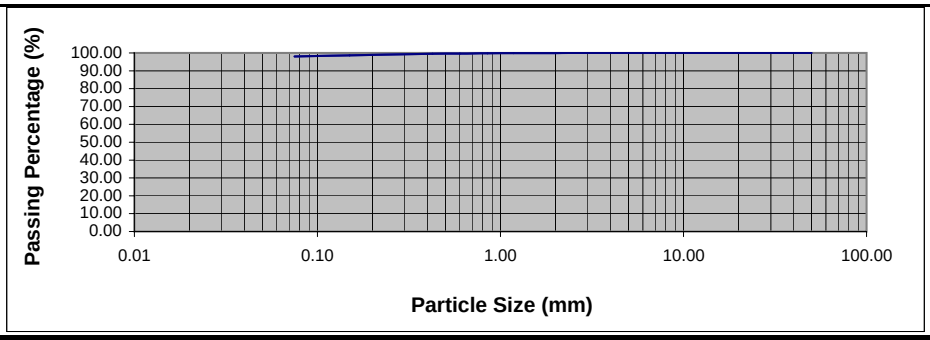
Location	**BH # A11**			**Sampling Date**	27.03.2010
Weight (gr)	534	**Depth (m)**	6	**Testing Date**	7.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.00**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.00	0.00	0.00	100.00	
2.36 mm	**No. 8**	0.00	0.00	0.00	100.00	
2.00 mm	**No. 10**	0.70	0.70	0.13	99.87	
1.18 mm	**No. 16**	0.00	0.70	0.13	99.87	
850 µm	**No. 20**	0.30	1.00	0.19	99.81	**1.95**
600 µm	**No. 30**	0.70	1.70	0.32	99.68	
425 µm	**No. 40**	0.90	2.60	0.49	99.51	
150 µm	**No. 100**	4.50	7.10	1.33	98.67	
75 µm	**No. 200**	3.30	10.40	1.95	98.05	**98.05**
Pan		523.60	534.00	100.00	0.00	
TOTAL		**534.00**				

SOIL CLASSIFICATION	**ML**	**SILT**	
Atteberg Limits	**LL**	**PL**	**PI**
	20.60%	**16.67%**	**3.93%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.00	1.95	98.05

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	41

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A12**			**Sampling Date**	27.03.2010
Weight (gr)	444.3	**Depth (m)**	1.3	**Testing Date**	7.04.2010

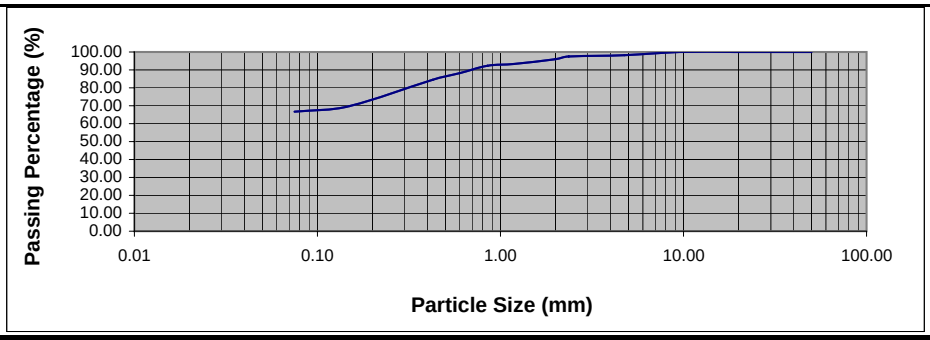
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.80**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	8.00	8.00	1.80	98.20	
2.36 mm	**No. 8**	3.00	11.00	2.48	97.52	
2.00 mm	**No. 10**	6.70	17.70	3.98	96.02	
1.18 mm	**No. 16**	12.20	29.90	6.73	93.27	
850 µm	**No. 20**	4.30	34.20	7.70	92.30	**31.49**
600 µm	**No. 30**	18.00	52.20	11.75	88.25	
425 µm	**No. 40**	17.00	69.20	15.58	84.42	
150 µm	**No. 100**	64.70	133.90	30.14	69.86	
75 µm	**No. 200**	14.00	147.90	33.29	66.71	**66.71**
Pan		296.40	444.30	100.00	0.00	
TOTAL		**444.30**				

SOIL CLASSIFICATION	**ML**	**SANDY SILT**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.80	31.49	66.71

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	42

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A12**			**Sampling Date**	27.03.2010
Weight (gr)	500	**Depth (m)**	3.5	**Testing Date**	7.04.2010

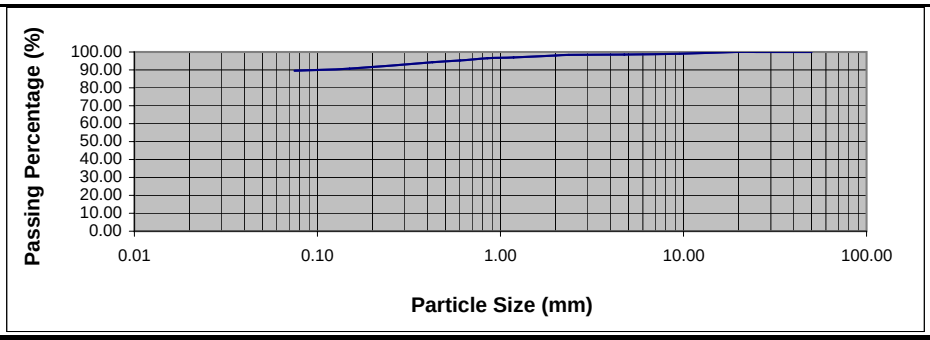
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.40**
9.5 mm	**3/8 in**	4.70	4.70	0.94	99.06	
4.75 mm	**No. 4**	2.30	7.00	1.40	98.60	
2.36 mm	**No. 8**	1.00	8.00	1.60	98.40	
2.00 mm	**No. 10**	2.00	10.00	2.00	98.00	
1.18 mm	**No. 16**	5.20	15.20	3.04	96.96	
850 µm	**No. 20**	2.00	17.20	3.44	96.56	**9.02**
600 µm	**No. 30**	6.60	23.80	4.76	95.24	
425 µm	**No. 40**	4.70	28.50	5.70	94.30	
150 µm	**No. 100**	18.00	46.50	9.30	90.70	
75 µm	**No. 200**	5.60	52.10	10.42	89.58	**89.58**
Pan		447.90	500.00	100.00	0.00	
TOTAL		**500.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	23.94%	**18.52%**	**5.42%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.40	9.02	89.58

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	43

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A12**			**Sampling Date**	27.03.2010
Weight (gr)	527	**Depth (m)**	4	**Testing Date**	7.04.2010

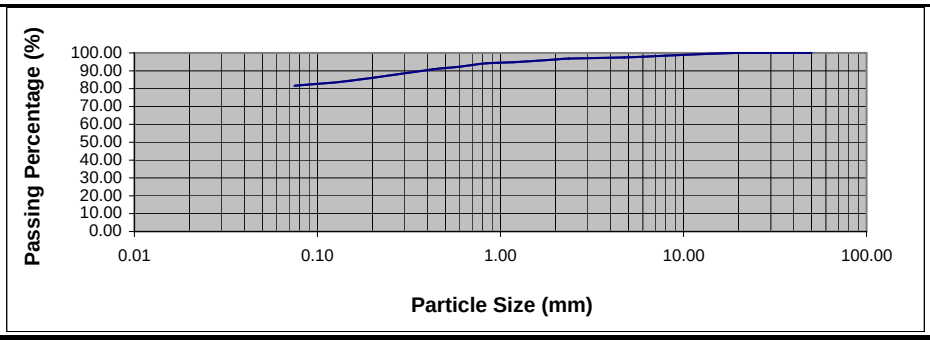
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.52**
9.5 mm	**3/8 in**	6.00	6.00	1.14	98.86	
4.75 mm	**No. 4**	7.30	13.30	2.52	97.48	
2.36 mm	**No. 8**	3.00	16.30	3.09	96.91	
2.00 mm	**No. 10**	3.00	19.30	3.66	96.34	
1.18 mm	**No. 16**	8.00	27.30	5.18	94.82	
850 µm	**No. 20**	3.00	30.30	5.75	94.25	**15.84**
600 µm	**No. 30**	10.10	40.40	7.67	92.33	
425 µm	**No. 40**	8.30	48.70	9.24	90.76	
150 µm	**No. 100**	33.40	82.10	15.58	84.42	
75 µm	**No. 200**	14.70	96.80	18.37	81.63	**81.63**
Pan		430.20	527.00	100.00	0.00	
TOTAL		**527.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	23.84%	**17.78%**	**6.06%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.52	15.84	81.63

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	44

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A12**			**Sampling Date**	27.03.2010
Weight (gr)	461	**Depth (m)**	6	**Testing Date**	7.04.2010

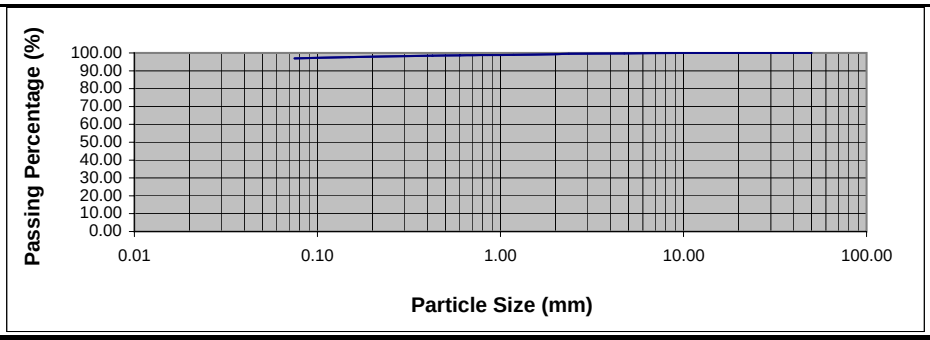
Sieve Size		**Mass Retained**	**Cumulative**			**Specification**
			Mass	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	%
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.26**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	1.20	1.20	0.26	99.74	
2.36 mm	**No. 8**	1.00	2.20	0.48	99.52	
2.00 mm	**No. 10**	1.00	3.20	0.69	99.31	
1.18 mm	**No. 16**	1.70	4.90	1.06	98.94	
850 µm	**No. 20**	0.40	5.30	1.15	98.85	**2.75**
600 µm	**No. 30**	1.00	6.30	1.37	98.63	
425 µm	**No. 40**	0.80	7.10	1.54	98.46	
150 µm	**No. 100**	3.80	10.90	2.36	97.64	
75 µm	**No. 200**	3.00	13.90	3.02	96.98	**96.98**
Pan		447.10	461.00	100.00	0.00	
TOTAL		**461.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	25.23%	**18.52%**	**6.71%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.26	2.75	96.98

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	45

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A13**			**Sampling Date**	27.03.2010
Weight (gr)	451.6	**Depth (m)**	1.5	**Testing Date**	7.04.2010

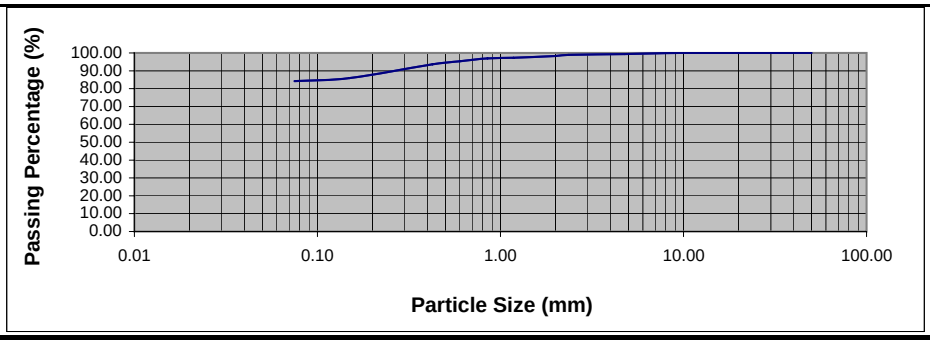
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.62**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	2.80	2.80	0.62	99.38	
2.36 mm	**No. 8**	2.00	4.80	1.06	98.94	
2.00 mm	**No. 10**	2.80	7.60	1.68	98.32	
1.18 mm	**No. 16**	4.60	12.20	2.70	97.30	
850 µm	**No. 20**	1.70	13.90	3.08	96.92	**15.17**
600 µm	**No. 30**	7.30	21.20	4.69	95.31	
425 µm	**No. 40**	7.40	28.60	6.33	93.67	
150 µm	**No. 100**	35.00	63.60	14.08	85.92	
75 µm	**No. 200**	7.70	71.30	15.79	84.21	**84.21**
Pan		380.30	451.60	100.00	0.00	
TOTAL		**451.60**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	24.58%	**18.75%**	**5.83%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.62	15.17	84.21

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	46

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

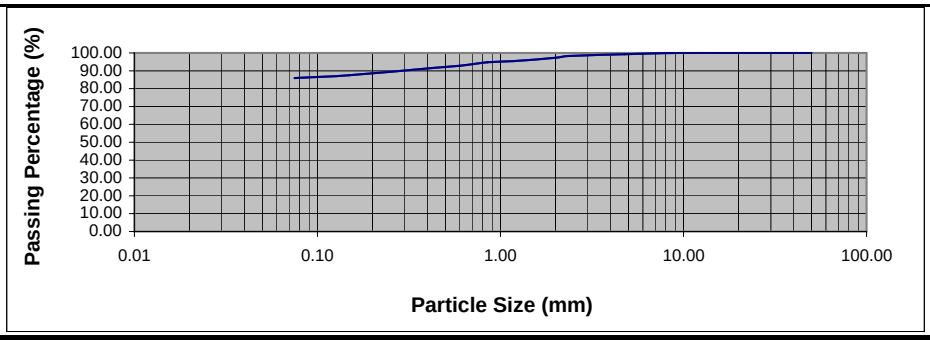
ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A13**			**Sampling Date**	27.03.2010
Weight (gr)	518	**Depth (m)**	3.5	**Testing Date**	7.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.71**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	3.70	3.70	0.71	99.29	
2.36 mm	**No. 8**	5.00	8.70	1.68	98.32	
2.00 mm	**No. 10**	5.30	14.00	2.70	97.30	
1.18 mm	**No. 16**	9.80	23.80	4.59	95.41	
850 µm	**No. 20**	3.10	26.90	5.19	94.81	**13.34**
600 µm	**No. 30**	10.10	37.00	7.14	92.86	
425 µm	**No. 40**	6.70	43.70	8.44	91.56	
150 µm	**No. 100**	20.90	64.60	12.47	87.53	
75 µm	**No. 200**	8.20	72.80	14.05	85.95	**85.95**
Pan		445.20	518.00	100.00	0.00	
TOTAL		**518.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**	
Atteberg Limits	**LL**	**PL**	**PI**
	23.54%	**16.67%**	**6.87%**
Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.71	13.34	85.95

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	47

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A13**			**Sampling Date**	27.03.2010
Weight (gr)	581.4	**Depth (m)**	5.5	**Testing Date**	7.04.2010

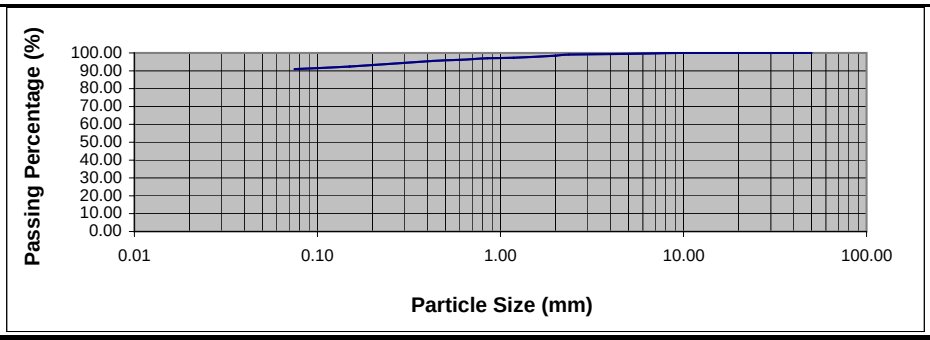
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.57**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	3.30	3.30	0.57	99.43	
2.36 mm	**No. 8**	2.00	5.30	0.91	99.09	
2.00 mm	**No. 10**	3.60	8.90	1.53	98.47	
1.18 mm	**No. 16**	6.60	15.50	2.67	97.33	
850 µm	**No. 20**	1.60	17.10	2.94	97.06	**8.48**
600 µm	**No. 30**	5.20	22.30	3.84	96.16	
425 µm	**No. 40**	3.80	26.10	4.49	95.51	
150 µm	**No. 100**	18.40	44.50	7.65	92.35	
75 µm	**No. 200**	8.10	52.60	9.05	90.95	**90.95**
Pan		528.80	581.40	100.00	0.00	
TOTAL		**581.40**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	19.05%	**13.64%**	**5.41%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.57	8.48	90.95

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	48

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A14**			**Sampling Date**	27.03.2010
Weight (gr)	650	**Depth (m)**	1.5	**Testing Date**	7.04.2010

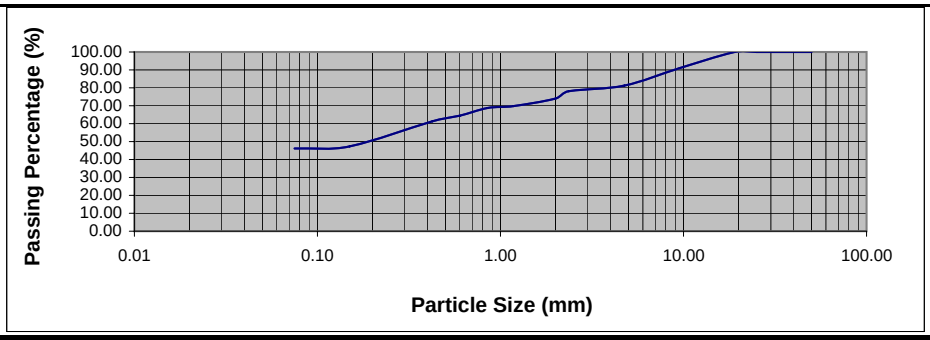
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**18.75**
9.5 mm	**3/8 in**	58.70	58.70	9.03	90.97	
4.75 mm	**No. 4**	63.20	121.90	18.75	81.25	
2.36 mm	**No. 8**	20.00	141.90	21.83	78.17	
2.00 mm	**No. 10**	26.80	168.70	25.95	74.05	
1.18 mm	**No. 16**	27.70	196.40	30.22	69.78	
850 µm	**No. 20**	7.00	203.40	31.29	68.71	**35.09**
600 µm	**No. 30**	27.70	231.10	35.55	64.45	
425 µm	**No. 40**	20.30	251.40	38.68	61.32	
150 µm	**No. 100**	91.00	342.40	52.68	47.32	
75 µm	**No. 200**	7.60	350.00	53.85	46.15	**46.15**
Pan		300.00	650.00	100.00	0.00	
TOTAL		**650.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	18.75	35.09	46.15

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	49

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A14**			**Sampling Date**	27.03.2010
Weight (gr)	464	**Depth (m)**	3.5	**Testing Date**	7.04.2010

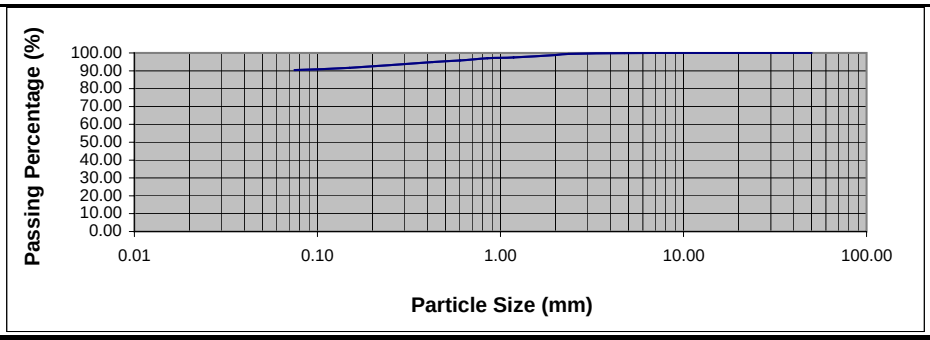
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.11**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.50	0.50	0.11	99.89	
2.36 mm	**No. 8**	2.00	2.50	0.54	99.46	
2.00 mm	**No. 10**	2.70	5.20	1.12	98.88	
1.18 mm	**No. 16**	6.40	11.60	2.50	97.50	
850 µm	**No. 20**	2.00	13.60	2.93	97.07	**9.50**
600 µm	**No. 30**	6.00	19.60	4.22	95.78	
425 µm	**No. 40**	4.00	23.60	5.09	94.91	
150 µm	**No. 100**	15.00	38.60	8.32	91.68	
75 µm	**No. 200**	6.00	44.60	9.61	90.39	**90.39**
Pan		419.40	464.00	100.00	0.00	
TOTAL		**464.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	23.76%	**19.12%**	**4.64%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.11	9.50	90.39

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	50

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A14**			**Sampling Date**	27.03.2010
Weight (gr)	561	**Depth (m)**	6	**Testing Date**	7.04.2010

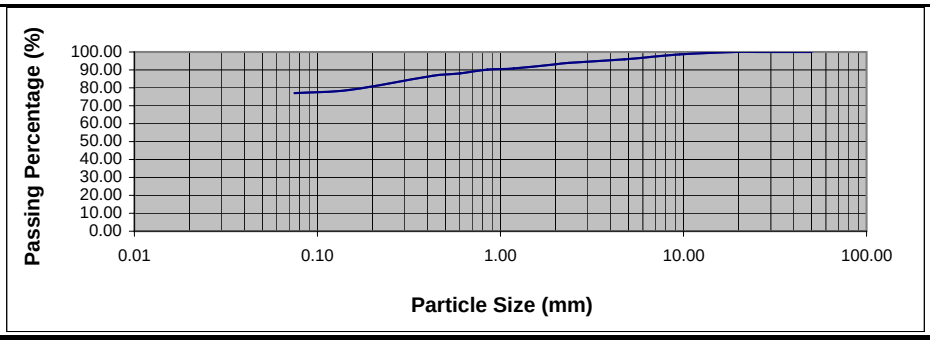
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**4.14**
9.5 mm	**3/8 in**	7.60	7.60	1.35	98.65	
4.75 mm	**No. 4**	15.60	23.20	4.14	95.86	
2.36 mm	**No. 8**	11.00	34.20	6.10	93.90	
2.00 mm	**No. 10**	4.50	38.70	6.90	93.10	
1.18 mm	**No. 16**	13.00	51.70	9.22	90.78	
850 µm	**No. 20**	3.40	55.10	9.82	90.18	**18.82**
600 µm	**No. 30**	12.00	67.10	11.96	88.04	
425 µm	**No. 40**	7.70	74.80	13.33	86.67	
150 µm	**No. 100**	44.00	118.80	21.18	78.82	
75 µm	**No. 200**	10.00	128.80	22.96	77.04	**77.04**
Pan		432.20	561.00	100.00	0.00	
TOTAL		**561.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	23.89%	**19.23%**	**4.66%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	4.14	18.82	77.04

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	51

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A15**			**Sampling Date**	27.03.2010
Weight (gr)	497.3	**Depth (m)**	1.5	**Testing Date**	7.04.2010

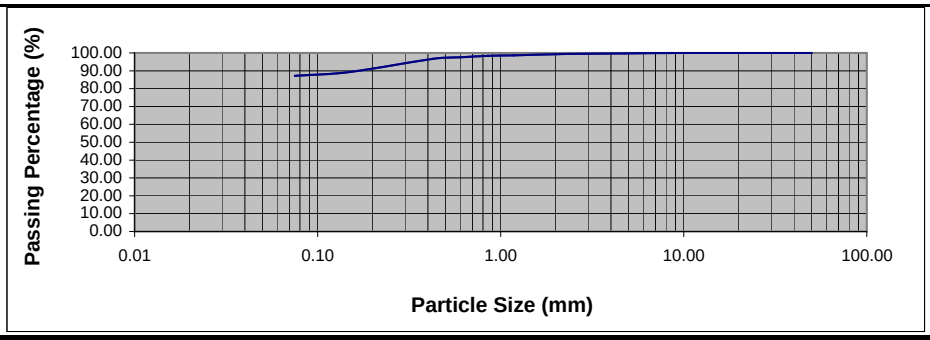
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.26**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	1.30	1.30	0.26	99.74	
2.36 mm	**No. 8**	1.30	2.60	0.52	99.48	
2.00 mm	**No. 10**	1.00	3.60	0.72	99.28	
1.18 mm	**No. 16**	3.00	6.60	1.33	98.67	
850 µm	**No. 20**	1.20	7.80	1.57	98.43	**12.57**
600 µm	**No. 30**	4.40	12.20	2.45	97.55	
425 µm	**No. 40**	4.50	16.70	3.36	96.64	
150 µm	**No. 100**	36.30	53.00	10.66	89.34	
75 µm	**No. 200**	10.80	63.80	12.83	87.17	**87.17**
Pan		433.50	497.30	100.00	0.00	
TOTAL		**497.30**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	25.41%	**21.28%**	**4.13%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.26	12.57	87.17

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	52

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A15**			**Sampling Date**	27.03.2010
Weight (gr)	625.7	**Depth (m)**	3.5	**Testing Date**	7.04.2010

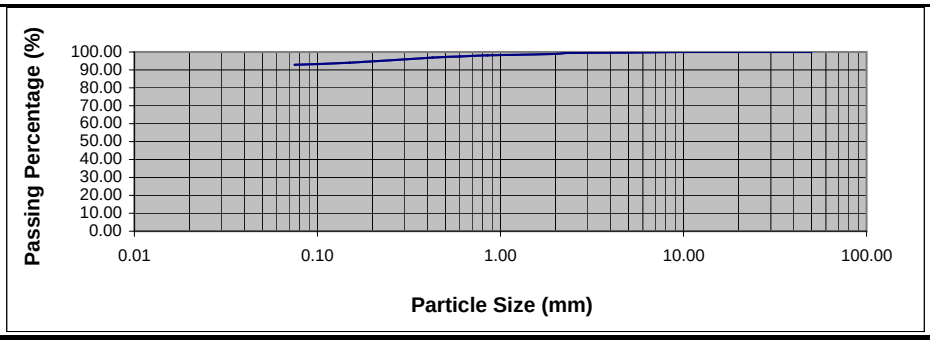
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.40**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	2.50	2.50	0.40	99.60	
2.36 mm	**No. 8**	1.10	3.60	0.58	99.42	
2.00 mm	**No. 10**	3.00	6.60	1.05	98.95	
1.18 mm	**No. 16**	3.70	10.30	1.65	98.35	
850 µm	**No. 20**	1.20	11.50	1.84	98.16	**6.74**
600 µm	**No. 30**	4.40	15.90	2.54	97.46	
425 µm	**No. 40**	3.80	19.70	3.15	96.85	
150 µm	**No. 100**	18.00	37.70	6.03	93.97	
75 µm	**No. 200**	7.00	44.70	7.14	92.86	**92.86**
Pan		581.00	625.70	100.00	0.00	
TOTAL		**625.70**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	22.51%	**17.65%**	**4.86%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.40	6.74	92.86

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	53

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A15**			**Sampling Date**	27.03.2010
Weight (gr)	526	**Depth (m)**	5.5	**Testing Date**	7.04.2010

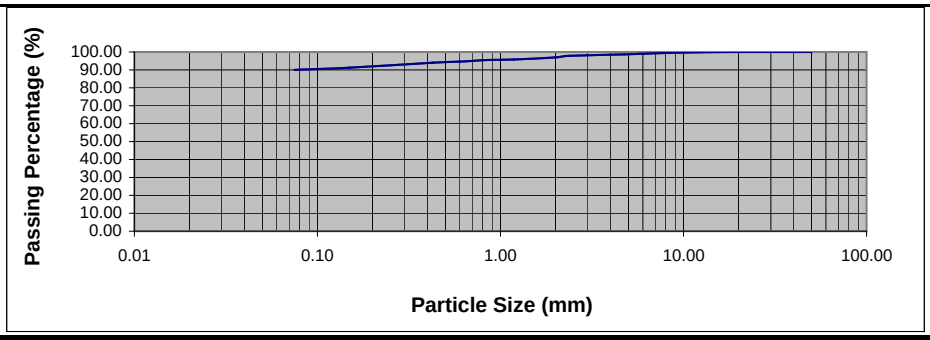
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	0.00	0.00	0.00	100.00	
25.0 mm	1 in	0.00	0.00	0.00	100.00	
19.0 mm	3/4 in	0.00	0.00	0.00	100.00	1.37
9.5 mm	3/8 in	2.00	2.00	0.38	99.62	
4.75 mm	No. 4	5.20	7.20	1.37	98.63	
2.36 mm	No. 8	4.00	11.20	2.13	97.87	
2.00 mm	No. 10	4.70	15.90	3.02	96.98	
1.18 mm	No. 16	6.20	22.10	4.20	95.80	
850 µm	No. 20	1.50	23.60	4.49	95.51	8.63
600 µm	No. 30	4.70	28.30	5.38	94.62	
425 µm	No. 40	3.30	31.60	6.01	93.99	
150 µm	No. 100	14.60	46.20	8.78	91.22	
75 µm	No. 200	6.40	52.60	10.00	90.00	90.00
Pan		473.40	526.00	100.00	0.00	
TOTAL		**526.00**				

SOIL CLASSIFICATION	CL-ML	SILTY CLAY

Atteberg Limits	LL	PL	PI
	23.73%	17.24%	6.49%

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	1.37	8.63	90.00

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	54

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A16**			**Sampling Date**	27.03.2010
Weight (gr)	510	**Depth (m)**	1.5	**Testing Date**	4.04.2010

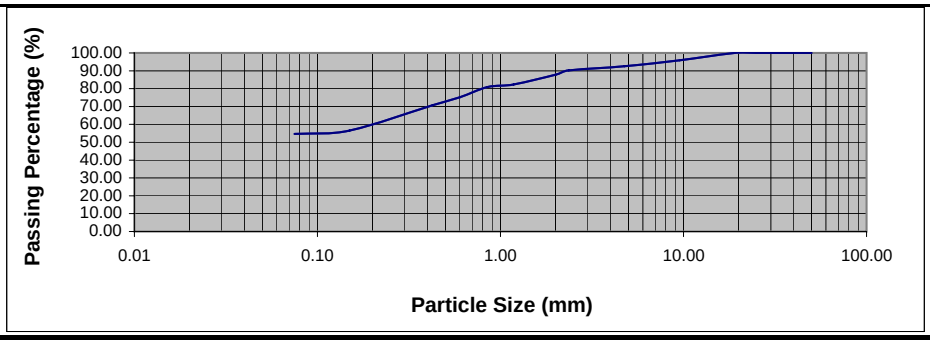
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**7.43**
9.5 mm	**3/8 in**	21.20	21.20	4.16	95.84	
4.75 mm	**No. 4**	16.70	37.90	7.43	92.57	
2.36 mm	**No. 8**	12.00	49.90	9.78	90.22	
2.00 mm	**No. 10**	12.40	62.30	12.22	87.78	
1.18 mm	**No. 16**	27.60	89.90	17.63	82.37	
850 µm	**No. 20**	7.60	97.50	19.12	80.88	**37.90**
600 µm	**No. 30**	29.20	126.70	24.84	75.16	
425 µm	**No. 40**	22.60	149.30	29.27	70.73	
150 µm	**No. 100**	72.50	221.80	43.49	56.51	
75 µm	**No. 200**	9.40	231.20	45.33	54.67	**54.67**
Pan		278.80	510.00	100.00	0.00	
TOTAL		**510.00**				

SOIL CLASSIFICATION	**CL-ML**	**SANDY SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	21.45%	**16.07%**	**5.38%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	7.43	37.90	54.67

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	55

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A16**			**Sampling Date**	27.03.2010
Weight (gr)	579	**Depth (m)**	3.5	**Testing Date**	4.04.2010

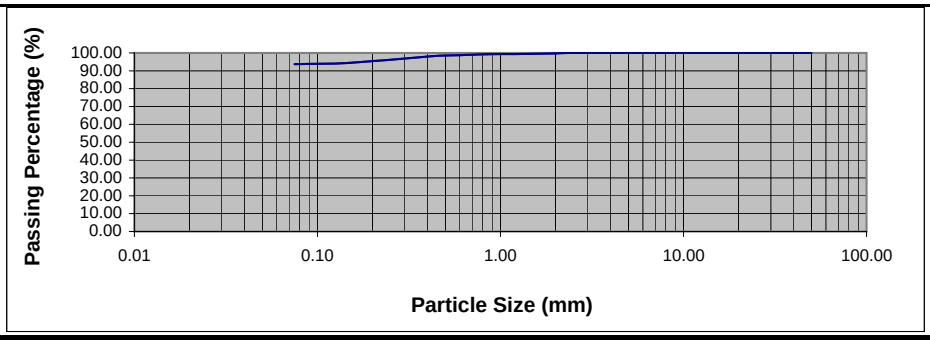
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.00**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.00	0.00	0.00	100.00	
2.36 mm	**No. 8**	0.00	0.00	0.00	100.00	
2.00 mm	**No. 10**	1.30	1.30	0.22	99.78	
1.18 mm	**No. 16**	2.10	3.40	0.59	99.41	
850 µm	**No. 20**	0.80	4.20	0.73	99.27	**6.29**
600 µm	**No. 30**	3.20	7.40	1.28	98.72	
425 µm	**No. 40**	3.00	10.40	1.80	98.20	
150 µm	**No. 100**	21.80	32.20	5.56	94.44	
75 µm	**No. 200**	4.20	36.40	6.29	93.71	**93.71**
Pan		542.60	579.00	100.00	0.00	
TOTAL		**579.00**				

SOIL CLASSIFICATION	**CL**	**LEAN CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	25.55%	**17.65%**	**7.90%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.00	6.29	93.71

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	56

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A16**			**Sampling Date**	27.03.2010
Weight (gr)	515	**Depth (m)**	5.5	**Testing Date**	4.04.2010

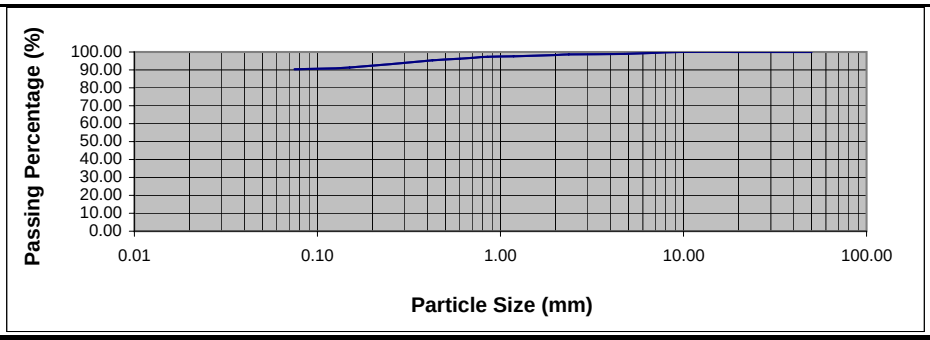
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.11**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	5.70	5.70	1.11	98.89	
2.36 mm	**No. 8**	1.20	6.90	1.34	98.66	
2.00 mm	**No. 10**	2.00	8.90	1.73	98.27	
1.18 mm	**No. 16**	3.50	12.40	2.41	97.59	
850 µm	**No. 20**	1.40	13.80	2.68	97.32	**8.54**
600 µm	**No. 30**	5.60	19.40	3.77	96.23	
425 µm	**No. 40**	4.70	24.10	4.68	95.32	
150 µm	**No. 100**	20.40	44.50	8.64	91.36	
75 µm	**No. 200**	5.20	49.70	9.65	90.35	**90.35**
Pan		465.30	515.00	100.00	0.00	
TOTAL		**515.00**				

SOIL CLASSIFICATION	**CL**	**LEAN CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	26.71%	**19.05%**	**7.66%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.11	8.54	90.35

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	57

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A16**			**Sampling Date**	27.03.2010
Weight (gr)	523	**Depth (m)**	6	**Testing Date**	4.04.2010

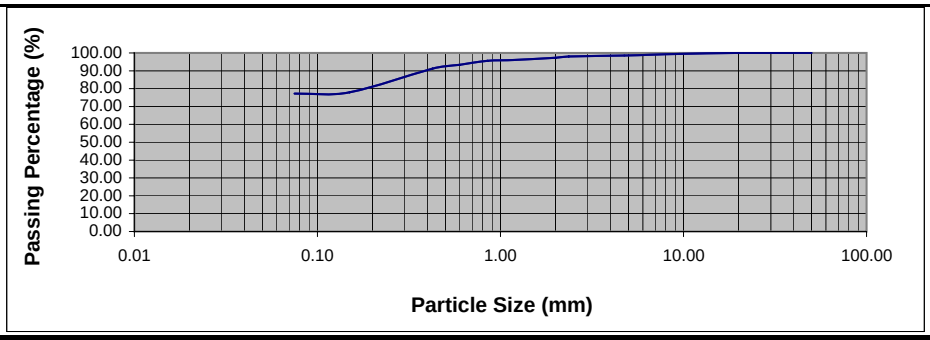
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	**Alternative**	(gr)	Retained (gr)	%	%	%
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.41**
9.5 mm	**3/8 in**	2.60	2.60	0.50	99.50	
4.75 mm	**No. 4**	4.80	7.40	1.41	98.59	
2.36 mm	**No. 8**	3.00	10.40	1.99	98.01	
2.00 mm	**No. 10**	3.50	13.90	2.66	97.34	
1.18 mm	**No. 16**	6.70	20.60	3.94	96.06	
850 µm	**No. 20**	2.50	23.10	4.42	95.58	**21.30**
600 µm	**No. 30**	11.60	34.70	6.63	93.37	
425 µm	**No. 40**	11.30	46.00	8.80	91.20	
150 µm	**No. 100**	69.30	115.30	22.05	77.95	
75 µm	**No. 200**	3.50	118.80	22.72	77.28	**77.28**
Pan		404.20	523.00	100.00	0.00	
TOTAL		**523.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	23.36%	**16.67%**	**6.69%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.41	21.30	77.28

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	58

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A17**			**Sampling Date**	27.03.2010
Weight (gr)	1020	**Depth (m)**	0.7	**Testing Date**	1.04.2010

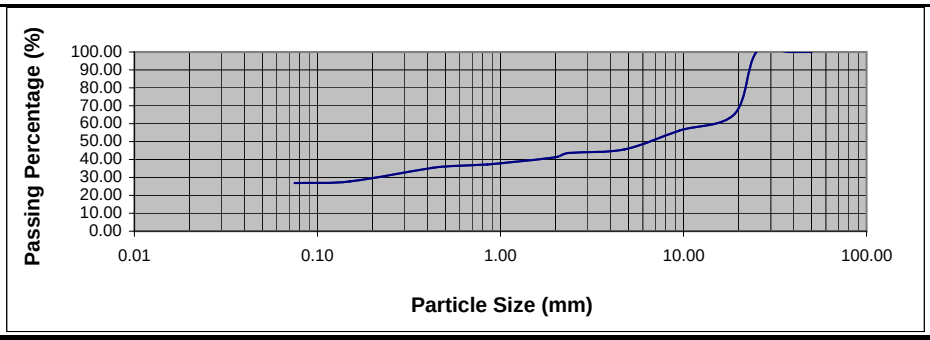
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	0.00	0.00	0.00	100.00	
25.0 mm	1 in	0.00	0.00	0.00	100.00	
19.0 mm	3/4 in	353.00	353.00	34.61	65.39	54.40
9.5 mm	3/8 in	94.30	447.30	43.85	56.15	
4.75 mm	No. 4	107.60	554.90	54.40	45.60	
2.36 mm	No. 8	20.00	574.90	56.36	43.64	
2.00 mm	No. 10	24.40	599.30	58.75	41.25	
1.18 mm	No. 16	26.70	626.00	61.37	38.63	
850 µm	No. 20	14.00	640.00	62.75	37.25	18.73
600 µm	No. 30	7.10	647.10	63.44	36.56	
425 µm	No. 40	12.60	659.70	64.68	35.32	
150 µm	No. 100	77.20	736.90	72.25	27.75	
75 µm	No. 200	9.00	745.90	73.13	26.87	26.87
Pan		274.10	1020.00	100.00	0.00	
TOTAL		**1020.00**				

SOIL CLASSIFICATION	GM	SILTY GRAVEL WITH SAND

Atteberg Limits	LL	PL	PI
	23.38%	20.29%	3.09%

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	54.40	18.73	26.87

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	59

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A17**			**Sampling Date**	27.03.2010
Weight (gr)	502	**Depth (m)**	1.5	**Testing Date**	1.04.2010

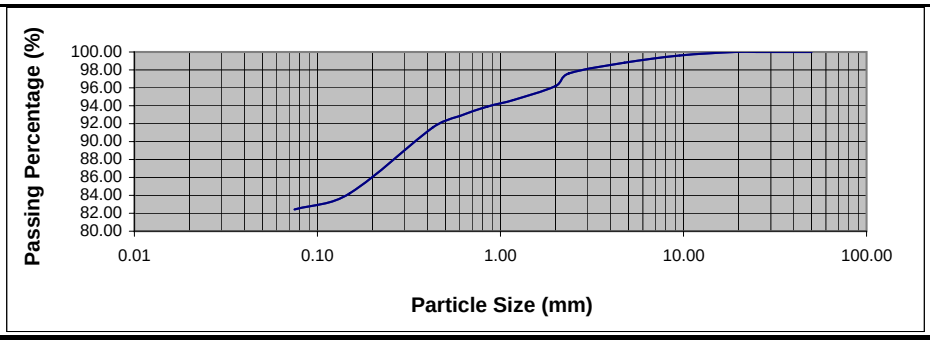
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.20**
9.5 mm	**3/8 in**	2.00	2.00	0.40	99.60	
4.75 mm	**No. 4**	4.00	6.00	1.20	98.80	
2.36 mm	**No. 8**	6.00	12.00	2.39	97.61	
2.00 mm	**No. 10**	7.10	19.10	3.80	96.20	
1.18 mm	**No. 16**	7.80	26.90	5.36	94.64	
850 µm	**No. 20**	3.70	30.60	6.10	93.90	**16.37**
600 µm	**No. 30**	5.30	35.90	7.15	92.85	
425 µm	**No. 40**	6.50	42.40	8.45	91.55	
150 µm	**No. 100**	36.80	79.20	15.78	84.22	
75 µm	**No. 200**	9.00	88.20	17.57	82.43	**82.43**
Pan		413.80	502.00	100.00	0.00	
TOTAL		**502.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	24.88%	**20.75%**	**4.13%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.20	16.37	82.43

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	60

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A17**			**Sampling Date**	27.03.2010
Weight (gr)	456	**Depth (m)**	2.5	**Testing Date**	1.04.2010

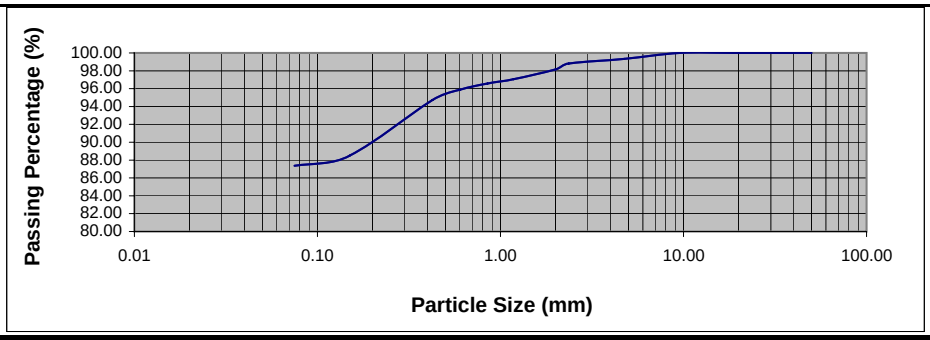
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.66**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	3.00	3.00	0.66	99.34	
2.36 mm	**No. 8**	2.40	5.40	1.18	98.82	
2.00 mm	**No. 10**	3.00	8.40	1.84	98.16	
1.18 mm	**No. 16**	5.00	13.40	2.94	97.06	
850 µm	**No. 20**	2.20	15.60	3.42	96.58	**11.97**
600 µm	**No. 30**	3.20	18.80	4.12	95.88	
425 µm	**No. 40**	5.20	24.00	5.26	94.74	
150 µm	**No. 100**	28.50	52.50	11.51	88.49	
75 µm	**No. 200**	5.10	57.60	12.63	87.37	**87.37**
Pan		398.40	456.00	100.00	0.00	
TOTAL		**456.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	24.15%	**19.00%**	**5.15%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.66	11.97	87.37

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	61

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A17**			**Sampling Date**	27.03.2010
Weight (gr)	485	**Depth (m)**	3.5	**Testing Date**	1.04.2010

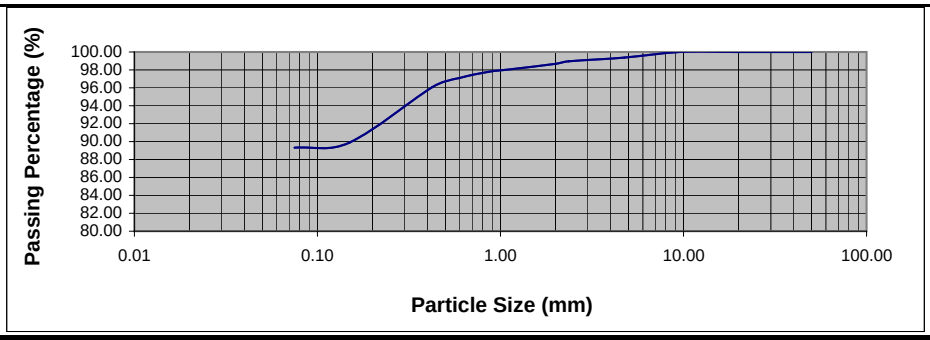
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.62**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	3.00	3.00	0.62	99.38	
2.36 mm	**No. 8**	2.00	5.00	1.03	98.97	
2.00 mm	**No. 10**	1.40	6.40	1.32	98.68	
1.18 mm	**No. 16**	2.80	9.20	1.90	98.10	
850 µm	**No. 20**	1.60	10.80	2.23	97.77	**10.06**
600 µm	**No. 30**	3.20	14.00	2.89	97.11	
425 µm	**No. 40**	5.00	19.00	3.92	96.08	
150 µm	**No. 100**	30.00	49.00	10.10	89.90	
75 µm	**No. 200**	2.80	51.80	10.68	89.32	**89.32**
Pan		433.20	485.00	100.00	0.00	
TOTAL		**485.00**				

SOIL CLASSIFICATION	**ML**	**SILT**

Atteberg Limits	**LL**	**PL**	**PI**
	25.33%	**21.43%**	**3.90%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.62	10.06	89.32

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	62

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

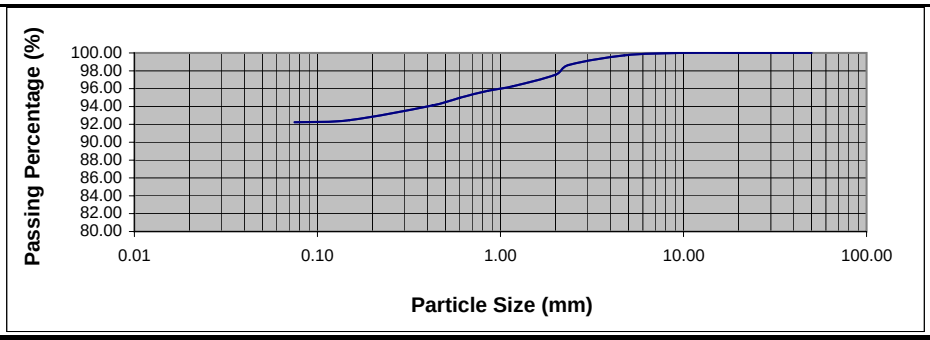
ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A17**			**Sampling Date**	27.03.2010
Weight (gr)	468	**Depth (m)**	4.5	**Testing Date**	1.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.28**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	1.30	1.30	0.28	99.72	
2.36 mm	**No. 8**	5.00	6.30	1.35	98.65	
2.00 mm	**No. 10**	5.10	11.40	2.44	97.56	
1.18 mm	**No. 16**	6.00	17.40	3.72	96.28	
850 µm	**No. 20**	2.50	19.90	4.25	95.75	**7.48**
600 µm	**No. 30**	3.60	23.50	5.02	94.98	
425 µm	**No. 40**	4.00	27.50	5.88	94.12	
150 µm	**No. 100**	7.70	35.20	7.52	92.48	
75 µm	**No. 200**	1.10	36.30	7.76	92.24	**92.24**
Pan		431.70	468.00	100.00	0.00	
TOTAL		**468.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**	
Atteberg Limits	**LL**	**PL**	**PI**
	21.09%	**16.33%**	**4.76%**
Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.28	7.48	92.24

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	63

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A17**			**Sampling Date**	27.03.2010
Weight (gr)	515	**Depth (m)**	5.5	**Testing Date**	1.04.2010

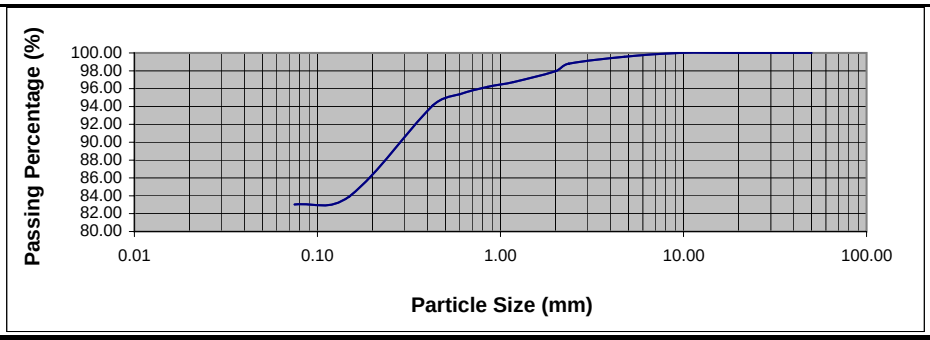
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.43**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	2.20	2.20	0.43	99.57	
2.36 mm	**No. 8**	4.00	6.20	1.20	98.80	
2.00 mm	**No. 10**	4.30	10.50	2.04	97.96	
1.18 mm	**No. 16**	6.30	16.80	3.26	96.74	
850 µm	**No. 20**	2.80	19.60	3.81	96.19	**16.54**
600 µm	**No. 30**	4.20	23.80	4.62	95.38	
425 µm	**No. 40**	6.70	30.50	5.92	94.08	
150 µm	**No. 100**	52.20	82.70	16.06	83.94	
75 µm	**No. 200**	4.70	87.40	16.97	83.03	**83.03**
Pan		427.60	515.00	100.00	0.00	
TOTAL		**515.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	21.28%	**15.79%**	**5.49%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.43	16.54	83.03

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	64

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A18**			**Sampling Date**	27.03.2010
Weight (gr)	511	**Depth (m)**	2.5	**Testing Date**	1.04.2010

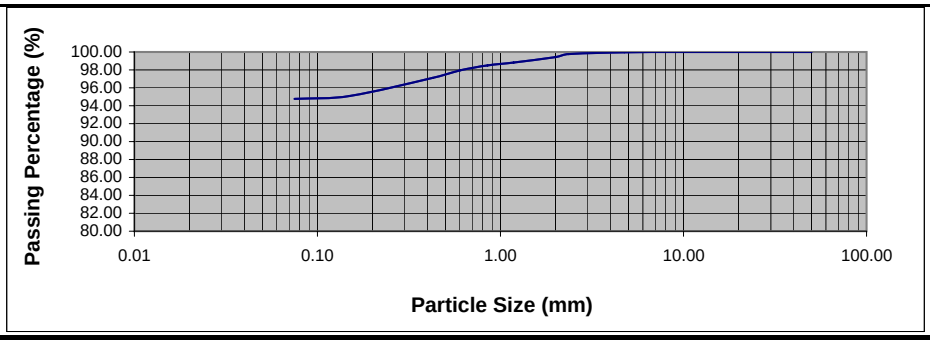
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.04**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.20	0.20	0.04	99.96	
2.36 mm	**No. 8**	1.00	1.20	0.23	99.77	
2.00 mm	**No. 10**	1.70	2.90	0.57	99.43	
1.18 mm	**No. 16**	3.10	6.00	1.17	98.83	
850 µm	**No. 20**	1.70	7.70	1.51	98.49	**5.19**
600 µm	**No. 30**	2.80	10.50	2.05	97.95	
425 µm	**No. 40**	4.30	14.80	2.90	97.10	
150 µm	**No. 100**	10.30	25.10	4.91	95.09	
75 µm	**No. 200**	1.60	26.70	5.23	94.77	**94.77**
Pan		484.30	511.00	100.00	0.00	
TOTAL		**511.00**				

SOIL CLASSIFICATION	**CL**	**LEAN CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	26.21%	**18.00%**	**8.21%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.04	5.19	94.77

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	65

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A18**			**Sampling Date**	27.03.2010
Weight (gr)	433	**Depth (m)**	3.5	**Testing Date**	1.04.2010

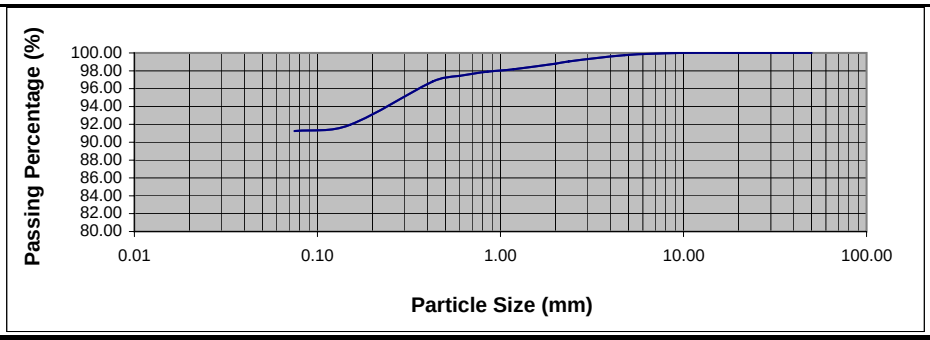
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.25**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	1.10	1.10	0.25	99.75	
2.36 mm	**No. 8**	3.00	4.10	0.95	99.05	
2.00 mm	**No. 10**	1.10	5.20	1.20	98.80	
1.18 mm	**No. 16**	2.70	7.90	1.82	98.18	
850 µm	**No. 20**	1.20	9.10	2.10	97.90	**8.50**
600 µm	**No. 30**	2.00	11.10	2.56	97.44	
425 µm	**No. 40**	2.80	13.90	3.21	96.79	
150 µm	**No. 100**	21.00	34.90	8.06	91.94	
75 µm	**No. 200**	3.00	37.90	8.75	91.25	**91.25**
Pan		395.10	433.00	100.00	0.00	
TOTAL		**433.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	25.62%	**20.51%**	**5.11%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.25	8.50	91.25

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	66

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A18**			**Sampling Date**	27.03.2010
Weight (gr)	480	**Depth (m)**	4.5	**Testing Date**	1.04.2010

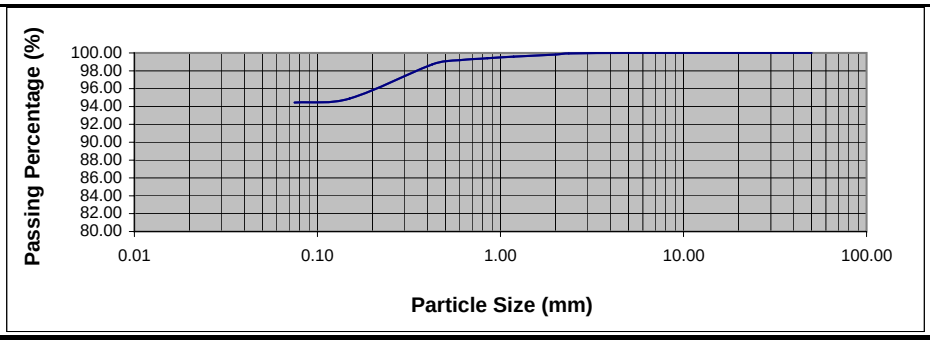
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.00**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.00	0.00	0.00	100.00	
2.36 mm	**No. 8**	0.30	0.30	0.06	99.94	
2.00 mm	**No. 10**	0.60	0.90	0.19	99.81	
1.18 mm	**No. 16**	1.10	2.00	0.42	99.58	
850 µm	**No. 20**	0.80	2.80	0.58	99.42	**5.56**
600 µm	**No. 30**	1.10	3.90	0.81	99.19	
425 µm	**No. 40**	2.20	6.10	1.27	98.73	
150 µm	**No. 100**	18.40	24.50	5.10	94.90	
75 µm	**No. 200**	2.20	26.70	5.56	94.44	**94.44**
Pan		453.30	480.00	100.00	0.00	
TOTAL		**480.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	24.30%	**18.97%**	**5.33%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.00	5.56	94.44

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	67

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A18**			**Sampling Date**	27.03.2010
Weight (gr)	448	**Depth (m)**	5.5	**Testing Date**	1.04.2010

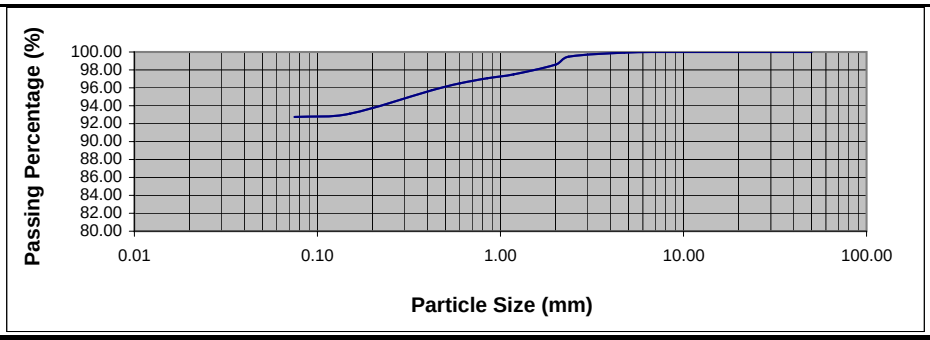
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.07**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.30	0.30	0.07	99.93	
2.36 mm	**No. 8**	2.00	2.30	0.51	99.49	
2.00 mm	**No. 10**	4.00	6.30	1.41	98.59	
1.18 mm	**No. 16**	4.90	11.20	2.50	97.50	
850 µm	**No. 20**	1.90	13.10	2.92	97.08	**7.19**
600 µm	**No. 30**	2.60	15.70	3.50	96.50	
425 µm	**No. 40**	3.30	19.00	4.24	95.76	
150 µm	**No. 100**	11.90	30.90	6.90	93.10	
75 µm	**No. 200**	1.60	32.50	7.25	92.75	**92.75**
Pan		415.50	448.00	100.00	0.00	
TOTAL		**448.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	24.96%	**19.05%**	**5.91%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.07	7.19	92.75

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	68

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

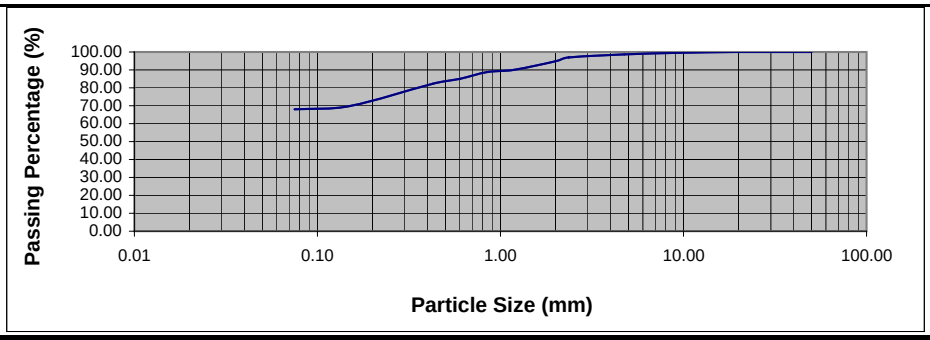
Location	**BH # A19**			**Sampling Date**	27.03.2010
Weight (gr)	910	**Depth (m)**	2	**Testing Date**	4.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.32**
9.5 mm	**3/8 in**	3.80	3.80	0.42	99.58	
4.75 mm	**No. 4**	8.20	12.00	1.32	98.68	
2.36 mm	**No. 8**	16.00	28.00	3.08	96.92	
2.00 mm	**No. 10**	18.80	46.80	5.14	94.86	
1.18 mm	**No. 16**	43.80	90.60	9.96	90.04	
850 µm	**No. 20**	11.20	101.80	11.19	88.81	**30.68**
600 µm	**No. 30**	35.00	136.80	15.03	84.97	
425 µm	**No. 40**	25.00	161.80	17.78	82.22	
150 µm	**No. 100**	112.60	274.40	30.15	69.85	
75 µm	**No. 200**	16.80	291.20	32.00	68.00	**68.00**
Pan		618.80	910.00	100.00	0.00	
TOTAL		**910.00**				

SOIL CLASSIFICATION	**ML**	**SANDY SILT**	
Atteberg Limits	**LL**	**PL**	**PI**
	22.75%	**18.87%**	**3.88%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.32	30.68	68.00

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	69

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A19**			**Sampling Date**	27.03.2010
Weight (gr)	579	**Depth (m)**	3.5	**Testing Date**	4.04.2010

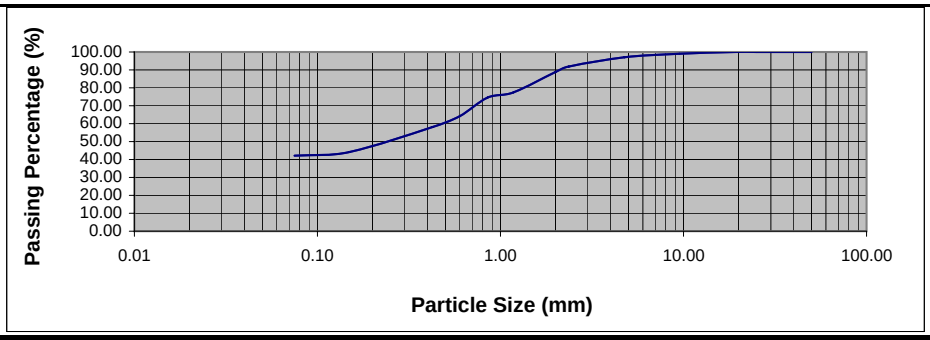
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.99**
9.5 mm	**3/8 in**	5.80	5.80	1.00	99.00	
4.75 mm	**No. 4**	11.50	17.30	2.99	97.01	
2.36 mm	**No. 8**	30.00	47.30	8.17	91.83	
2.00 mm	**No. 10**	17.40	64.70	11.17	88.83	
1.18 mm	**No. 16**	65.80	130.50	22.54	77.46	
850 µm	**No. 20**	16.60	147.10	25.41	74.59	**54.91**
600 µm	**No. 30**	60.30	207.40	35.82	64.18	
425 µm	**No. 40**	35.00	242.40	41.87	58.13	
150 µm	**No. 100**	80.50	322.90	55.77	44.23	
75 µm	**No. 200**	12.30	335.20	57.89	42.11	**42.11**
Pan		243.80	579.00	100.00	0.00	
TOTAL		**579.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.99	54.91	42.11

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	70

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A19**			**Sampling Date**	27.03.2010
Weight (gr)	1164	**Depth (m)**	5.5	**Testing Date**	4.04.2010

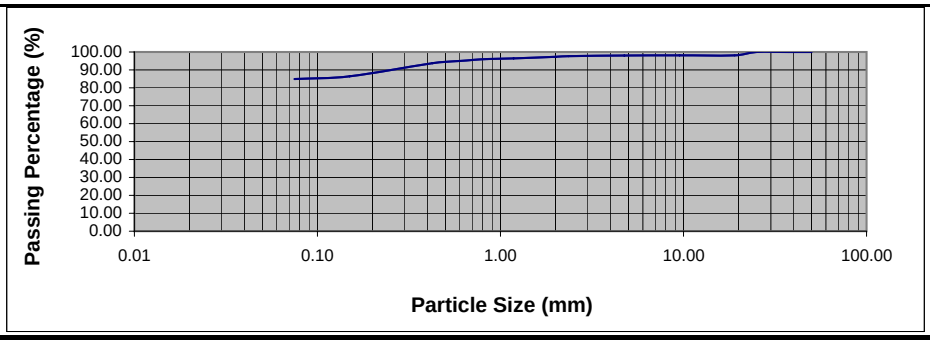
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	21.40	21.40	1.84	98.16	**1.99**
9.5 mm	**3/8 in**	0.00	21.40	1.84	98.16	
4.75 mm	**No. 4**	1.80	23.20	1.99	98.01	
2.36 mm	**No. 8**	4.00	27.20	2.34	97.66	
2.00 mm	**No. 10**	4.40	31.60	2.71	97.29	
1.18 mm	**No. 16**	10.20	41.80	3.59	96.41	
850 µm	**No. 20**	3.60	45.40	3.90	96.10	**13.06**
600 µm	**No. 30**	13.00	58.40	5.02	94.98	
425 µm	**No. 40**	14.60	73.00	6.27	93.73	
150 µm	**No. 100**	85.20	158.20	13.59	86.41	
75 µm	**No. 200**	17.00	175.20	15.05	84.95	**84.95**
Pan		988.80	1164.00	100.00	0.00	
TOTAL		**1164.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	23.50%	**19.15%**	**4.35%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.99	13.06	84.95

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	71

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A20**			**Sampling Date**	27.03.2010
Weight (gr)	450	**Depth (m)**	1	**Testing Date**	4.04.2010

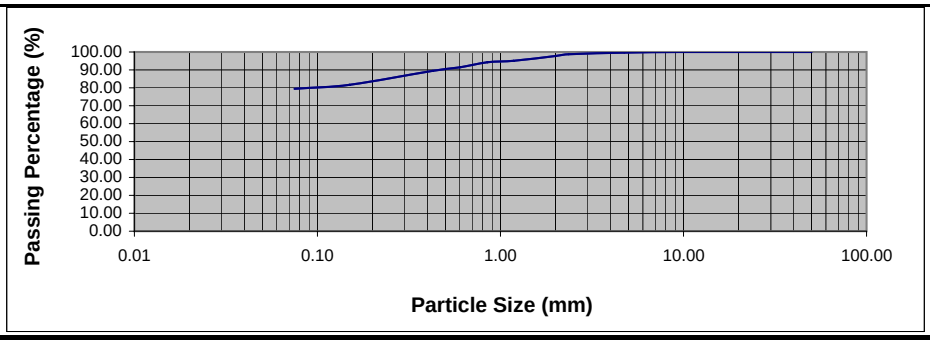
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.36**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	1.60	1.60	0.36	99.64	
2.36 mm	**No. 8**	4.00	5.60	1.24	98.76	
2.00 mm	**No. 10**	4.30	9.90	2.20	97.80	
1.18 mm	**No. 16**	12.20	22.10	4.91	95.09	
850 µm	**No. 20**	3.70	25.80	5.73	94.27	**20.16**
600 µm	**No. 30**	12.70	38.50	8.56	91.44	
425 µm	**No. 40**	9.10	47.60	10.58	89.42	
150 µm	**No. 100**	34.60	82.20	18.27	81.73	
75 µm	**No. 200**	10.10	92.30	20.51	79.49	**79.49**
Pan		357.70	450.00	100.00	0.00	
TOTAL		**450.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	24.38%	**18.37%**	**6.01%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.36	20.16	79.49

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	72

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A20**			**Sampling Date**	27.03.2010
Weight (gr)	1236	**Depth (m)**	2.5	**Testing Date**	4.04.2010

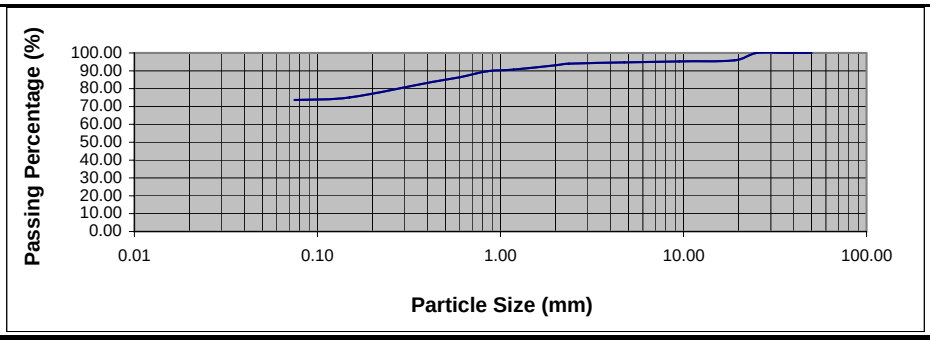
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	51.40	51.40	4.16	95.84	**5.32**
9.5 mm	**3/8 in**	7.80	59.20	4.79	95.21	
4.75 mm	**No. 4**	6.60	65.80	5.32	94.68	
2.36 mm	**No. 8**	8.00	73.80	5.97	94.03	
2.00 mm	**No. 10**	11.40	85.20	6.89	93.11	
1.18 mm	**No. 16**	30.00	115.20	9.32	90.68	
850 µm	**No. 20**	11.20	126.40	10.23	89.77	**21.04**
600 µm	**No. 30**	41.60	168.00	13.59	86.41	
425 µm	**No. 40**	32.00	200.00	16.18	83.82	
150 µm	**No. 100**	108.40	308.40	24.95	75.05	
75 µm	**No. 200**	17.40	325.80	26.36	73.64	**73.64**
Pan		910.20	1236.00	100.00	0.00	
TOTAL		**1236.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	23.63%	**18.00%**	**5.63%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	5.32	21.04	73.64

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	73

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

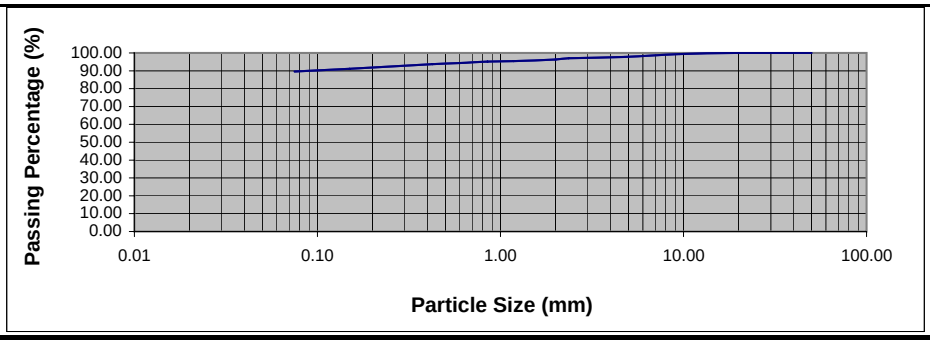
ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A20**			**Sampling Date**	27.03.2010
Weight (gr)	842	**Depth (m)**	4	**Testing Date**	4.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.23**
9.5 mm	**3/8 in**	5.00	5.00	0.59	99.41	
4.75 mm	**No. 4**	13.80	18.80	2.23	97.77	
2.36 mm	**No. 8**	6.00	24.80	2.95	97.05	
2.00 mm	**No. 10**	6.20	31.00	3.68	96.32	
1.18 mm	**No. 16**	7.40	38.40	4.56	95.44	
850 µm	**No. 20**	2.20	40.60	4.82	95.18	**8.15**
600 µm	**No. 30**	6.60	47.20	5.61	94.39	
425 µm	**No. 40**	5.40	52.60	6.25	93.75	
150 µm	**No. 100**	21.80	74.40	8.84	91.16	
75 µm	**No. 200**	13.00	87.40	10.38	89.62	**89.62**
Pan		754.60	842.00	100.00	0.00	
TOTAL		**842.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**	
Atteberg Limits	**LL**	**PL**	**PI**
	29.72%	**23.21%**	**6.51%**
Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.23	8.15	89.62

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	74

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

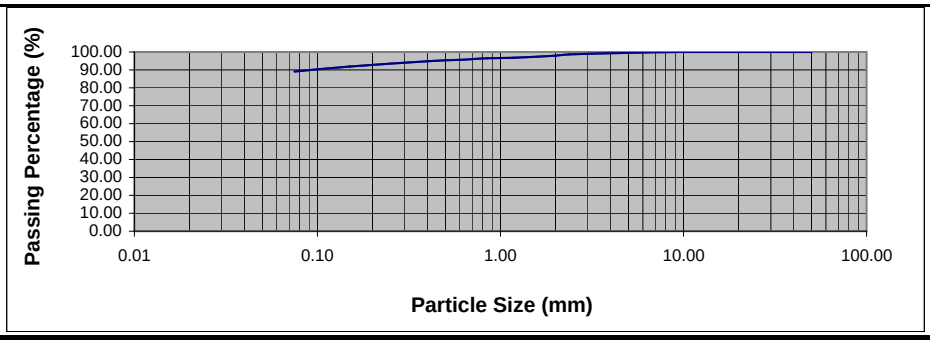
ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A20**			**Sampling Date**	27.03.2010
Weight (gr)	400	**Depth (m)**	5	**Testing Date**	4.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.55**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	2.20	2.20	0.55	99.45	
2.36 mm	**No. 8**	3.00	5.20	1.30	98.70	
2.00 mm	**No. 10**	3.00	8.20	2.05	97.95	
1.18 mm	**No. 16**	4.50	12.70	3.18	96.83	
850 µm	**No. 20**	1.20	13.90	3.48	96.53	**10.30**
600 µm	**No. 30**	3.50	17.40	4.35	95.65	
425 µm	**No. 40**	2.60	20.00	5.00	95.00	
150 µm	**No. 100**	12.40	32.40	8.10	91.90	
75 µm	**No. 200**	11.00	43.40	10.85	89.15	**89.15**
Pan		356.60	400.00	100.00	0.00	
TOTAL		**400.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**	
Atteberg Limits	**LL**	**PL**	**PI**
	23.46%	**19.30%**	**4.16%**
Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.55	10.30	89.15

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	75

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A20**			**Sampling Date**	27.03.2010
Weight (gr)	400	**Depth (m)**	6	**Testing Date**	4.04.2010

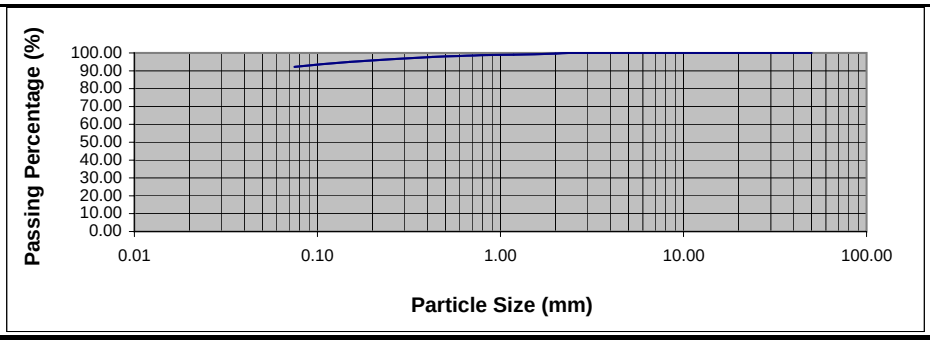
Sieve Size		**Mass Retained**	**Cumulative**			**Specification**
			Mass	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	%
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.00**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.00	0.00	0.00	100.00	
2.36 mm	**No. 8**	0.00	0.00	0.00	100.00	
2.00 mm	**No. 10**	1.60	1.60	0.40	99.60	
1.18 mm	**No. 16**	2.20	3.80	0.95	99.05	
850 µm	**No. 20**	0.80	4.60	1.15	98.85	**7.78**
600 µm	**No. 30**	2.30	6.90	1.73	98.28	
425 µm	**No. 40**	2.00	8.90	2.23	97.78	
150 µm	**No. 100**	11.00	19.90	4.98	95.03	
75 µm	**No. 200**	11.20	31.10	7.78	92.23	**92.23**
Pan		368.90	400.00	100.00	0.00	
TOTAL		**400.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	30.65%	**24.32%**	**6.33%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.00	7.78	92.23

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	76

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A21**			**Sampling Date**	27.03.2010
Weight (gr)	500	**Depth (m)**	1.5	**Testing Date**	4.04.2010

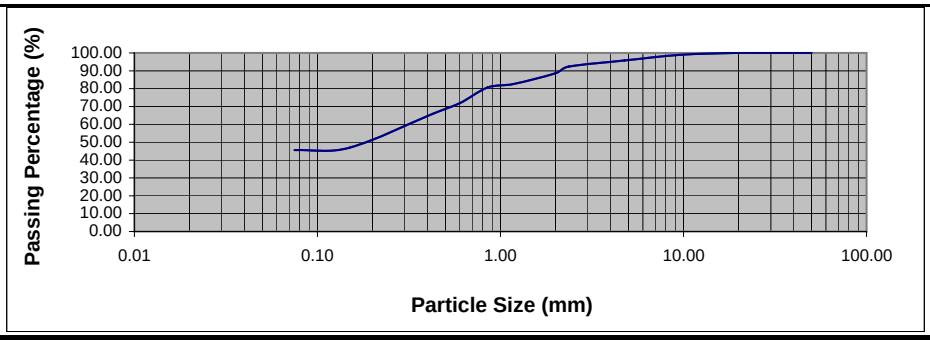
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**4.22**
9.5 mm	**3/8 in**	5.40	5.40	1.08	98.92	
4.75 mm	**No. 4**	15.70	21.10	4.22	95.78	
2.36 mm	**No. 8**	17.00	38.10	7.62	92.38	
2.00 mm	**No. 10**	19.00	57.10	11.42	88.58	
1.18 mm	**No. 16**	29.90	87.00	17.40	82.60	
850 µm	**No. 20**	9.90	96.90	19.38	80.62	**50.16**
600 µm	**No. 30**	44.00	140.90	28.18	71.82	
425 µm	**No. 40**	29.60	170.50	34.10	65.90	
150 µm	**No. 100**	94.60	265.10	53.02	46.98	
75 µm	**No. 200**	6.80	271.90	54.38	45.62	**45.62**
Pan		228.10	500.00	100.00	0.00	
TOTAL		**500.00**				

SOIL CLASSIFICATION	**SC-SM**	**SILTY, CLAYEY SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	18.61%	**13.73%**	**4.88%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	4.22	50.16	45.62

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	77

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A21**			**Sampling Date**	27.03.2010
Weight (gr)	480	**Depth (m)**	4	**Testing Date**	4.04.2010

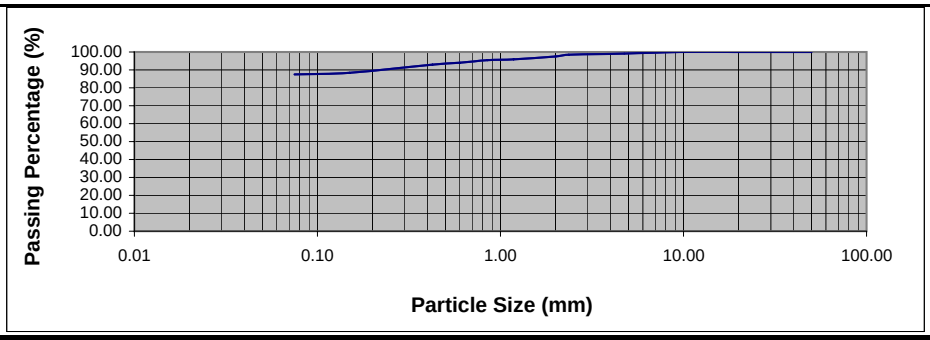
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.88**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	4.20	4.20	0.88	99.13	
2.36 mm	**No. 8**	3.00	7.20	1.50	98.50	
2.00 mm	**No. 10**	4.80	12.00	2.50	97.50	
1.18 mm	**No. 16**	7.70	19.70	4.10	95.90	
850 µm	**No. 20**	2.20	21.90	4.56	95.44	**11.67**
600 µm	**No. 30**	7.00	28.90	6.02	93.98	
425 µm	**No. 40**	5.10	34.00	7.08	92.92	
150 µm	**No. 100**	21.50	55.50	11.56	88.44	
75 µm	**No. 200**	4.70	60.20	12.54	87.46	**87.46**
Pan		419.80	480.00	100.00	0.00	
TOTAL		**480.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	26.33%	**20.00%**	**6.33%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.88	11.67	87.46

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	78

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A21**			**Sampling Date**	27.03.2010
Weight (gr)	529	**Depth (m)**	6	**Testing Date**	4.04.2010

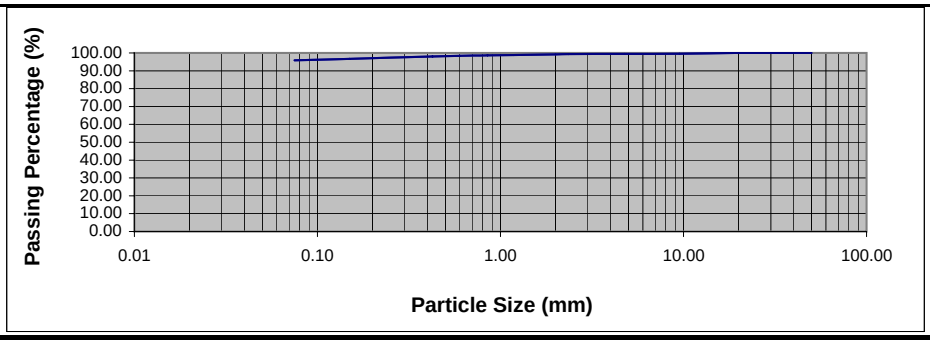
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.51**
9.5 mm	**3/8 in**	2.60	2.60	0.49	99.51	
4.75 mm	**No. 4**	0.10	2.70	0.51	99.49	
2.36 mm	**No. 8**	0.70	3.40	0.64	99.36	
2.00 mm	**No. 10**	0.90	4.30	0.81	99.19	
1.18 mm	**No. 16**	1.90	6.20	1.17	98.83	
850 µm	**No. 20**	0.70	6.90	1.30	98.70	**3.65**
600 µm	**No. 30**	1.80	8.70	1.64	98.36	
425 µm	**No. 40**	1.60	10.30	1.95	98.05	
150 µm	**No. 100**	7.10	17.40	3.29	96.71	
75 µm	**No. 200**	4.60	22.00	4.16	95.84	**95.84**
Pan		507.00	529.00	100.00	0.00	
TOTAL		**529.00**				

SOIL CLASSIFICATION	**CL**	**LEAN CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	28.15%	**18.18%**	**9.97%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.51	3.65	95.84

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	79

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A22**			**Sampling Date**	27.03.2010
Weight (gr)	524	**Depth (m)**	1	**Testing Date**	7.04.2010

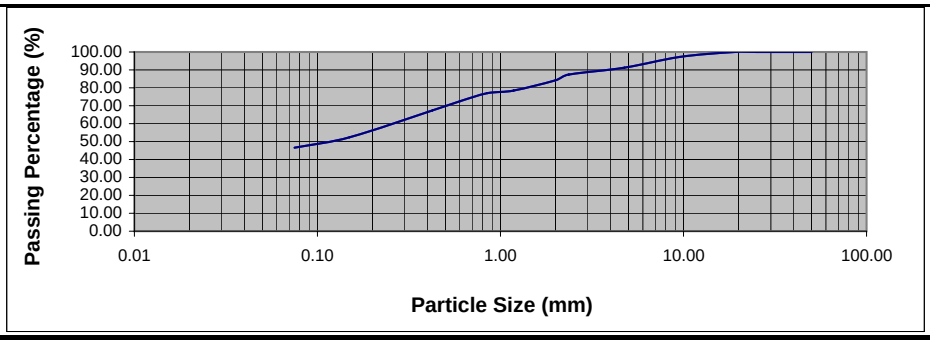
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**8.78**
9.5 mm	**3/8 in**	14.70	14.70	2.81	97.19	
4.75 mm	**No. 4**	31.30	46.00	8.78	91.22	
2.36 mm	**No. 8**	20.00	66.00	12.60	87.40	
2.00 mm	**No. 10**	16.70	82.70	15.78	84.22	
1.18 mm	**No. 16**	30.10	112.80	21.53	78.47	
850 µm	**No. 20**	7.30	120.10	22.92	77.08	**44.62**
600 µm	**No. 30**	24.20	144.30	27.54	72.46	
425 µm	**No. 40**	26.70	171.00	32.63	67.37	
150 µm	**No. 100**	78.20	249.20	47.56	52.44	
75 µm	**No. 200**	30.60	279.80	53.40	46.60	**46.60**
Pan		244.20	524.00	100.00	0.00	
TOTAL		**524.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	8.78	44.62	46.60

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	80

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A22**			**Sampling Date**	27.03.2010
Weight (gr)	505	**Depth (m)**	3.5	**Testing Date**	7.04.2010

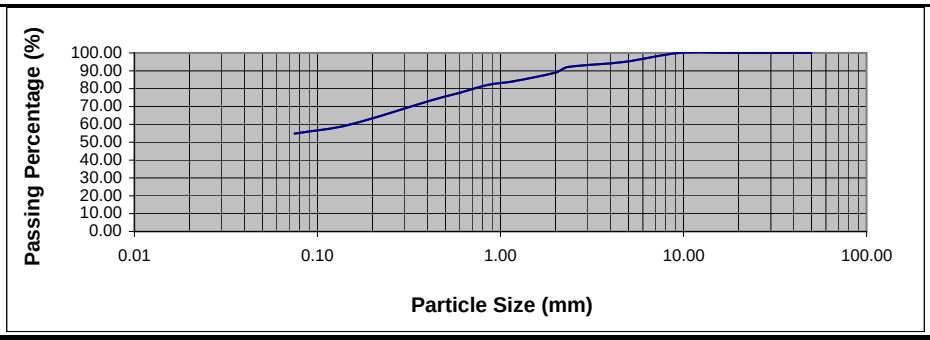
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**5.01**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	25.30	25.30	5.01	94.99	
2.36 mm	**No. 8**	14.00	39.30	7.78	92.22	
2.00 mm	**No. 10**	16.50	55.80	11.05	88.95	
1.18 mm	**No. 16**	24.20	80.00	15.84	84.16	
850 µm	**No. 20**	10.50	90.50	17.92	82.08	**40.18**
600 µm	**No. 30**	22.10	112.60	22.30	77.70	
425 µm	**No. 40**	20.60	133.20	26.38	73.62	
150 µm	**No. 100**	69.70	202.90	40.18	59.82	
75 µm	**No. 200**	25.30	228.20	45.19	54.81	**54.81**
Pan		276.80	505.00	100.00	0.00	
TOTAL		**505.00**				

SOIL CLASSIFICATION	**ML**	**SANDY SILT**

Atteberg Limits	**LL**	**PL**	**PI**
	25.42%	**21.62%**	**3.80%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	5.01	40.18	54.81

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	81

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

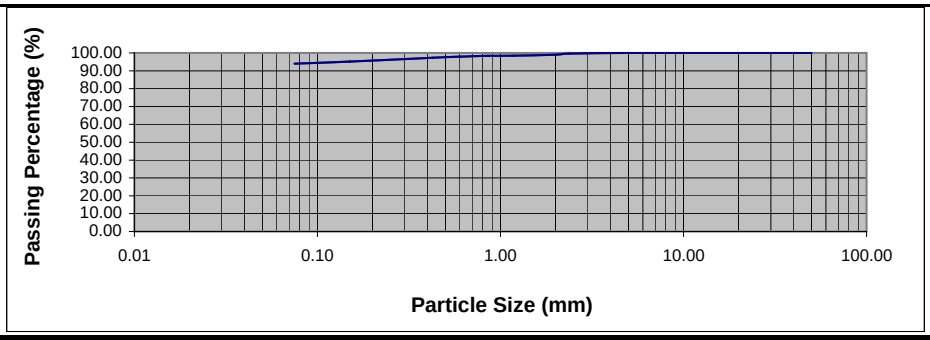
Location	**BH # A22**			**Sampling Date**	27.03.2010
Weight (gr)	635	**Depth (m)**	5.5	**Testing Date**	7.04.2010

Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	0.00	0.00	0.00	100.00	
25.0 mm	1 in	0.00	0.00	0.00	100.00	
19.0 mm	3/4 in	0.00	0.00	0.00	100.00	0.00
9.5 mm	3/8 in	0.00	0.00	0.00	100.00	
4.75 mm	No. 4	0.00	0.00	0.00	100.00	
2.36 mm	No. 8	2.00	2.00	0.31	99.69	
2.00 mm	No. 10	4.10	6.10	0.96	99.04	
1.18 mm	No. 16	3.40	9.50	1.50	98.50	
850 µm	No. 20	1.00	10.50	1.65	98.35	6.05
600 µm	No. 30	2.60	13.10	2.06	97.94	
425 µm	No. 40	3.70	16.80	2.65	97.35	
150 µm	No. 100	14.20	31.00	4.88	95.12	
75 µm	No. 200	7.40	38.40	6.05	93.95	93.95
Pan		596.60	635.00	100.00	0.00	
TOTAL		**635.00**				

SOIL CLASSIFICATION	CL-ML	SILTY CLAY	
Atteberg Limits	**LL**	**PL**	**PI**
	22.98%	**17.02%**	**5.96%**

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	0.00	6.05	93.95

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	82

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	5677	**Depth (m)**	1	**Testing Date**	12.04.2010

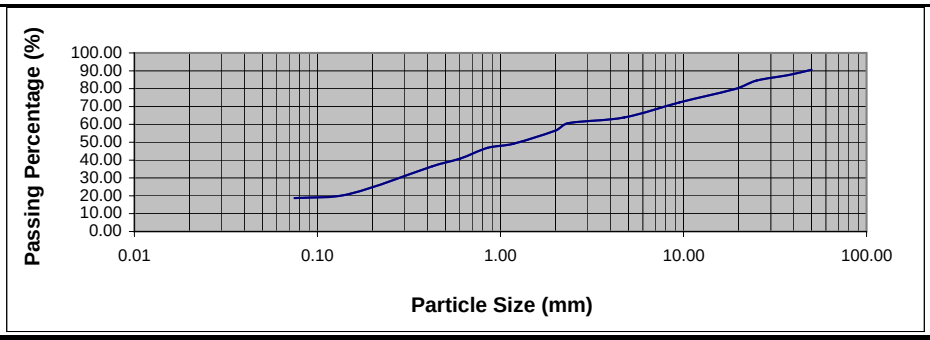
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	532.00	532.00	9.37	90.63	
37.5 mm	**1.5 in**	171.50	703.50	12.39	87.61	
25.0 mm	**1 in**	178.50	882.00	15.54	84.46	
19.0 mm	**3/4 in**	269.50	1151.50	20.28	79.72	**36.13**
9.5 mm	**3/8 in**	420.00	1571.50	27.68	72.32	
4.75 mm	**No. 4**	479.50	2051.00	36.13	63.87	
2.36 mm	**No. 8**	175.00	2226.00	39.21	60.79	
2.00 mm	**No. 10**	241.50	2467.50	43.46	56.54	
1.18 mm	**No. 16**	416.50	2884.00	50.80	49.20	
850 µm	**No. 20**	133.00	3017.00	53.14	46.86	**45.13**
600 µm	**No. 30**	346.50	3363.50	59.25	40.75	
425 µm	**No. 40**	238.00	3601.50	63.44	36.56	
150 µm	**No. 100**	882.00	4483.50	78.98	21.02	
75 µm	**No. 200**	129.50	4613.00	81.26	18.74	**18.74**
Pan		1064.00	5677.00	100.00	0.00	
TOTAL		**5677.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

LL	**PL**	**PI**
Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	36.13	45.13	18.74

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	83

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	5355	**Depth (m)**	2	**Testing Date**	12.04.2010

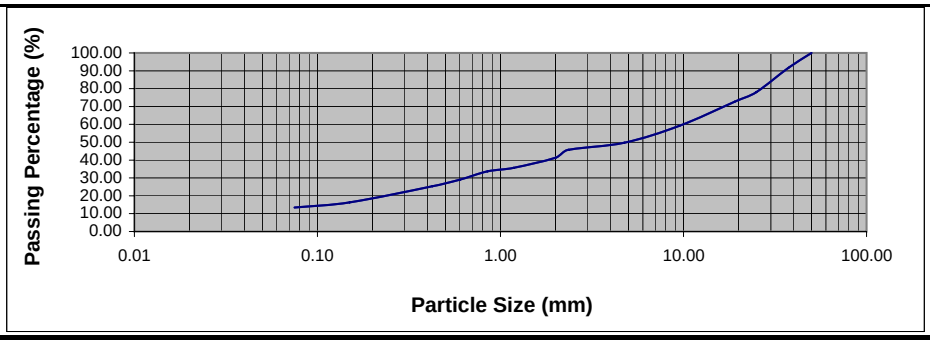
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	441.00	441.00	8.24	91.76	
25.0 mm	1 in	734.00	1175.00	21.94	78.06	
19.0 mm	3/4 in	290.50	1465.50	27.37	72.63	50.31
9.5 mm	3/8 in	717.50	2183.00	40.77	59.23	
4.75 mm	No. 4	511.00	2694.00	50.31	49.69	
2.36 mm	No. 8	210.00	2904.00	54.23	45.77	
2.00 mm	No. 10	238.00	3142.00	58.67	41.33	
1.18 mm	No. 16	301.00	3443.00	64.30	35.70	
850 µm	No. 20	108.50	3551.50	66.32	33.68	36.21
600 µm	No. 30	248.50	3800.00	70.96	29.04	
425 µm	No. 40	196.00	3996.00	74.62	25.38	
150 µm	No. 100	486.50	4482.50	83.71	16.29	
75 µm	No. 200	150.50	4633.00	86.52	13.48	13.48
Pan		722.00	5355.00	100.00	0.00	
TOTAL		**5355.00**				

SOIL CLASSIFICATION	GM	SILTY GRAVEL WITH SAND

Atteberg Limits	LL	PL	PI
	Non Plastic		

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	50.31	36.21	13.48

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	84

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	2184	**Depth (m)**	4	**Testing Date**	12.04.2010

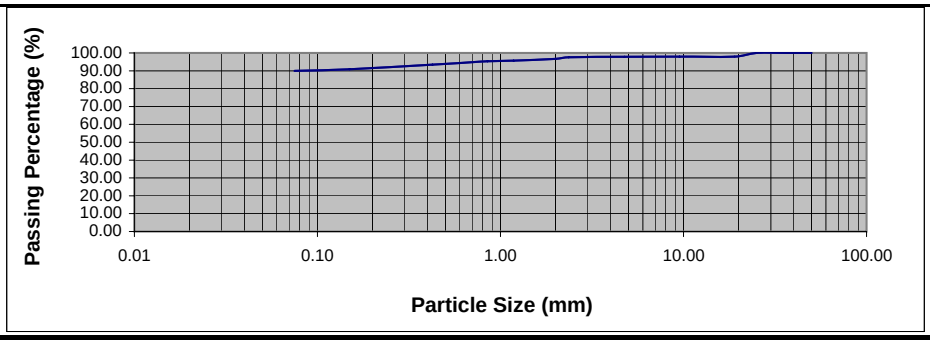
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	0.00	0.00	0.00	100.00	
25.0 mm	1 in	0.00	0.00	0.00	100.00	
19.0 mm	3/4 in	44.10	44.10	2.02	97.98	2.18
9.5 mm	3/8 in	0.00	44.10	2.02	97.98	
4.75 mm	No. 4	3.50	47.60	2.18	97.82	
2.36 mm	No. 8	5.60	53.20	2.44	97.56	
2.00 mm	No. 10	19.95	73.15	3.35	96.65	
1.18 mm	No. 16	20.65	93.80	4.29	95.71	
850 µm	No. 20	8.05	101.85	4.66	95.34	7.87
600 µm	No. 30	21.70	123.55	5.66	94.34	
425 µm	No. 40	18.90	142.45	6.52	93.48	
150 µm	No. 100	58.10	200.55	9.18	90.82	
75 µm	No. 200	18.90	219.45	10.05	89.95	89.95
Pan		1964.55	2184.00	100.00	0.00	
TOTAL		**2184.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	LL	PL	PI
	28.67%	**21.74%**	**6.93%**

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	2.18	7.87	89.95

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	85

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	2928	**Depth (m)**	5	**Testing Date**	12.04.2010

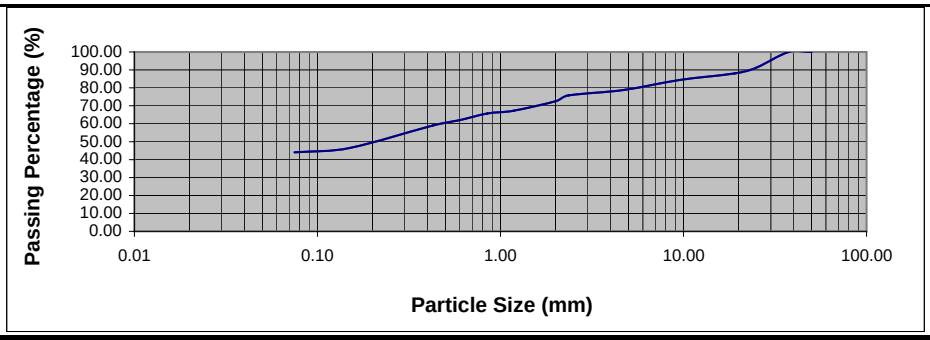
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	255.60	255.60	8.73	91.27	
19.0 mm	**3/4 in**	94.80	350.40	11.97	88.03	**21.11**
9.5 mm	**3/8 in**	107.70	458.10	15.65	84.35	
4.75 mm	**No. 4**	159.90	618.00	21.11	78.89	
2.36 mm	**No. 8**	90.00	708.00	24.18	75.82	
2.00 mm	**No. 10**	96.00	804.00	27.46	72.54	
1.18 mm	**No. 16**	153.30	957.30	32.69	67.31	
850 µm	**No. 20**	45.60	1002.90	34.25	65.75	**34.83**
600 µm	**No. 30**	108.90	1111.80	37.97	62.03	
425 µm	**No. 40**	90.90	1202.70	41.08	58.92	
150 µm	**No. 100**	364.50	1567.20	53.52	46.48	
75 µm	**No. 200**	70.50	1637.70	55.93	44.07	**44.07**
Pan		1290.30	2928.00	100.00	0.00	
TOTAL		**2928.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	21.11	34.83	44.07

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	86

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	2866	**Depth (m)**	7	**Testing Date**	12.04.2010

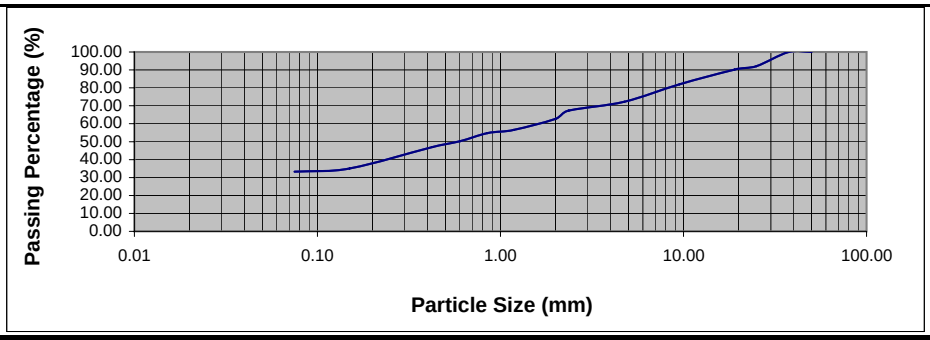
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	228.00	228.00	7.96	92.04	
19.0 mm	**3/4 in**	52.80	280.80	9.80	90.20	**27.77**
9.5 mm	**3/8 in**	236.20	517.00	18.04	81.96	
4.75 mm	**No. 4**	279.00	796.00	27.77	72.23	
2.36 mm	**No. 8**	140.00	936.00	32.66	67.34	
2.00 mm	**No. 10**	133.80	1069.80	37.33	62.67	
1.18 mm	**No. 16**	174.60	1244.40	43.42	56.58	
850 µm	**No. 20**	53.00	1297.40	45.27	54.73	**38.97**
600 µm	**No. 30**	130.00	1427.40	49.80	50.20	
425 µm	**No. 40**	91.00	1518.40	52.98	47.02	
150 µm	**No. 100**	342.80	1861.20	64.94	35.06	
75 µm	**No. 200**	51.60	1912.80	66.74	33.26	**33.26**
Pan		953.20	2866.00	100.00	0.00	
TOTAL		**2866.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	27.77	38.97	33.26

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	87

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	3762	**Depth (m)**	8	**Testing Date**	12.04.2010

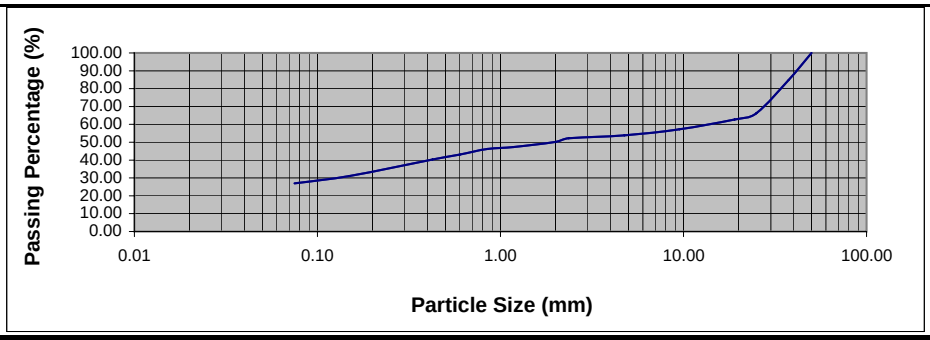
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	570.00	570.00	15.15	84.85	
25.0 mm	**1 in**	702.00	1272.00	33.81	66.19	
19.0 mm	**3/4 in**	132.00	1404.00	37.32	62.68	**46.17**
9.5 mm	**3/8 in**	204.00	1608.00	42.74	57.26	
4.75 mm	**No. 4**	129.00	1737.00	46.17	53.83	
2.36 mm	**No. 8**	60.00	1797.00	47.77	52.23	
2.00 mm	**No. 10**	78.00	1875.00	49.84	50.16	
1.18 mm	**No. 16**	108.00	1983.00	52.71	47.29	
850 µm	**No. 20**	39.00	2022.00	53.75	46.25	**26.87**
600 µm	**No. 30**	117.00	2139.00	56.86	43.14	
425 µm	**No. 40**	105.00	2244.00	59.65	40.35	
150 µm	**No. 100**	348.00	2592.00	68.90	31.10	
75 µm	**No. 200**	156.00	2748.00	73.05	26.95	**26.95**
Pan		1014.00	3762.00	100.00	0.00	
TOTAL		**3762.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	46.17	26.87	26.95

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	88

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	5366.1	**Depth (m)**	9.5	**Testing Date**	12.04.2010

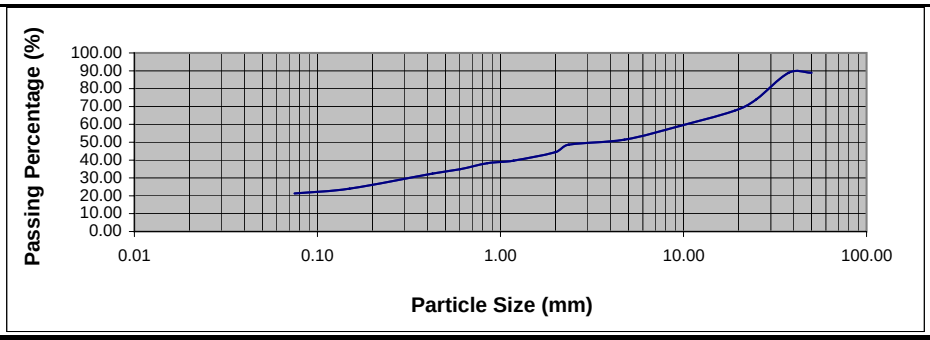
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	597.00	597.00	11.13	88.87	
37.5 mm	1.5 in	0.00	597.00	11.13	88.87	
25.0 mm	1 in	798.00	1395.00	26.00	74.00	
19.0 mm	3/4 in	339.00	1734.00	32.31	67.69	48.58
9.5 mm	3/8 in	465.00	2199.00	40.98	59.02	
4.75 mm	No. 4	408.00	2607.00	48.58	51.42	
2.36 mm	No. 8	150.00	2757.00	51.38	48.62	
2.00 mm	No. 10	225.00	2982.00	55.57	44.43	
1.18 mm	No. 16	252.00	3234.00	60.27	39.73	
850 µm	No. 20	81.00	3315.00	61.78	38.22	30.13
600 µm	No. 30	180.00	3495.00	65.13	34.87	
425 µm	No. 40	129.00	3624.00	67.54	32.46	
150 µm	No. 100	453.00	4077.00	75.98	24.02	
75 µm	No. 200	147.00	4224.00	78.72	21.28	21.28
Pan		1142.10	5366.10	100.00	0.00	
TOTAL		**5366.10**				

SOIL CLASSIFICATION	SM	SILTY SAND WITH GRAVEL

Atteberg Limits	LL	PL	PI
	Non Plastic		

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	48.58	30.13	21.28

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	89

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	4080	**Depth (m)**	11	**Testing Date**	12.04.2010

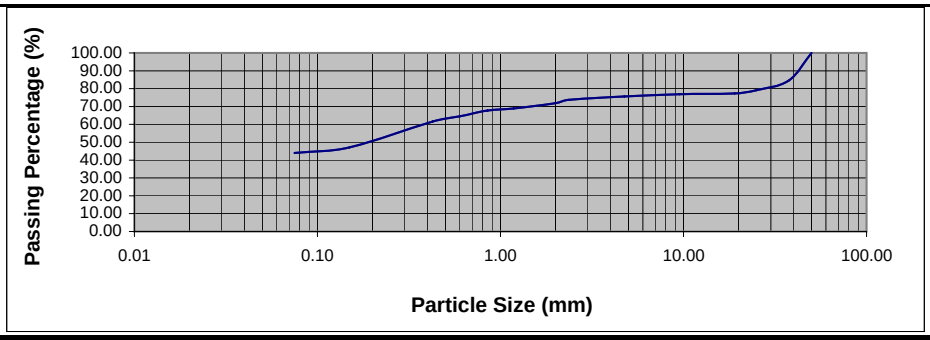
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	633.90	633.90	15.54	84.46	
25.0 mm	**1 in**	217.50	851.40	20.87	79.13	
19.0 mm	**3/4 in**	74.70	926.10	22.70	77.30	**24.38**
9.5 mm	**3/8 in**	18.00	944.10	23.14	76.86	
4.75 mm	**No. 4**	50.40	994.50	24.38	75.63	
2.36 mm	**No. 8**	75.00	1069.50	26.21	73.79	
2.00 mm	**No. 10**	77.40	1146.90	28.11	71.89	
1.18 mm	**No. 16**	123.30	1270.20	31.13	68.87	
850 µm	**No. 20**	47.10	1317.30	32.29	67.71	**31.63**
600 µm	**No. 30**	129.60	1446.90	35.46	64.54	
425 µm	**No. 40**	120.60	1567.50	38.42	61.58	
150 µm	**No. 100**	588.00	2155.50	52.83	47.17	
75 µm	**No. 200**	129.60	2285.10	56.01	43.99	**43.99**
Pan		1794.90	4080.00	100.00	0.00	
TOTAL		**4080.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	24.38	31.63	43.99

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	90

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	1333.7	**Depth (m)**	11.5	**Testing Date**	12.04.2010

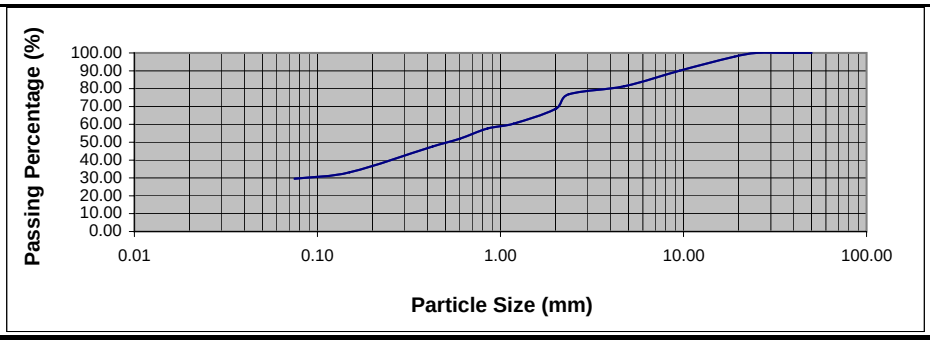
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	0.00	0.00	0.00	100.00	
25.0 mm	1 in	0.00	0.00	0.00	100.00	
19.0 mm	3/4 in	27.00	27.00	2.02	97.98	18.59
9.5 mm	3/8 in	106.00	133.00	9.97	90.03	
4.75 mm	No. 4	115.00	248.00	18.59	81.41	
2.36 mm	No. 8	60.00	308.00	23.09	76.91	
2.00 mm	No. 10	110.00	418.00	31.34	68.66	
1.18 mm	No. 16	110.00	528.00	39.59	60.41	
850 µm	No. 20	36.00	564.00	42.29	57.71	51.81
600 µm	No. 30	77.00	641.00	48.06	51.94	
425 µm	No. 40	58.00	699.00	52.41	47.59	
150 µm	No. 100	192.00	891.00	66.81	33.19	
75 µm	No. 200	48.00	939.00	70.41	29.59	29.59
Pan		394.70	1333.70	100.00	0.00	
TOTAL		**1333.70**				

SOIL CLASSIFICATION	SM	SILTY SAND WITH GRAVEL

Atteberg Limits	LL	PL	PI
	Non Plastic		

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	18.59	51.81	29.59

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	91

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	4771.2	**Depth (m)**	12.5	**Testing Date**	12.04.2010

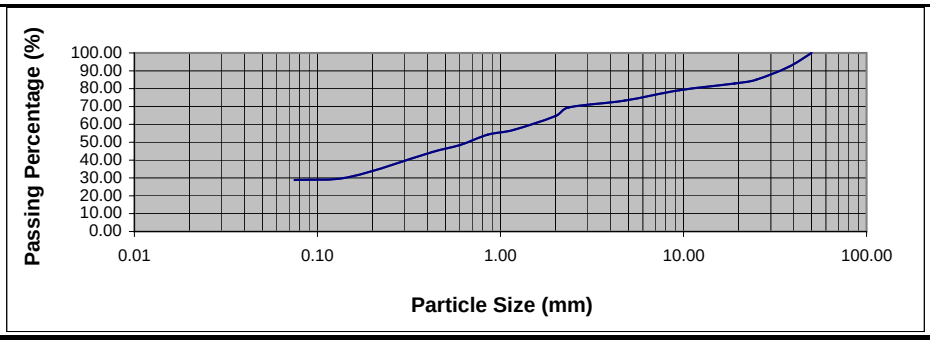
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	372.00	372.00	7.80	92.20	
25.0 mm	1 in	342.00	714.00	14.96	85.04	
19.0 mm	3/4 in	102.00	816.00	17.10	82.90	26.66
9.5 mm	3/8 in	180.00	996.00	20.88	79.12	
4.75 mm	No. 4	276.00	1272.00	26.66	73.34	
2.36 mm	No. 8	180.00	1452.00	30.43	69.57	
2.00 mm	No. 10	231.00	1683.00	35.27	64.73	
1.18 mm	No. 16	375.00	2058.00	43.13	56.87	
850 µm	No. 20	126.00	2184.00	45.77	54.23	44.49
600 µm	No. 30	277.50	2461.50	51.59	48.41	
425 µm	No. 40	184.80	2646.30	55.46	44.54	
150 µm	No. 100	669.00	3315.30	69.49	30.51	
75 µm	No. 200	79.20	3394.50	71.15	28.85	28.85
Pan		1376.70	4771.20	100.00	0.00	
TOTAL		**4771.20**				

SOIL CLASSIFICATION	SM	SILTY SAND WITH GRAVEL

Atteberg Limits	LL	PL	PI
	Non Plastic		

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	26.66	44.49	28.85

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	92

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	548.1	**Depth (m)**	14	**Testing Date**	12.04.2010

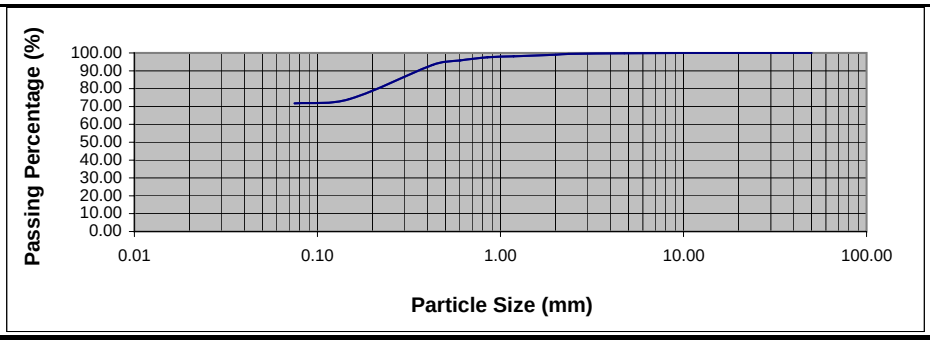
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.18**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	1.00	1.00	0.18	99.82	
2.36 mm	**No. 8**	2.00	3.00	0.55	99.45	
2.00 mm	**No. 10**	2.50	5.50	1.00	99.00	
1.18 mm	**No. 16**	5.00	10.50	1.92	98.08	
850 µm	**No. 20**	2.60	13.10	2.39	97.61	**28.02**
600 µm	**No. 30**	10.00	23.10	4.21	95.79	
425 µm	**No. 40**	13.70	36.80	6.71	93.29	
150 µm	**No. 100**	104.60	141.40	25.80	74.20	
75 µm	**No. 200**	13.20	154.60	28.21	71.79	**71.79**
Pan		393.50	548.10	100.00	0.00	
TOTAL		**548.10**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	32.04%	**27.59%**	**4.45%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.18	28.02	71.79

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	93

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	469	**Depth (m)**	16	**Testing Date**	12.04.2010

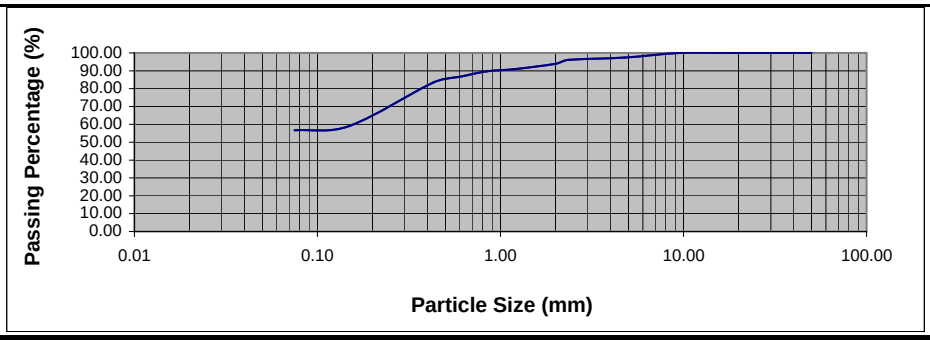
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	**Alternative**	(gr)	Retained (gr)	%	%	%
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.56**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	12.00	12.00	2.56	97.44	
2.36 mm	**No. 8**	6.00	18.00	3.84	96.16	
2.00 mm	**No. 10**	10.60	28.60	6.10	93.90	
1.18 mm	**No. 16**	14.40	43.00	9.17	90.83	
850 µm	**No. 20**	5.10	48.10	10.26	89.74	**40.72**
600 µm	**No. 30**	14.70	62.80	13.39	86.61	
425 µm	**No. 40**	15.70	78.50	16.74	83.26	
150 µm	**No. 100**	113.10	191.60	40.85	59.15	
75 µm	**No. 200**	11.40	203.00	43.28	56.72	**56.72**
Pan		266.00	469.00	100.00	0.00	
TOTAL		**469.00**				

SOIL CLASSIFICATION	**ML**	**SANDY SILT**

Atteberg Limits	**LL**	**PL**	**PI**
	22.24%	**18.75%**	**3.49%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.56	40.72	56.72

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	94

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	710	**Depth (m)**	16.5	**Testing Date**	12.04.2010

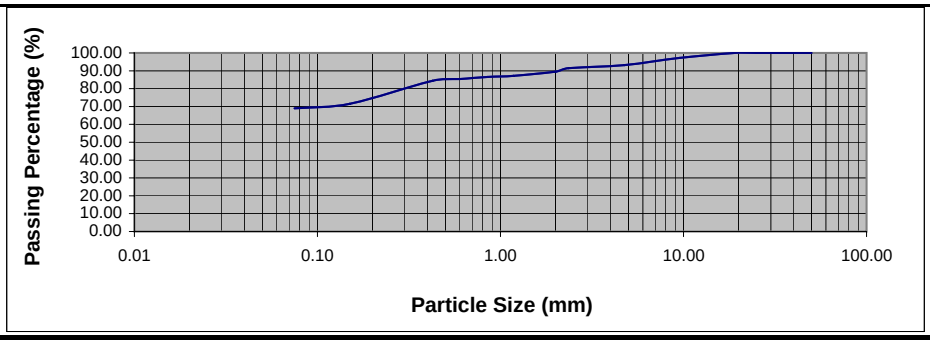
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**6.85**
9.5 mm	**3/8 in**	19.70	19.70	2.77	97.23	
4.75 mm	**No. 4**	28.90	48.60	6.85	93.15	
2.36 mm	**No. 8**	12.00	60.60	8.54	91.46	
2.00 mm	**No. 10**	14.00	74.60	10.51	89.49	
1.18 mm	**No. 16**	16.40	91.00	12.82	87.18	
850 µm	**No. 20**	4.30	95.30	13.42	86.58	**24.14**
600 µm	**No. 30**	8.50	103.80	14.62	85.38	
425 µm	**No. 40**	6.80	110.60	15.58	84.42	
150 µm	**No. 100**	91.40	202.00	28.45	71.55	
75 µm	**No. 200**	18.00	220.00	30.99	69.01	**69.01**
Pan		490.00	710.00	100.00	0.00	
TOTAL		**710.00**				

SOIL CLASSIFICATION	**CL-ML**	**SANDY SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	36.66%	**31.58%**	**5.08%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	6.85	24.14	69.01

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	95

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	445.9	**Depth (m)**	17.5	**Testing Date**	12.04.2010

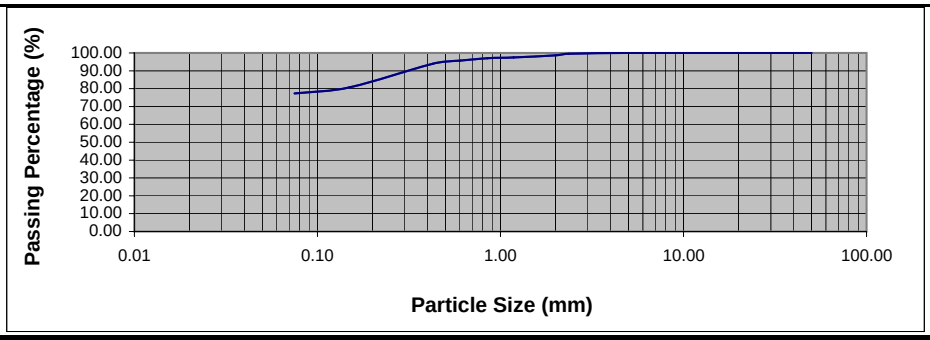
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.00**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.00	0.00	0.00	100.00	
2.36 mm	**No. 8**	2.00	2.00	0.45	99.55	
2.00 mm	**No. 10**	4.00	6.00	1.35	98.65	
1.18 mm	**No. 16**	5.00	11.00	2.47	97.53	
850 µm	**No. 20**	2.00	13.00	2.92	97.08	**22.65**
600 µm	**No. 30**	6.00	19.00	4.26	95.74	
425 µm	**No. 40**	8.00	27.00	6.06	93.94	
150 µm	**No. 100**	59.00	86.00	19.29	80.71	
75 µm	**No. 200**	15.00	101.00	22.65	77.35	**77.35**
Pan		344.90	445.90	100.00	0.00	
TOTAL		**445.90**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	33.96%	**29.17%**	**4.79%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.00	22.65	77.35

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	96

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A23**			**Sampling Date**	27.03.2010
Weight (gr)	457	**Depth (m)**	18.5	**Testing Date**	12.04.2010

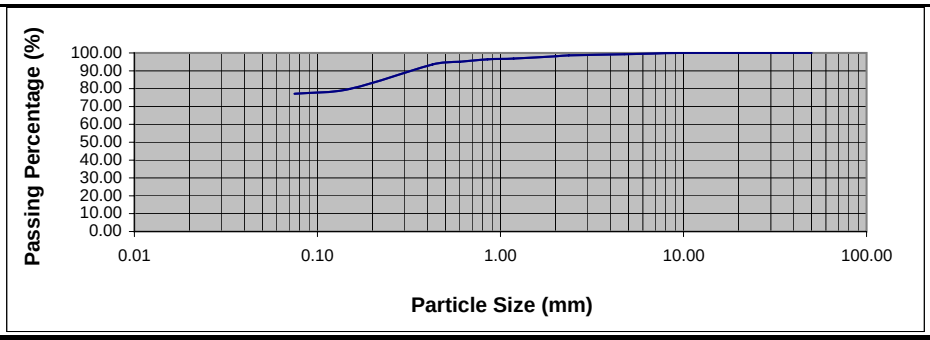
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.70**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	3.20	3.20	0.70	99.30	
2.36 mm	**No. 8**	3.00	6.20	1.36	98.64	
2.00 mm	**No. 10**	2.60	8.80	1.93	98.07	
1.18 mm	**No. 16**	5.60	14.40	3.15	96.85	
850 µm	**No. 20**	2.10	16.50	3.61	96.39	**22.14**
600 µm	**No. 30**	6.20	22.70	4.97	95.03	
425 µm	**No. 40**	6.90	29.60	6.48	93.52	
150 µm	**No. 100**	62.70	92.30	20.20	79.80	
75 µm	**No. 200**	12.10	104.40	22.84	77.16	**77.16**
Pan		352.60	457.00	100.00	0.00	
TOTAL		**457.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	29.31%	**23.64%**	**5.67%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.70	22.14	77.16

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	97

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A24**			**Sampling Date**	27.03.2010
Weight (gr)	4428	**Depth (m)**	0.5	**Testing Date**	12.04.2010

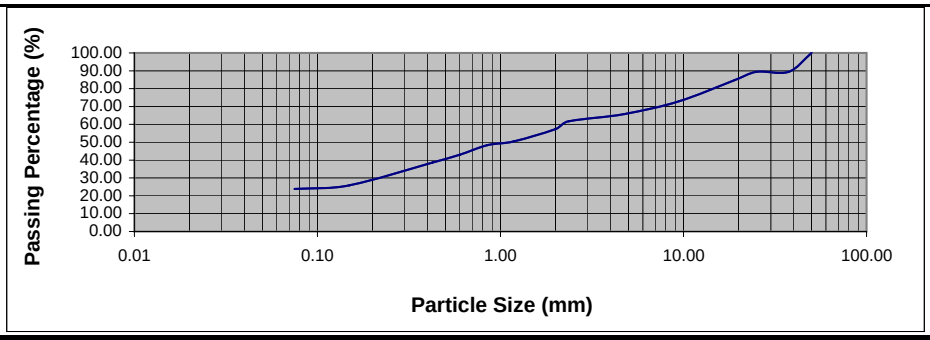
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	**Alternative**	(gr)	Retained (gr)	%	%	%
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	468.90	468.90	10.59	89.41	
25.0 mm	**1 in**	0.00	468.90	10.59	89.41	
19.0 mm	**3/4 in**	204.30	673.20	15.20	84.80	**34.22**
9.5 mm	**3/8 in**	519.30	1192.50	26.93	73.07	
4.75 mm	**No. 4**	322.80	1515.30	34.22	65.78	
2.36 mm	**No. 8**	180.00	1695.30	38.29	61.71	
2.00 mm	**No. 10**	192.30	1887.60	42.63	57.37	
1.18 mm	**No. 16**	307.80	2195.40	49.58	50.42	
850 µm	**No. 20**	90.30	2285.70	51.62	48.38	**41.97**
600 µm	**No. 30**	237.30	2523.00	56.98	43.02	
425 µm	**No. 40**	196.80	2719.80	61.42	38.58	
150 µm	**No. 100**	561.00	3280.80	74.09	25.91	
75 µm	**No. 200**	93.00	3373.80	76.19	23.81	**23.81**
Pan		1054.20	4428.00	100.00	0.00	
TOTAL		**4428.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	34.22	41.97	23.81

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	98

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A24**			**Sampling Date**	27.03.2010
Weight (gr)	1000	**Depth (m)**	2.5	**Testing Date**	12.04.2010

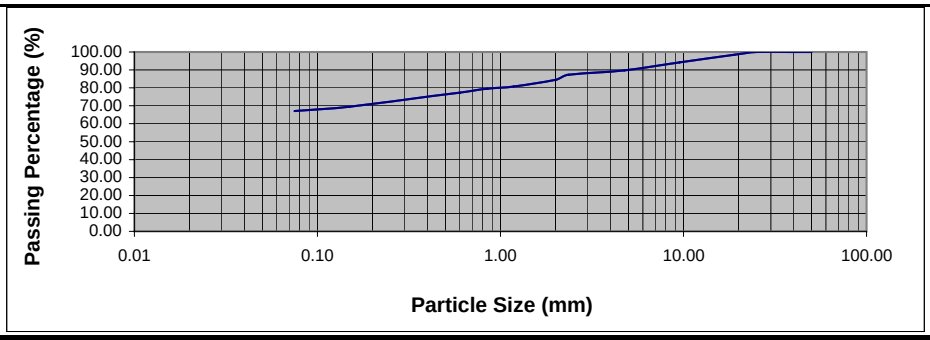
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	15.30	15.30	1.53	98.47	**10.23**
9.5 mm	**3/8 in**	43.00	58.30	5.83	94.17	
4.75 mm	**No. 4**	44.00	102.30	10.23	89.77	
2.36 mm	**No. 8**	24.00	126.30	12.63	87.37	
2.00 mm	**No. 10**	29.00	155.30	15.53	84.47	
1.18 mm	**No. 16**	37.50	192.80	19.28	80.72	
850 µm	**No. 20**	11.80	204.60	20.46	79.54	**22.73**
600 µm	**No. 30**	22.00	226.60	22.66	77.34	
425 µm	**No. 40**	18.40	245.00	24.50	75.50	
150 µm	**No. 100**	60.40	305.40	30.54	69.46	
75 µm	**No. 200**	24.20	329.60	32.96	67.04	**67.04**
Pan		670.40	1000.00	100.00	0.00	
TOTAL		**1000.00**				

SOIL CLASSIFICATION	**ML**	**SANDY SILT**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	10.23	22.73	67.04

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	99

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A24**			**Sampling Date**	27.03.2010
Weight (gr)	3030	**Depth (m)**	4	**Testing Date**	12.04.2010

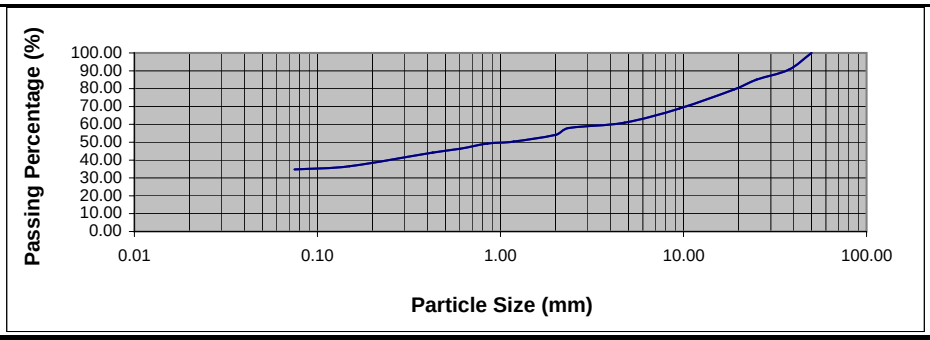
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	284.40	284.40	9.39	90.61	
25.0 mm	**1 in**	167.70	452.10	14.92	85.08	
19.0 mm	**3/4 in**	164.70	616.80	20.36	79.64	**39.09**
9.5 mm	**3/8 in**	325.20	942.00	31.09	68.91	
4.75 mm	**No. 4**	242.40	1184.40	39.09	60.91	
2.36 mm	**No. 8**	90.00	1274.40	42.06	57.94	
2.00 mm	**No. 10**	115.20	1389.60	45.86	54.14	
1.18 mm	**No. 16**	113.40	1503.00	49.60	50.40	
850 µm	**No. 20**	33.30	1536.30	50.70	49.30	**26.17**
600 µm	**No. 30**	89.40	1625.70	53.65	46.35	
425 µm	**No. 40**	64.50	1690.20	55.78	44.22	
150 µm	**No. 100**	231.00	1921.20	63.41	36.59	
75 µm	**No. 200**	56.10	1977.30	65.26	34.74	**34.74**
Pan		1052.70	3030.00	100.00	0.00	
TOTAL		**3030.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	39.09	26.17	34.74

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	100

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A24**			**Sampling Date**	27.03.2010
Weight (gr)	3387	**Depth (m)**	5	**Testing Date**	12.04.2010

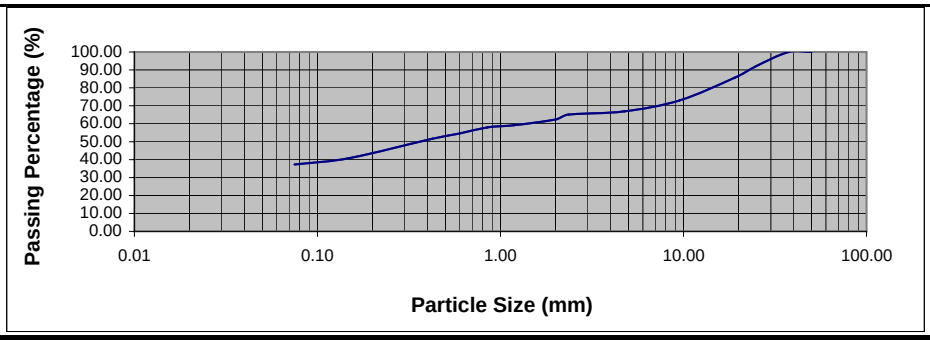
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	265.50	265.50	7.84	92.16	
19.0 mm	**3/4 in**	220.20	485.70	14.34	85.66	**33.12**
9.5 mm	**3/8 in**	430.50	916.20	27.05	72.95	
4.75 mm	**No. 4**	205.50	1121.70	33.12	66.88	
2.36 mm	**No. 8**	60.00	1181.70	34.89	65.11	
2.00 mm	**No. 10**	93.90	1275.60	37.66	62.34	
1.18 mm	**No. 16**	108.60	1384.20	40.87	59.13	
850 µm	**No. 20**	37.50	1421.70	41.98	58.02	**29.60**
600 µm	**No. 30**	117.60	1539.30	45.45	54.55	
425 µm	**No. 40**	98.10	1637.40	48.34	51.66	
150 µm	**No. 100**	366.30	2003.70	59.16	40.84	
75 µm	**No. 200**	120.60	2124.30	62.72	37.28	**37.28**
Pan		1262.70	3387.00	100.00	0.00	
TOTAL		**3387.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	33.12	29.60	37.28

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	101

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A24**			**Sampling Date**	27.03.2010
Weight (gr)	4542	**Depth (m)**	5.5	**Testing Date**	12.04.2010

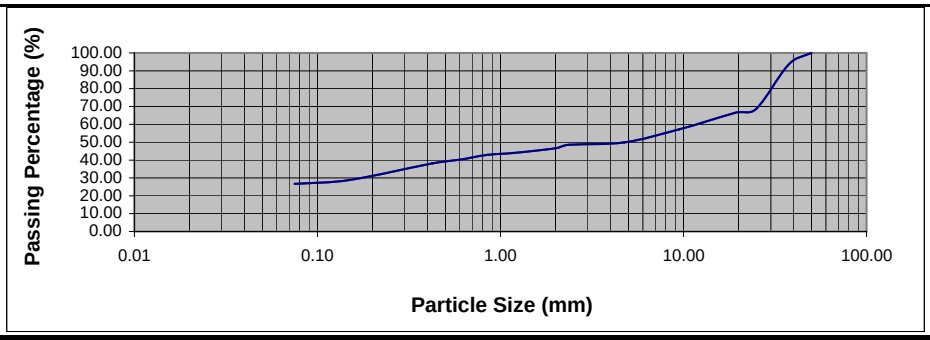
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	293.10	293.10	6.45	93.55	
25.0 mm	1 in	1129.20	1422.30	31.31	68.69	
19.0 mm	3/4 in	102.60	1524.90	33.57	66.43	50.10
9.5 mm	3/8 in	417.30	1942.20	42.76	57.24	
4.75 mm	No. 4	333.30	2275.50	50.10	49.90	
2.36 mm	No. 8	60.00	2335.50	51.42	48.58	
2.00 mm	No. 10	90.30	2425.80	53.41	46.59	
1.18 mm	No. 16	117.30	2543.10	55.99	44.01	
850 µm	No. 20	47.40	2590.50	57.03	42.97	23.16
600 µm	No. 30	125.40	2715.90	59.80	40.20	
425 µm	No. 40	94.20	2810.10	61.87	38.13	
150 µm	No. 100	420.00	3230.10	71.12	28.88	
75 µm	No. 200	97.50	3327.60	73.26	26.74	26.74
Pan		1214.40	4542.00	100.00	0.00	
TOTAL		**4542.00**				

SOIL CLASSIFICATION	GM	SILTY GRAVEL WITH SAND

Atteberg Limits	LL	PL	PI
	Non Plastic		

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	50.10	23.16	26.74

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	102

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A25**			**Sampling Date**	27.03.2010
Weight (gr)	3591	**Depth (m)**	1	**Testing Date**	12.04.2010

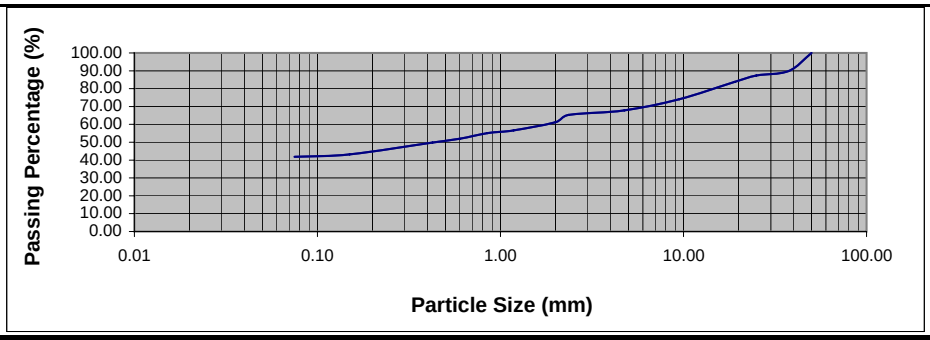
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	362.70	362.70	10.10	89.90	
25.0 mm	1 in	92.10	454.80	12.66	87.34	
19.0 mm	3/4 in	128.40	583.20	16.24	83.76	32.19
9.5 mm	3/8 in	347.40	930.60	25.91	74.09	
4.75 mm	No. 4	225.30	1155.90	32.19	67.81	
2.36 mm	No. 8	90.00	1245.90	34.70	65.30	
2.00 mm	No. 10	147.00	1392.90	38.79	61.21	
1.18 mm	No. 16	165.90	1558.80	43.41	56.59	
850 µm	No. 20	51.90	1610.70	44.85	55.15	25.93
600 µm	No. 30	112.50	1723.20	47.99	52.01	
425 µm	No. 40	78.00	1801.20	50.16	49.84	
150 µm	No. 100	239.70	2040.90	56.83	43.17	
75 µm	No. 200	46.20	2087.10	58.12	41.88	41.88
Pan		1503.90	3591.00	100.00	0.00	
TOTAL		**3591.00**				

SOIL CLASSIFICATION	SM	SILTY SAND WITH GRAVEL

Atteberg Limits	LL	PL	PI
	Non Plastic		

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	32.19	25.93	41.88

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	103

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A25**			**Sampling Date**	27.03.2010
Weight (gr)	2847	**Depth (m)**	2.2	**Testing Date**	12.04.2010

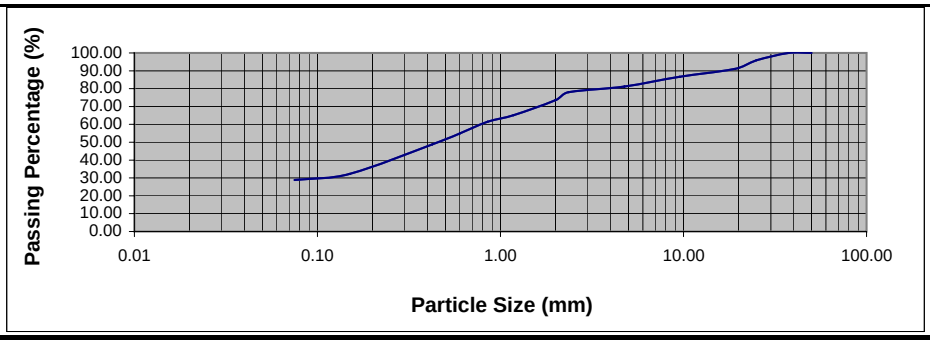
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	118.20	118.20	4.15	95.85	
19.0 mm	**3/4 in**	135.90	254.10	8.93	91.07	**18.79**
9.5 mm	**3/8 in**	126.00	380.10	13.35	86.65	
4.75 mm	**No. 4**	154.80	534.90	18.79	81.21	
2.36 mm	**No. 8**	90.00	624.90	21.95	78.05	
2.00 mm	**No. 10**	126.60	751.50	26.40	73.60	
1.18 mm	**No. 16**	240.00	991.50	34.83	65.17	
850 µm	**No. 20**	104.70	1096.20	38.50	61.50	**52.38**
600 µm	**No. 30**	186.60	1282.80	45.06	54.94	
425 µm	**No. 40**	174.00	1456.80	51.17	48.83	
150 µm	**No. 100**	472.80	1929.60	67.78	32.22	
75 µm	**No. 200**	96.60	2026.20	71.17	28.83	**28.83**
Pan		820.80	2847.00	100.00	0.00	
TOTAL		**2847.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	18.79	52.38	28.83

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	104

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A25**			**Sampling Date**	27.03.2010
Weight (gr)	1003	**Depth (m)**	3	**Testing Date**	12.04.2010

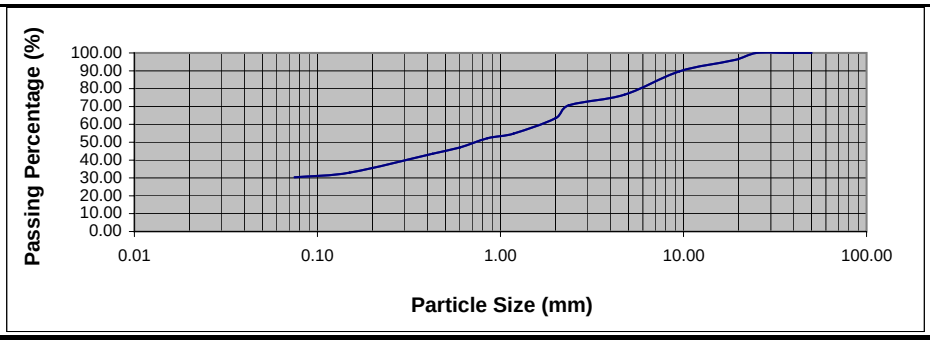
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	39.10	39.10	3.90	96.10	**23.36**
9.5 mm	**3/8 in**	64.10	103.20	10.29	89.71	
4.75 mm	**No. 4**	131.10	234.30	23.36	76.64	
2.36 mm	**No. 8**	60.00	294.30	29.34	70.66	
2.00 mm	**No. 10**	72.50	366.80	36.57	63.43	
1.18 mm	**No. 16**	86.50	453.30	45.19	54.81	
850 µm	**No. 20**	25.40	478.70	47.73	52.27	**46.25**
600 µm	**No. 30**	52.30	531.00	52.94	47.06	
425 µm	**No. 40**	35.10	566.10	56.44	43.56	
150 µm	**No. 100**	106.50	672.60	67.06	32.94	
75 µm	**No. 200**	25.60	698.20	69.61	30.39	**30.39**
Pan		304.80	1003.00	100.00	0.00	
TOTAL		**1003.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	23.36	46.25	30.39

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	105

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A25**			**Sampling Date**	27.03.2010
Weight (gr)	4749	**Depth (m)**	3.6	**Testing Date**	12.04.2010

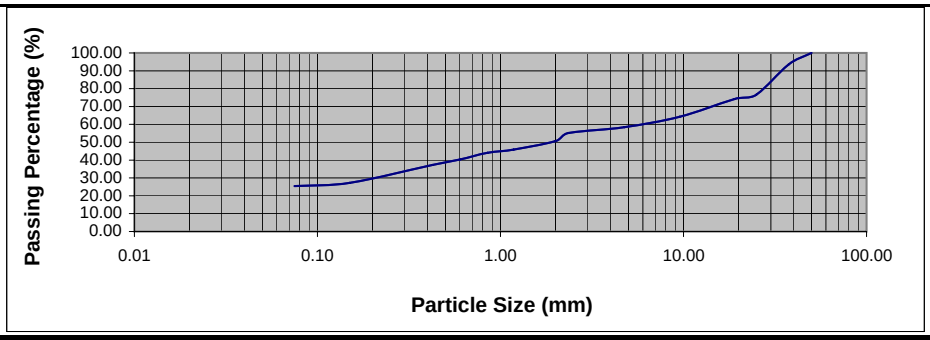
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	306.00	306.00	6.44	93.56	
25.0 mm	**1 in**	804.00	1110.00	23.37	76.63	
19.0 mm	**3/4 in**	116.40	1226.40	25.82	74.18	**41.62**
9.5 mm	**3/8 in**	469.80	1696.20	35.72	64.28	
4.75 mm	**No. 4**	280.20	1976.40	41.62	58.38	
2.36 mm	**No. 8**	150.00	2126.40	44.78	55.22	
2.00 mm	**No. 10**	216.60	2343.00	49.34	50.66	
1.18 mm	**No. 16**	228.60	2571.60	54.15	45.85	
850 µm	**No. 20**	84.00	2655.60	55.92	44.08	**32.96**
600 µm	**No. 30**	179.40	2835.00	59.70	40.30	
425 µm	**No. 40**	144.00	2979.00	62.73	37.27	
150 µm	**No. 100**	475.50	3454.50	72.74	27.26	
75 µm	**No. 200**	87.00	3541.50	74.57	25.43	**25.43**
Pan		1207.50	4749.00	100.00	0.00	
TOTAL		**4749.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	41.62	32.96	25.43

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	106

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A25**			**Sampling Date**	27.03.2010
Weight (gr)	3108	**Depth (m)**	4.5	**Testing Date**	12.04.2010

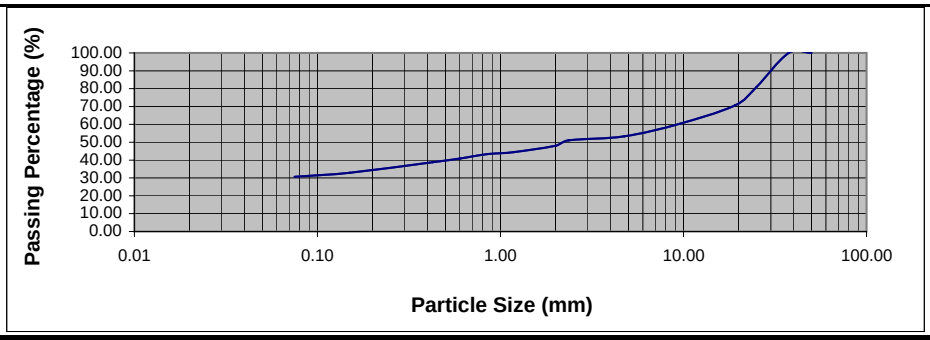
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	597.00	597.00	19.21	80.79	
19.0 mm	**3/4 in**	318.60	915.60	29.46	70.54	**46.70**
9.5 mm	**3/8 in**	316.80	1232.40	39.65	60.35	
4.75 mm	**No. 4**	219.00	1451.40	46.70	53.30	
2.36 mm	**No. 8**	69.00	1520.40	48.92	51.08	
2.00 mm	**No. 10**	96.00	1616.40	52.01	47.99	
1.18 mm	**No. 16**	111.00	1727.40	55.58	44.42	
850 µm	**No. 20**	32.10	1759.50	56.61	43.39	**22.63**
600 µm	**No. 30**	79.80	1839.30	59.18	40.82	
425 µm	**No. 40**	62.10	1901.40	61.18	38.82	
150 µm	**No. 100**	183.60	2085.00	67.08	32.92	
75 µm	**No. 200**	69.60	2154.60	69.32	30.68	**30.68**
Pan		953.40	3108.00	100.00	0.00	
TOTAL		**3108.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	28.12%	**25.86%**	**2.26%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	46.70	22.63	30.68

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	107

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A25**			**Sampling Date**	27.03.2010
Weight (gr)	3912	**Depth (m)**	5.5	**Testing Date**	12.04.2010

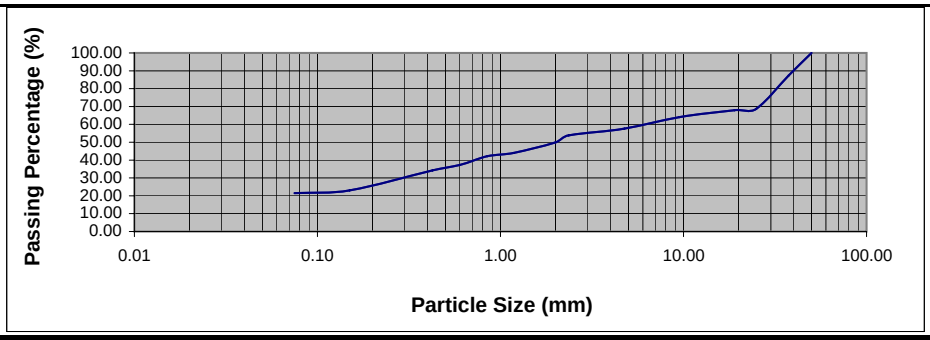
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	492.60	492.60	12.59	87.41	
25.0 mm	**1 in**	731.70	1224.30	31.30	68.70	
19.0 mm	**3/4 in**	31.50	1255.80	32.10	67.90	**42.34**
9.5 mm	**3/8 in**	151.20	1407.00	35.97	64.03	
4.75 mm	**No. 4**	249.30	1656.30	42.34	57.66	
2.36 mm	**No. 8**	150.00	1806.30	46.17	53.83	
2.00 mm	**No. 10**	153.30	1959.60	50.09	49.91	
1.18 mm	**No. 16**	230.40	2190.00	55.98	44.02	
850 µm	**No. 20**	72.00	2262.00	57.82	42.18	**36.18**
600 µm	**No. 30**	190.50	2452.50	62.69	37.31	
425 µm	**No. 40**	122.10	2574.60	65.81	34.19	
150 µm	**No. 100**	435.90	3010.50	76.96	23.04	
75 µm	**No. 200**	61.20	3071.70	78.52	21.48	**21.48**
Pan		840.30	3912.00	100.00	0.00	
TOTAL		**3912.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	42.34	36.18	21.48

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	108

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A26**			**Sampling Date**	27.03.2010
Weight (gr)	620	**Depth (m)**	1.5	**Testing Date**	12.04.2010

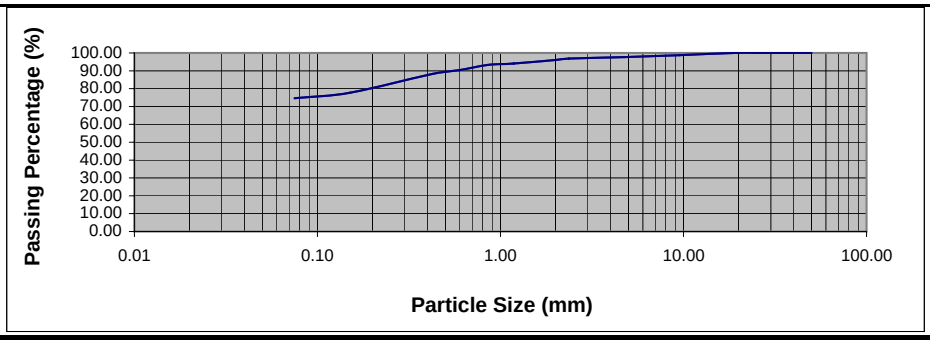
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.31**
9.5 mm	**3/8 in**	8.00	8.00	1.29	98.71	
4.75 mm	**No. 4**	6.30	14.30	2.31	97.69	
2.36 mm	**No. 8**	5.00	19.30	3.11	96.89	
2.00 mm	**No. 10**	5.30	24.60	3.97	96.03	
1.18 mm	**No. 16**	12.10	36.70	5.92	94.08	
850 µm	**No. 20**	4.90	41.60	6.71	93.29	**23.05**
600 µm	**No. 30**	17.60	59.20	9.55	90.45	
425 µm	**No. 40**	13.60	72.80	11.74	88.26	
150 µm	**No. 100**	65.40	138.20	22.29	77.71	
75 µm	**No. 200**	19.00	157.20	25.35	74.65	**74.65**
Pan		462.80	620.00	100.00	0.00	
TOTAL		**620.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	22.20%	**16.98%**	**5.22%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.31	23.05	74.65

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	109

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

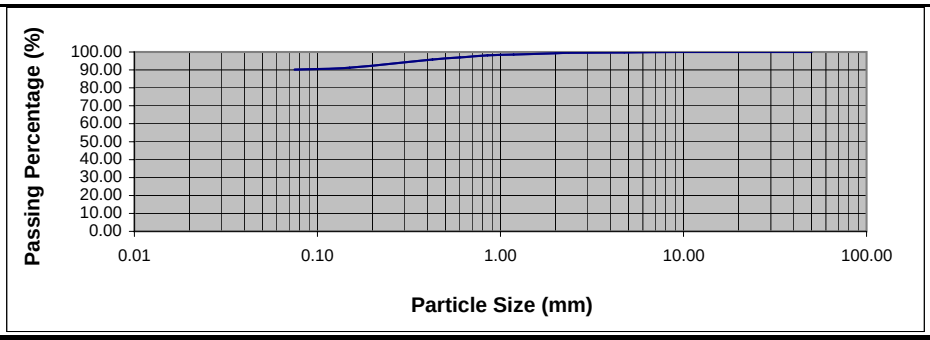
ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A26**			**Sampling Date**	27.03.2010
Weight (gr)	569	**Depth (m)**	3.5	**Testing Date**	12.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.25**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	1.40	1.40	0.25	99.75	
2.36 mm	**No. 8**	1.00	2.40	0.42	99.58	
2.00 mm	**No. 10**	1.50	3.90	0.69	99.31	
1.18 mm	**No. 16**	4.40	8.30	1.46	98.54	
850 µm	**No. 20**	2.20	10.50	1.85	98.15	**9.60**
600 µm	**No. 30**	6.70	17.20	3.02	96.98	
425 µm	**No. 40**	6.70	23.90	4.20	95.80	
150 µm	**No. 100**	25.80	49.70	8.73	91.27	
75 µm	**No. 200**	6.30	56.00	9.84	90.16	**90.16**
Pan		513.00	569.00	100.00	0.00	
TOTAL		**569.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**	
Atteberg Limits	**LL**	**PL**	**PI**
	22.49%	**15.56%**	**6.93%**
Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.25	9.60	90.16

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	110

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A26**			**Sampling Date**	27.03.2010
Weight (gr)	622	**Depth (m)**	5	**Testing Date**	12.04.2010

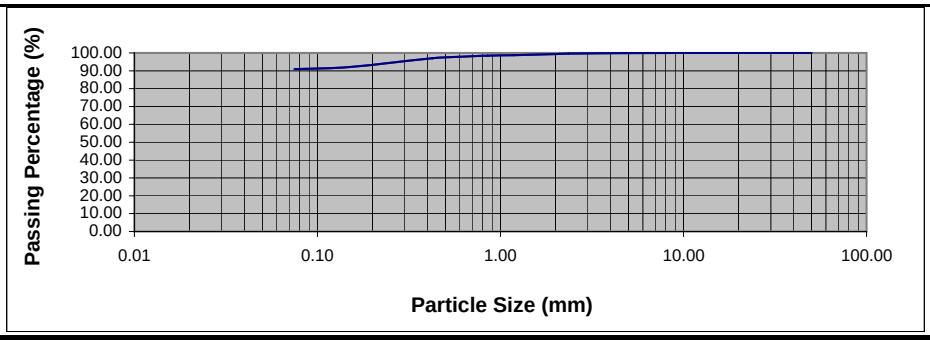
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.06**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.40	0.40	0.06	99.94	
2.36 mm	**No. 8**	2.00	2.40	0.39	99.61	
2.00 mm	**No. 10**	1.40	3.80	0.61	99.39	
1.18 mm	**No. 16**	4.00	7.80	1.25	98.75	
850 µm	**No. 20**	1.70	9.50	1.53	98.47	**8.97**
600 µm	**No. 30**	4.10	13.60	2.19	97.81	
425 µm	**No. 40**	4.80	18.40	2.96	97.04	
150 µm	**No. 100**	30.50	48.90	7.86	92.14	
75 µm	**No. 200**	7.30	56.20	9.04	90.96	**90.96**
Pan		565.80	622.00	100.00	0.00	
TOTAL		**622.00**				

SOIL CLASSIFICATION	**CL**	**LEAN CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	23.12%	**15.56%**	**7.56%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.06	8.97	90.96

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	111

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A27**			**Sampling Date**	27.03.2010
Weight (gr)	540	**Depth (m)**	1.5	**Testing Date**	1.04.2010

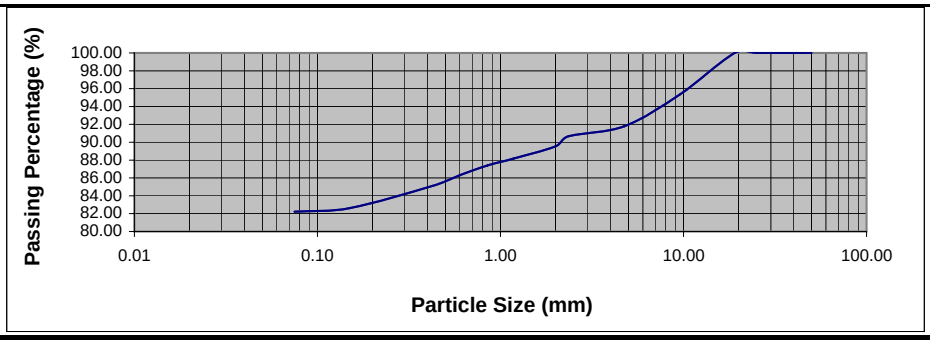
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**8.20**
9.5 mm	**3/8 in**	25.30	25.30	4.69	95.31	
4.75 mm	**No. 4**	19.00	44.30	8.20	91.80	
2.36 mm	**No. 8**	6.00	50.30	9.31	90.69	
2.00 mm	**No. 10**	6.20	56.50	10.46	89.54	
1.18 mm	**No. 16**	7.40	63.90	11.83	88.17	
850 µm	**No. 20**	4.10	68.00	12.59	87.41	**9.57**
600 µm	**No. 30**	5.90	73.90	13.69	86.31	
425 µm	**No. 40**	6.50	80.40	14.89	85.11	
150 µm	**No. 100**	13.50	93.90	17.39	82.61	
75 µm	**No. 200**	2.10	96.00	17.78	82.22	**82.22**
Pan		444.00	540.00	100.00	0.00	
TOTAL		**540.00**				

SOIL CLASSIFICATION	**CL**	**LEAN CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	26.19%	**15.63%**	**10.56%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	8.20	9.57	82.22

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	112

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

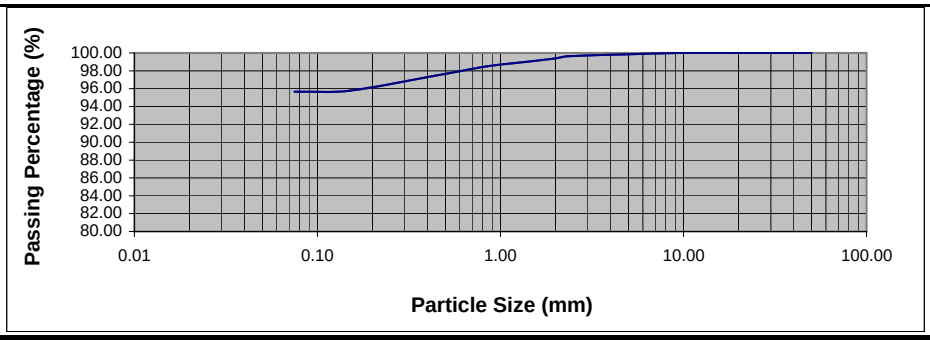
ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A27**			**Sampling Date**	27.03.2010
Weight (gr)	495	**Depth (m)**	2.5	**Testing Date**	1.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.16**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.80	0.80	0.16	99.84	
2.36 mm	**No. 8**	1.00	1.80	0.36	99.64	
2.00 mm	**No. 10**	1.20	3.00	0.61	99.39	
1.18 mm	**No. 16**	2.70	5.70	1.15	98.85	
850 µm	**No. 20**	1.70	7.40	1.49	98.51	**4.18**
600 µm	**No. 30**	2.70	10.10	2.04	97.96	
425 µm	**No. 40**	2.80	12.90	2.61	97.39	
150 µm	**No. 100**	8.00	20.90	4.22	95.78	
75 µm	**No. 200**	0.60	21.50	4.34	95.66	**95.66**
Pan		473.50	495.00	100.00	0.00	
TOTAL		**495.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**	
Atteberg Limits	**LL**	**PL**	**PI**
	21.76%	**15.69%**	**6.07%**
Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.16	4.18	95.66

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	113

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

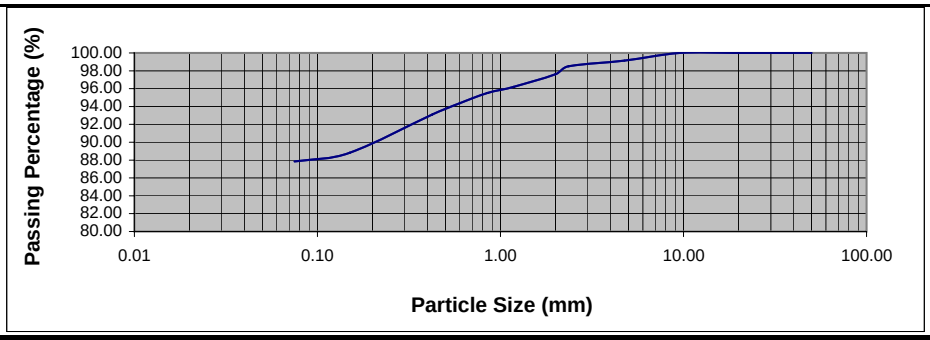
ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A27**			**Sampling Date**	27.03.2010
Weight (gr)	480	**Depth (m)**	3.5	**Testing Date**	1.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.85**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	4.10	4.10	0.85	99.15	
2.36 mm	**No. 8**	3.00	7.10	1.48	98.52	
2.00 mm	**No. 10**	4.30	11.40	2.38	97.63	
1.18 mm	**No. 16**	6.80	18.20	3.79	96.21	
850 µm	**No. 20**	3.30	21.50	4.48	95.52	**11.29**
600 µm	**No. 30**	5.50	27.00	5.63	94.38	
425 µm	**No. 40**	6.00	33.00	6.88	93.13	
150 µm	**No. 100**	20.70	53.70	11.19	88.81	
75 µm	**No. 200**	4.60	58.30	12.15	87.85	**87.85**
Pan		421.70	480.00	100.00	0.00	
TOTAL		**480.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**	
Atteberg Limits	**LL**	**PL**	**PI**
	23.93%	**18.60%**	**5.33%**
Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.85	11.29	87.85

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	114

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

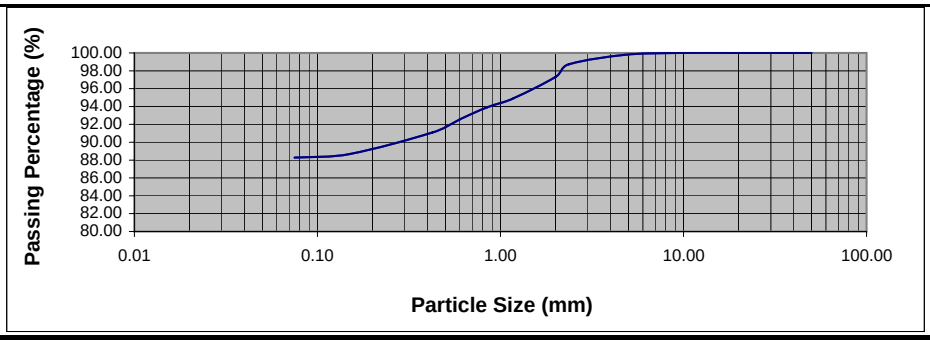
Location	**BH # A27**			**Sampling Date**	27.03.2010
Weight (gr)	472	**Depth (m)**	4.5	**Testing Date**	1.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.21**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	1.00	1.00	0.21	99.79	
2.36 mm	**No. 8**	5.00	6.00	1.27	98.73	
2.00 mm	**No. 10**	6.70	12.70	2.69	97.31	
1.18 mm	**No. 16**	11.20	23.90	5.06	94.94	
850 µm	**No. 20**	4.80	28.70	6.08	93.92	**11.50**
600 µm	**No. 30**	6.40	35.10	7.44	92.56	
425 µm	**No. 40**	6.90	42.00	8.90	91.10	
150 µm	**No. 100**	11.50	53.50	11.33	88.67	
75 µm	**No. 200**	1.80	55.30	11.72	88.28	**88.28**
Pan		416.70	472.00	100.00	0.00	
TOTAL		**472.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**	
Atteberg Limits	**LL**	**PL**	**PI**
	25.68%	**18.87%**	**6.81%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.21	11.50	88.28

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	115

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A27**			**Sampling Date**	27.03.2010
Weight (gr)	520	**Depth (m)**	5.5	**Testing Date**	1.04.2010

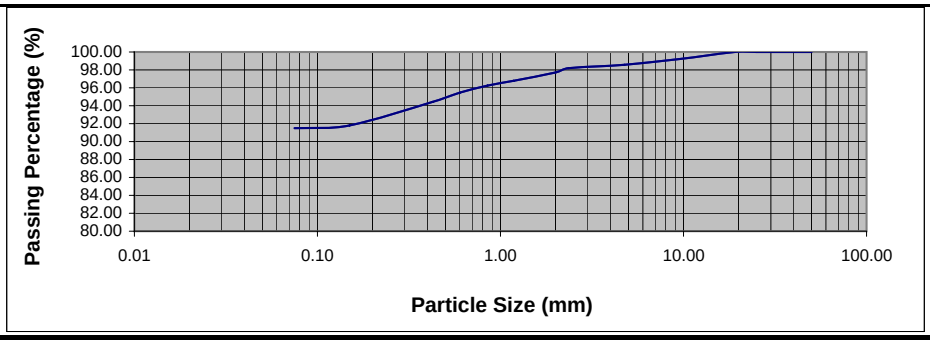
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.42**
9.5 mm	**3/8 in**	4.10	4.10	0.79	99.21	
4.75 mm	**No. 4**	3.30	7.40	1.42	98.58	
2.36 mm	**No. 8**	2.00	9.40	1.81	98.19	
2.00 mm	**No. 10**	2.50	11.90	2.29	97.71	
1.18 mm	**No. 16**	4.80	16.70	3.21	96.79	
850 µm	**No. 20**	2.80	19.50	3.75	96.25	**7.08**
600 µm	**No. 30**	4.10	23.60	4.54	95.46	
425 µm	**No. 40**	5.40	29.00	5.58	94.42	
150 µm	**No. 100**	13.60	42.60	8.19	91.81	
75 µm	**No. 200**	1.60	44.20	8.50	91.50	**91.50**
Pan		475.80	520.00	100.00	0.00	
TOTAL		**520.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	22.45%	**18.42%**	**4.03%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.42	7.08	91.50

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	116

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A28**			**Sampling Date**	27.03.2010
Weight (gr)	485	**Depth (m)**	2	**Testing Date**	1.04.2010

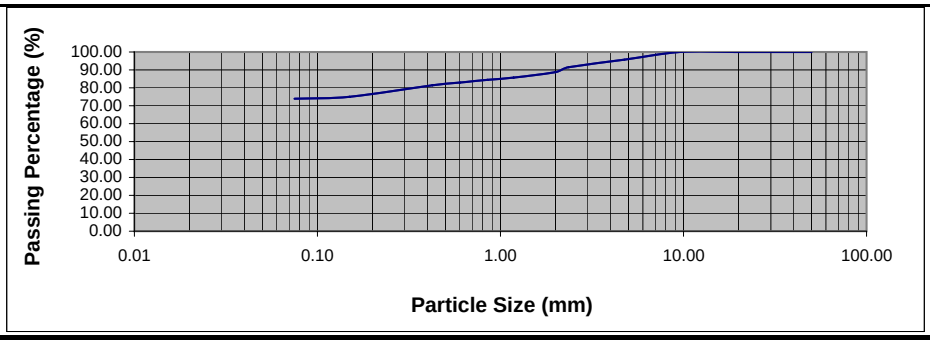
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**4.33**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	21.00	21.00	4.33	95.67	
2.36 mm	**No. 8**	20.00	41.00	8.45	91.55	
2.00 mm	**No. 10**	13.40	54.40	11.22	88.78	
1.18 mm	**No. 16**	14.70	69.10	14.25	85.75	
850 µm	**No. 20**	6.10	75.20	15.51	84.49	**21.71**
600 µm	**No. 30**	7.30	82.50	17.01	82.99	
425 µm	**No. 40**	7.50	90.00	18.56	81.44	
150 µm	**No. 100**	31.10	121.10	24.97	75.03	
75 µm	**No. 200**	5.20	126.30	26.04	73.96	**73.96**
Pan		358.70	485.00	100.00	0.00	
TOTAL		**485.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	26.73%	**21.67%**	**5.06%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	4.33	21.71	73.96

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	117

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A28**			**Sampling Date**	27.03.2010
Weight (gr)	520	**Depth (m)**	2.7	**Testing Date**	1.04.2010

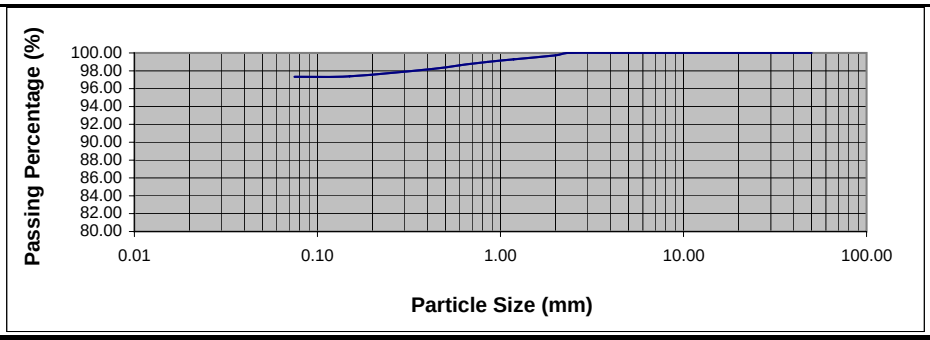
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.00**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.00	0.00	0.00	100.00	
2.36 mm	**No. 8**	0.00	0.00	0.00	100.00	
2.00 mm	**No. 10**	1.40	1.40	0.27	99.73	
1.18 mm	**No. 16**	2.30	3.70	0.71	99.29	
850 µm	**No. 20**	1.50	5.20	1.00	99.00	**2.67**
600 µm	**No. 30**	2.00	7.20	1.38	98.62	
425 µm	**No. 40**	2.10	9.30	1.79	98.21	
150 µm	**No. 100**	4.30	13.60	2.62	97.38	
75 µm	**No. 200**	0.30	13.90	2.67	97.33	**97.33**
Pan		506.10	520.00	100.00	0.00	
TOTAL		**520.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	23.61%	**19.35%**	**4.26%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.00	2.67	97.33

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	118

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A28**			**Sampling Date**	27.03.2010
Weight (gr)	466	**Depth (m)**	3.7	**Testing Date**	1.04.2010

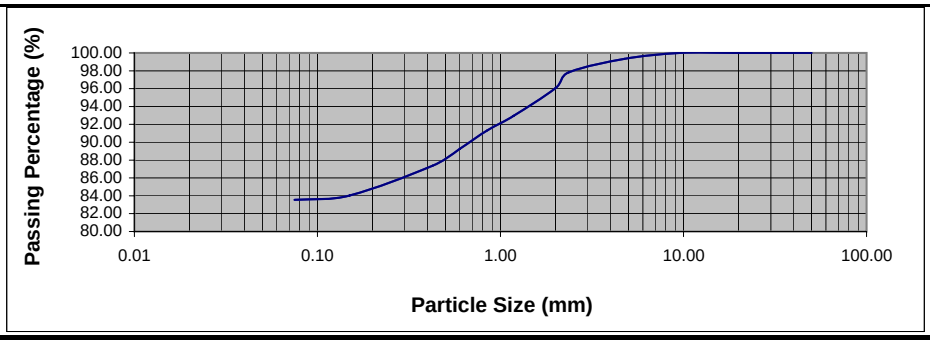
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.67**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	3.10	3.10	0.67	99.33	
2.36 mm	**No. 8**	7.00	10.10	2.17	97.83	
2.00 mm	**No. 10**	8.30	18.40	3.95	96.05	
1.18 mm	**No. 16**	14.40	32.80	7.04	92.96	
850 µm	**No. 20**	7.50	40.30	8.65	91.35	**15.79**
600 µm	**No. 30**	9.70	50.00	10.73	89.27	
425 µm	**No. 40**	8.90	58.90	12.64	87.36	
150 µm	**No. 100**	15.50	74.40	15.97	84.03	
75 µm	**No. 200**	2.30	76.70	16.46	83.54	**83.54**
Pan		389.30	466.00	100.00	0.00	
TOTAL		**466.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	26.78%	**21.05%**	**5.73%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.67	15.79	83.54

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	119

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

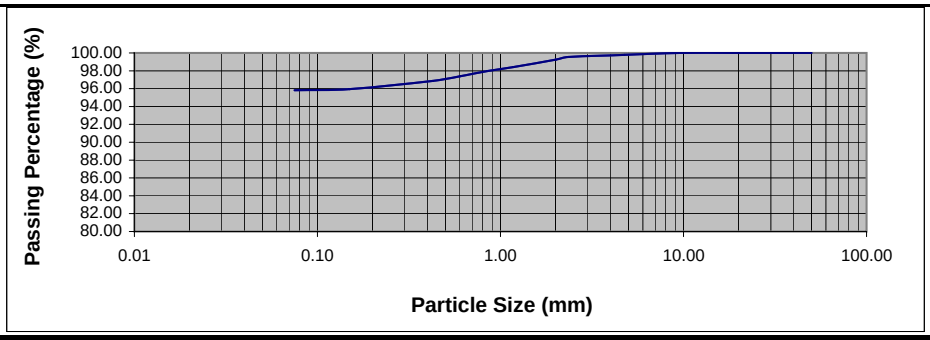
ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A28**			**Sampling Date**	27.03.2010
Weight (gr)	455	**Depth (m)**	4.5	**Testing Date**	1.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.22**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	1.00	1.00	0.22	99.78	
2.36 mm	**No. 8**	1.00	2.00	0.44	99.56	
2.00 mm	**No. 10**	1.40	3.40	0.75	99.25	
1.18 mm	**No. 16**	3.80	7.20	1.58	98.42	
850 µm	**No. 20**	2.00	9.20	2.02	97.98	**3.96**
600 µm	**No. 30**	2.70	11.90	2.62	97.38	
425 µm	**No. 40**	2.40	14.30	3.14	96.86	
150 µm	**No. 100**	4.10	18.40	4.04	95.96	
75 µm	**No. 200**	0.60	19.00	4.18	95.82	**95.82**
Pan		436.00	455.00	100.00	0.00	
TOTAL		**455.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**	
Atteberg Limits	**LL**	**PL**	**PI**
	24.68%	**19.67%**	**5.01%**
Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.22	3.96	95.82

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	120

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

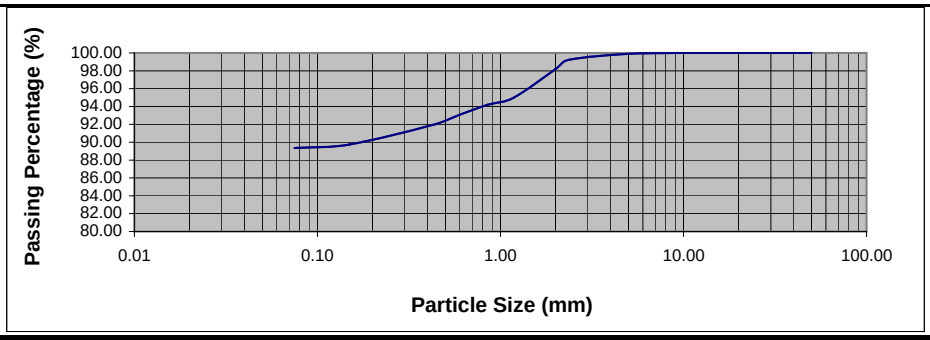
ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A28**			**Sampling Date**	27.03.2010
Weight (gr)	465	**Depth (m)**	5.5	**Testing Date**	1.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.13**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	0.60	0.60	0.13	99.87	
2.36 mm	**No. 8**	3.00	3.60	0.77	99.23	
2.00 mm	**No. 10**	4.80	8.40	1.81	98.19	
1.18 mm	**No. 16**	14.90	23.30	5.01	94.99	
850 µm	**No. 20**	3.70	27.00	5.81	94.19	**10.52**
600 µm	**No. 30**	5.20	32.20	6.92	93.08	
425 µm	**No. 40**	5.30	37.50	8.06	91.94	
150 µm	**No. 100**	10.20	47.70	10.26	89.74	
75 µm	**No. 200**	1.80	49.50	10.65	89.35	**89.35**
Pan		415.50	465.00	100.00	0.00	
TOTAL		**465.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**	
Atteberg Limits	**LL**	**PL**	**PI**
	23.20%	**16.42%**	**6.78%**
Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.13	10.52	89.35

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	121

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A29**			**Sampling Date**	27.03.2010
Weight (gr)	520	**Depth (m)**	2.5	**Testing Date**	1.04.2010

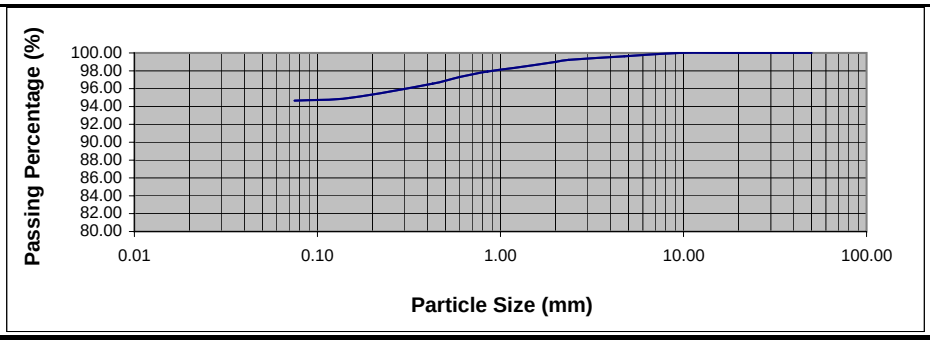
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.38**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	2.00	2.00	0.38	99.62	
2.36 mm	**No. 8**	2.00	4.00	0.77	99.23	
2.00 mm	**No. 10**	1.20	5.20	1.00	99.00	
1.18 mm	**No. 16**	3.60	8.80	1.69	98.31	
850 µm	**No. 20**	2.00	10.80	2.08	97.92	**4.96**
600 µm	**No. 30**	3.20	14.00	2.69	97.31	
425 µm	**No. 40**	3.90	17.90	3.44	96.56	
150 µm	**No. 100**	8.30	26.20	5.04	94.96	
75 µm	**No. 200**	1.60	27.80	5.35	94.65	**94.65**
Pan		492.20	520.00	100.00	0.00	
TOTAL		**520.00**				

SOIL CLASSIFICATION	**CL**	**LEAN CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	23.09%	**13.33%**	**9.76%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.38	4.96	94.65

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	122

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A29**			**Sampling Date**	27.03.2010
Weight (gr)	460	**Depth (m)**	3.5	**Testing Date**	1.04.2010

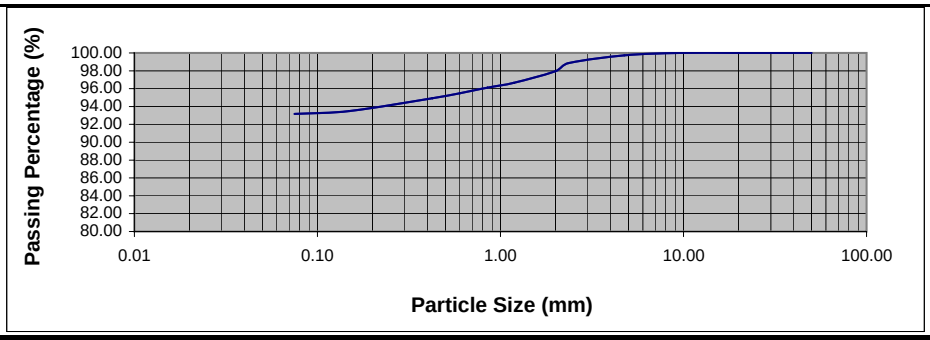
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.26**
9.5 mm	**3/8 in**	0.00	0.00	0.00	100.00	
4.75 mm	**No. 4**	1.20	1.20	0.26	99.74	
2.36 mm	**No. 8**	4.00	5.20	1.13	98.87	
2.00 mm	**No. 10**	4.20	9.40	2.04	97.96	
1.18 mm	**No. 16**	6.00	15.40	3.35	96.65	
850 µm	**No. 20**	2.50	17.90	3.89	96.11	**6.57**
600 µm	**No. 30**	2.90	20.80	4.52	95.48	
425 µm	**No. 40**	2.50	23.30	5.07	94.93	
150 µm	**No. 100**	6.60	29.90	6.50	93.50	
75 µm	**No. 200**	1.50	31.40	6.83	93.17	**93.17**
Pan		428.60	460.00	100.00	0.00	
TOTAL		**460.00**				

SOIL CLASSIFICATION	**CL**	**LEAN CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	25.54%	**17.95%**	**7.59%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.26	6.57	93.17

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	123

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A29**			**Sampling Date**	27.03.2010
Weight (gr)	1401	**Depth (m)**	4.5	**Testing Date**	1.04.2010

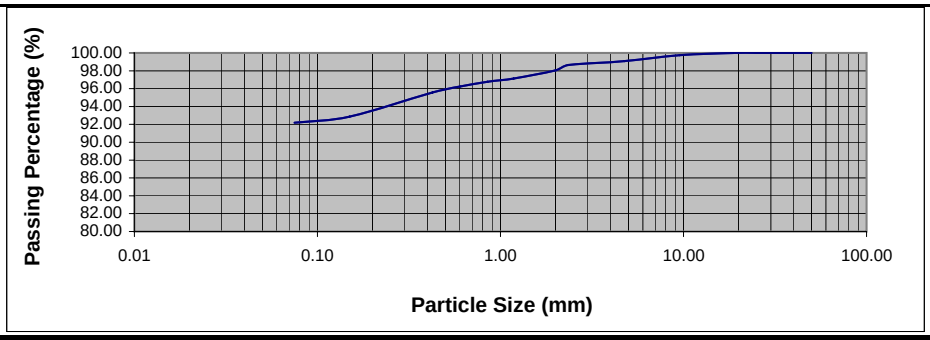
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.92**
9.5 mm	**3/8 in**	3.60	3.60	0.26	99.74	
4.75 mm	**No. 4**	9.30	12.90	0.92	99.08	
2.36 mm	**No. 8**	6.00	18.90	1.35	98.65	
2.00 mm	**No. 10**	8.40	27.30	1.95	98.05	
1.18 mm	**No. 16**	12.90	40.20	2.87	97.13	
850 µm	**No. 20**	5.10	45.30	3.23	96.77	**6.90**
600 µm	**No. 30**	7.50	52.80	3.77	96.23	
425 µm	**No. 40**	9.30	62.10	4.43	95.57	
150 µm	**No. 100**	37.80	99.90	7.13	92.87	
75 µm	**No. 200**	9.60	109.50	7.82	92.18	**92.18**
Pan		1291.50	1401.00	100.00	0.00	
TOTAL		**1401.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	24.51%	**17.65%**	**6.86%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.92	6.90	92.18

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	124

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A29**			**Sampling Date**	27.03.2010
Weight (gr)	545	**Depth (m)**	5.5	**Testing Date**	1.04.2010

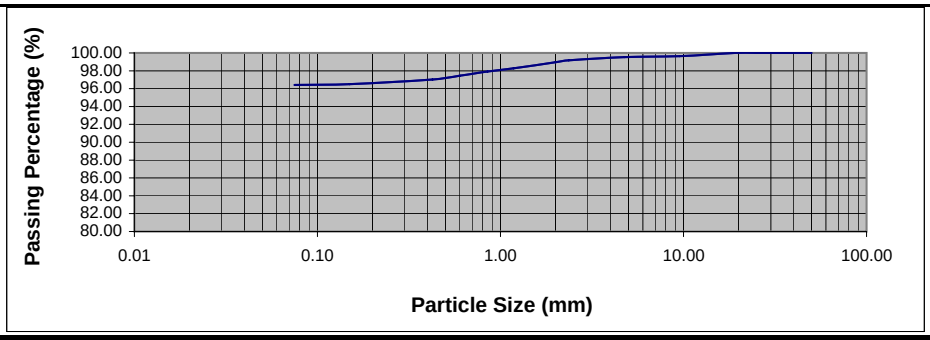
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.46**
9.5 mm	**3/8 in**	2.00	2.00	0.37	99.63	
4.75 mm	**No. 4**	0.50	2.50	0.46	99.54	
2.36 mm	**No. 8**	2.00	4.50	0.83	99.17	
2.00 mm	**No. 10**	1.20	5.70	1.05	98.95	
1.18 mm	**No. 16**	3.70	9.40	1.72	98.28	
850 µm	**No. 20**	1.90	11.30	2.07	97.93	**3.12**
600 µm	**No. 30**	2.60	13.90	2.55	97.45	
425 µm	**No. 40**	2.30	16.20	2.97	97.03	
150 µm	**No. 100**	2.80	19.00	3.49	96.51	
75 µm	**No. 200**	0.50	19.50	3.58	96.42	**96.42**
Pan		525.50	545.00	100.00	0.00	
TOTAL		**545.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	24.88%	**20.31%**	**4.57%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.46	3.12	96.42

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	125

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A30**			**Sampling Date**	27.03.2010
Weight (gr)	1797	**Depth (m)**	1.5	**Testing Date**	4.04.2010

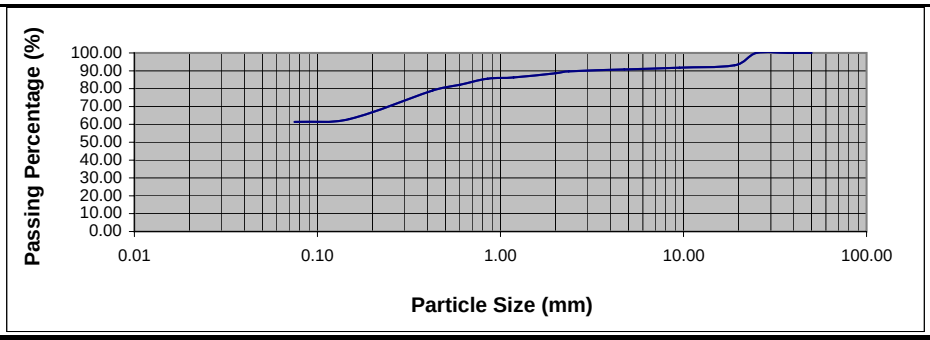
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	0.00	0.00	0.00	100.00	
25.0 mm	1 in	0.00	0.00	0.00	100.00	
19.0 mm	3/4 in	123.60	123.60	6.88	93.12	9.27
9.5 mm	3/8 in	24.00	147.60	8.21	91.79	
4.75 mm	No. 4	18.90	166.50	9.27	90.73	
2.36 mm	No. 8	18.00	184.50	10.27	89.73	
2.00 mm	No. 10	19.80	204.30	11.37	88.63	
1.18 mm	No. 16	41.40	245.70	13.67	86.33	
850 µm	No. 20	13.20	258.90	14.41	85.59	29.40
600 µm	No. 30	60.90	319.80	17.80	82.20	
425 µm	No. 40	59.40	379.20	21.10	78.90	
150 µm	No. 100	286.50	665.70	37.05	62.95	
75 µm	No. 200	29.10	694.80	38.66	61.34	61.34
Pan		1102.20	1797.00	100.00	0.00	
TOTAL		**1797.00**				

SOIL CLASSIFICATION	CL-ML	SANDY SILTY CLAY

Atteberg Limits	LL	PL	PI
	23.23%	18.18%	5.05%

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	9.27	29.40	61.34

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	126

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A30**			**Sampling Date**	27.03.2010
Weight (gr)	639	**Depth (m)**	3.5	**Testing Date**	4.04.2010

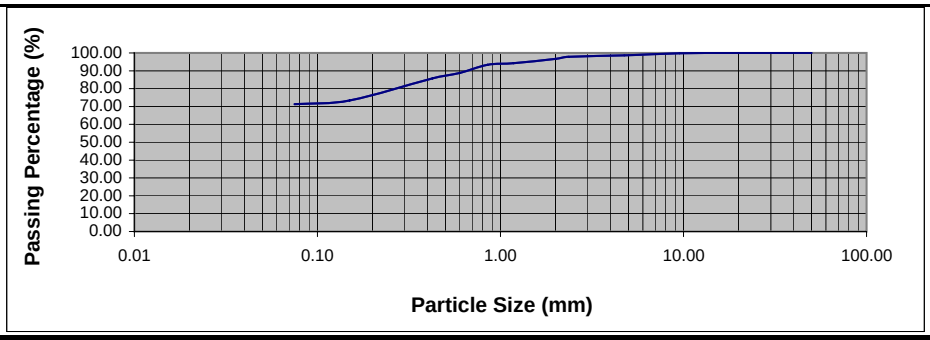
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**1.36**
9.5 mm	**3/8 in**	1.40	1.40	0.22	99.78	
4.75 mm	**No. 4**	7.30	8.70	1.36	98.64	
2.36 mm	**No. 8**	5.00	13.70	2.14	97.86	
2.00 mm	**No. 10**	7.70	21.40	3.35	96.65	
1.18 mm	**No. 16**	15.50	36.90	5.77	94.23	
850 µm	**No. 20**	5.30	42.20	6.60	93.40	**27.28**
600 µm	**No. 30**	29.60	71.80	11.24	88.76	
425 µm	**No. 40**	19.10	90.90	14.23	85.77	
150 µm	**No. 100**	79.30	170.20	26.64	73.36	
75 µm	**No. 200**	12.80	183.00	28.64	71.36	**71.36**
Pan		456.00	639.00	100.00	0.00	
TOTAL		**639.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY WITH SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	20.69%	**16.67%**	**4.02%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	1.36	27.28	71.36

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	127

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

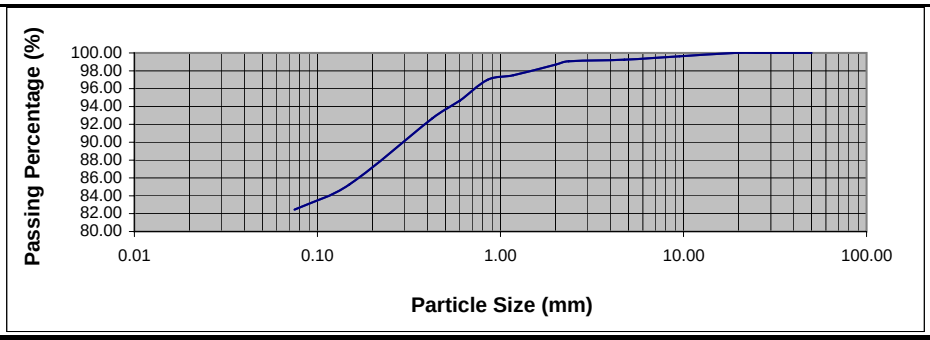
Location	**BH # A30**			**Sampling Date**	27.03.2010
Weight (gr)	550	**Depth (m)**	4.5	**Testing Date**	4.04.2010

Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**0.75**
9.5 mm	**3/8 in**	2.10	2.10	0.38	99.62	
4.75 mm	**No. 4**	2.00	4.10	0.75	99.25	
2.36 mm	**No. 8**	1.00	5.10	0.93	99.07	
2.00 mm	**No. 10**	2.10	7.20	1.31	98.69	
1.18 mm	**No. 16**	6.50	13.70	2.49	97.51	
850 µm	**No. 20**	2.90	16.60	3.02	96.98	**16.80**
600 µm	**No. 30**	12.80	29.40	5.35	94.65	
425 µm	**No. 40**	10.80	40.20	7.31	92.69	
150 µm	**No. 100**	40.70	80.90	14.71	85.29	
75 µm	**No. 200**	15.60	96.50	17.55	82.45	**82.45**
Pan		453.50	550.00	100.00	0.00	
TOTAL		**550.00**				

SOIL CLASSIFICATION	**ML**	**SILT WITH SAND**	
Atteberg Limits	**LL**	**PL**	**PI**
	22.73%	**18.92%**	**3.81%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	0.75	16.80	82.45

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	128

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A30**			**Sampling Date**	27.03.2010
Weight (gr)	3048	**Depth (m)**	7	**Testing Date**	4.04.2010

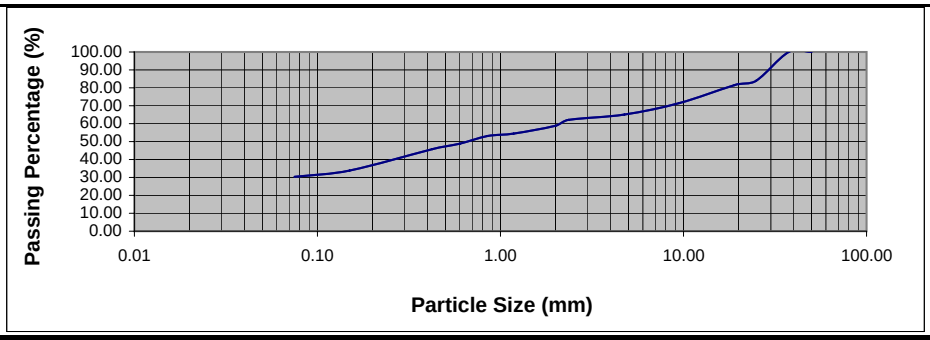
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	486.00	486.00	15.94	84.06	
19.0 mm	**3/4 in**	78.00	564.00	18.50	81.50	**34.94**
9.5 mm	**3/8 in**	303.00	867.00	28.44	71.56	
4.75 mm	**No. 4**	198.00	1065.00	34.94	65.06	
2.36 mm	**No. 8**	90.00	1155.00	37.89	62.11	
2.00 mm	**No. 10**	99.00	1254.00	41.14	58.86	
1.18 mm	**No. 16**	135.00	1389.00	45.57	54.43	
850 µm	**No. 20**	39.00	1428.00	46.85	53.15	**34.74**
600 µm	**No. 30**	132.00	1560.00	51.18	48.82	
425 µm	**No. 40**	93.00	1653.00	54.23	45.77	
150 µm	**No. 100**	363.00	2016.00	66.14	33.86	
75 µm	**No. 200**	108.00	2124.00	69.69	30.31	**30.31**
Pan		924.00	3048.00	100.00	0.00	
TOTAL		**3048.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	34.94	34.74	30.31

Remarks :



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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	129

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A30**			**Sampling Date**	27.03.2010
Weight (gr)	598	**Depth (m)**	9.5	**Testing Date**	4.04.2010

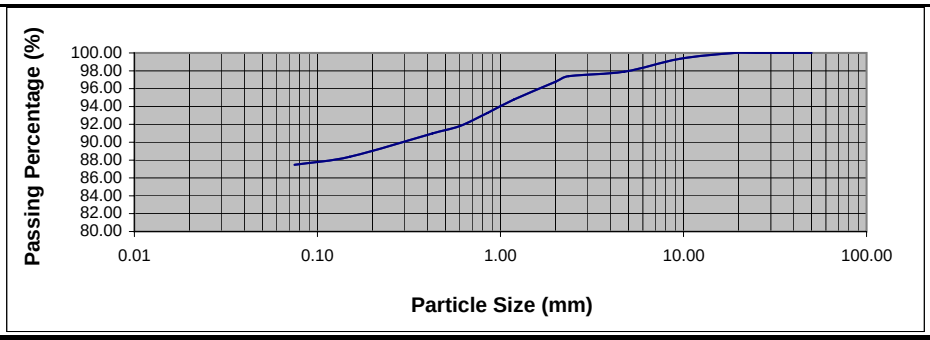
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.09**
9.5 mm	**3/8 in**	4.00	4.00	0.67	99.33	
4.75 mm	**No. 4**	8.50	12.50	2.09	97.91	
2.36 mm	**No. 8**	3.00	15.50	2.59	97.41	
2.00 mm	**No. 10**	3.80	19.30	3.23	96.77	
1.18 mm	**No. 16**	12.00	31.30	5.23	94.77	
850 µm	**No. 20**	8.90	40.20	6.72	93.28	**10.43**
600 µm	**No. 30**	8.80	49.00	8.19	91.81	
425 µm	**No. 40**	4.90	53.90	9.01	90.99	
150 µm	**No. 100**	15.70	69.60	11.64	88.36	
75 µm	**No. 200**	5.30	74.90	12.53	87.47	**87.47**
Pan		523.10	598.00	100.00	0.00	
TOTAL		**598.00**				

SOIL CLASSIFICATION	**CL-ML**	**SILTY CLAY**

Atteberg Limits	**LL**	**PL**	**PI**
	30.49%	**24.44%**	**6.05%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.09	10.43	87.47

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	130

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A30**			**Sampling Date**	27.03.2010
Weight (gr)	5205	**Depth (m)**	11	**Testing Date**	4.04.2010

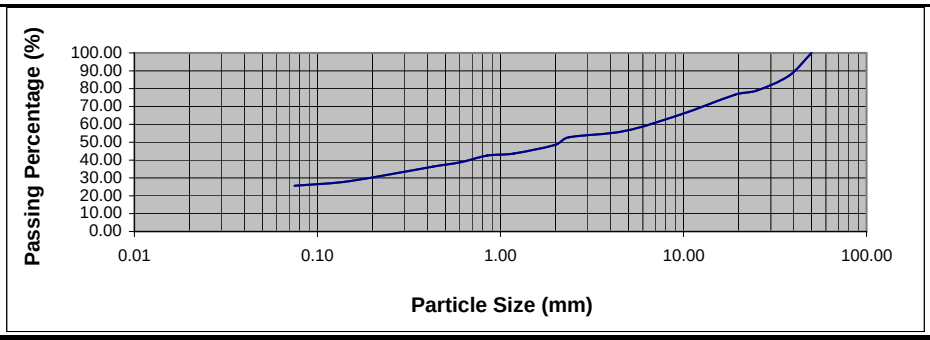
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	671.70	671.70	12.90	87.10	
25.0 mm	**1 in**	430.20	1101.90	21.17	78.83	
19.0 mm	**3/4 in**	121.80	1223.70	23.51	76.49	**43.76**
9.5 mm	**3/8 in**	581.40	1805.10	34.68	65.32	
4.75 mm	**No. 4**	472.80	2277.90	43.76	56.24	
2.36 mm	**No. 8**	180.00	2457.90	47.22	52.78	
2.00 mm	**No. 10**	221.10	2679.00	51.47	48.53	
1.18 mm	**No. 16**	255.60	2934.60	56.38	43.62	
850 µm	**No. 20**	57.00	2991.60	57.48	42.52	**30.61**
600 µm	**No. 30**	200.10	3191.70	61.32	38.68	
425 µm	**No. 40**	124.50	3316.20	63.71	36.29	
150 µm	**No. 100**	420.00	3736.20	71.78	28.22	
75 µm	**No. 200**	135.00	3871.20	74.37	25.63	**25.63**
Pan		1333.80	5205.00	100.00	0.00	
TOTAL		**5205.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	43.76	30.61	25.63

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	131

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A30**			**Sampling Date**	27.03.2010
Weight (gr)	643	**Depth (m)**	12.5	**Testing Date**	4.04.2010

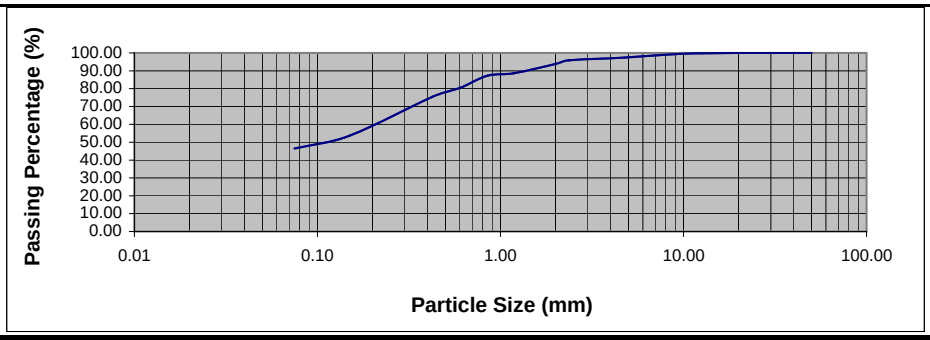
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	0.00	0.00	0.00	100.00	
19.0 mm	**3/4 in**	0.00	0.00	0.00	100.00	**2.60**
9.5 mm	**3/8 in**	3.40	3.40	0.53	99.47	
4.75 mm	**No. 4**	13.30	16.70	2.60	97.40	
2.36 mm	**No. 8**	10.00	26.70	4.15	95.85	
2.00 mm	**No. 10**	13.00	39.70	6.17	93.83	
1.18 mm	**No. 16**	33.40	73.10	11.37	88.63	
850 µm	**No. 20**	9.00	82.10	12.77	87.23	**50.92**
600 µm	**No. 30**	44.00	126.10	19.61	80.39	
425 µm	**No. 40**	32.00	158.10	24.59	75.41	
150 µm	**No. 100**	140.00	298.10	46.36	53.64	
75 µm	**No. 200**	46.00	344.10	53.51	46.49	**46.49**
Pan		298.90	643.00	100.00	0.00	
TOTAL		**643.00**				

SOIL CLASSIFICATION	**SC-SM**	**SILTY, CLAYEY SAND**

Atteberg Limits	**LL**	**PL**	**PI**
	28.37%	**22.73%**	**5.64%**

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	2.60	50.92	46.49

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	132

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A30**			**Sampling Date**	27.03.2010
Weight (gr)	4107	**Depth (m)**	14	**Testing Date**	4.04.2010

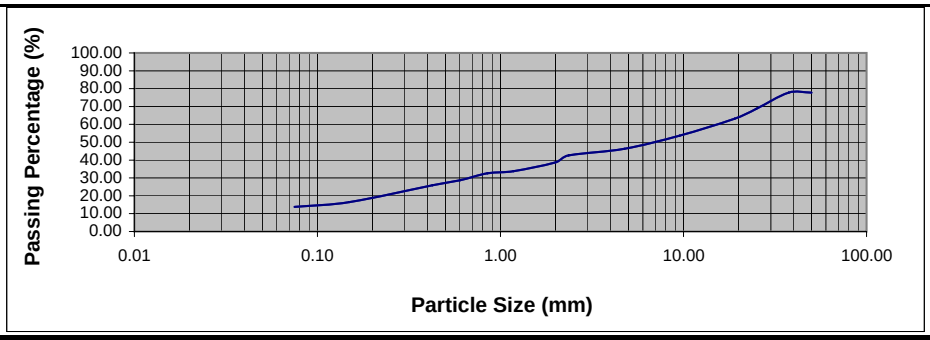
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	912.00	912.00	22.21	77.79	
37.5 mm	1.5 in	0.00	912.00	22.21	77.79	
25.0 mm	1 in	373.20	1285.20	31.29	68.71	
19.0 mm	3/4 in	228.00	1513.20	36.84	63.16	53.71
9.5 mm	3/8 in	391.20	1904.40	46.37	53.63	
4.75 mm	No. 4	301.50	2205.90	53.71	46.29	
2.36 mm	No. 8	150.00	2355.90	57.36	42.64	
2.00 mm	No. 10	160.50	2516.40	61.27	38.73	
1.18 mm	No. 16	202.50	2718.90	66.20	33.80	
850 µm	No. 20	48.00	2766.90	67.37	32.63	32.49
600 µm	No. 30	162.00	2928.90	71.31	28.69	
425 µm	No. 40	114.00	3042.90	74.09	25.91	
150 µm	No. 100	387.90	3430.80	83.54	16.46	
75 µm	No. 200	109.50	3540.30	86.20	13.80	13.80
Pan		566.70	4107.00	100.00	0.00	
TOTAL		**4107.00**				

SOIL CLASSIFICATION	GM	SILTY GRAVEL WITH SAND

Atteberg Limits	LL	PL	PI
	Non Plastic		

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	53.71	32.49	13.80

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	133

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A30**			**Sampling Date**	27.03.2010
Weight (gr)	2802	**Depth (m)**	15.5	**Testing Date**	4.04.2010

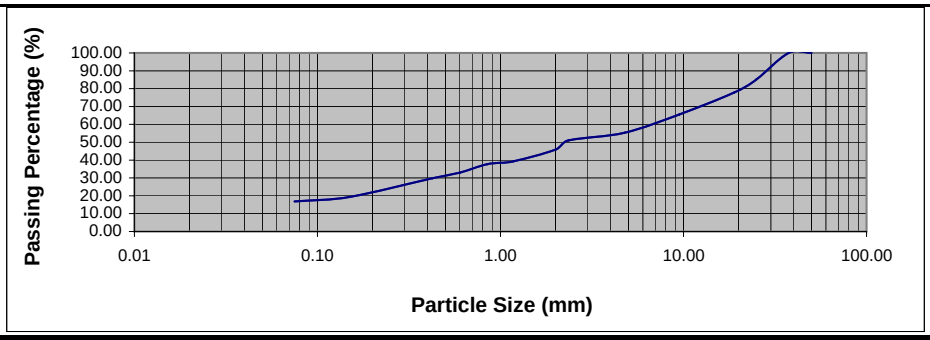
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	418.00	418.00	14.92	85.08	
19.0 mm	**3/4 in**	200.00	618.00	22.06	77.94	**44.68**
9.5 mm	**3/8 in**	345.00	963.00	34.37	65.63	
4.75 mm	**No. 4**	289.00	1252.00	44.68	55.32	
2.36 mm	**No. 8**	120.00	1372.00	48.97	51.03	
2.00 mm	**No. 10**	143.40	1515.40	54.08	45.92	
1.18 mm	**No. 16**	184.40	1699.80	60.66	39.34	
850 µm	**No. 20**	44.80	1744.60	62.26	37.74	**38.47**
600 µm	**No. 30**	134.00	1878.60	67.04	32.96	
425 µm	**No. 40**	87.40	1966.00	70.16	29.84	
150 µm	**No. 100**	292.60	2258.60	80.61	19.39	
75 µm	**No. 200**	71.20	2329.80	83.15	16.85	**16.85**
Pan		472.20	2802.00	100.00	0.00	
TOTAL		**2802.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	44.68	38.47	16.85

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	134

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A30**			**Sampling Date**	27.03.2010
Weight (gr)	3256	**Depth (m)**	16.5	**Testing Date**	4.04.2010

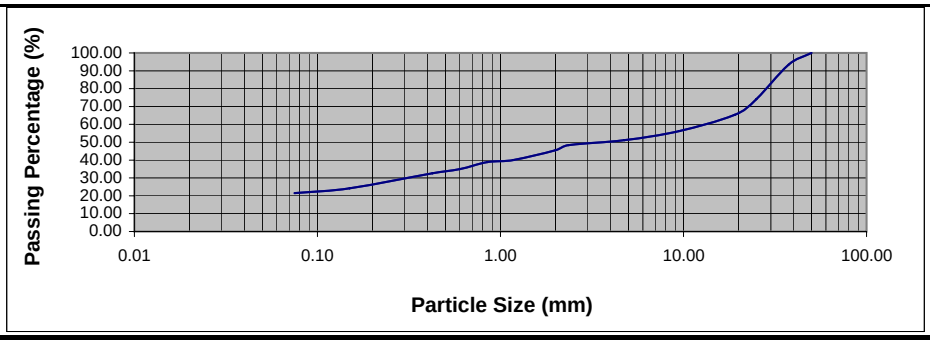
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	214.00	214.00	6.57	93.43	
25.0 mm	**1 in**	630.60	844.60	25.94	74.06	
19.0 mm	**3/4 in**	285.40	1130.00	34.71	65.29	**48.85**
9.5 mm	**3/8 in**	293.00	1423.00	43.70	56.30	
4.75 mm	**No. 4**	167.60	1590.60	48.85	51.15	
2.36 mm	**No. 8**	90.00	1680.60	51.62	48.38	
2.00 mm	**No. 10**	94.00	1774.60	54.50	45.50	
1.18 mm	**No. 16**	177.00	1951.60	59.94	40.06	
850 µm	**No. 20**	39.20	1990.80	61.14	38.86	**29.62**
600 µm	**No. 30**	126.80	2117.60	65.04	34.96	
425 µm	**No. 40**	76.00	2193.60	67.37	32.63	
150 µm	**No. 100**	276.00	2469.60	75.85	24.15	
75 µm	**No. 200**	85.40	2555.00	78.47	21.53	**21.53**
Pan		701.00	3256.00	100.00	0.00	
TOTAL		**3256.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	48.85	29.62	21.53

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	135

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A30**			**Sampling Date**	27.03.2010
Weight (gr)	3110	**Depth (m)**	18	**Testing Date**	4.04.2010

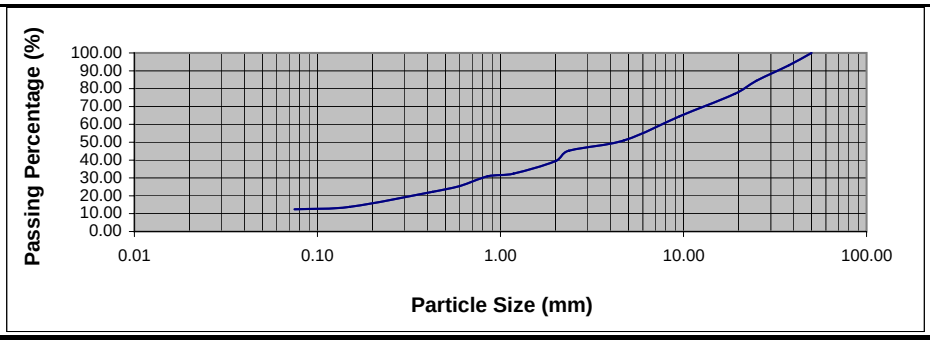
Sieve Size		Mass Retained	Cumulative			Specification
			Mass	Retained	Passing	Limits
Standard	Alternative	(gr)	Retained (gr)	%	%	%
50.0mm	2 in	0.00	0.00	0.00	100.00	
37.5 mm	1.5 in	217.20	217.20	6.98	93.02	
25.0 mm	1 in	268.00	485.20	15.60	84.40	
19.0 mm	3/4 in	227.20	712.40	22.91	77.09	48.94
9.5 mm	3/8 in	391.00	1103.40	35.48	64.52	
4.75 mm	No. 4	418.60	1522.00	48.94	51.06	
2.36 mm	No. 8	180.00	1702.00	54.73	45.27	
2.00 mm	No. 10	182.60	1884.60	60.60	39.40	
1.18 mm	No. 16	216.40	2101.00	67.56	32.44	
850 µm	No. 20	46.40	2147.40	69.05	30.95	38.62
600 µm	No. 30	171.20	2318.60	74.55	25.45	
425 µm	No. 40	99.40	2418.00	77.75	22.25	
150 µm	No. 100	263.00	2681.00	86.21	13.79	
75 µm	No. 200	42.00	2723.00	87.56	12.44	12.44
Pan		387.00	3110.00	100.00	0.00	
TOTAL		**3110.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	LL	PL	PI
	Non Plastic		

Percentage of Contents	%Gravel	%Sand	%Silt & Clay
	48.94	38.62	12.44

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul - Province
Project	**Ministry of Public Health (MOPH) Facility, Kabul Province**	**Sample No.**	136

SIEVE ANALYSIS, ATTERBERG LIMITS, SOIL CLASSIFICATION

ASTM D 422, ASTM D-4318, ASTM D-2487

Location	**BH # A30**			**Sampling Date**	27.03.2010
Weight (gr)	3202	**Depth (m)**	20	**Testing Date**	4.04.2010

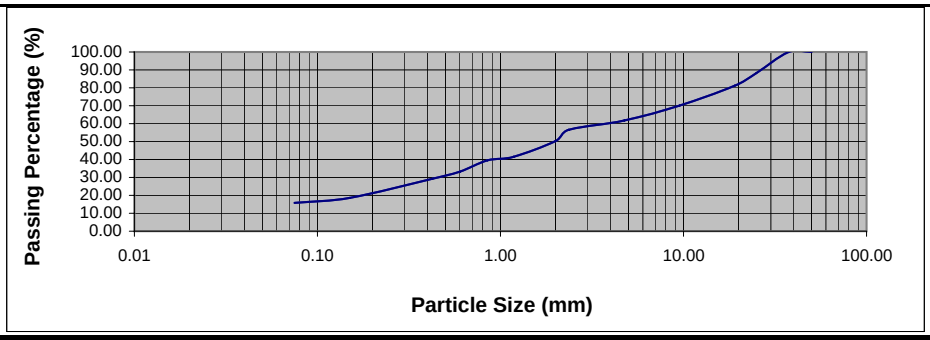
Sieve Size		**Mass**	**Cumulative**			**Specification**
		Retained	**Mass**	**Retained**	**Passing**	**Limits**
Standard	**Alternative**	(gr)	Retained (gr)	%	%	**%**
50.0mm	**2 in**	0.00	0.00	0.00	100.00	
37.5 mm	**1.5 in**	0.00	0.00	0.00	100.00	
25.0 mm	**1 in**	377.00	377.00	11.77	88.23	
19.0 mm	**3/4 in**	225.00	602.00	18.80	81.20	**38.25**
9.5 mm	**3/8 in**	355.40	957.40	29.90	70.10	
4.75 mm	**No. 4**	267.40	1224.80	38.25	61.75	
2.36 mm	**No. 8**	166.00	1390.80	43.44	56.56	
2.00 mm	**No. 10**	201.40	1592.20	49.73	50.27	
1.18 mm	**No. 16**	281.00	1873.20	58.50	41.50	
850 µm	**No. 20**	61.00	1934.20	60.41	39.59	**45.94**
600 µm	**No. 30**	204.40	2138.60	66.79	33.21	
425 µm	**No. 40**	126.00	2264.60	70.72	29.28	
150 µm	**No. 100**	342.00	2606.60	81.41	18.59	
75 µm	**No. 200**	89.20	2695.80	84.19	15.81	**15.81**
Pan		506.20	3202.00	100.00	0.00	
TOTAL		**3202.00**				

SOIL CLASSIFICATION	**SM**	**SILTY SAND WITH GRAVEL**

Atteberg Limits	**LL**	**PL**	**PI**
	Non Plastic		

Percentage of Contents	**%Gravel**	**%Sand**	**%Silt & Clay**
	38.25	45.94	15.81

Remarks :



Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

Omran Geotechnical Company

Appendix F

Lab Test Results of Boreholes

- ***Atterberg Limits Test Results***

Professional Geotechnical Services

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

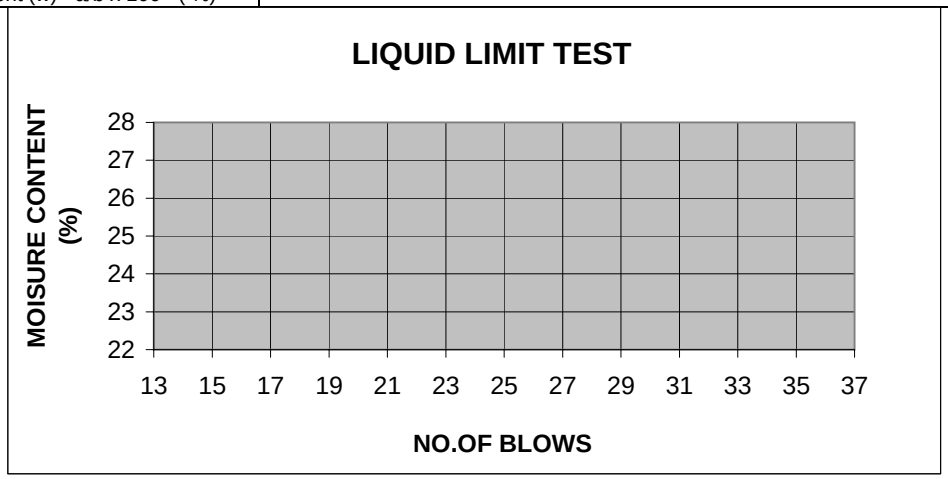
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	1
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A1	Depth: m	1

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

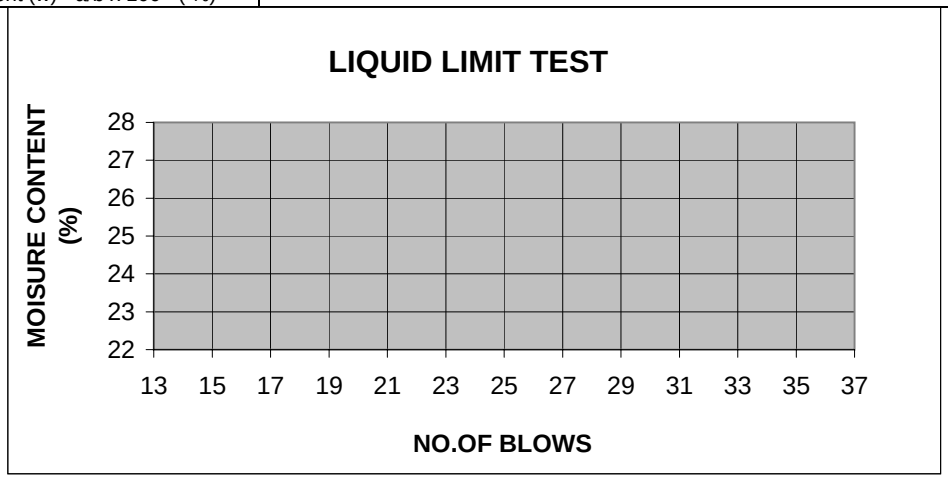
MATERIAL TESTING LAB

Omran Geotechnic Company

ATTERBERG LIMITS
ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	2
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A1	Depth: m	2

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

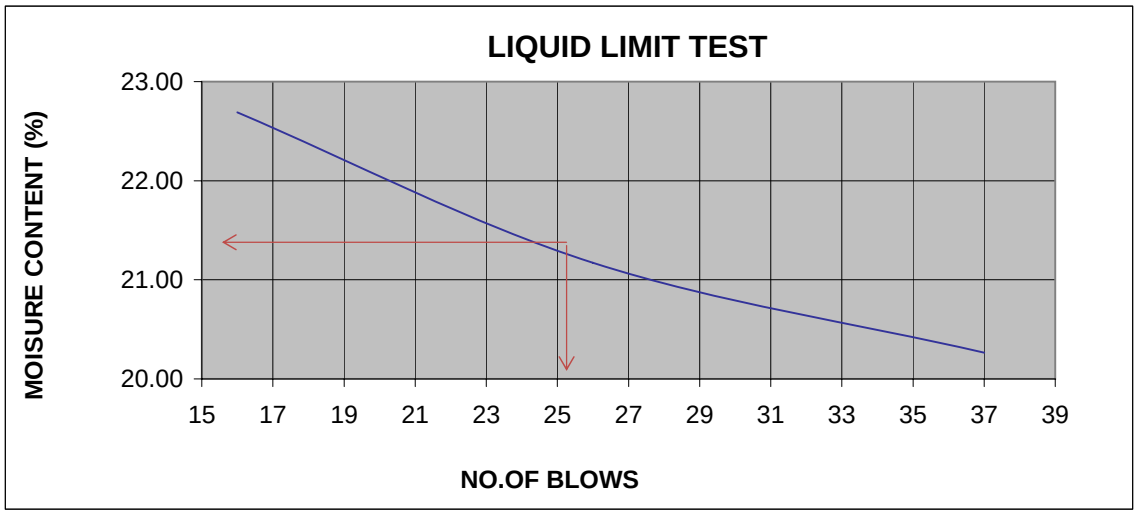
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	3
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A1	Depth: m	3

Description	Liquid Limit			Plastic Limit
No of Blows	16	26	37	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	51.2	49.2	49.1	31.8
Wt of Dry soil + Container W2 (g)	45.8	44.5	44.5	30.3
Wt of container W3 (g)	22	22.3	21.8	21.9
Wt. of water (a) W1 - W2 (g)	5.4	4.7	4.6	1.5
Wt. of Dry soil (b) W2 - W3 (g)	23.8	22.2	22.7	8.4
Moisture Content (w)= a/b x 100 (%)	22.69	21.17	20.26	17.86



LL= 21.37% **PL=** 17.86% **PI=** 3.51%

Remarks:

Tested by:	Hayat		
Checked by:	Jafari	E-mail:	
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com	

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

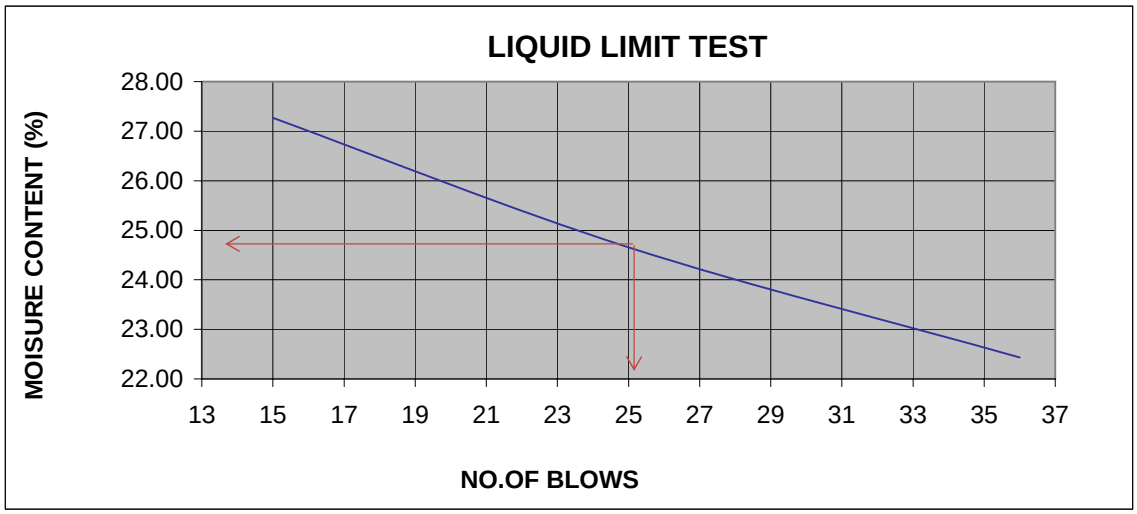
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	4
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A1	Depth: m	4

Description	Liquid Limit			Plastic Limit
No of Blows	15	25	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	23.9	22.6	26	20.4
Wt of Dry soil + Container W2 (g)	21.8	20.8	23.6	19.3
Wt of container W3 (g)	14.1	13.5	12.9	13.9
Wt. of water (a) W1 - W2 (g)	2.1	1.8	2.4	1.1
Wt. of Dry soil (b) W2 - W3 (g)	7.7	7.3	10.7	5.4
Moisture Content (w)= a/b x 100 (%)	27.27	24.66	22.43	20.37



LL= 24.78% **PL=** 20.37% **PI=** 4.41%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

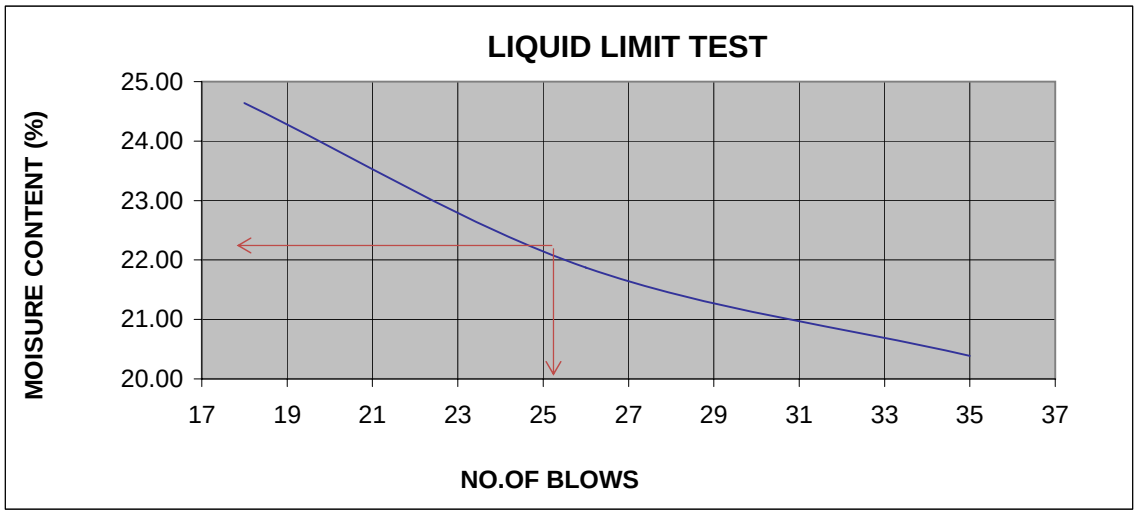
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	5
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A1	Depth: m	4.5

Description	Liquid Limit			Plastic Limit
No of Blows	18	26	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	31.5	35.5	35.5	28.1
Wt of Dry soil + Container W2 (g)	29.8	33.4	33.4	27.5
Wt of container W3 (g)	22.9	23.8	23.1	23.6
Wt. of water (a) W1 - W2 (g)	1.7	2.1	2.1	0.6
Wt. of Dry soil (b) W2 - W3 (g)	6.9	9.6	10.3	3.9
Moisture Content (w)= a/b x 100 (%)	24.64	21.88	20.39	15.38



LL= 22.30% **PL=** 15.38% **PI=** 6.92%

Remarks:

Tested by:	Hayat		
Checked by:	Jafari	E-mail:	
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com	

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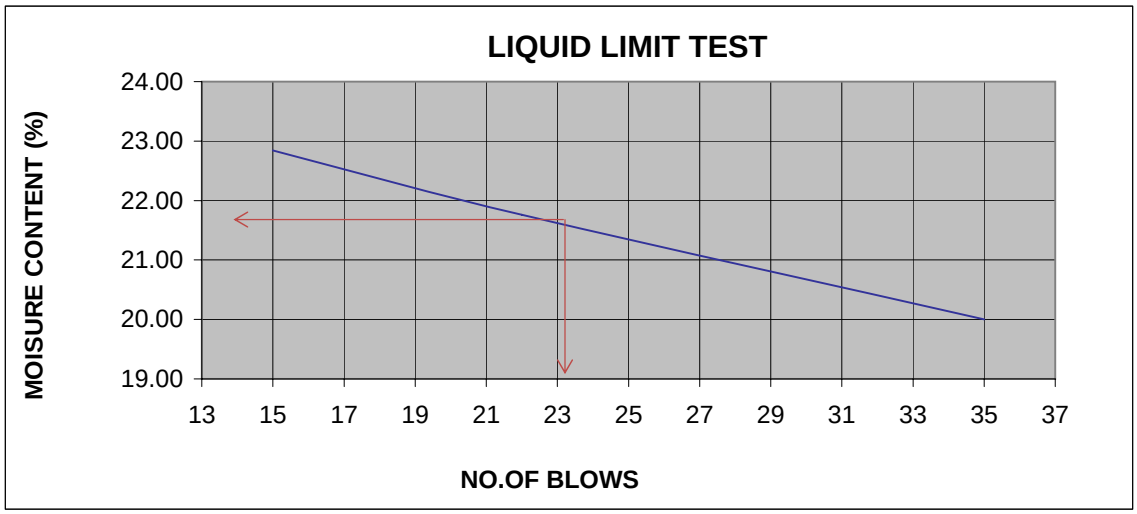
MATERIAL TESTING LAB

Omran Geotechnic Company

ATTERBERG LIMITS
ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	6
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A1	Depth: m	6

Description	Liquid Limit			Plastic Limit
No of Blows	15	22	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	43.1	43	40.9	21.4
Wt of Dry soil + Container W2 (g)	37.8	38.3	37	20.4
Wt of container W3 (g)	14.6	16.7	17.5	14.1
Wt. of water (a) W1 - W2 (g)	5.3	4.7	3.9	1
Wt. of Dry soil (b) W2 - W3 (g)	23.2	21.6	19.5	6.3
Moisture Content (w)= a/b x 100 (%)	22.84	21.76	20.00	15.87



LL= 21.53% **PL=** 15.87% **PI=** 5.66%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

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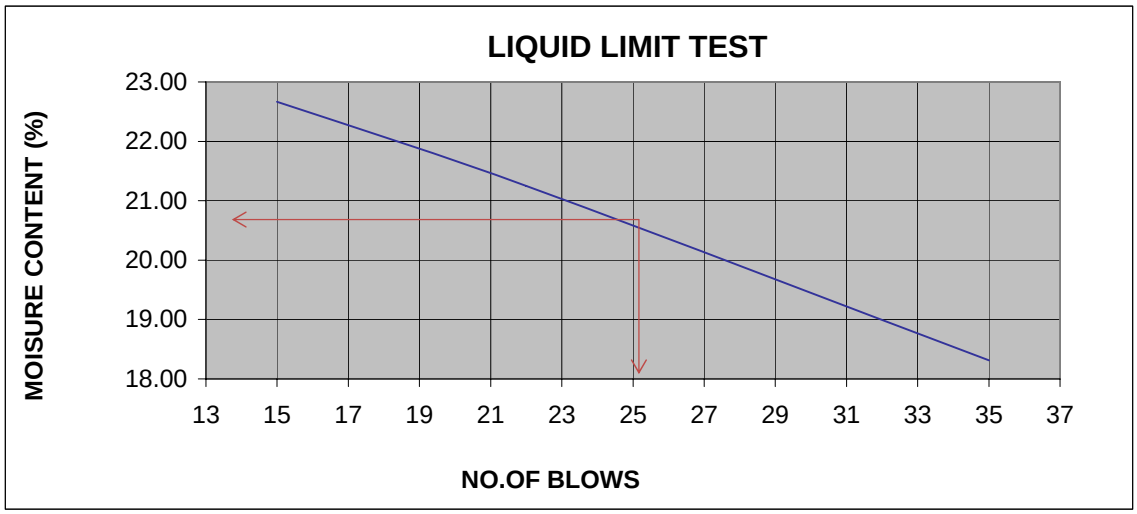
MATERIAL TESTING LAB

Omran Geotechnic Company

ATTERBERG LIMITS
ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	7
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A2	Depth: m	1

Description	Liquid Limit			Plastic Limit
No of Blows	15	22	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	15.1	15.6	16.1	11.5
Wt of Dry soil + Container W2 (g)	13.4	13.9	14.8	10.7
Wt of container W3 (g)	5.9	5.9	7.7	5.6
Wt. of water (a) W1 - W2 (g)	1.7	1.7	1.3	0.8
Wt. of Dry soil (b) W2 - W3 (g)	7.5	8.0	7.1	5.1
Moisture Content (w)= a/b x 100 (%)	22.67	21.25	18.31	15.69



LL= 20.74% **PL=** 15.69% **PI=** 5.05%

Remarks:

Tested by:	Hayat		
Checked by:	Jafari	E-mail:	
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com	

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MATERIAL TESTING LAB

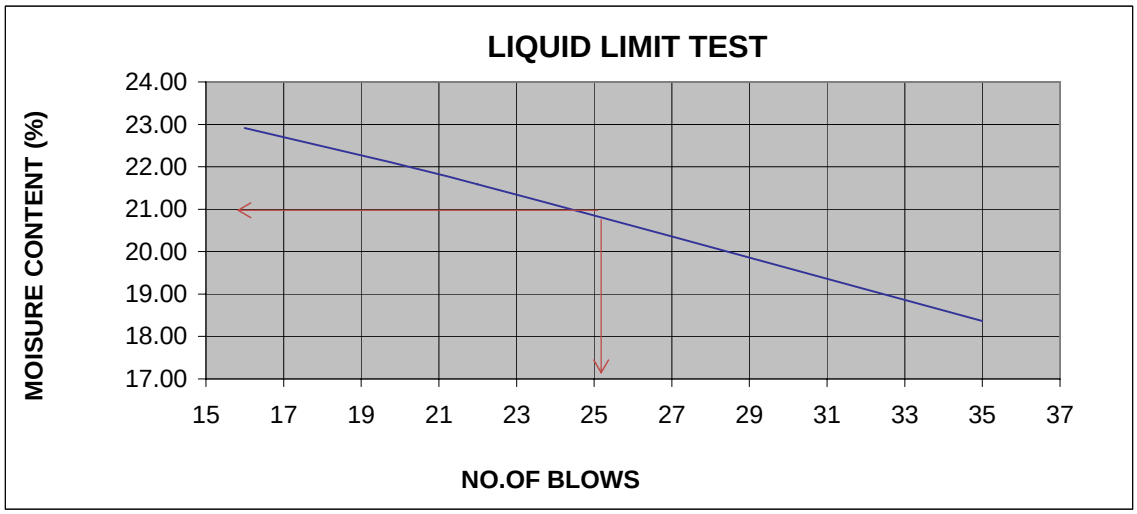
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	8
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A2	Depth: m	3

Description	Liquid Limit			Plastic Limit
No of Blows	16	22	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	35.2	40.9	35.1	27.3
Wt of Dry soil + Container W2 (g)	33	37.9	33.3	26.8
Wt of container W3 (g)	23.4	24	23.5	23.7
Wt. of water (a) W1 - W2 (g)	2.2	3.0	1.8	0.5
Wt. of Dry soil (b) W2 - W3 (g)	9.6	13.9	9.8	3.1
Moisture Content (w)= a/b x 100 (%)	22.92	21.58	18.37	16.13



LL= 20.95% **PL=** 16.13% **PI=** 4.82%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

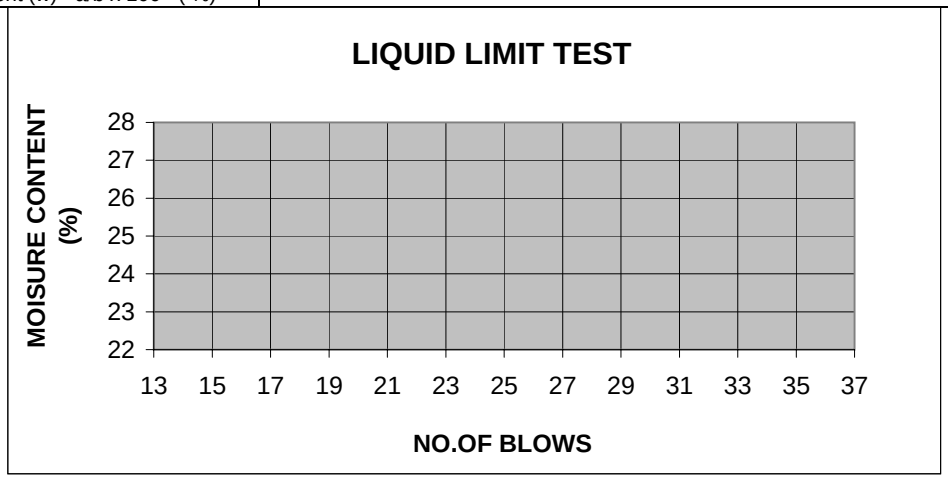
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	9
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A2	Depth: m	5.5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
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Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

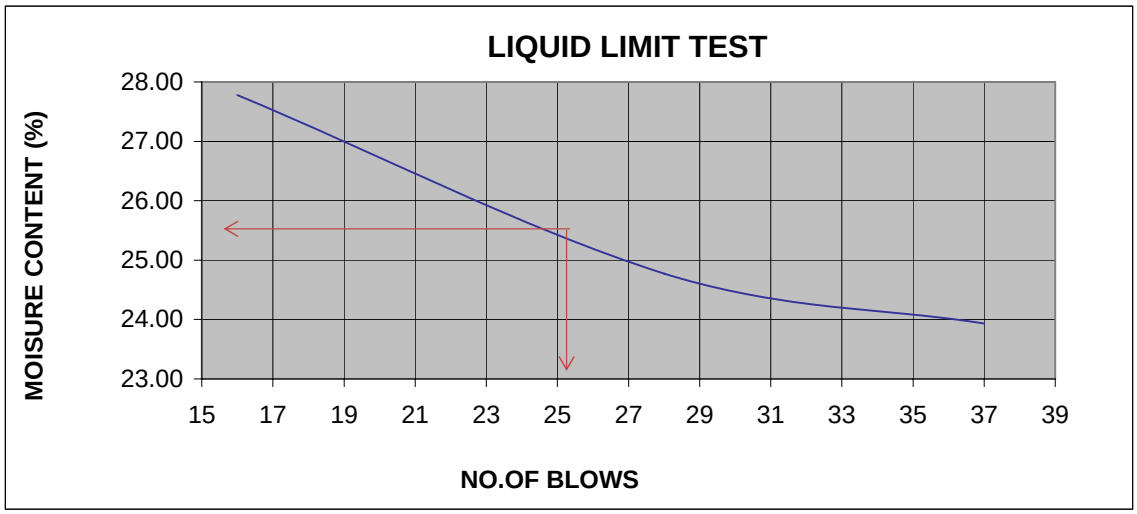
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	10
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A2	Depth: m	6

Description	Liquid Limit			Plastic Limit
No of Blows	16	28	37	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	37.1	37.6	38.1	27.9
Wt of Dry soil + Container W2 (g)	34.1	34.9	35.3	27.2
Wt of container W3 (g)	23.3	24	23.6	23.8
Wt. of water (a) W1 - W2 (g)	3	2.7	2.8	0.7
Wt. of Dry soil (b) W2 - W3 (g)	10.8	10.9	11.7	3.4
Moisture Content (w)= a/b x 100 (%)	27.78	24.77	23.93	20.59



LL= 25.49% **PL=** 20.59% **PI=** 4.90%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
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MATERIAL TESTING LAB

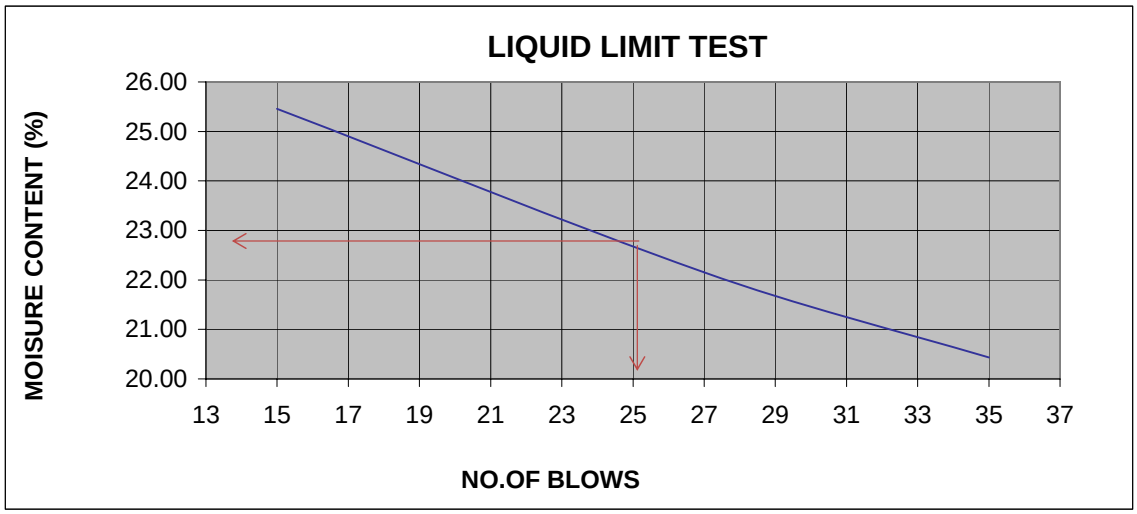
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	11
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A3	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	15	27	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	36.5	42.4	34.1	26.8
Wt of Dry soil + Container W2 (g)	33.7	38.9	32.2	26.3
Wt of container W3 (g)	22.7	23.1	22.9	23.4
Wt. of water (a) W1 - W2 (g)	2.8	3.5	1.9	0.5
Wt. of Dry soil (b) W2 - W3 (g)	11	15.8	9.3	2.9
Moisture Content (w)= a/b x 100 (%)	25.45	22.15	20.43	17.24



LL= 22.67% **PL=** 17.24% **PI=** 5.43%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

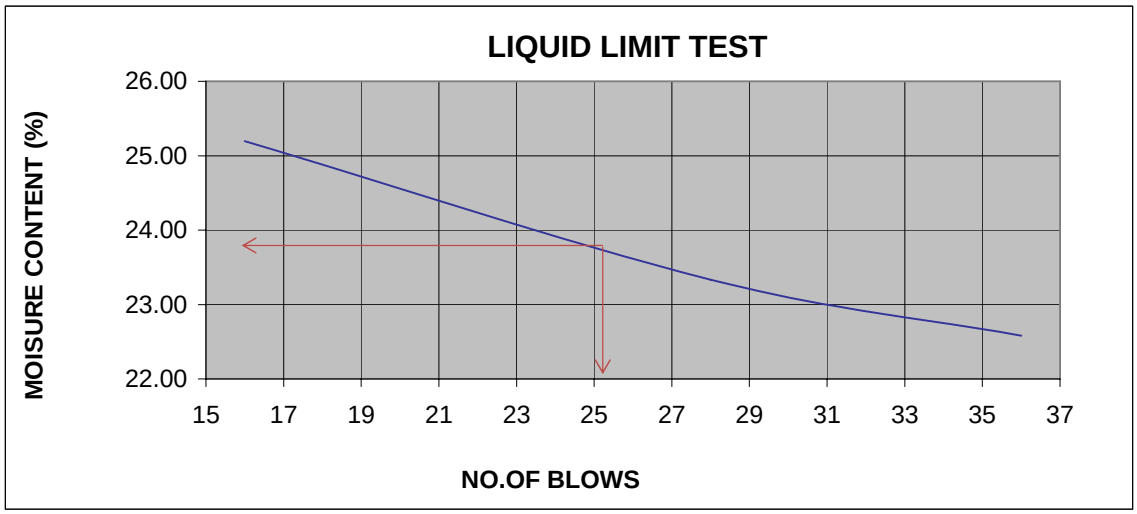
MATERIAL TESTING LAB

Omran Geotechnic Company

ATTERBERG LIMITS
ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	12
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A3	Depth: m	2.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	28	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	39.2	38.6	34.9	28
Wt of Dry soil + Container W2 (g)	36	35.8	32.8	27.3
Wt of container W3 (g)	23.3	23.8	23.5	23.5
Wt. of water (a) W1 - W2 (g)	3.2	2.8	2.1	0.7
Wt. of Dry soil (b) W2 - W3 (g)	12.7	12.0	9.3	3.8
Moisture Content (w)= a/b x 100 (%)	25.20	23.33	22.58	18.42



LL= 23.70% **PL=** 18.42% **PI=** 5.28%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

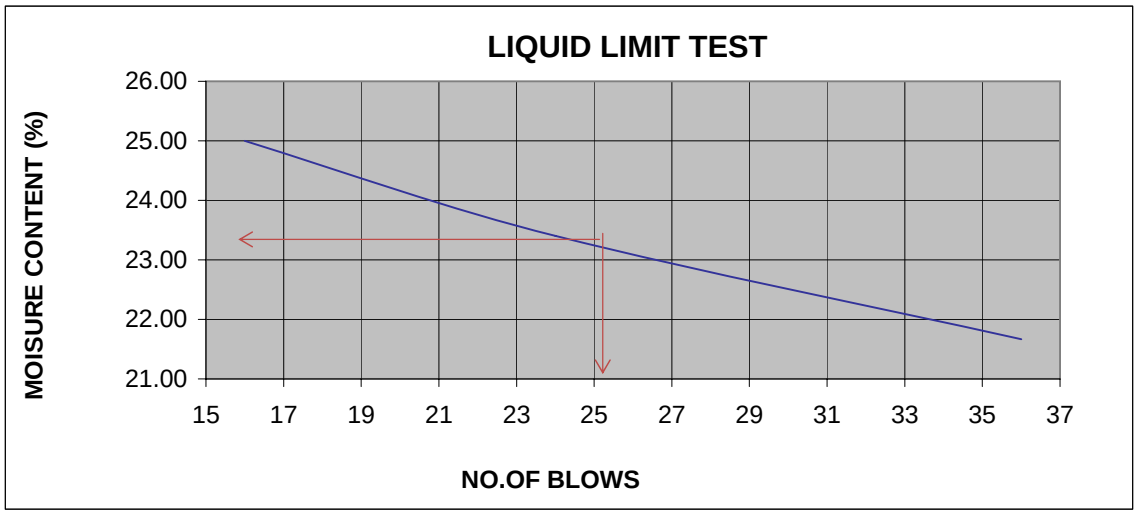
MATERIAL TESTING LAB

Omran Geotechnic Company

ATTERBERG LIMITS
ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	13
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A3	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	24	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	37.8	35.9	31.3	29.7
Wt of Dry soil + Container W2 (g)	35	33.7	30	28.8
Wt of container W3 (g)	23.8	24.3	24	23.8
Wt. of water (a) W1 - W2 (g)	2.8	2.2	1.3	0.9
Wt. of Dry soil (b) W2 - W3 (g)	11.2	9.4	6	5
Moisture Content (w)= a/b x 100 (%)	25.00	23.40	21.67	18.00



LL= 23.35% **PL=** 18.00% **PI=** 5.35%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

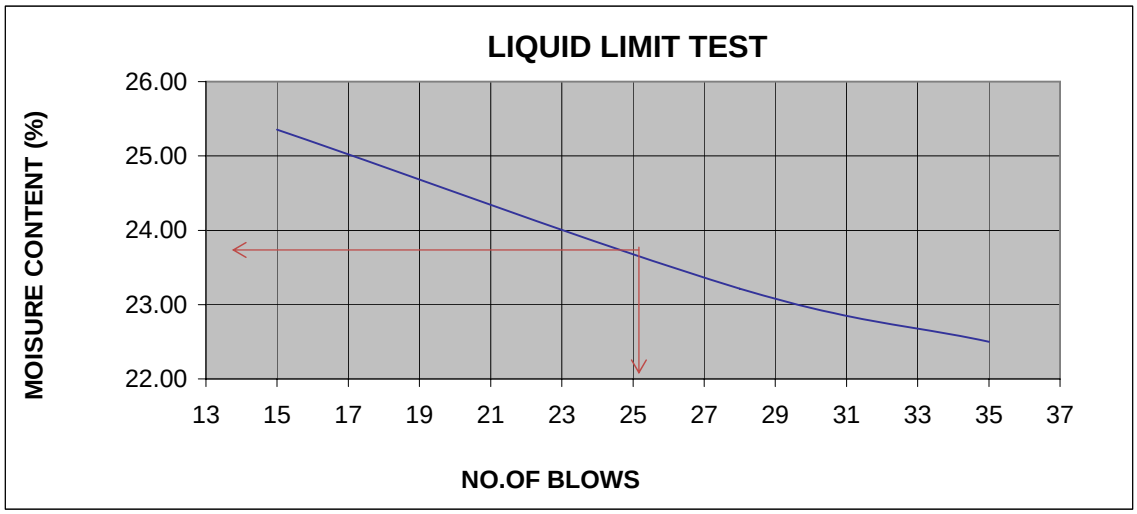
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	14
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A3	Depth: m	5.5

Description	Liquid Limit			Plastic Limit
No of Blows	15	28	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	31.8	37.4	33.9	31
Wt of Dry soil + Container W2 (g)	30	34.8	32.1	29.8
Wt of container W3 (g)	22.9	23.6	24.1	23.4
Wt. of water (a) W1 - W2 (g)	1.8	2.6	1.8	1.2
Wt. of Dry soil (b) W2 - W3 (g)	7.1	11.2	8	6.4
Moisture Content (w)= a/b x 100 (%)	25.35	23.21	22.50	18.75



LL= 23.68% **PL=** 18.75% **PI=** 4.93%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

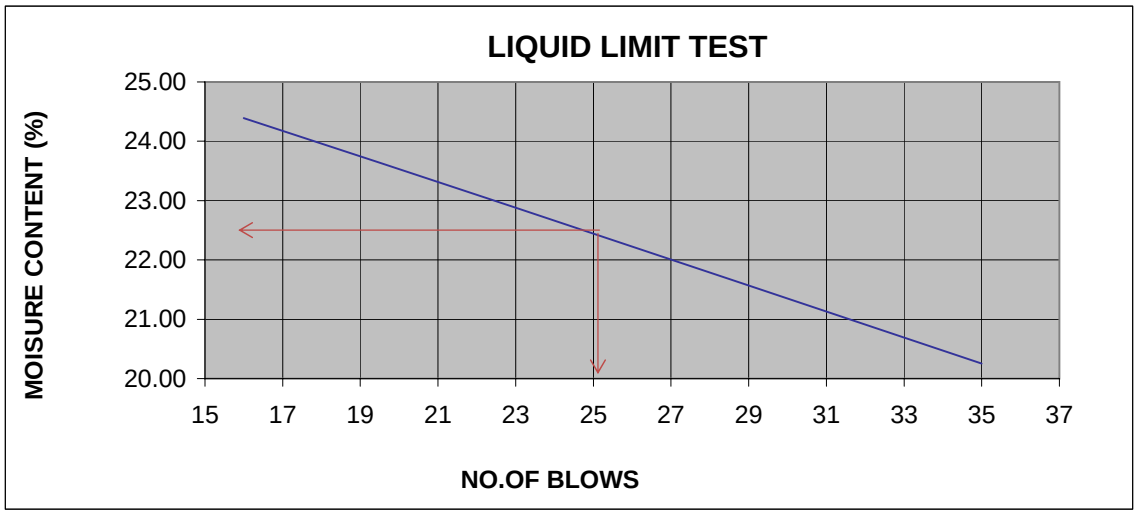
MATERIAL TESTING LAB

Omran Geotechnic Company

ATTERBERG LIMITS
ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	15
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A4	Depth: m	2

Description	Liquid Limit			Plastic Limit
No of Blows	16	23	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	42.2	46.8	41.2	37.1
Wt of Dry soil + Container W2 (g)	40.2	44.1	39.6	36.4
Wt of container W3 (g)	32	32.3	31.7	32
Wt. of water (a) W1 - W2 (g)	2	2.7	1.6	0.7
Wt. of Dry soil (b) W2 - W3 (g)	8.2	11.8	7.9	4.4
Moisture Content (w)= a/b x 100 (%)	24.39	22.88	20.25	15.91



LL= 22.50% **PL=** 15.91% **PI=** 6.59%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

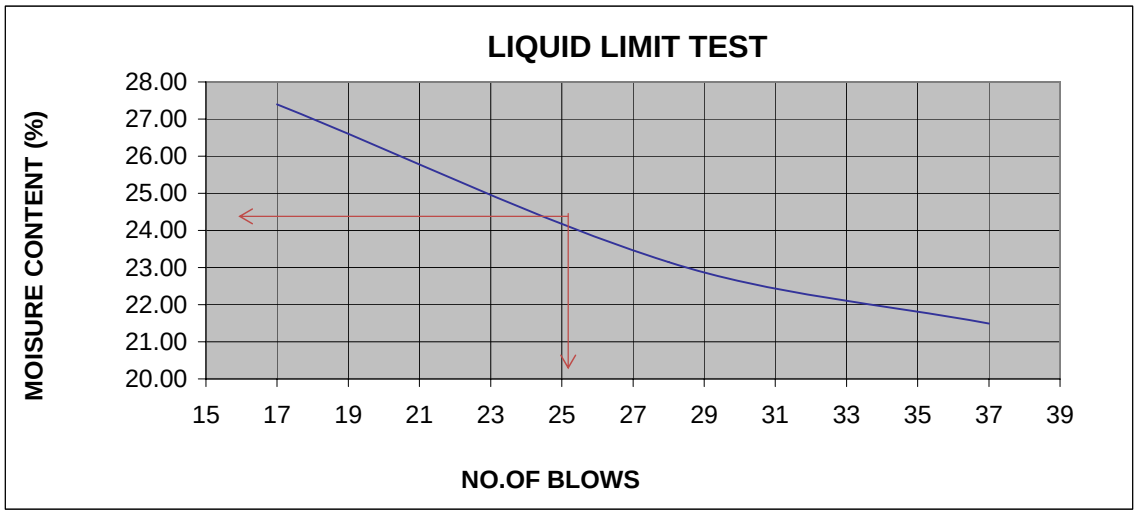
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	16
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A4	Depth: m	4

Description	Liquid Limit			Plastic Limit
No of Blows	17	28	37	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	22.8	27.4	29.1	16.8
Wt of Dry soil + Container W2 (g)	20.8	24.9	26.5	16
Wt of container W3 (g)	13.5	14.1	14.4	11.8
Wt. of water (a) W1 - W2 (g)	2	2.5	2.6	0.8
Wt. of Dry soil (b) W2 - W3 (g)	7.3	10.8	12.1	4.2
Moisture Content (w)= a/b x 100 (%)	27.40	23.15	21.49	19.05



LL= 24.01% **PL=** 19.05% **PI=** 4.96%

Remarks:

Tested by:	Hayat		
Checked by:	Jafari	E-mail:	
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com	

OMRAN GEOTECHNICAL COMPANY

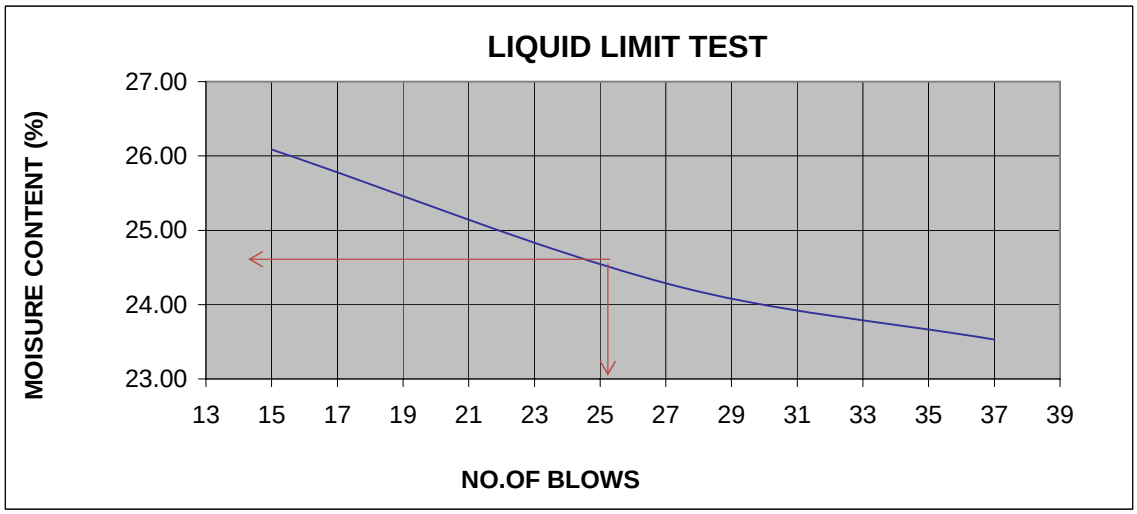
MATERIAL TESTING LAB

Omran Geotechnic Company

ATTERBERG LIMITS
ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	17
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A4	Depth: m	6

Description	Liquid Limit			Plastic Limit
No of Blows	15	27	37	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	32.1	25.4	28.1	19.1
Wt of Dry soil + Container W2 (g)	28.5	23.7	26.1	18.3
Wt of container W3 (g)	14.7	16.7	17.6	14.3
Wt. of water (a) W1 - W2 (g)	3.6	1.7	2	0.8
Wt. of Dry soil (b) W2 - W3 (g)	13.8	7.0	8.5	4
Moisture Content (w)= a/b x 100 (%)	26.09	24.29	23.53	20.00



LL= 24.63% **PL=** 20.00% **PI=** 4.63%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

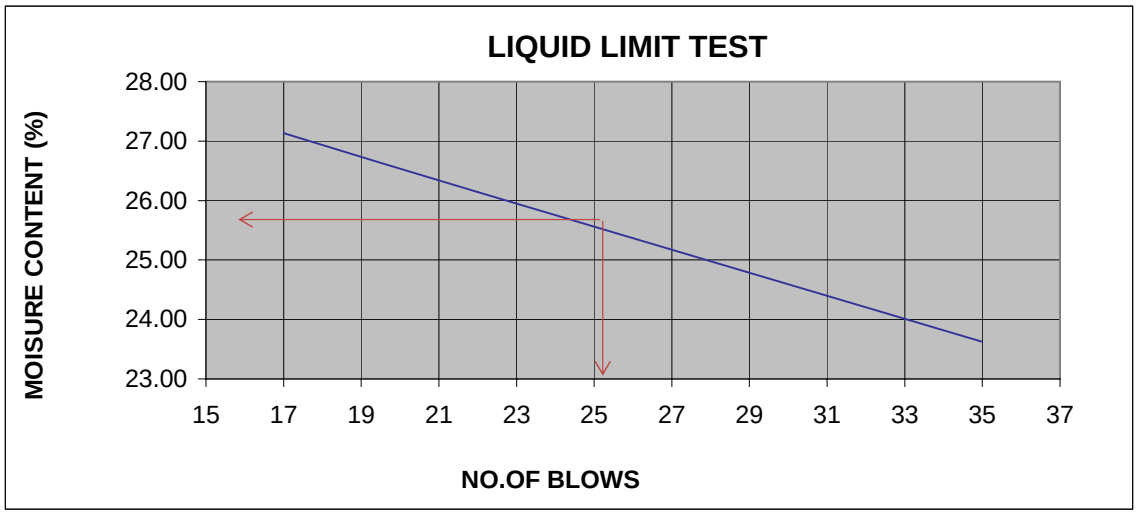
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	18
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A5	Depth: m	1

Description	Liquid Limit			Plastic Limit
No of Blows	17	22	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	40.3	43.6	46.6	30.5
Wt of Dry soil + Container W2 (g)	36.8	39.6	42.3	29.4
Wt of container W3 (g)	23.9	24.3	24.1	23.9
Wt. of water (a) W1 - W2 (g)	3.5	4.0	4.3	1.1
Wt. of Dry soil (b) W2 - W3 (g)	12.9	15.3	18.2	5.5
Moisture Content (w)= a/b x 100 (%)	27.13	26.14	23.63	20.00



LL= 25.63% **PL=** 20.00% **PI=** 5.63%

Remarks:

Tested by:	Hayat		
Checked by:	Jafari	E-mail:	
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com	

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

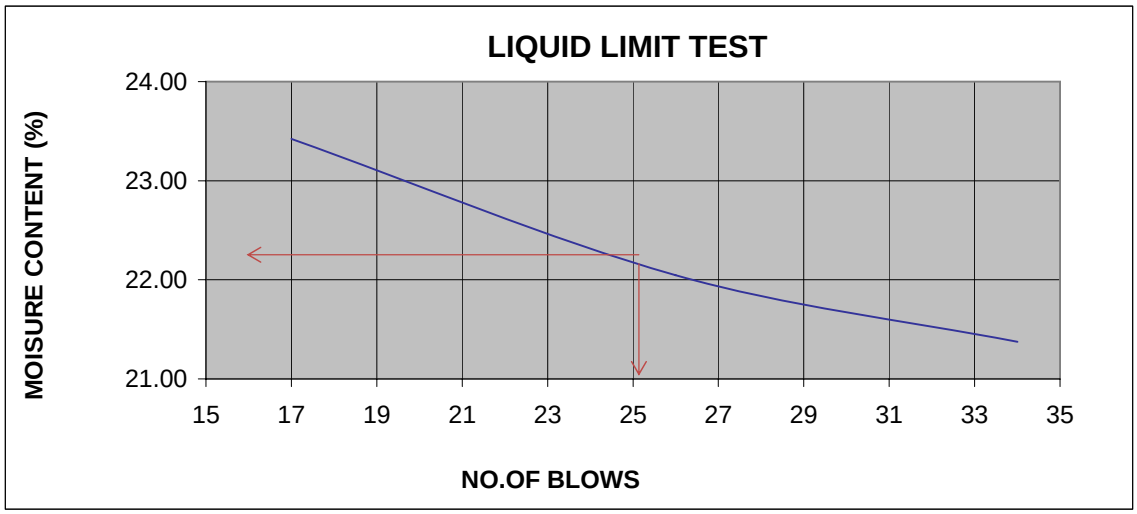
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	19
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A5	Depth: m	3

Description	Liquid Limit			Plastic Limit
No of Blows	17	26	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	27.7	29.5	30.2	18.7
Wt of Dry soil + Container W2 (g)	25.1	26.7	27.4	17.9
Wt of container W3 (g)	14	14	14.3	13.4
Wt. of water (a) W1 - W2 (g)	2.6	2.8	2.8	0.8
Wt. of Dry soil (b) W2 - W3 (g)	11.1	12.7	13.1	4.5
Moisture Content (w)= a/b x 100 (%)	23.42	22.05	21.37	17.78



LL= 22.28% **PL=** 17.78% **PI=** 4.50%

Remarks:

Tested by:	Hayat		
Checked by:	Jafari	E-mail:	
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com	

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MATERIAL TESTING LAB

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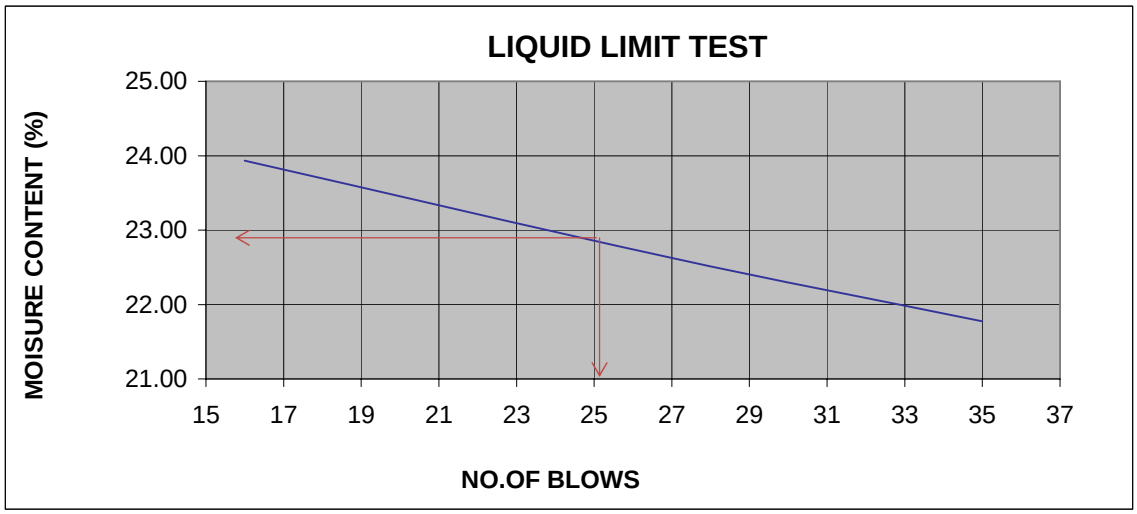
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	20
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A5	Depth: m	5

Description	Liquid Limit			Plastic Limit
No of Blows	16	27	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	22.3	22.8	21.2	11.8
Wt of Dry soil + Container W2 (g)	19.5	19.7	18.5	10.9
Wt of container W3 (g)	7.8	6	6.1	6
Wt. of water (a) W1 - W2 (g)	2.8	3.1	2.7	0.9
Wt. of Dry soil (b) W2 - W3 (g)	11.7	13.7	12.4	4.9
Moisture Content (w)= a/b x 100 (%)	23.93	22.63	21.77	18.37



LL= 22.77% **PL=** 18.37% **PI=** 4.40%

Remarks:

Tested by:	Hayat		
Checked by:	Jafari	E-mail:	
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com	

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MATERIAL TESTING LAB

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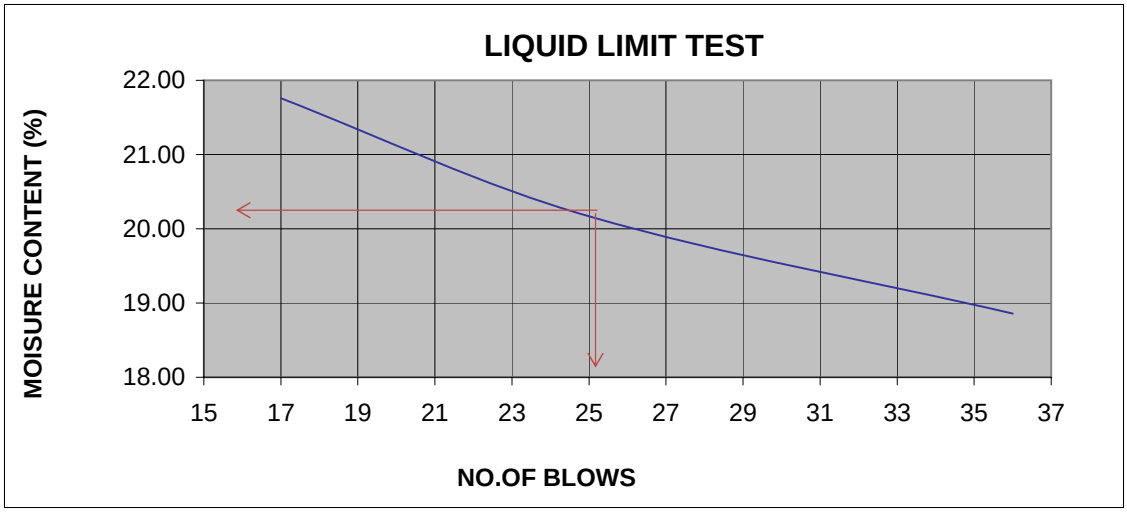
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	21
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A6	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	25	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	39.7	42	39.9	22.1
Wt of Dry soil + Container W2 (g)	35	37.2	35.6	20.9
Wt of container W3 (g)	13.4	13.4	12.8	13.4
Wt. of water (a) W1 - W2 (g)	4.7	4.8	4.3	1.2
Wt. of Dry soil (b) W2 - W3 (g)	21.6	23.8	22.8	7.5
Moisture Content (w)= a/b x 100 (%)	21.76	20.17	18.86	16.00



LL= 20.26% **PL=** 16.00% **PI=** 4.26%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

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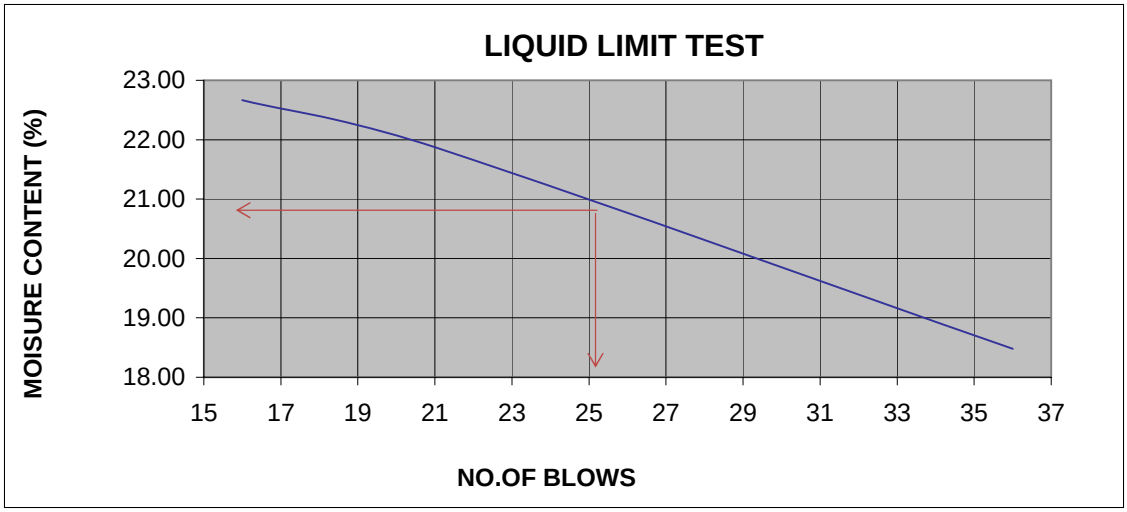
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	22
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A6	Depth: m	4

Description	Liquid Limit			Plastic Limit
No of Blows	16	21	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	26.2	21.8	25.3	16.6
Wt of Dry soil + Container W2 (g)	24.5	20.4	23.6	15.9
Wt of container W3 (g)	17	14	14.4	11.8
Wt. of water (a) W1 - W2 (g)	1.7	1.4	1.7	0.7
Wt. of Dry soil (b) W2 - W3 (g)	7.5	6.4	9.2	4.1
Moisture Content (w)= a/b x 100 (%)	22.67	21.88	18.48	17.07



LL= 21.01% **PL=** 17.07% **PI=** 3.94%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

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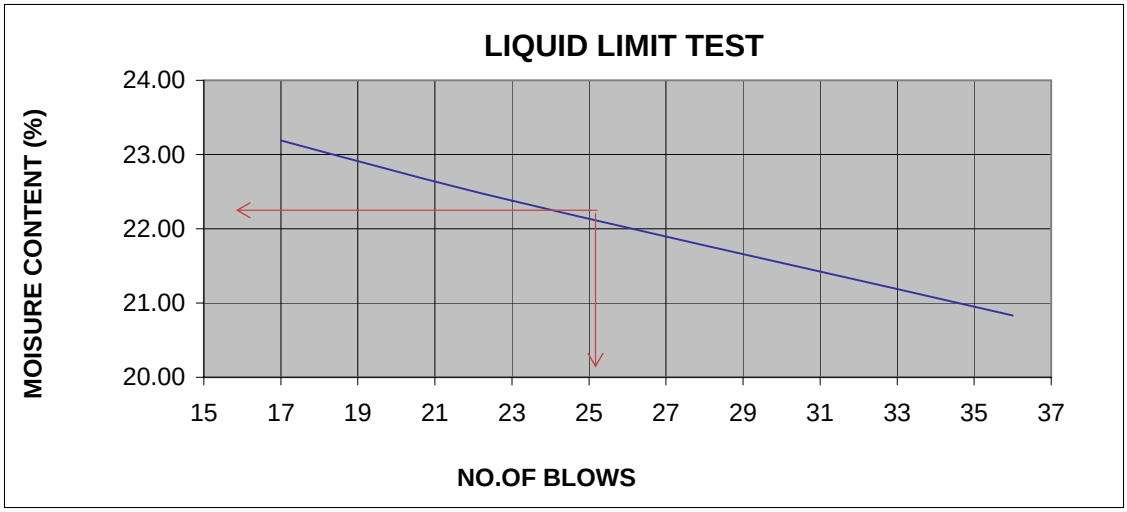
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	23
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A6	Depth: m	5

Description	Liquid Limit			Plastic Limit
No of Blows	17	23	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	31.1	31	30.3	19
Wt of Dry soil + Container W2 (g)	27.9	27.8	27.3	18.2
Wt of container W3 (g)	14.1	13.5	12.9	13.5
Wt. of water (a) W1 - W2 (g)	3.2	3.2	3	0.8
Wt. of Dry soil (b) W2 - W3 (g)	13.8	14.3	14.4	4.7
Moisture Content (w)= a/b x 100 (%)	23.19	22.38	20.83	17.02



LL= 21.13% **PL=** 17.02% **PI=** 4.11%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
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MATERIAL TESTING LAB

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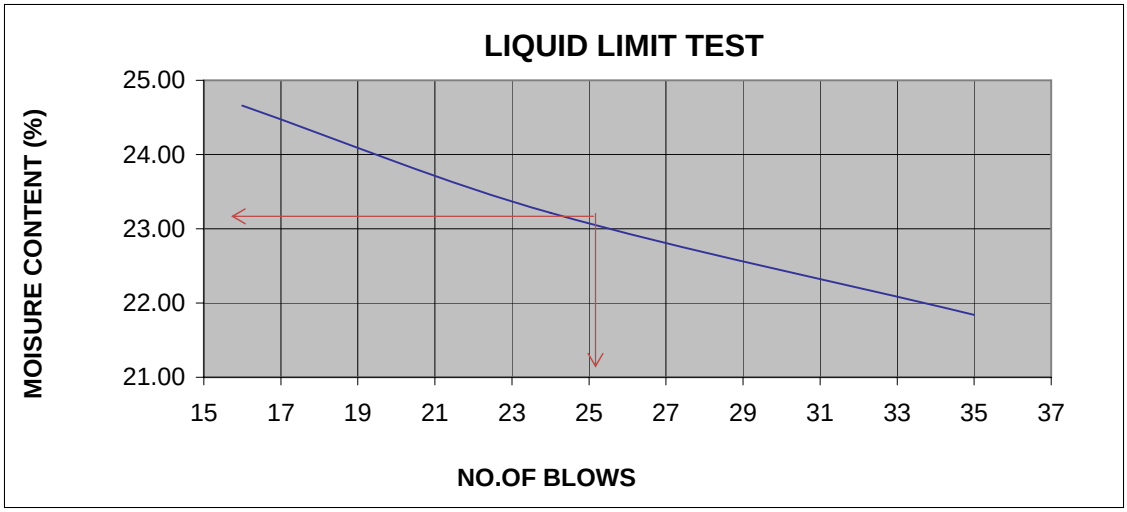
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	24
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A6	Depth: m	6

Description	Liquid Limit			Plastic Limit
No of Blows	16	24	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	23.8	23.6	28.1	19.2
Wt of Dry soil + Container W2 (g)	22	22.3	26.2	18.4
Wt of container W3 (g)	14.7	16.7	17.5	14.3
Wt. of water (a) W1 - W2 (g)	1.8	1.3	1.9	0.8
Wt. of Dry soil (b) W2 - W3 (g)	7.3	5.6	8.7	4.1
Moisture Content (w)= a/b x 100 (%)	24.66	23.21	21.84	19.51



LL= 23.23% **PL=** 19.51% **PI=** 3.72%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

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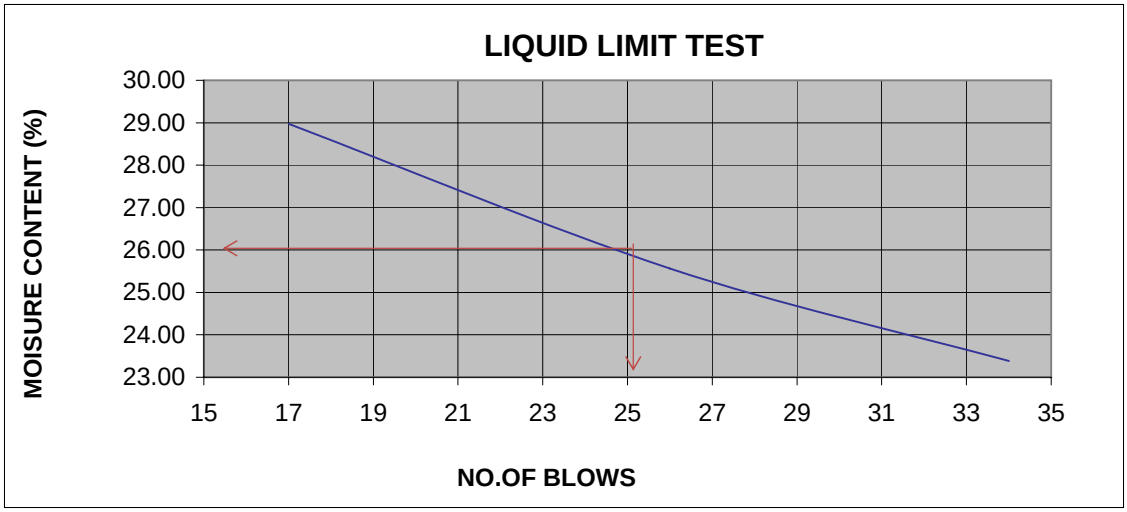
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	25
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A7	Depth: m	2

Description	Liquid Limit			Plastic Limit
No of Blows	17	26	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	36.8	39.8	39.1	28.3
Wt of Dry soil + Container W2 (g)	33.7	36.4	36.2	27.6
Wt of container W3 (g)	23	23.1	23.8	24
Wt. of water (a) W1 - W2 (g)	3.1	3.4	2.9	0.7
Wt. of Dry soil (b) W2 - W3 (g)	10.7	13.3	12.4	3.6
Moisture Content (w)= a/b x 100 (%)	28.97	25.56	23.39	19.44



LL= 25.97% **PL=** 19.44% **PI=** 6.53%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

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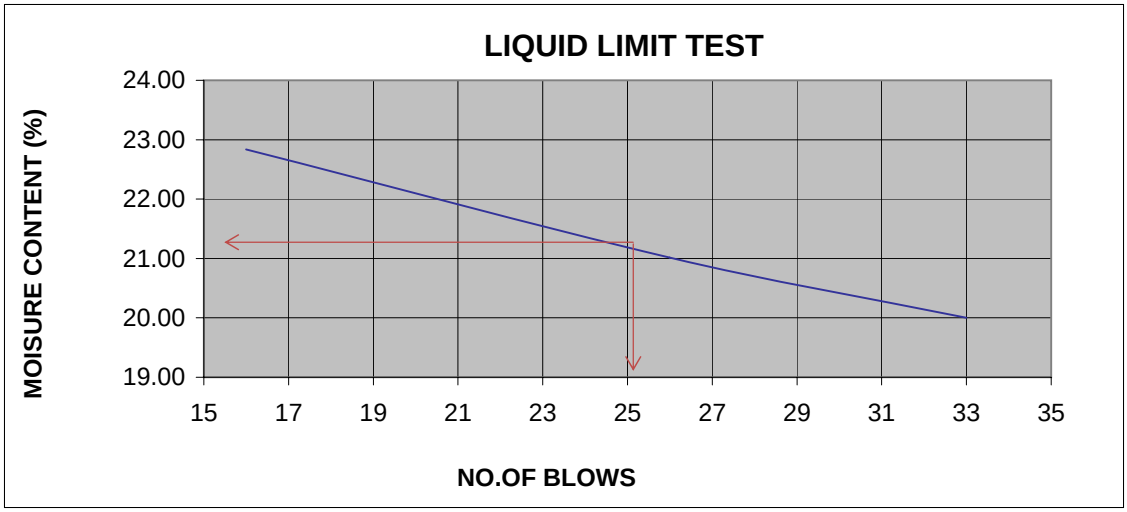
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	26
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A7	Depth: m	4

Description	Liquid Limit			Plastic Limit
No of Blows	16	26	33	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	39.9	40.6	39.8	28.3
Wt of Dry soil + Container W2 (g)	37	37.7	37.1	27.6
Wt of container W3 (g)	24.3	23.9	23.6	23.5
Wt. of water (a) W1 - W2 (g)	2.9	2.9	2.7	0.7
Wt. of Dry soil (b) W2 - W3 (g)	12.7	13.8	13.5	4.1
Moisture Content (w)= a/b x 100 (%)	22.83	21.01	20.00	17.07



LL= 21.28% **PL=** 17.07% **PI=** 4.21%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

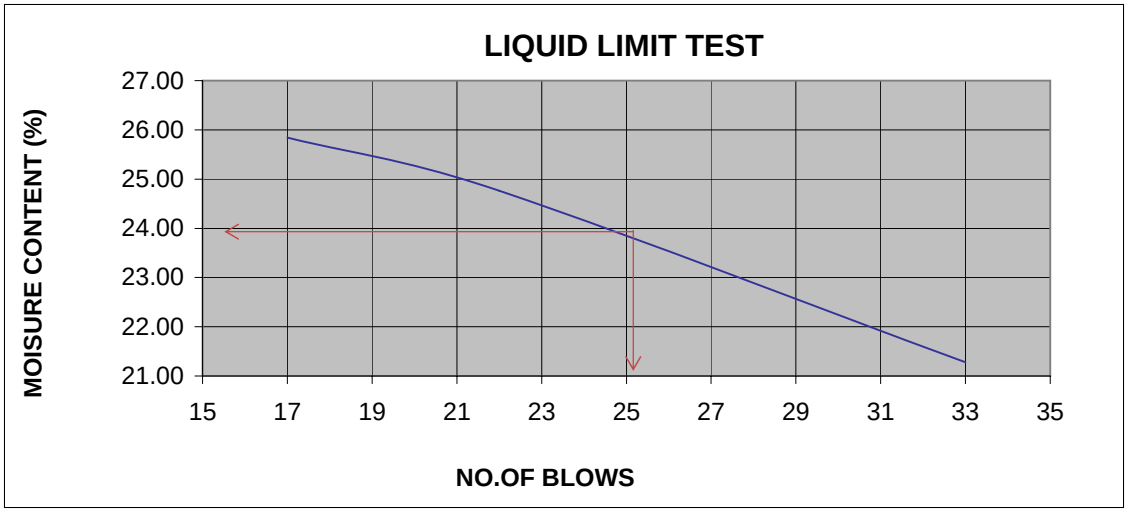
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	27
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A7	Depth: m	6

Description	Liquid Limit			Plastic Limit
No of Blows	17	22	33	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	34.2	36.8	34.7	26.9
Wt of Dry soil + Container W2 (g)	31.9	34.2	32.7	26.4
Wt of container W3 (g)	23	23.7	23.3	23.5
Wt. of water (a) W1 - W2 (g)	2.3	2.6	2	0.5
Wt. of Dry soil (b) W2 - W3 (g)	8.9	10.5	9.4	2.9
Moisture Content (w)= a/b x 100 (%)	25.84	24.76	21.28	17.24



LL= 23.96% **PL=** 17.24% **PI=** 6.72%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

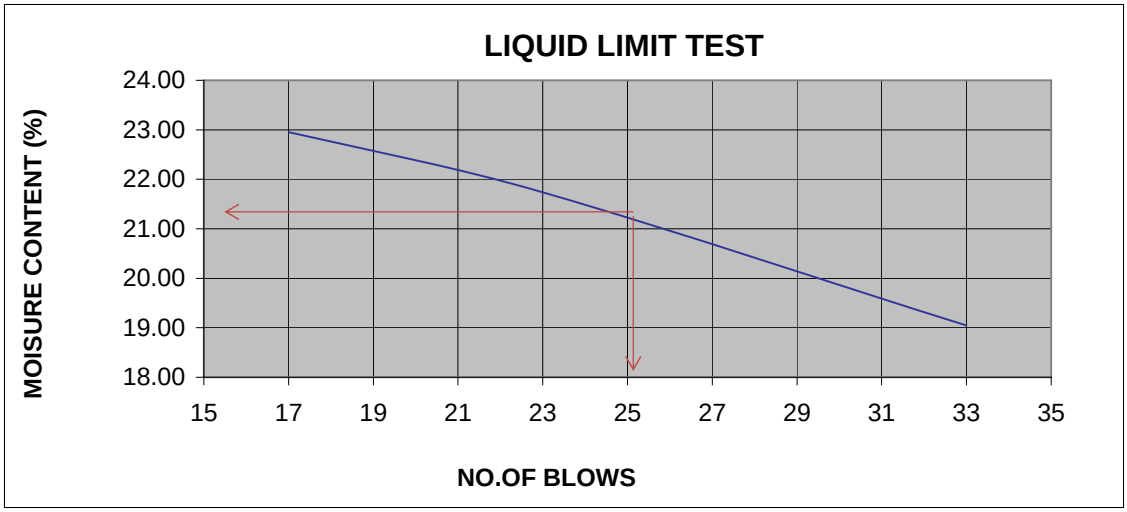
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	28
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A8	Depth: m	2

Description	Liquid Limit			Plastic Limit
No of Blows	17	23	33	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	32.1	28	32.6	19.3
Wt of Dry soil + Container W2 (g)	29.3	26.0	30.2	18.6
Wt of container W3 (g)	17.1	16.8	17.6	14.4
Wt. of water (a) W1 - W2 (g)	2.8	2.0	2.4	0.7
Wt. of Dry soil (b) W2 - W3 (g)	12.2	9.2	12.6	4.2
Moisture Content (w)= a/b x 100 (%)	22.95	21.74	19.05	16.67



LL= 21.24% **PL=** 16.67% **PI=** 4.57%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

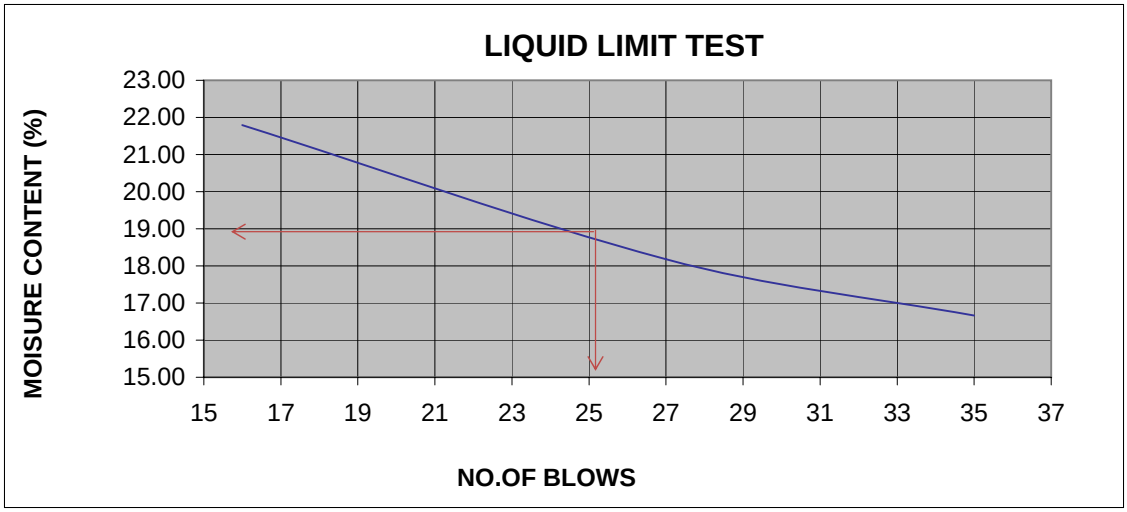
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	29
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A8	Depth: m	4

Description	Liquid Limit			Plastic Limit
No of Blows	16	27	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	36.6	32.7	30.2	18
Wt of Dry soil + Container W2 (g)	33.2	30.3	28.2	17.6
Wt of container W3 (g)	17.6	17.1	16.2	14.4
Wt. of water (a) W1 - W2 (g)	3.4	2.4	2	0.4
Wt. of Dry soil (b) W2 - W3 (g)	15.6	13.2	12	3.2
Moisture Content (w)= a/b x 100 (%)	21.79	18.18	16.67	12.50



LL= 18.88% **PL=** 12.50% **PI=** 6.38%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

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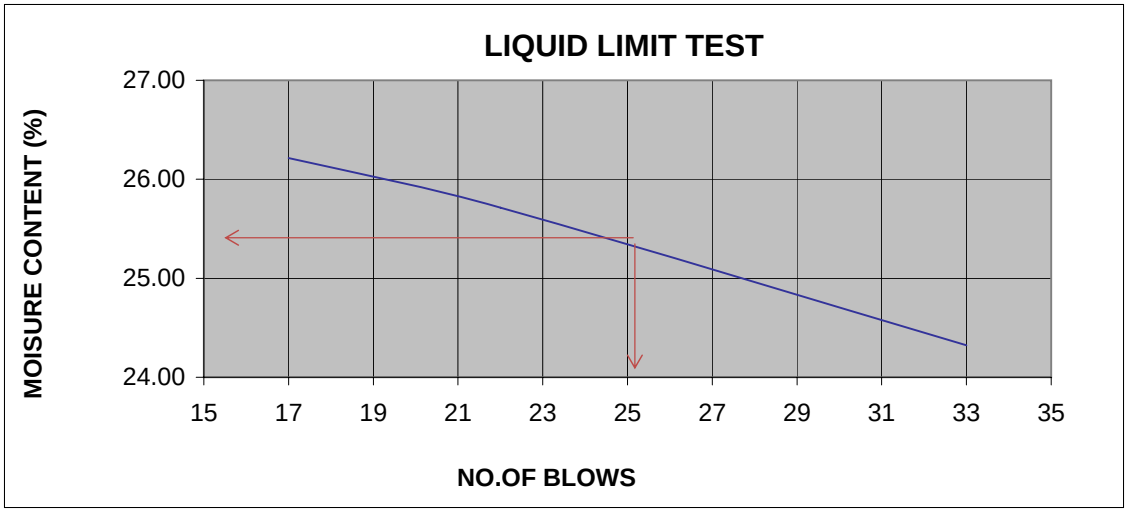
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	30
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A8	Depth: m	6

Description	Liquid Limit			Plastic Limit
No of Blows	17	22	33	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	36.1	41.4	42.6	27.6
Wt of Dry soil + Container W2 (g)	33.4	37.8	39	27.1
Wt of container W3 (g)	23.1	23.8	24.2	24
Wt. of water (a) W1 - W2 (g)	2.7	3.6	3.6	0.5
Wt. of Dry soil (b) W2 - W3 (g)	10.3	14.0	14.8	3.1
Moisture Content (w)= a/b x 100 (%)	26.21	25.71	24.32	16.13



LL= 25.41% **PL=** 16.13% **PI=** 9.28%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

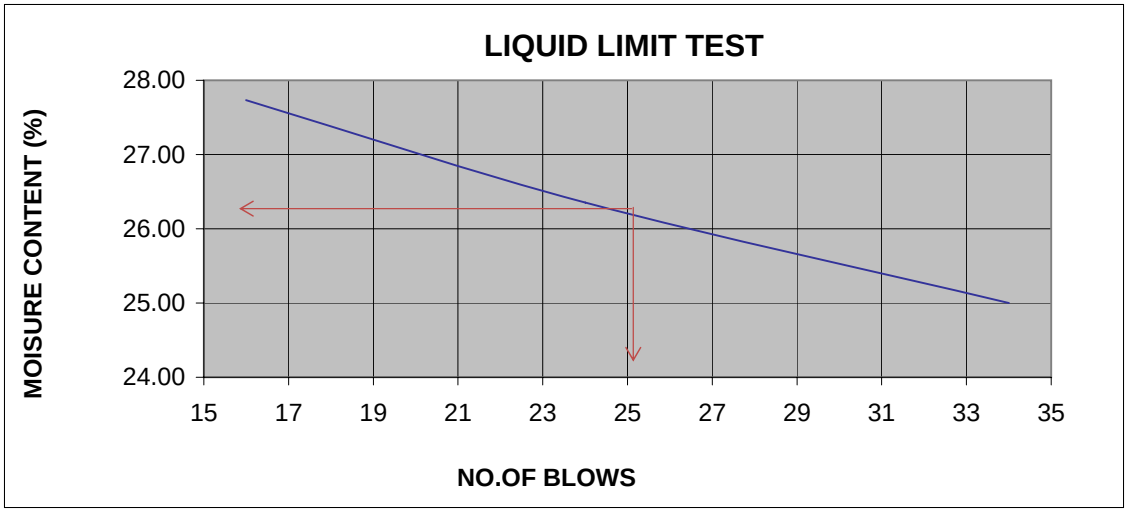
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	31
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A9	Depth: m	2

Description	Liquid Limit			Plastic Limit
No of Blows	16	24	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	38.1	42.4	41.7	30.3
Wt of Dry soil + Container W2 (g)	34.8	38.5	38.2	29.1
Wt of container W3 (g)	22.9	23.7	24.2	23.6
Wt. of water (a) W1 - W2 (g)	3.3	3.9	3.5	1.2
Wt. of Dry soil (b) W2 - W3 (g)	11.9	14.8	14	5.5
Moisture Content (w)= a/b x 100 (%)	27.73	26.35	25.00	21.82



LL= 26.36% **PL=** 21.82% **PI=** 4.54%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

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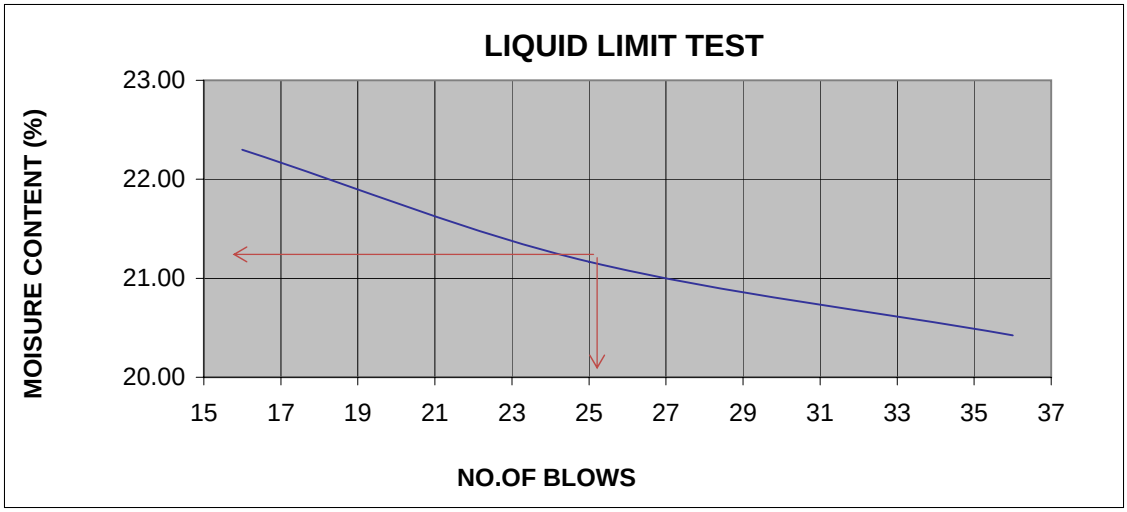
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	32
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A9	Depth: m	4

Description	Liquid Limit			Plastic Limit
No of Blows	16	25	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	41.4	40.6	40.6	29.2
Wt of Dry soil + Container W2 (g)	38.1	37.7	37.7	28.4
Wt of container W3 (g)	23.3	24	23.5	23.8
Wt. of water (a) W1 - W2 (g)	3.3	2.9	2.9	0.8
Wt. of Dry soil (b) W2 - W3 (g)	14.8	13.7	14.2	4.6
Moisture Content (w)= a/b x 100 (%)	22.30	21.17	20.42	17.39



LL= 21.29% **PL=** 17.39% **PI=** 3.90%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

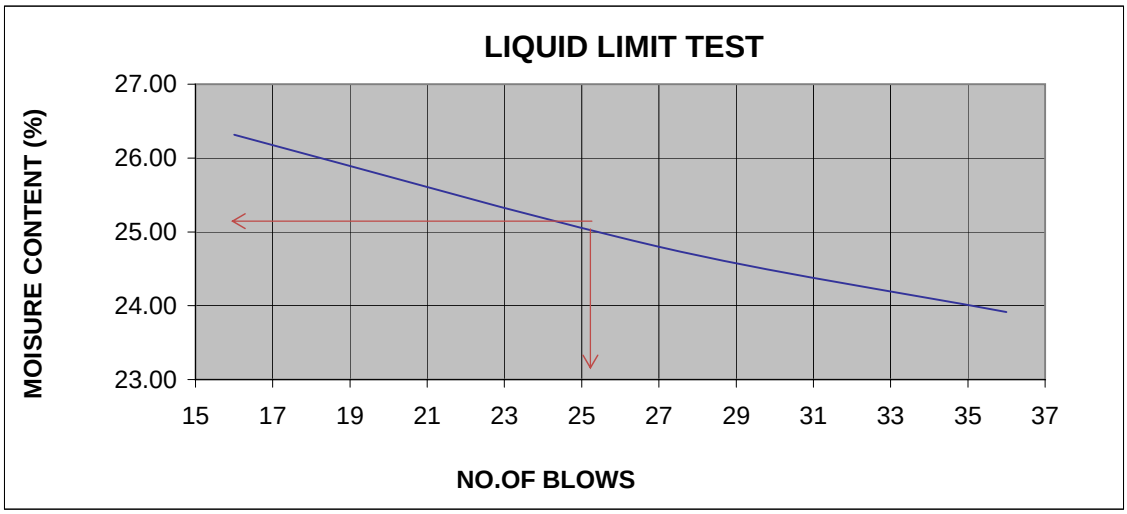
MATERIAL TESTING LAB

Omran Geotechnic Company

ATTERBERG LIMITS
ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	33
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A9	Depth: m	5

Description	Liquid Limit			Plastic Limit
No of Blows	16	27	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	36.5	37.9	44.6	27.6
Wt of Dry soil + Container W2 (g)	33.5	34.8	40.2	26.7
Wt of container W3 (g)	22.1	22.3	21.8	21.9
Wt. of water (a) W1 - W2 (g)	3	3.1	4.4	0.9
Wt. of Dry soil (b) W2 - W3 (g)	11.4	12.5	18.4	4.8
Moisture Content (w)= a/b x 100 (%)	26.32	24.80	23.91	18.75



LL= 25.01% **PL=** 18.75% **PI=** 6.26%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

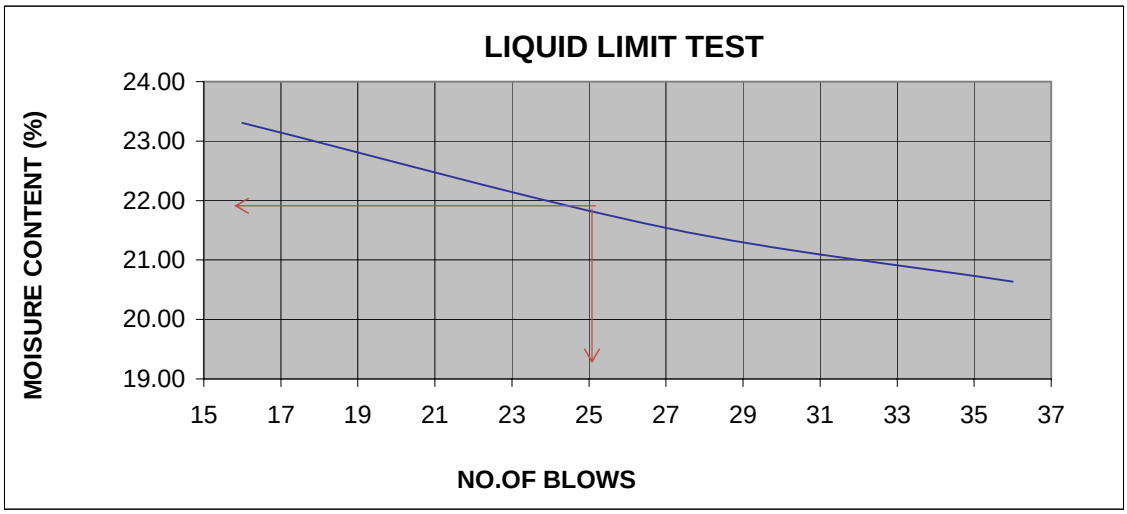
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	34
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A10	Depth: m	0.7

Description	Liquid Limit			Plastic Limit
No of Blows	16	27	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	39.2	38.9	38.2	28.1
Wt of Dry soil + Container W2 (g)	36.1	36.1	35.6	27.4
Wt of container W3 (g)	22.8	23.1	23	23.4
Wt. of water (a) W1 - W2 (g)	3.1	2.8	2.6	0.7
Wt. of Dry soil (b) W2 - W3 (g)	13.3	13.0	12.6	4
Moisture Content (w)= a/b x 100 (%)	23.31	21.54	20.63	17.50



LL= 21.82% **PL=** 17.50% **PI=** 4.32%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

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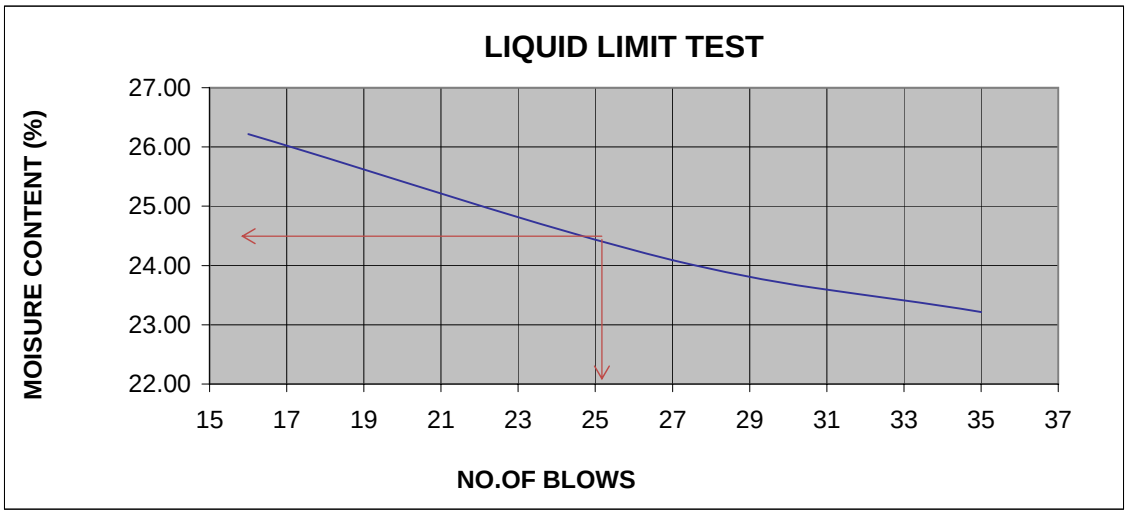
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	35
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A10	Depth: m	2

Description	Liquid Limit			Plastic Limit
No of Blows	16	27	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	42.8	39.3	42.5	27.2
Wt of Dry soil + Container W2 (g)	38.5	36.0	38.6	26.4
Wt of container W3 (g)	22.1	22.3	21.8	21.9
Wt. of water (a) W1 - W2 (g)	4.3	3.3	3.9	0.8
Wt. of Dry soil (b) W2 - W3 (g)	16.4	13.7	16.8	4.5
Moisture Content (w)= a/b x 100 (%)	26.22	24.09	23.21	17.78



LL= 24.50% **PL=** 17.78% **PI=** 6.72%

Remarks:

Tested by:	Hayat		
Checked by:	Jafari	E-mail:	
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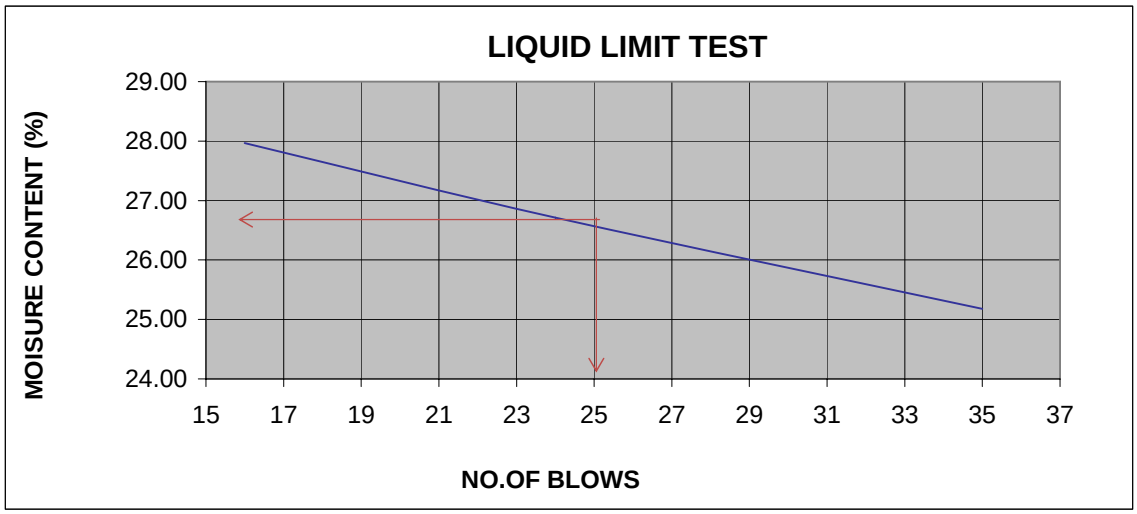
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	36
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A10	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	24	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	38	42.2	41.6	30.1
Wt of Dry soil + Container W2 (g)	34.7	38.3	38.1	28.9
Wt of container W3 (g)	22.9	23.7	24.2	23.5
Wt. of water (a) W1 - W2 (g)	3.3	3.9	3.5	1.2
Wt. of Dry soil (b) W2 - W3 (g)	11.8	14.6	13.9	5.4
Moisture Content (w)= a/b x 100 (%)	27.97	26.71	25.18	22.22



LL= 26.62% **PL=** 22.22% **PI=** 4.40%

Remarks:

Tested by:	Hayat	
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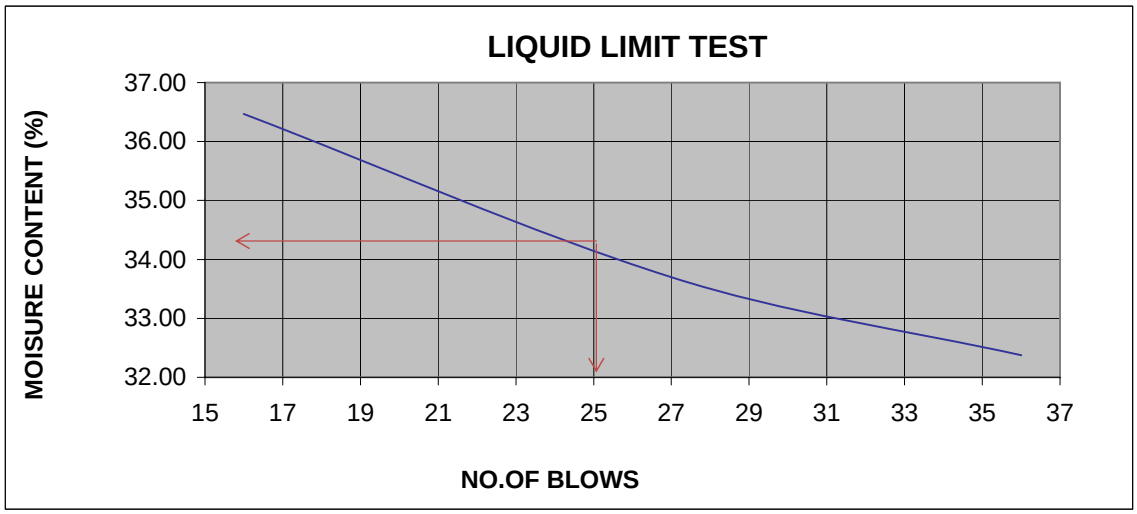
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	37
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A10	Depth: m	5

Description	Liquid Limit			Plastic Limit
No of Blows	16	27	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	46.1	47.9	42.6	35.5
Wt of Dry soil + Container W2 (g)	39.9	41.8	38.1	32.9
Wt of container W3 (g)	22.9	23.7	24.2	23.5
Wt. of water (a) W1 - W2 (g)	6.2	6.1	4.5	2.6
Wt. of Dry soil (b) W2 - W3 (g)	17	18.1	13.9	9.4
Moisture Content (w)= a/b x 100 (%)	36.47	33.70	32.37	27.66



LL= 34.18% **PL=** 27.66% **PI=** 6.52%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
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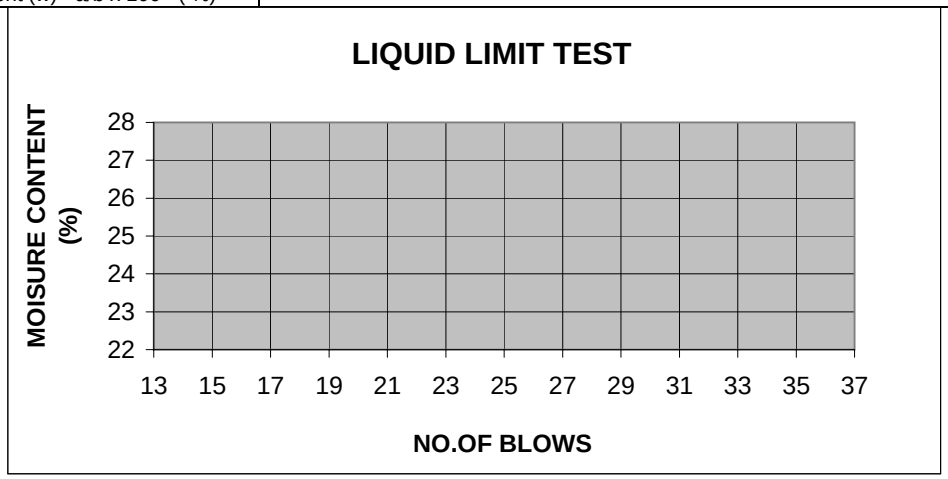
MATERIAL TESTING LAB

Omran Geotechnic Company

ATTERBERG LIMITS
ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	38
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A11	Depth: m	1.5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

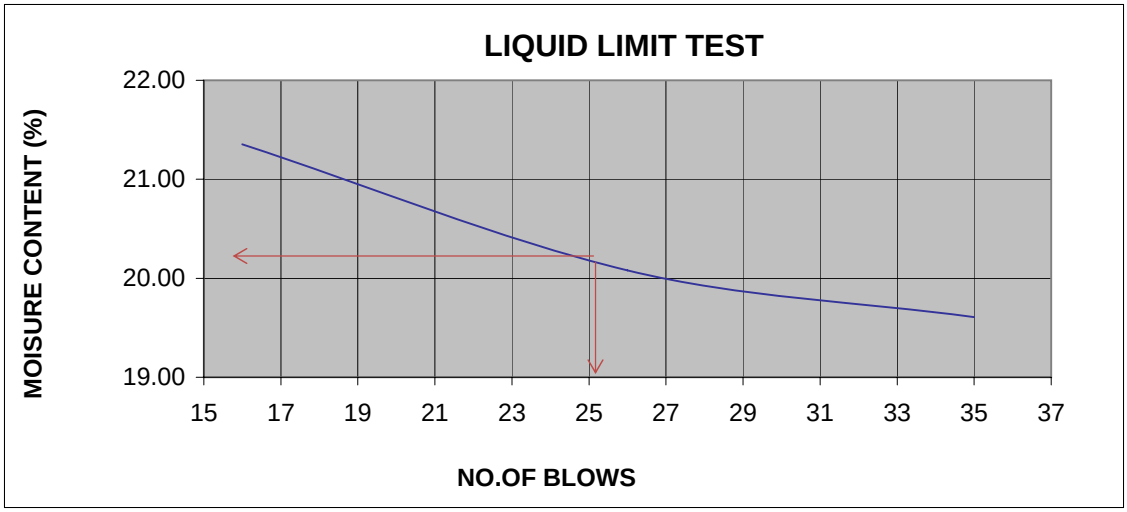
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	39
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A11	Depth: m	4

Description	Liquid Limit			Plastic Limit
No of Blows	16	26	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	31	36.4	36.5	11.3
Wt of Dry soil + Container W2 (g)	26.9	31.3	31.5	10.5
Wt of container W3 (g)	7.7	5.9	6	5.6
Wt. of water (a) W1 - W2 (g)	4.1	5.1	5	0.8
Wt. of Dry soil (b) W2 - W3 (g)	19.2	25.4	25.5	4.9
Moisture Content (w)= a/b x 100 (%)	21.35	20.08	19.61	16.33



LL= 20.34% **PL=** 16.33% **PI=** 4.01%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
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MATERIAL TESTING LAB

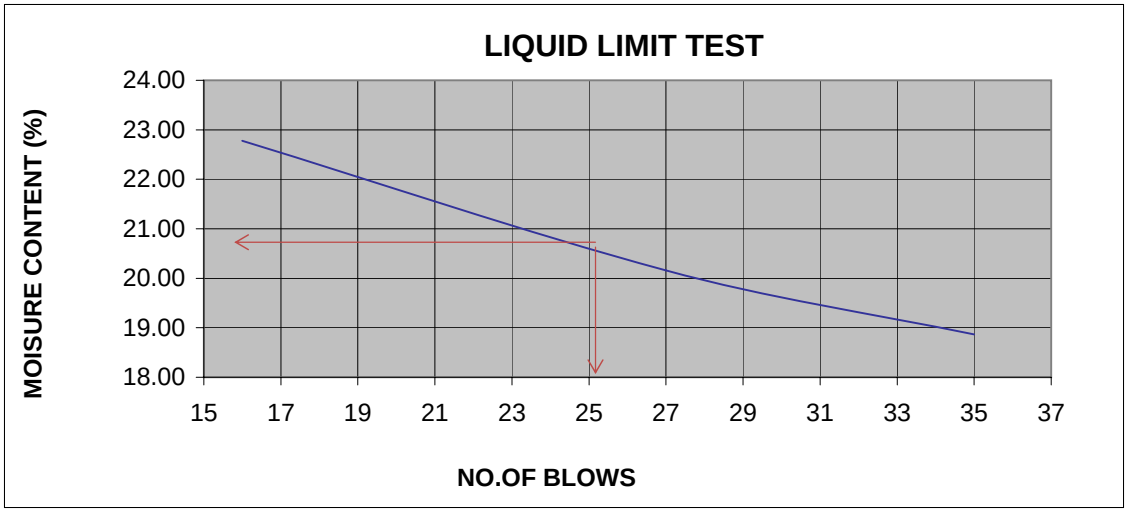
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	40
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A11	Depth: m	6

Description	Liquid Limit			Plastic Limit
No of Blows	16	27	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	75.1	72.5	66.3	41.7
Wt of Dry soil + Container W2 (g)	68.7	67.5	61.3	41.1
Wt of container W3 (g)	40.6	42.7	34.8	37.5
Wt. of water (a) W1 - W2 (g)	6.4	5.0	5	0.6
Wt. of Dry soil (b) W2 - W3 (g)	28.1	24.8	26.5	3.6
Moisture Content (w)= a/b x 100 (%)	22.78	20.16	18.87	16.67



LL= 20.60% **PL=** 16.67% **PI=** 3.93%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
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MATERIAL TESTING LAB

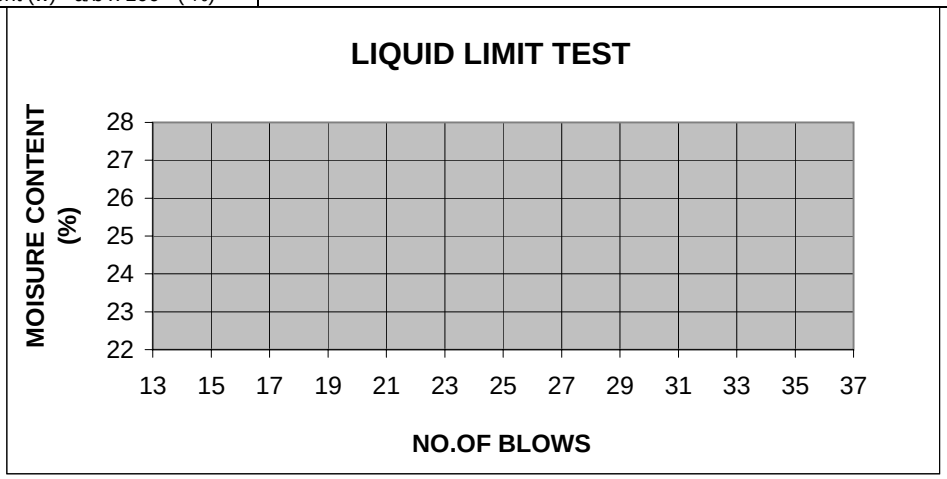
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	41
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A12	Depth: m	1.3

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

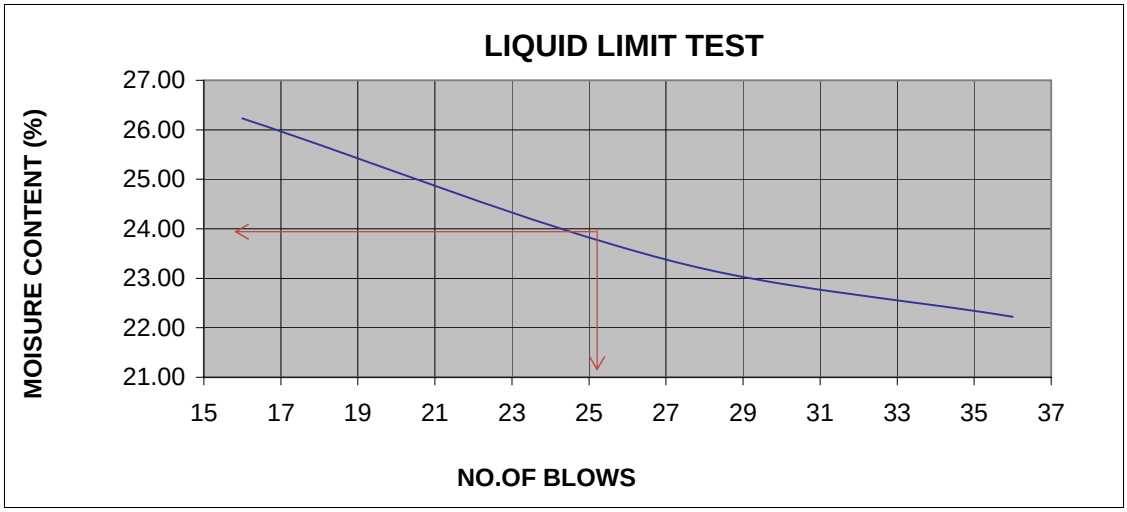
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	42
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A12	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	27	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	30.7	32.8	31.4	29.9
Wt of Dry soil + Container W2 (g)	29.1	31.0	30	28.9
Wt of container W3 (g)	23	23.3	23.7	23.5
Wt. of water (a) W1 - W2 (g)	1.6	1.8	1.4	1
Wt. of Dry soil (b) W2 - W3 (g)	6.1	7.7	6.3	5.4
Moisture Content (w)= a/b x 100 (%)	26.23	23.38	22.22	18.52



LL= 23.94% **PL=** 18.52% **PI=** 5.42%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

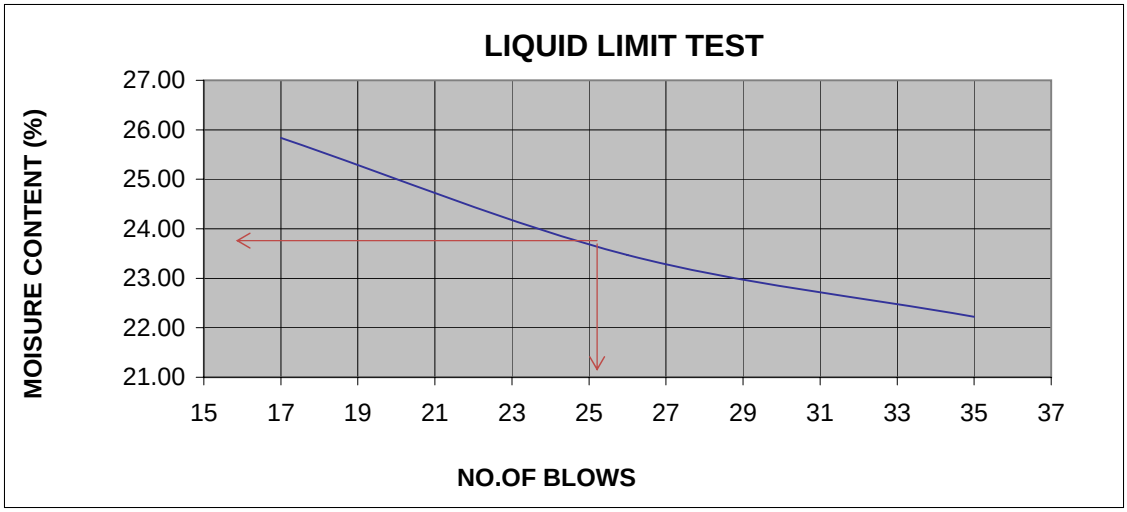
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	43
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A12	Depth: m	4

Description	Liquid Limit			Plastic Limit
No of Blows	17	26	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	39	35.6	34.2	28.7
Wt of Dry soil + Container W2 (g)	35.9	33.3	32.4	27.9
Wt of container W3 (g)	23.9	23.5	24.3	23.4
Wt. of water (a) W1 - W2 (g)	3.1	2.3	1.8	0.8
Wt. of Dry soil (b) W2 - W3 (g)	12	9.8	8.1	4.5
Moisture Content (w)= a/b x 100 (%)	25.83	23.47	22.22	17.78



LL= 23.84% **PL=** 17.78% **PI=** 6.06%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

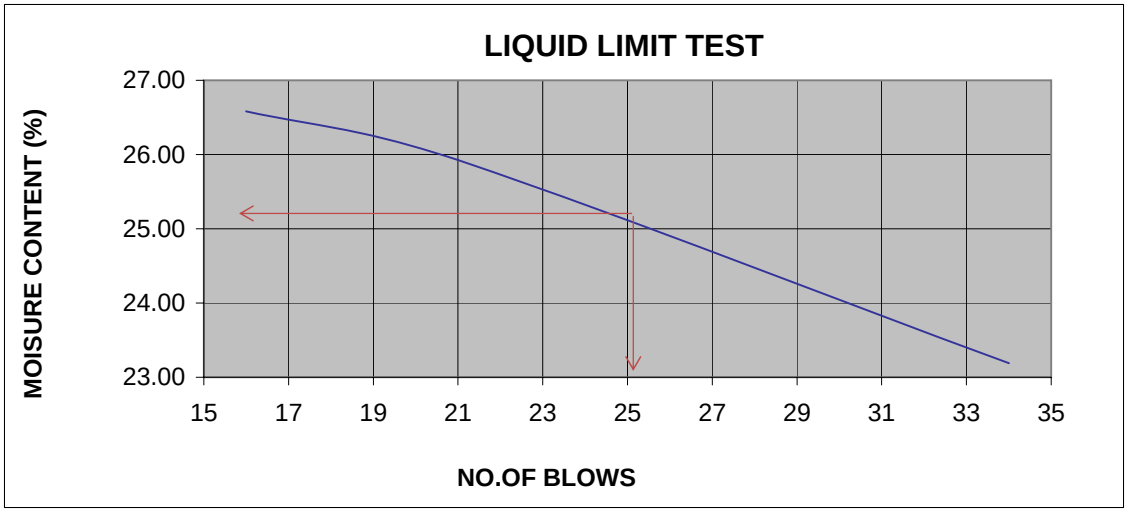
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	44
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A12	Depth: m	6

Description	Liquid Limit			Plastic Limit
No of Blows	16	21	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	24.4	27.6	31	14.8
Wt of Dry soil + Container W2 (g)	22.3	24.8	27.8	14.3
Wt of container W3 (g)	14.4	14	14	11.6
Wt. of water (a) W1 - W2 (g)	2.1	2.8	3.2	0.5
Wt. of Dry soil (b) W2 - W3 (g)	7.9	10.8	13.8	2.7
Moisture Content (w)= a/b x 100 (%)	26.58	25.93	23.19	18.52



LL= 25.23% **PL=** 18.52% **PI=** 6.71%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

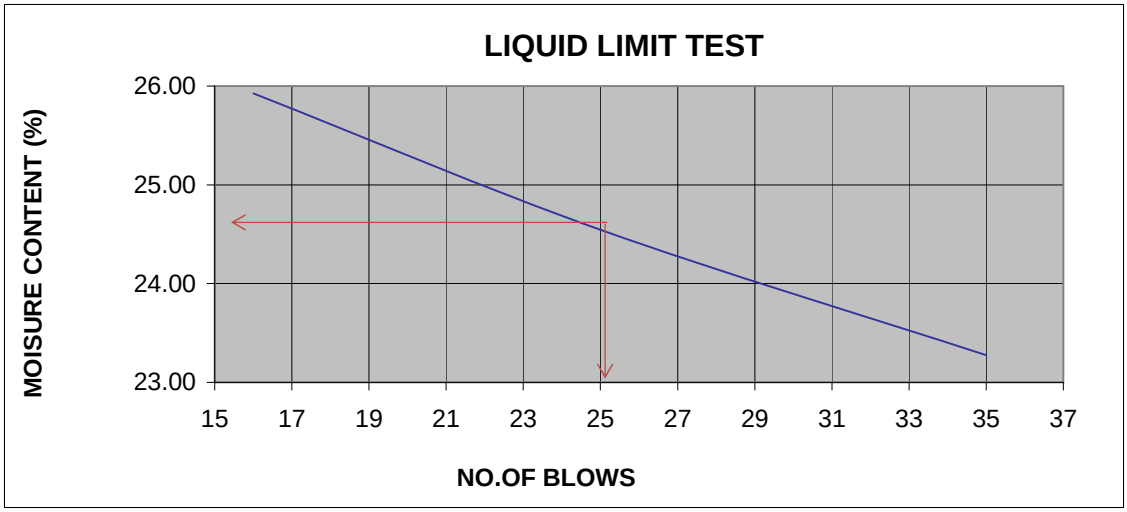
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	45
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A13	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	25	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	41.3	37.1	38.3	27.4
Wt of Dry soil + Container W2 (g)	37.8	34.4	35.6	26.8
Wt of container W3 (g)	24.3	23.4	24	23.6
Wt. of water (a) W1 - W2 (g)	3.5	2.7	2.7	0.6
Wt. of Dry soil (b) W2 - W3 (g)	13.5	11.0	11.6	3.2
Moisture Content (w)= a/b x 100 (%)	25.93	24.55	23.28	18.75



LL= 24.58% **PL=** 18.75% **PI=** 5.83%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

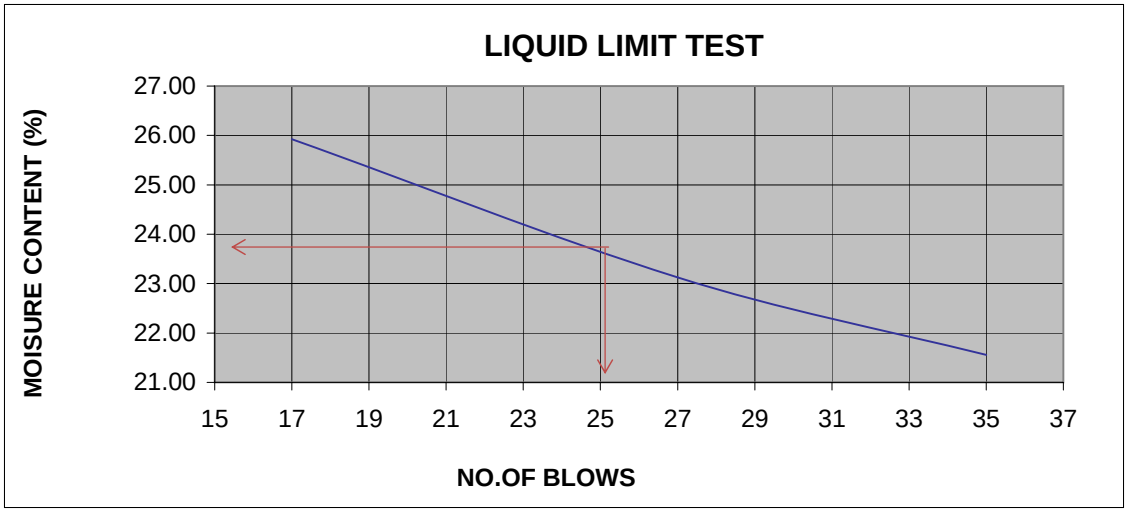
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	46
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A13	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	27	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	37.3	43.4	43.6	26.3
Wt of Dry soil + Container W2 (g)	34.5	39.7	40	25.9
Wt of container W3 (g)	23.7	23.7	23.3	23.5
Wt. of water (a) W1 - W2 (g)	2.8	3.7	3.6	0.4
Wt. of Dry soil (b) W2 - W3 (g)	10.8	16.0	16.7	2.4
Moisture Content (w)= a/b x 100 (%)	25.93	23.13	21.56	16.67



LL= 23.54% **PL=** 16.67% **PI=** 6.87%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

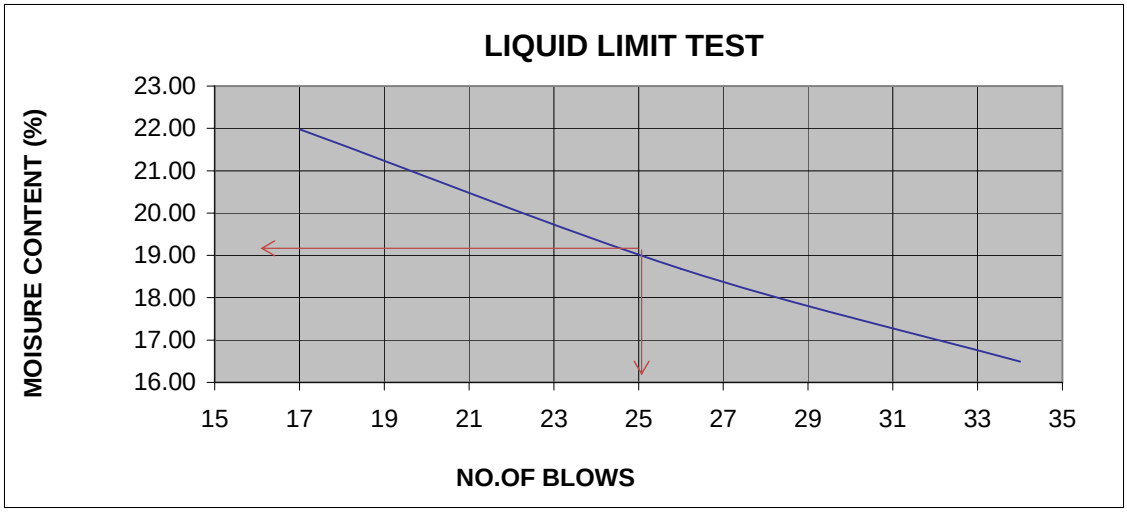
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	47
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A13	Depth: m	5.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	26	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	24.7	24.3	24.2	18.5
Wt of Dry soil + Container W2 (g)	22.7	22.6	22.6	17.9
Wt of container W3 (g)	13.6	13.5	12.9	13.5
Wt. of water (a) W1 - W2 (g)	2	1.7	1.6	0.6
Wt. of Dry soil (b) W2 - W3 (g)	9.1	9.1	9.7	4.4
Moisture Content (w)= a/b x 100 (%)	21.98	18.68	16.49	13.64



LL= 19.05% **PL=** 13.64% **PI=** 5.41%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

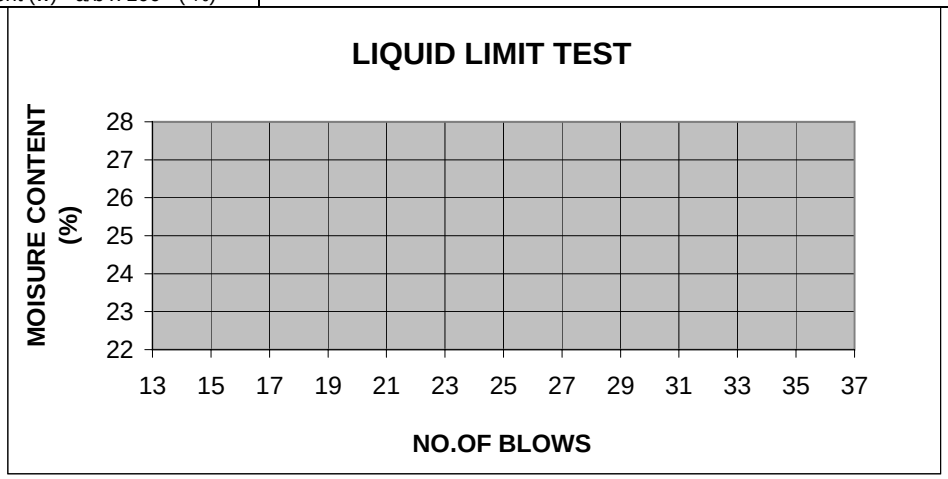
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	48
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A14	Depth: m	1.5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
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MATERIAL TESTING LAB

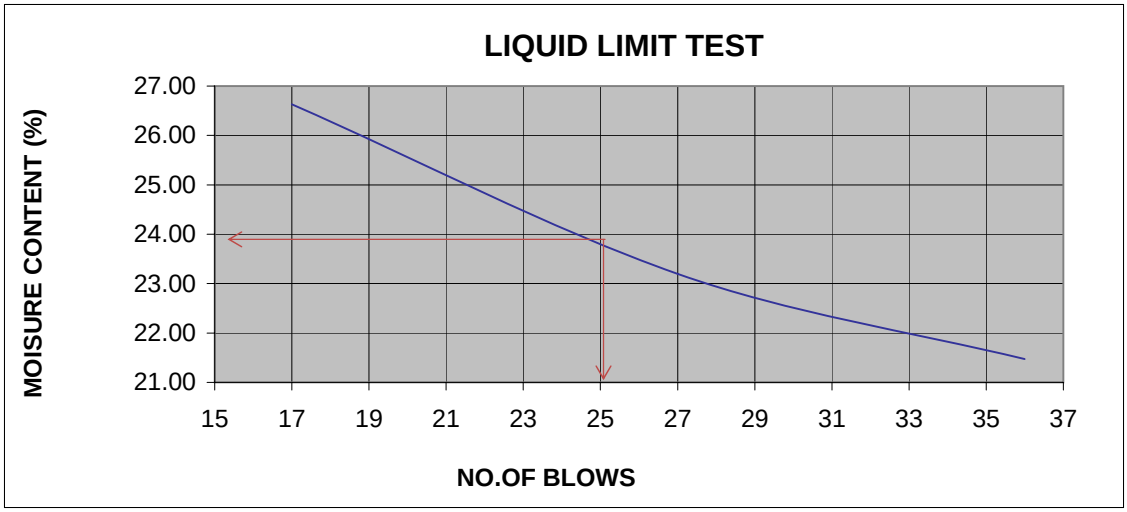
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	49
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A14	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	27	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	46.3	47.2	43.5	31.6
Wt of Dry soil + Container W2 (g)	41.4	42.7	40	30.3
Wt of container W3 (g)	23	23.3	23.7	23.5
Wt. of water (a) W1 - W2 (g)	4.9	4.5	3.5	1.3
Wt. of Dry soil (b) W2 - W3 (g)	18.4	19.4	16.3	6.8
Moisture Content (w)= a/b x 100 (%)	26.63	23.20	21.47	19.12



LL= 23.76% **PL=** 19.12% **PI=** 4.64%

Remarks:

Tested by: Hayat

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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

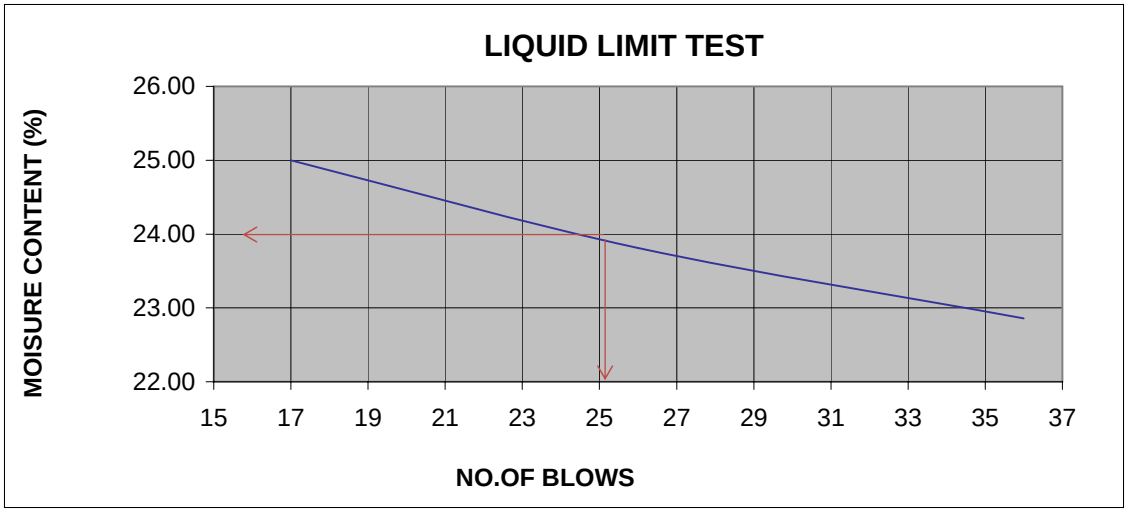
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	50
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A14	Depth: m	6

Description	Liquid Limit			Plastic Limit
No of Blows	17	26	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	33.1	36.2	36.7	26.8
Wt of Dry soil + Container W2 (g)	31.1	33.7	34.3	26.3
Wt of container W3 (g)	23.1	23.2	23.8	23.7
Wt. of water (a) W1 - W2 (g)	2	2.5	2.4	0.5
Wt. of Dry soil (b) W2 - W3 (g)	8	10.5	10.5	2.6
Moisture Content (w)= a/b x 100 (%)	25.00	23.81	22.86	19.23



LL= 23.89% **PL=** 19.23% **PI=** 4.66%

Remarks:

Tested by:	Hayat	
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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

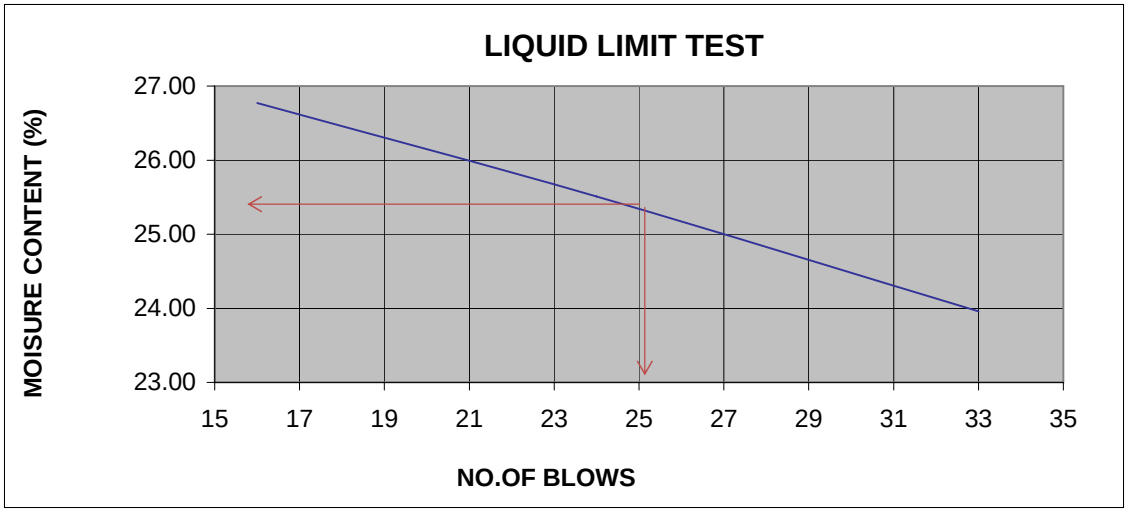
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	51
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A15	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	24	33	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	30.2	26.3	26.2	17.5
Wt of Dry soil + Container W2 (g)	26.8	23.8	23.9	16.5
Wt of container W3 (g)	14.1	14	14.3	11.8
Wt. of water (a) W1 - W2 (g)	3.4	2.5	2.3	1
Wt. of Dry soil (b) W2 - W3 (g)	12.7	9.8	9.6	4.7
Moisture Content (w)= a/b x 100 (%)	26.77	25.51	23.96	21.28



LL= 25.41% **PL=** 21.28% **PI=** 4.13%

Remarks:

Tested by:	Hayat	
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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

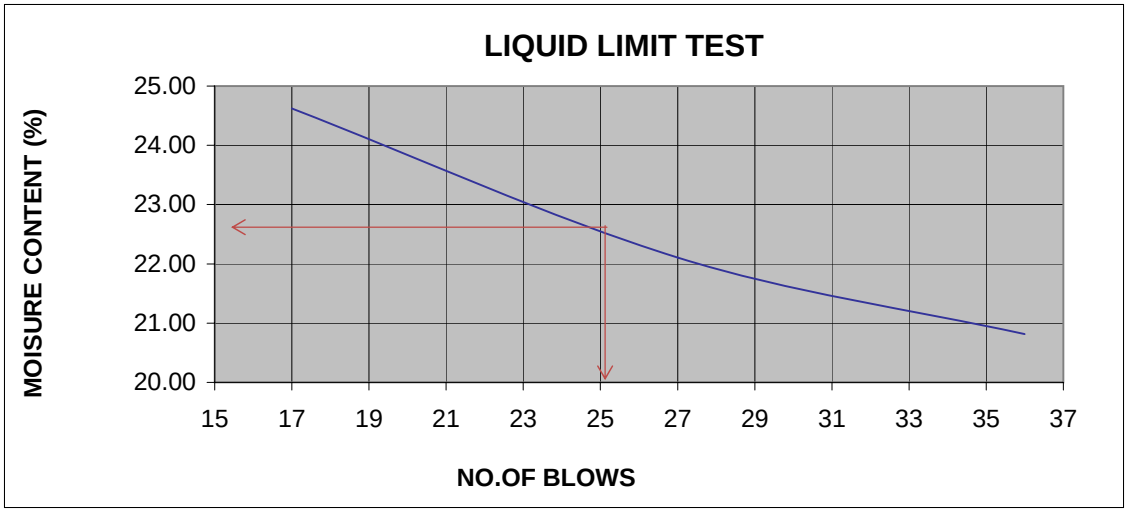
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	52
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A15	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	27	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	48.2	46.7	50.6	30.2
Wt of Dry soil + Container W2 (g)	43.3	42.5	46	29.3
Wt of container W3 (g)	23.4	23.5	23.9	24.2
Wt. of water (a) W1 - W2 (g)	4.9	4.2	4.6	0.9
Wt. of Dry soil (b) W2 - W3 (g)	19.9	19.0	22.1	5.1
Moisture Content (w)= a/b x 100 (%)	24.62	22.11	20.81	17.65



LL= 22.51% **PL=** 17.65% **PI=** 4.86%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

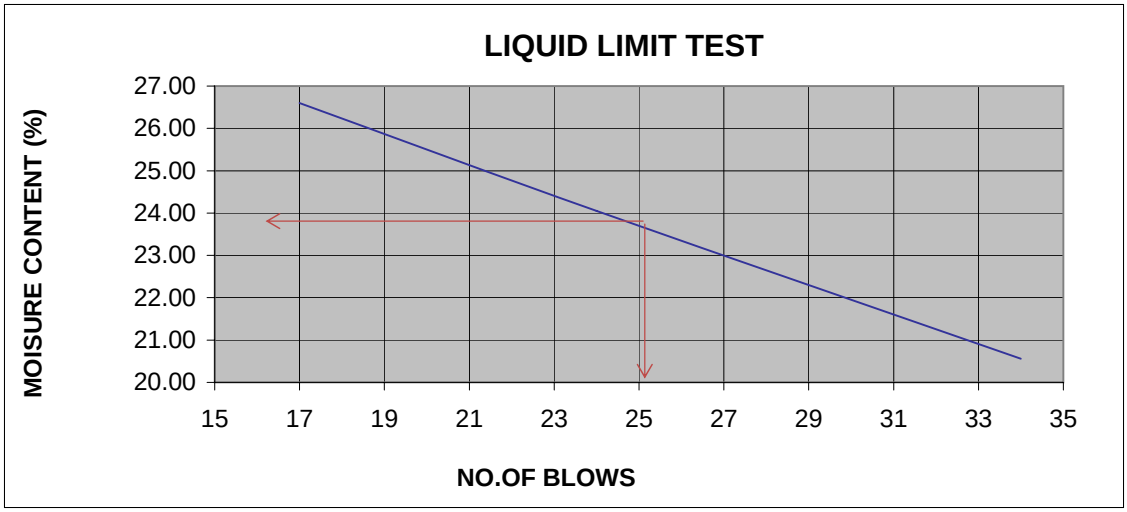
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	53
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A15	Depth: m	5.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	24	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	17.9	15.7	20.7	8.9
Wt of Dry soil + Container W2 (g)	15.4	13.8	18.5	8.4
Wt of container W3 (g)	6	5.9	7.8	5.5
Wt. of water (a) W1 - W2 (g)	2.5	1.9	2.2	0.5
Wt. of Dry soil (b) W2 - W3 (g)	9.4	7.9	10.7	2.9
Moisture Content (w)= a/b x 100 (%)	26.60	24.05	20.56	17.24



LL= 23.73% **PL=** 17.24% **PI=** 6.49%

Remarks:

Tested by: Hayat

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MATERIAL TESTING LAB

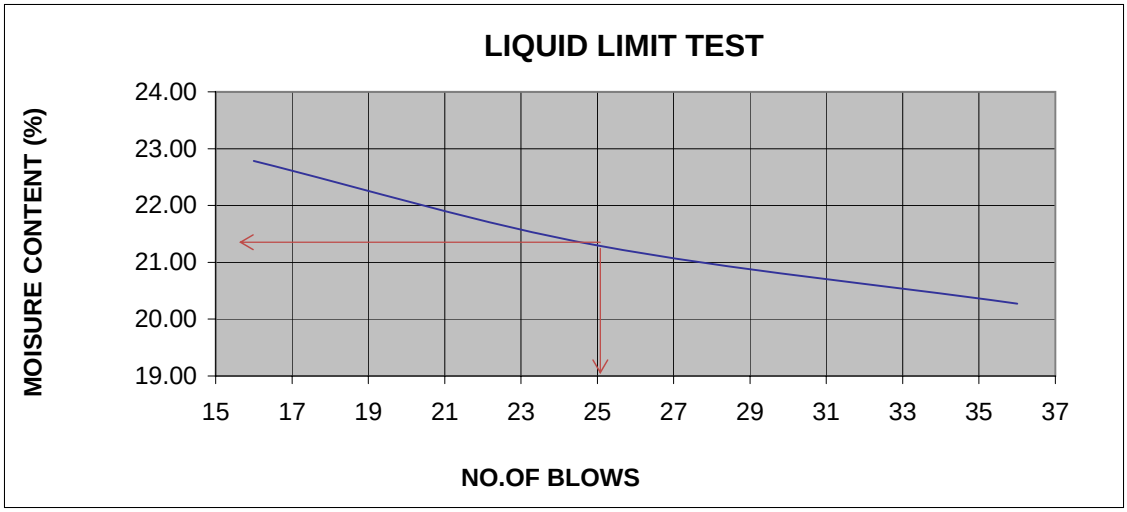
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	54
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A16	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	25	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	33.1	37.2	41.5	30.1
Wt of Dry soil + Container W2 (g)	31.3	34.9	38.5	29.2
Wt of container W3 (g)	23.4	24.1	23.7	23.6
Wt. of water (a) W1 - W2 (g)	1.8	2.3	3	0.9
Wt. of Dry soil (b) W2 - W3 (g)	7.9	10.8	14.8	5.6
Moisture Content (w)= a/b x 100 (%)	22.78	21.30	20.27	16.07



LL= 21.45% **PL=** 16.07% **PI=** 5.38%

Remarks:

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MATERIAL TESTING LAB

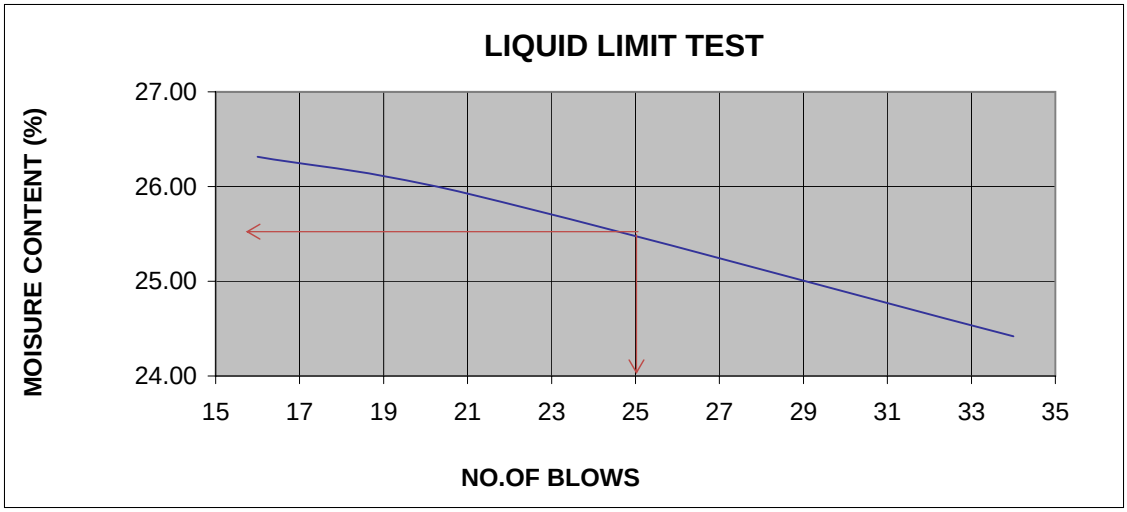
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	55
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A16	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	21	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	32.3	33.3	33.6	27.6
Wt of Dry soil + Container W2 (g)	30.3	31.2	31.5	27
Wt of container W3 (g)	22.7	23.1	22.9	23.6
Wt. of water (a) W1 - W2 (g)	2	2.1	2.1	0.6
Wt. of Dry soil (b) W2 - W3 (g)	7.6	8.1	8.6	3.4
Moisture Content (w)= a/b x 100 (%)	26.32	25.93	24.42	17.65



LL= 25.55% **PL=** 17.65% **PI=** 7.90%

Remarks:

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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

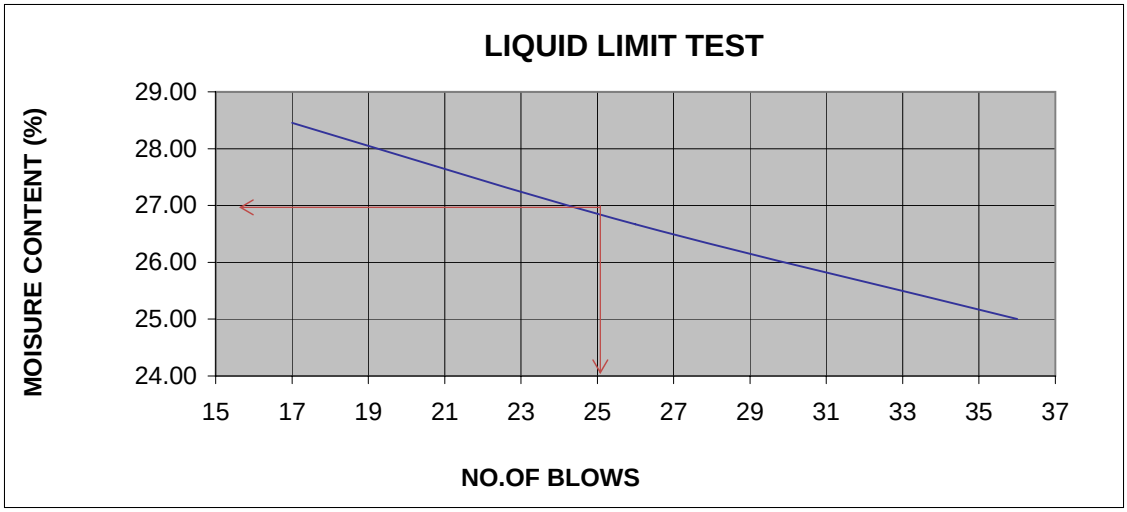
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	56
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A16	Depth: m	5.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	26	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	29.9	30.6	31.3	16.8
Wt of Dry soil + Container W2 (g)	26.4	27.0	27.6	16
Wt of container W3 (g)	14.1	13.5	12.8	11.8
Wt. of water (a) W1 - W2 (g)	3.5	3.6	3.7	0.8
Wt. of Dry soil (b) W2 - W3 (g)	12.3	13.5	14.8	4.2
Moisture Content (w)= a/b x 100 (%)	28.46	26.67	25.00	19.05



LL= 26.71% **PL=** 19.05% **PI=** 7.66%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

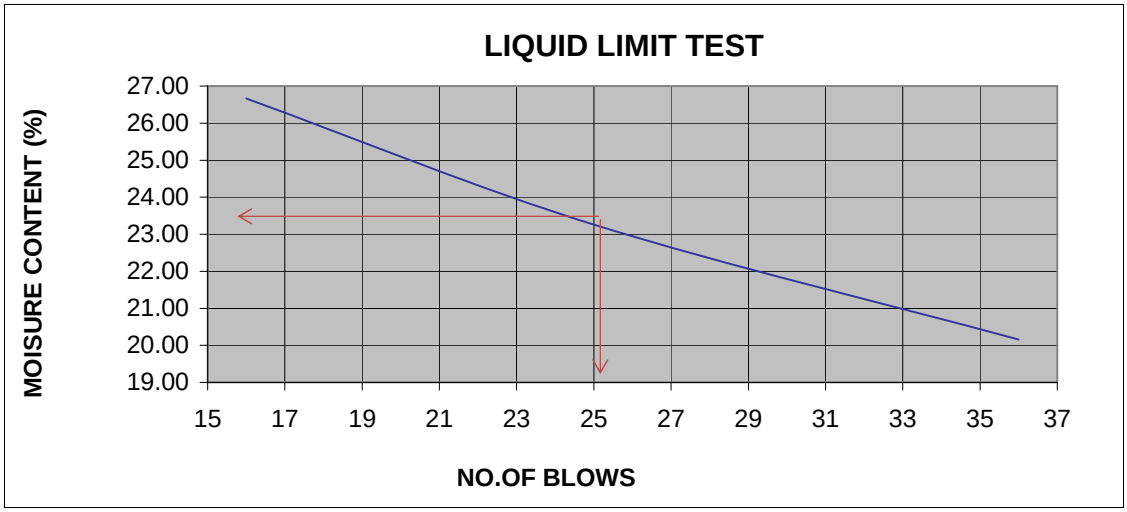
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	57
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A16	Depth: m	6

Description	Liquid Limit			Plastic Limit
No of Blows	16	25	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	33	34.6	39.3	29.1
Wt of Dry soil + Container W2 (g)	31	32.6	36.7	28.3
Wt of container W3 (g)	23.5	24	23.8	23.5
Wt. of water (a) W1 - W2 (g)	2	2.0	2.6	0.8
Wt. of Dry soil (b) W2 - W3 (g)	7.5	8.6	12.9	4.8
Moisture Content (w)= a/b x 100 (%)	26.67	23.26	20.16	16.67



LL= 23.36% **PL=** 16.67% **PI=** 6.69%

Remarks:

Tested by:	Hayat	
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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

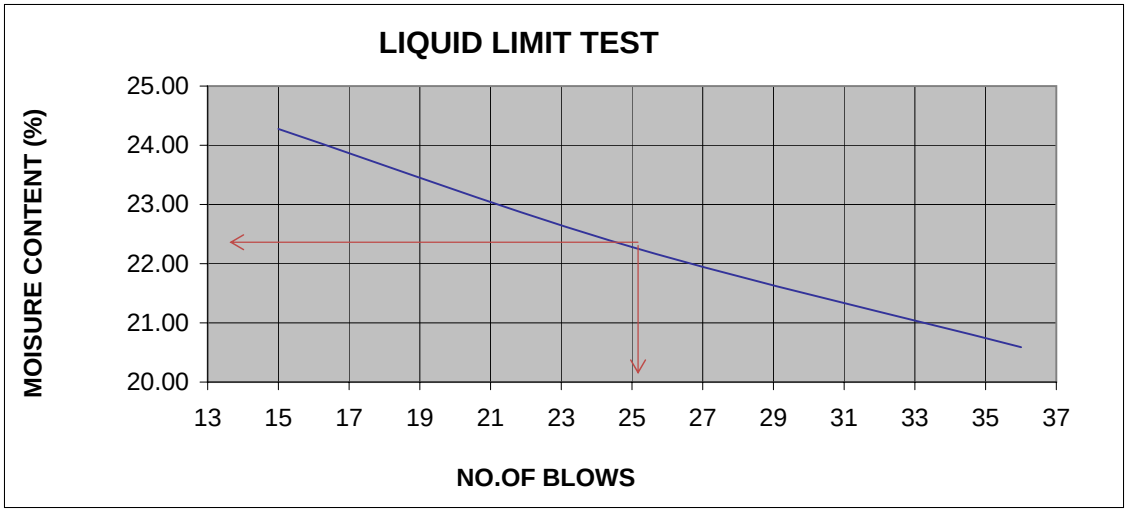
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	58
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A17	Depth: m	0.7

Description	Liquid Limit			Plastic Limit
No of Blows	15	25	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	44.4	46.8	40.1	32.5
Wt of Dry soil + Container W2 (g)	40.2	42.7	37.3	31.1
Wt of container W3 (g)	22.9	24.3	23.7	24.2
Wt. of water (a) W1 - W2 (g)	4.2	4.1	2.8	1.4
Wt. of Dry soil (b) W2 - W3 (g)	17.3	18.4	13.6	6.9
Moisture Content (w)= a/b x 100 (%)	24.28	22.28	20.59	20.29



LL= 23.38% **PL=** 20.29% **PI=** 3.09%

Remarks:

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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

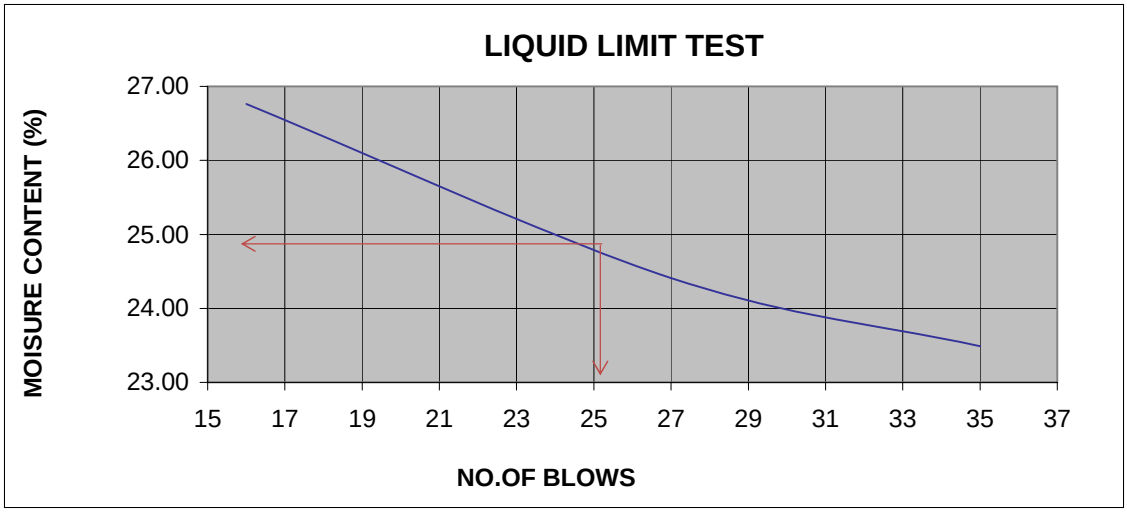
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	59
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A17	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	27	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	41.8	39.1	42.3	29.9
Wt of Dry soil + Container W2 (g)	38	36.0	38.8	28.8
Wt of container W3 (g)	23.8	23.3	23.9	23.5
Wt. of water (a) W1 - W2 (g)	3.8	3.1	3.5	1.1
Wt. of Dry soil (b) W2 - W3 (g)	14.2	12.7	14.9	5.3
Moisture Content (w)= a/b x 100 (%)	26.76	24.41	23.49	20.75



LL= 24.88% **PL=** 20.75% **PI=** 4.13%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

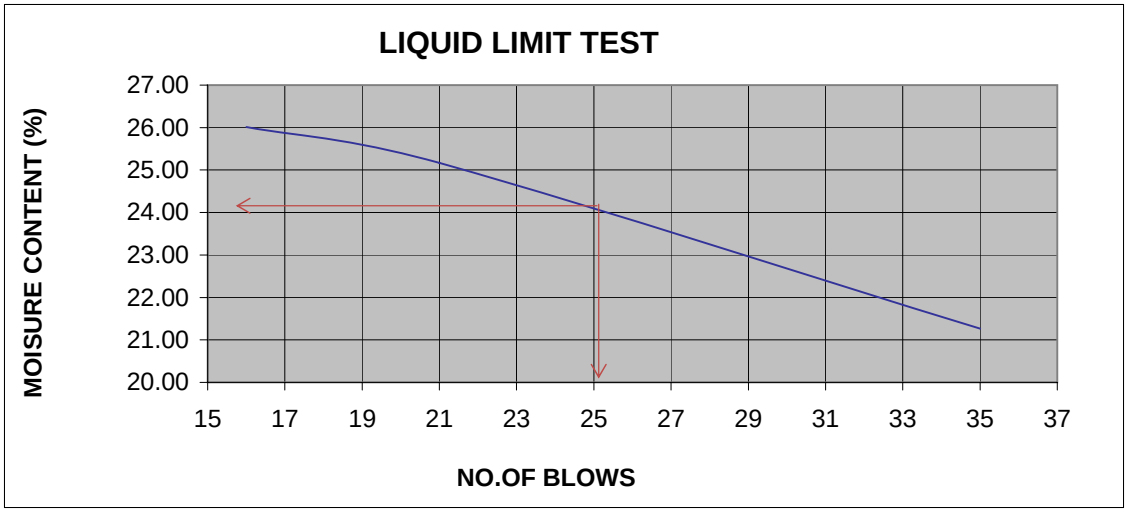
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	60
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A17	Depth: m	2.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	21	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	38.8	42.7	45.1	27.17
Wt of Dry soil + Container W2 (g)	35.6	38.9	41.4	26.6
Wt of container W3 (g)	23.3	23.8	24	23.6
Wt. of water (a) W1 - W2 (g)	3.2	3.8	3.7	0.57
Wt. of Dry soil (b) W2 - W3 (g)	12.3	15.1	17.4	3
Moisture Content (w)= a/b x 100 (%)	26.02	25.17	21.26	19.00



LL= 24.15% **PL=** 19.00% **PI=** 5.15%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

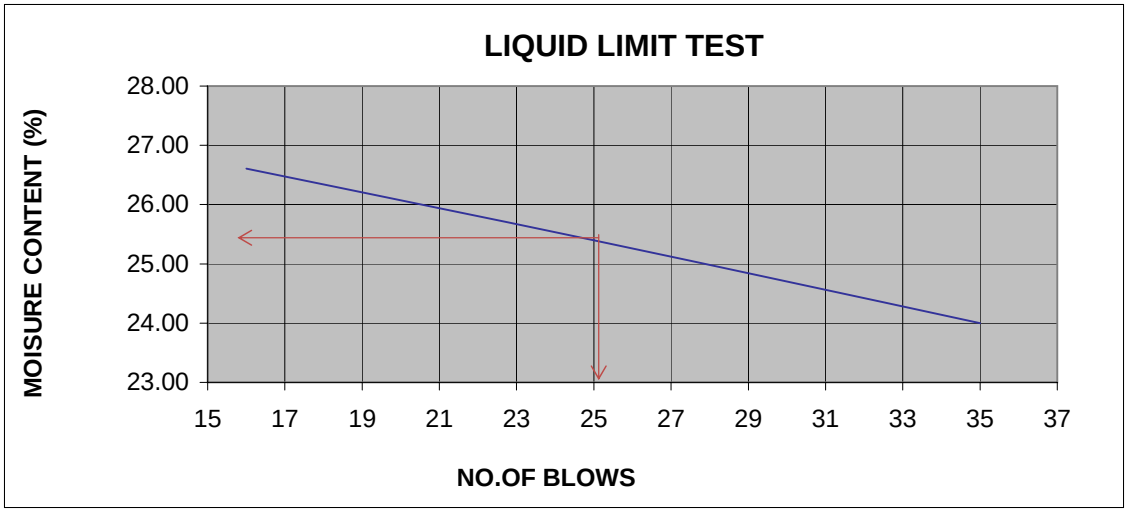
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	61
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A17	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	25	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	37.5	40	38.5	29.4
Wt of Dry soil + Container W2 (g)	34.6	36.8	35.5	28.5
Wt of container W3 (g)	23.7	24.2	23	24.3
Wt. of water (a) W1 - W2 (g)	2.9	3.2	3	0.9
Wt. of Dry soil (b) W2 - W3 (g)	10.9	12.6	12.5	4.2
Moisture Content (w)= a/b x 100 (%)	26.61	25.40	24.00	21.43



LL= 25.33% **PL=** 21.43% **PI=** 3.90%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

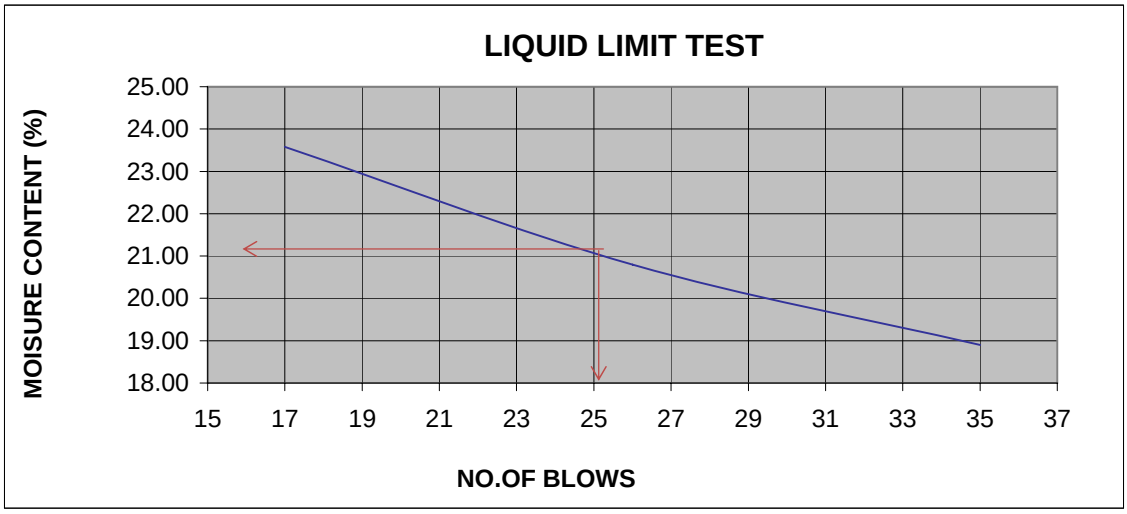
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	62
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A17	Depth: m	4.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	26	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	39.2	38.5	38.6	29.5
Wt of Dry soil + Container W2 (g)	36.3	35.9	36.2	28.7
Wt of container W3 (g)	24	23.4	23.5	23.8
Wt. of water (a) W1 - W2 (g)	2.9	2.6	2.4	0.8
Wt. of Dry soil (b) W2 - W3 (g)	12.3	12.5	12.7	4.9
Moisture Content (w)= a/b x 100 (%)	23.58	20.80	18.90	16.33



LL= 21.09% **PL=** 16.33% **PI=** 4.76%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

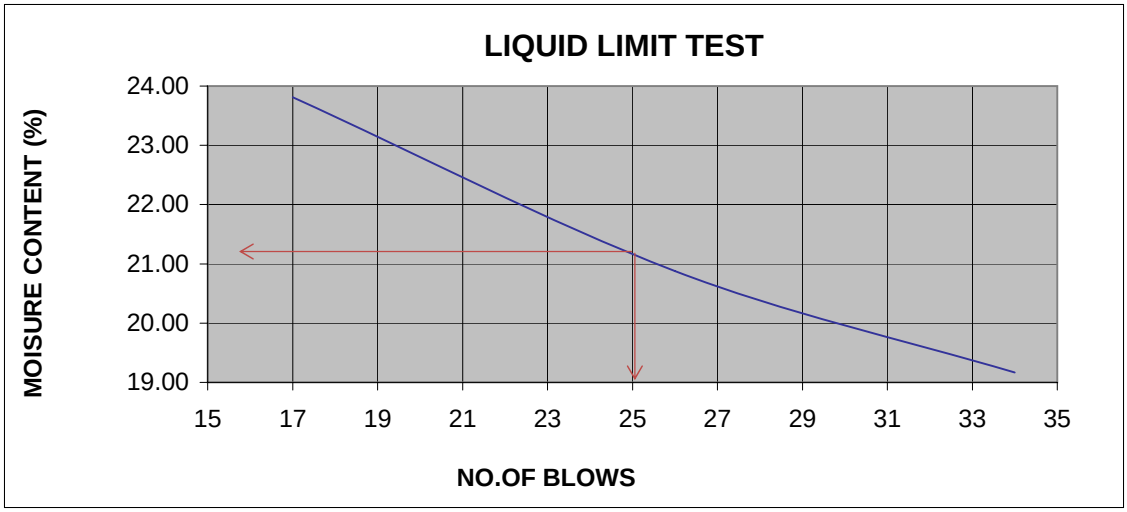
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	63
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A17	Depth: m	5.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	26	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	34.7	30.8	36.5	21.6
Wt of Dry soil + Container W2 (g)	32.2	28.9	34.2	21
Wt of container W3 (g)	21.7	19.8	22.2	17.2
Wt. of water (a) W1 - W2 (g)	2.5	1.9	2.3	0.6
Wt. of Dry soil (b) W2 - W3 (g)	10.5	9.1	12	3.8
Moisture Content (w)= a/b x 100 (%)	23.81	20.88	19.17	15.79



LL= 21.28% **PL=** 15.79% **PI=** 5.49%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

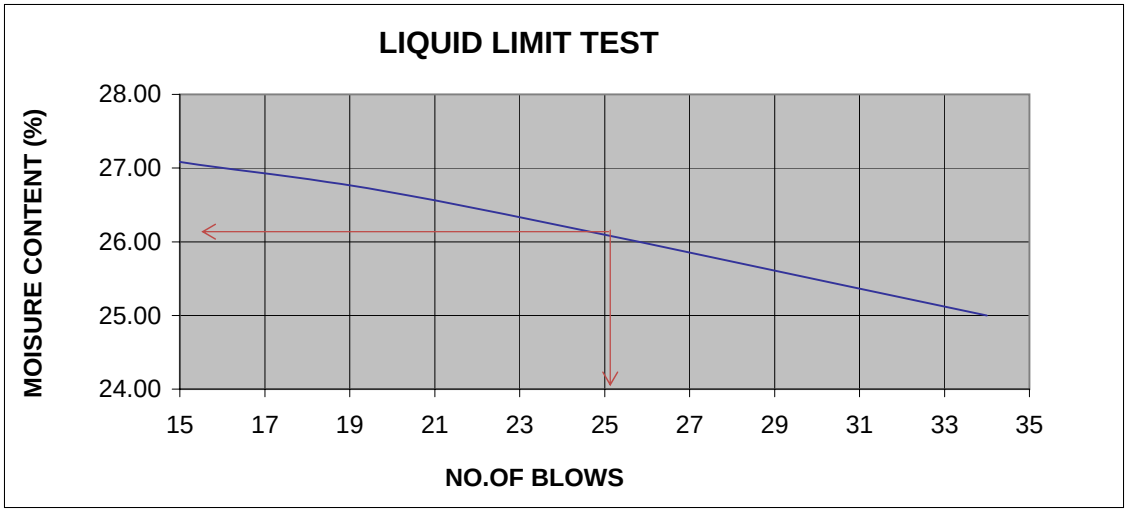
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	64
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A18	Depth: m	2.5

Description	Liquid Limit			Plastic Limit
No of Blows	15	21	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	35.1	40.5	33.8	30.2
Wt of Dry soil + Container W2 (g)	32.5	37.1	31.8	29.3
Wt of container W3 (g)	22.9	24.3	23.8	24.3
Wt. of water (a) W1 - W2 (g)	2.6	3.4	2	0.9
Wt. of Dry soil (b) W2 - W3 (g)	9.6	12.8	8	5
Moisture Content (w)= a/b x 100 (%)	27.08	26.56	25.00	18.00



LL= 26.21% **PL=** 18.00% **PI=** 8.21%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

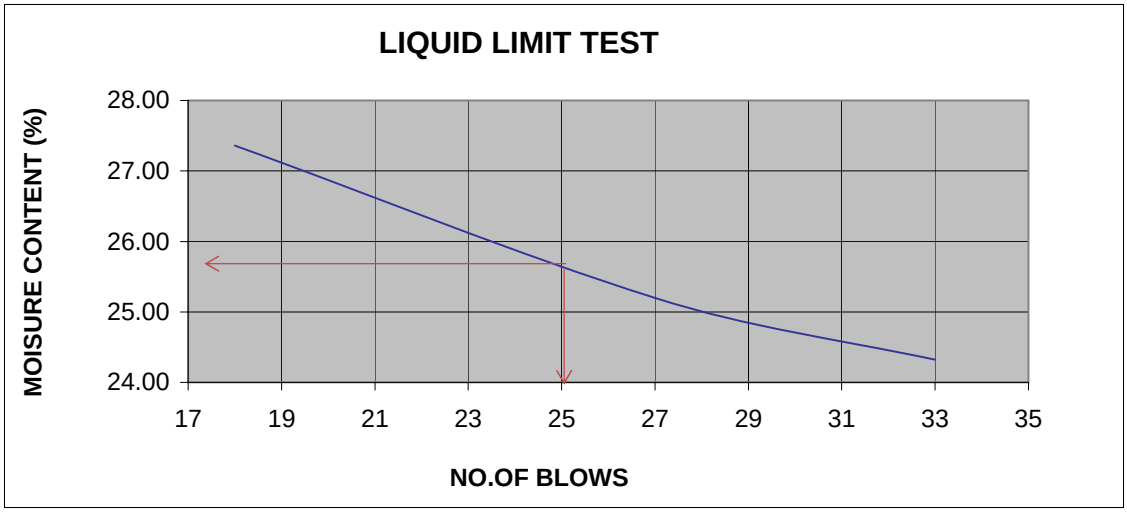
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	65
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A18	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	18	27	33	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	37	39	37.5	28
Wt of Dry soil + Container W2 (g)	34.1	35.8	34.8	27.2
Wt of container W3 (g)	23.5	23.1	23.7	23.3
Wt. of water (a) W1 - W2 (g)	2.9	3.2	2.7	0.8
Wt. of Dry soil (b) W2 - W3 (g)	10.6	12.7	11.1	3.9
Moisture Content (w)= a/b x 100 (%)	27.36	25.20	24.32	20.51



LL= 25.62% **PL=** 20.51% **PI=** 5.11%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

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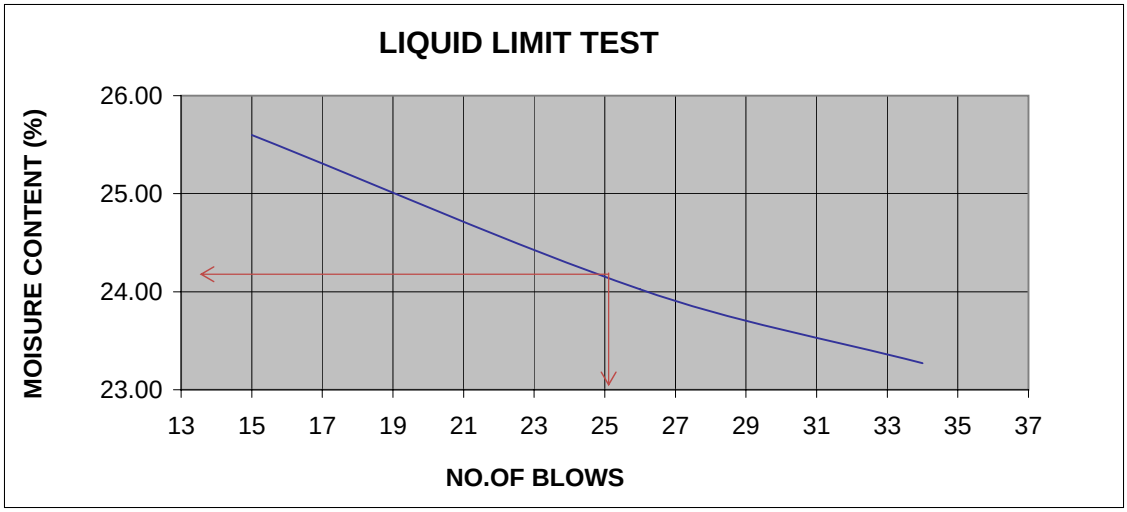
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	66
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A18	Depth: m	4.5

Description	Liquid Limit			Plastic Limit
No of Blows	15	26	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	29.2	32.6	32.4	20.4
Wt of Dry soil + Container W2 (g)	26	28.9	28.7	19.3
Wt of container W3 (g)	13.5	13.5	12.8	13.5
Wt. of water (a) W1 - W2 (g)	3.2	3.7	3.7	1.1
Wt. of Dry soil (b) W2 - W3 (g)	12.5	15.4	15.9	5.8
Moisture Content (w)= a/b x 100 (%)	25.60	24.03	23.27	18.97



LL= 24.30% **PL=** 18.97% **PI=** 5.33%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

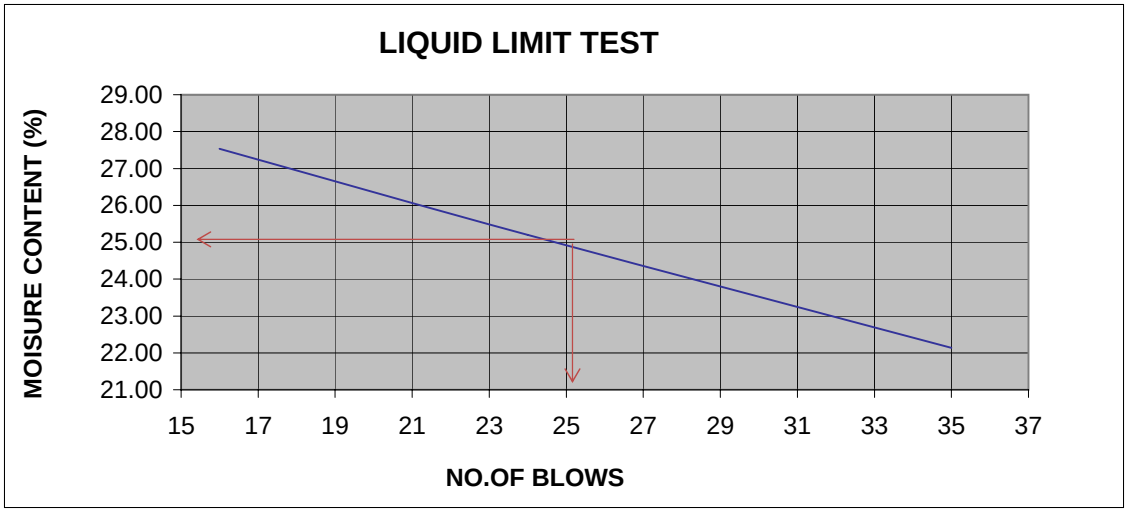
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	67
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A18	Depth: m	5.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	24	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	41.4	39	39.3	28.5
Wt of Dry soil + Container W2 (g)	37.6	35.8	36.4	27.7
Wt of container W3 (g)	23.8	23.1	23.3	23.5
Wt. of water (a) W1 - W2 (g)	3.8	3.2	2.9	0.8
Wt. of Dry soil (b) W2 - W3 (g)	13.8	12.7	13.1	4.2
Moisture Content (w)= a/b x 100 (%)	27.54	25.20	22.14	19.05



LL= 24.96% **PL=** 19.05% **PI=** 5.91%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

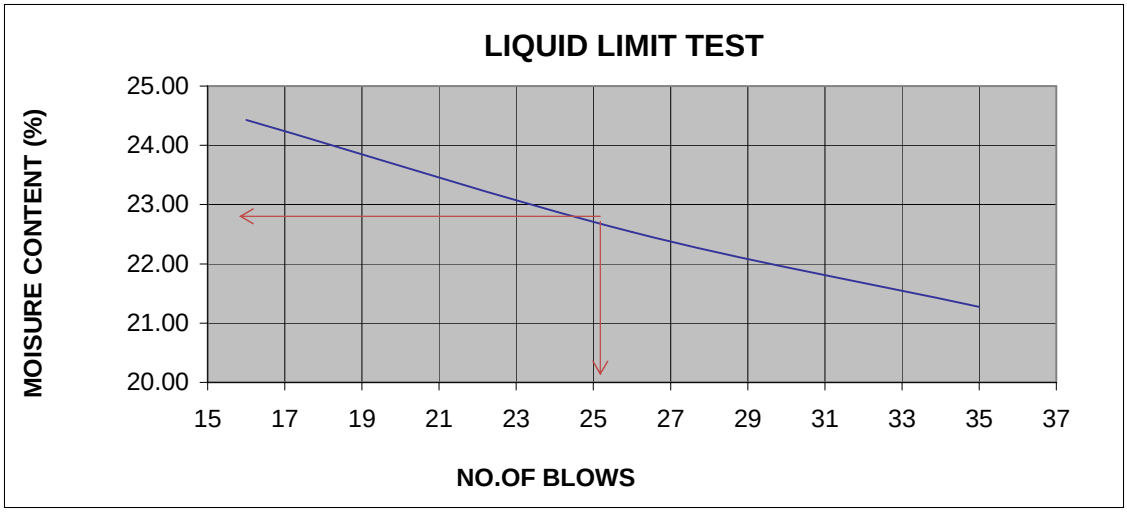
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	68
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A19	Depth: m	2

Description	Liquid Limit			Plastic Limit
No of Blows	16	26	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	28.9	32.1	31.7	20.7
Wt of Dry soil + Container W2 (g)	25.7	28.9	28.7	19.7
Wt of container W3 (g)	12.6	14.7	14.6	14.4
Wt. of water (a) W1 - W2 (g)	3.2	3.2	3	1
Wt. of Dry soil (b) W2 - W3 (g)	13.1	14.2	14.1	5.3
Moisture Content (w)= a/b x 100 (%)	24.43	22.54	21.28	18.87



LL= 22.75% **PL=** 18.87% **PI=** 3.88%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

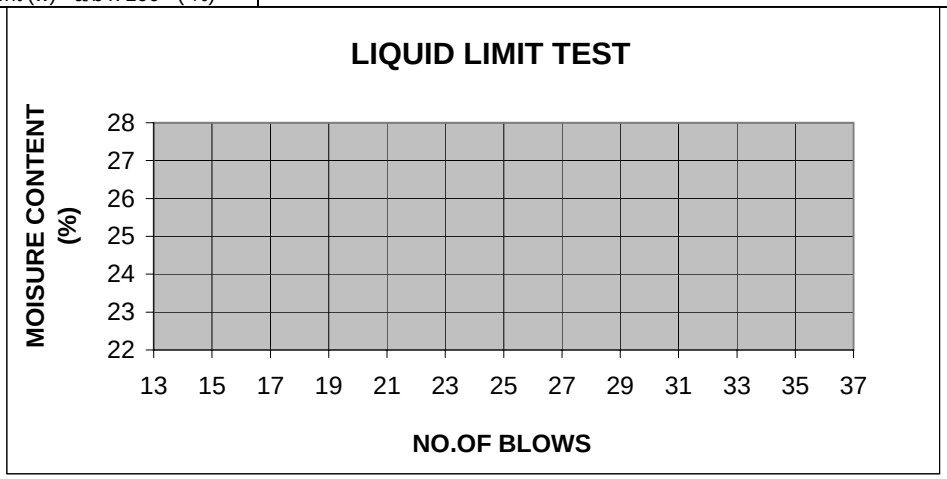
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	69
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A19	Depth: m	3.5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

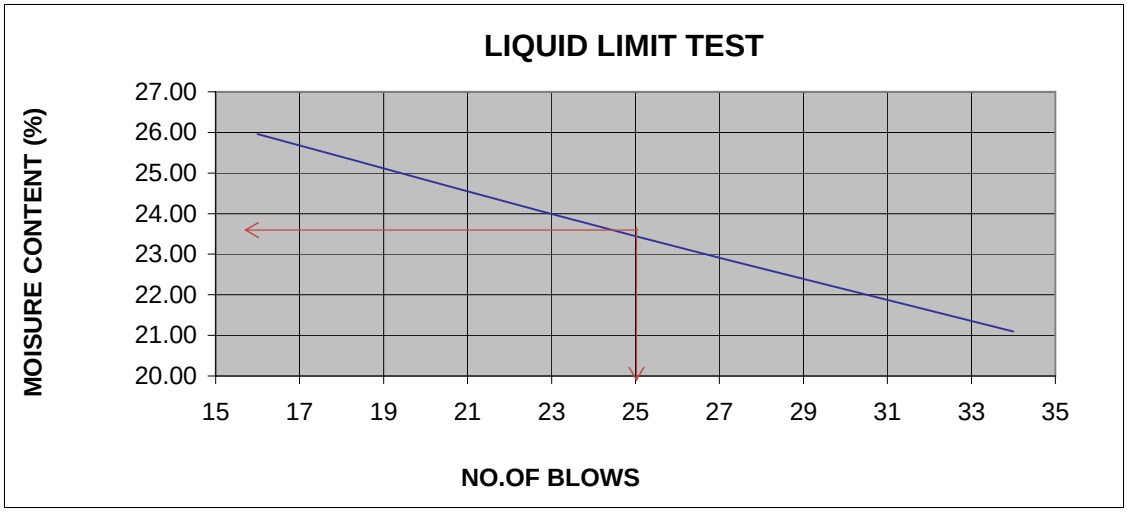
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	70
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A19	Depth: m	5.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	25	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	27.2	31.9	29.9	17.4
Wt of Dry soil + Container W2 (g)	24.5	28.5	27.2	16.5
Wt of container W3 (g)	14.1	14	14.4	11.8
Wt. of water (a) W1 - W2 (g)	2.7	3.4	2.7	0.9
Wt. of Dry soil (b) W2 - W3 (g)	10.4	14.5	12.8	4.7
Moisture Content (w)= a/b x 100 (%)	25.96	23.45	21.09	19.15



LL= 23.50% **PL=** 19.15% **PI=** 4.35%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

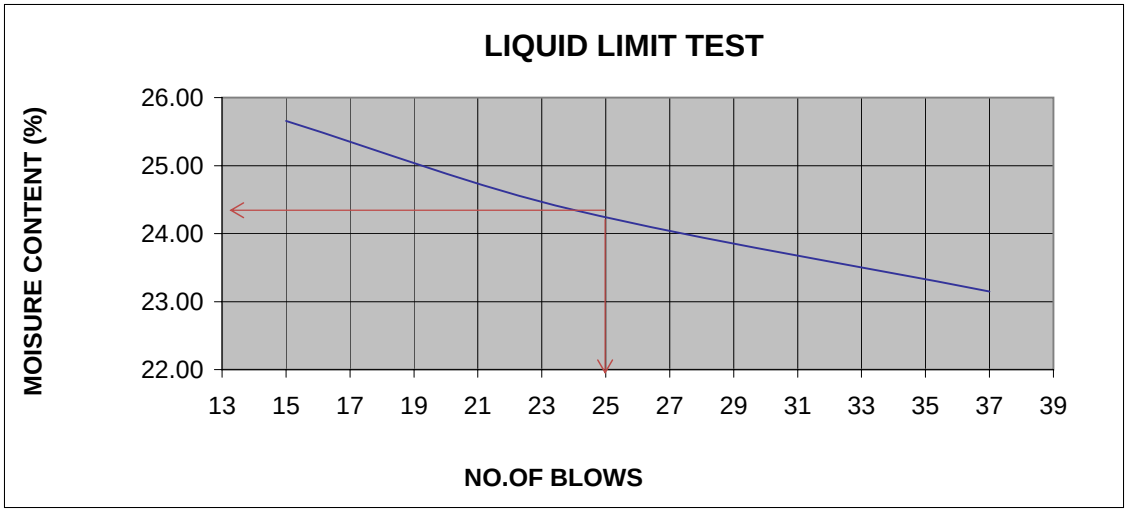
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	71
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A20	Depth: m	1

Description	Liquid Limit			Plastic Limit
No of Blows	15	24	37	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	42.1	37.7	37	29.3
Wt of Dry soil + Container W2 (g)	38.2	34.9	34.5	28.4
Wt of container W3 (g)	23	23.4	23.7	23.5
Wt. of water (a) W1 - W2 (g)	3.9	2.8	2.5	0.9
Wt. of Dry soil (b) W2 - W3 (g)	15.2	11.5	10.8	4.9
Moisture Content (w)= a/b x 100 (%)	25.66	24.35	23.15	18.37



LL= 24.38% **PL=** 18.37% **PI=** 6.01%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

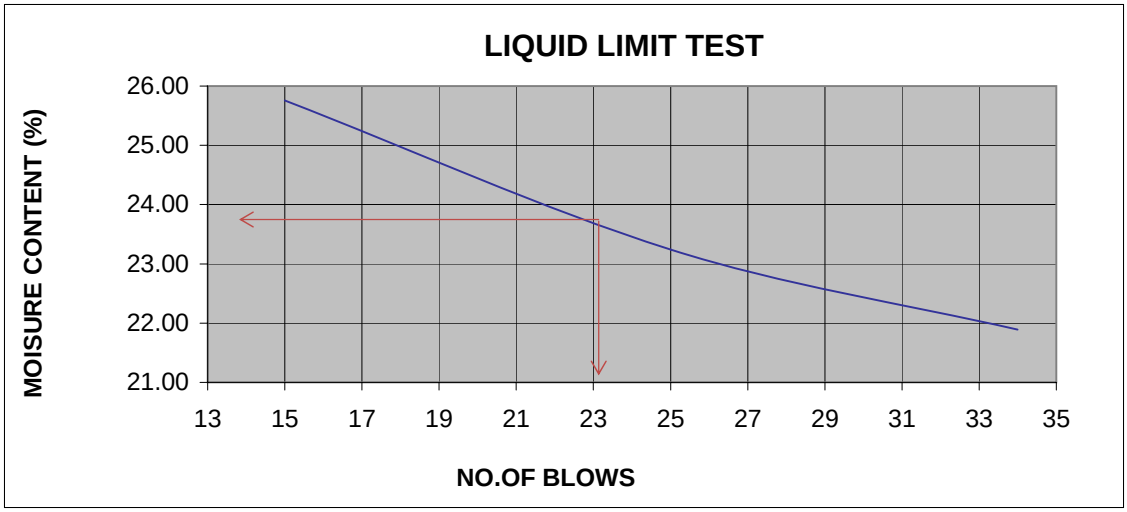
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	72
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A20	Depth: m	2.5

Description	Liquid Limit			Plastic Limit
No of Blows	15	25	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	30	31.5	34.9	19.3
Wt of Dry soil + Container W2 (g)	26.6	28.2	31.2	18.4
Wt of container W3 (g)	13.4	14	14.3	13.4
Wt. of water (a) W1 - W2 (g)	3.4	3.3	3.7	0.9
Wt. of Dry soil (b) W2 - W3 (g)	13.2	14.2	16.9	5
Moisture Content (w)= a/b x 100 (%)	25.76	23.24	21.89	18.00



LL= 23.63% **PL=** 18.00% **PI=** 5.63%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

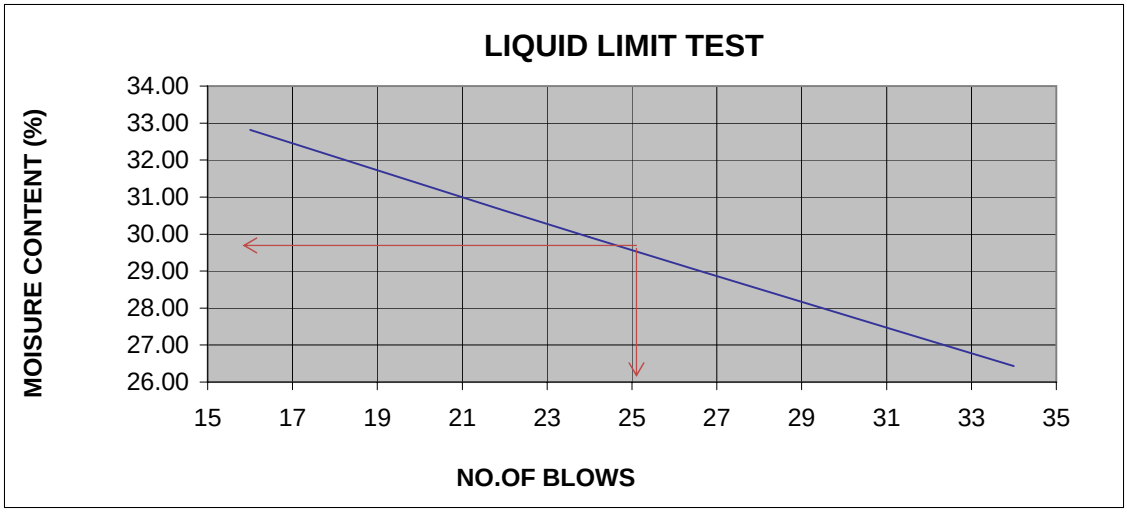
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	73
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A20	Depth: m	4

Description	Liquid Limit			Plastic Limit
No of Blows	16	24	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	39	40	36.7	28.4
Wt of Dry soil + Container W2 (g)	34.8	36.2	33	27.1
Wt of container W3 (g)	22	23.5	19	21.5
Wt. of water (a) W1 - W2 (g)	4.2	3.8	3.7	1.3
Wt. of Dry soil (b) W2 - W3 (g)	12.8	12.7	14	5.6
Moisture Content (w)= a/b x 100 (%)	32.81	29.92	26.43	23.21



LL= 29.72% **PL=** 23.21% **PI=** 6.51%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

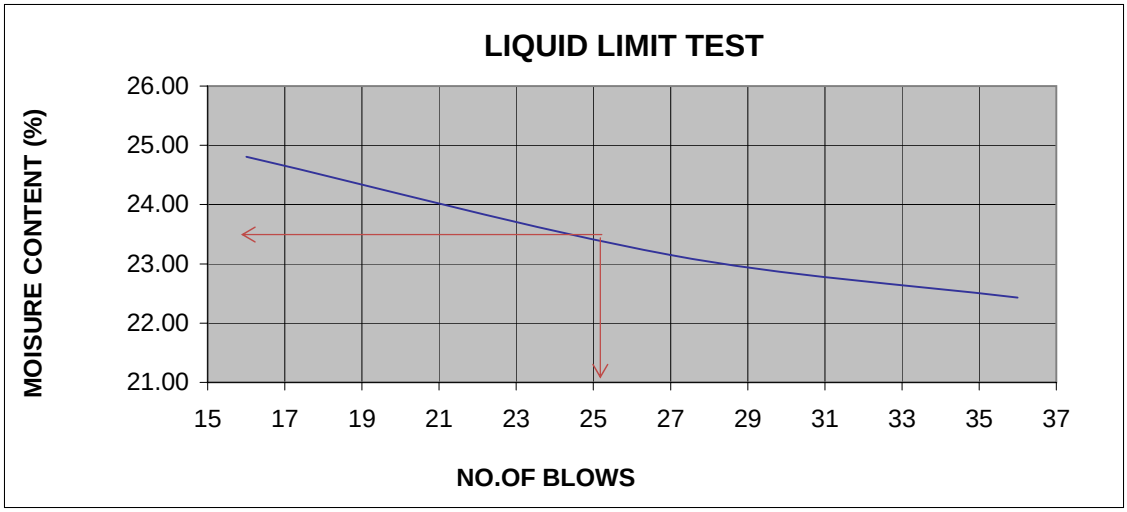
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	74
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A20	Depth: m	5

Description	Liquid Limit			Plastic Limit
No of Blows	16	27	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	33.2	30	30.7	21.2
Wt of Dry soil + Container W2 (g)	30	27.5	28.3	20.1
Wt of container W3 (g)	17.1	16.7	17.6	14.4
Wt. of water (a) W1 - W2 (g)	3.2	2.5	2.4	1.1
Wt. of Dry soil (b) W2 - W3 (g)	12.9	10.8	10.7	5.7
Moisture Content (w)= a/b x 100 (%)	24.81	23.15	22.43	19.30



LL= 23.46% **PL=** 19.30% **PI=** 4.16%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

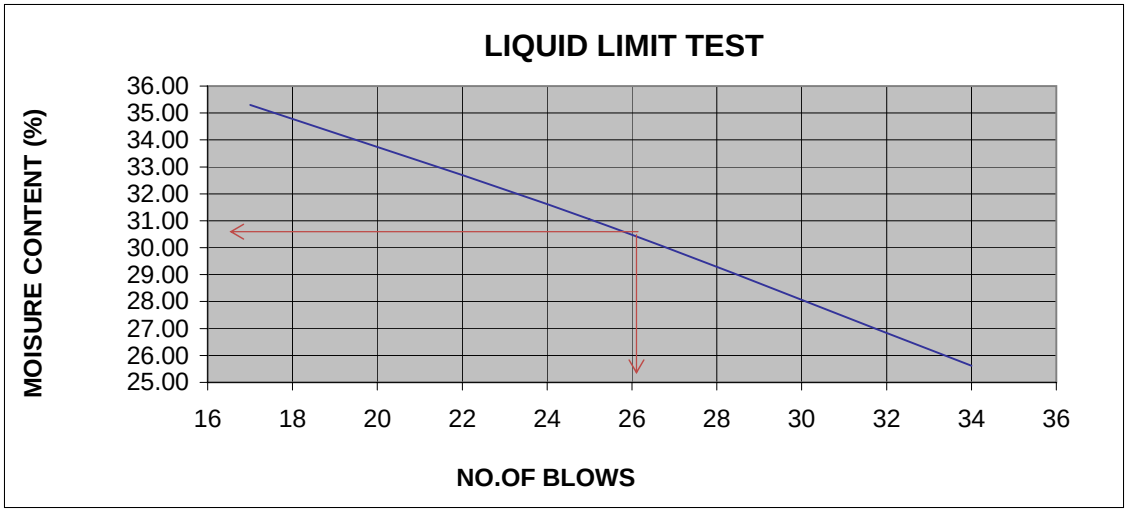
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	75
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A20	Depth: m	6

Description	Liquid Limit			Plastic Limit
No of Blows	17	25	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	40.1	41.1	38.6	28.1
Wt of Dry soil + Container W2 (g)	35.9	37.0	35.5	27.2
Wt of container W3 (g)	24	23.8	23.4	23.5
Wt. of water (a) W1 - W2 (g)	4.2	4.1	3.1	0.9
Wt. of Dry soil (b) W2 - W3 (g)	11.9	13.2	12.1	3.7
Moisture Content (w)= a/b x 100 (%)	35.29	31.06	25.62	24.32



LL= 30.65% **PL=** 24.32% **PI=** 6.33%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

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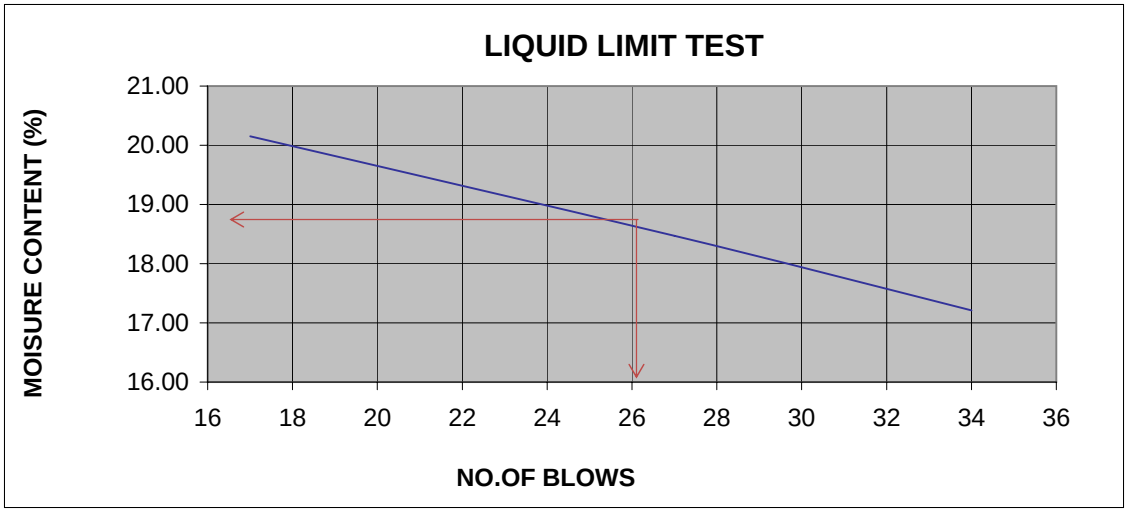
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	76
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A21	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	27	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	39.8	42.8	38.1	30
Wt of Dry soil + Container W2 (g)	37.1	39.9	36	29.3
Wt of container W3 (g)	23.7	24.2	23.8	24.2
Wt. of water (a) W1 - W2 (g)	2.7	2.9	2.1	0.7
Wt. of Dry soil (b) W2 - W3 (g)	13.4	15.7	12.2	5.1
Moisture Content (w)= a/b x 100 (%)	20.15	18.47	17.21	13.73



LL= 18.61% **PL=** 13.73% **PI=** 4.88%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

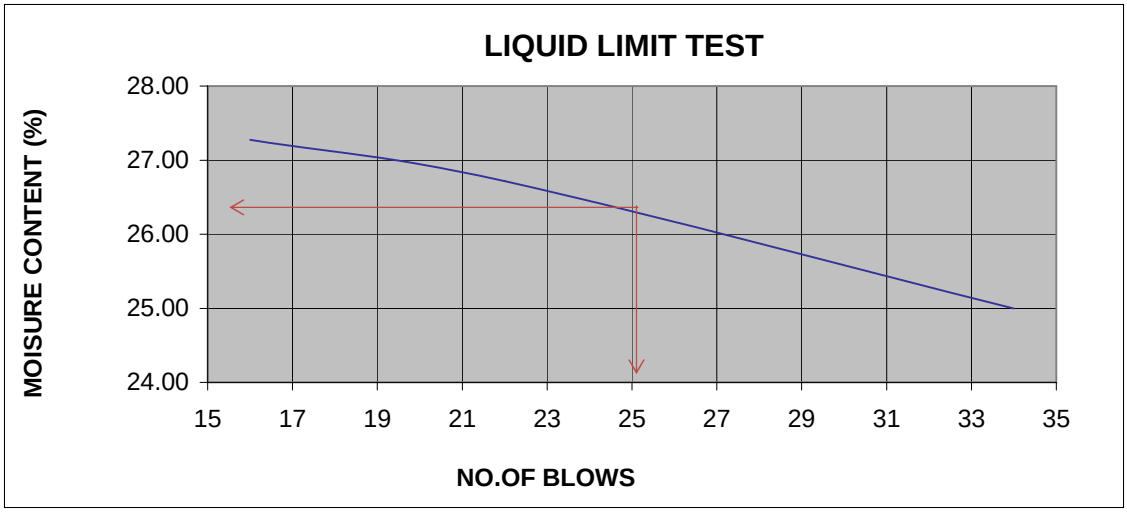
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	77
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A21	Depth: m	4

Description	Liquid Limit			Plastic Limit
No of Blows	16	22	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	42	40.9	38.5	29
Wt of Dry soil + Container W2 (g)	38.1	37.4	35.6	28.2
Wt of container W3 (g)	23.8	24.3	24	24.2
Wt. of water (a) W1 - W2 (g)	3.9	3.5	2.9	0.8
Wt. of Dry soil (b) W2 - W3 (g)	14.3	13.1	11.6	4
Moisture Content (w)= a/b x 100 (%)	27.27	26.72	25.00	20.00



LL= 26.33% **PL=** 20.00% **PI=** 6.33%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

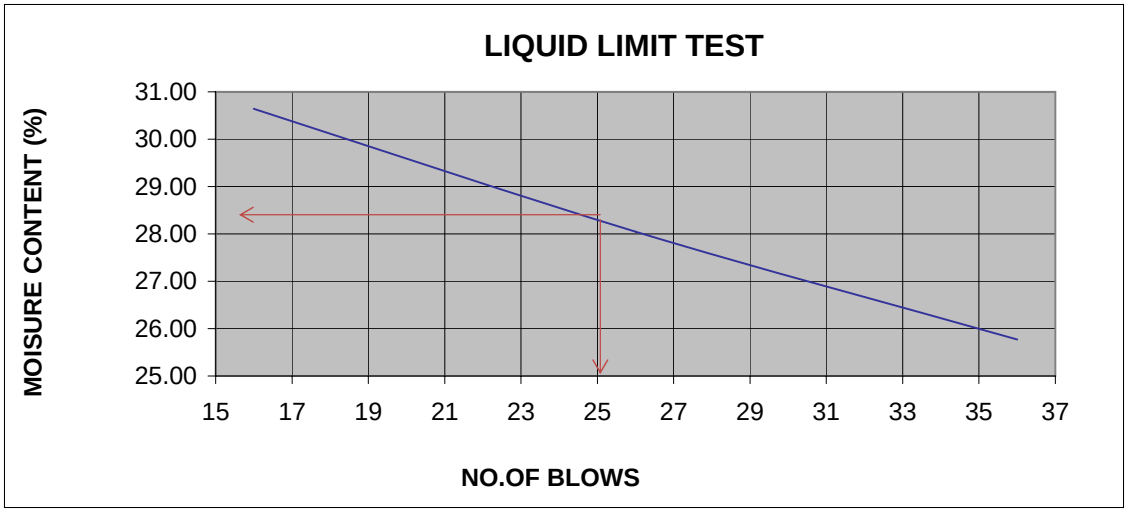
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	78
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A21	Depth: m	6

Description	Liquid Limit			Plastic Limit
No of Blows	16	26	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	31.5	34.5	36	27.4
Wt of Dry soil + Container W2 (g)	29.6	32.2	33.5	26.8
Wt of container W3 (g)	23.4	24	23.8	23.5
Wt. of water (a) W1 - W2 (g)	1.9	2.3	2.5	0.6
Wt. of Dry soil (b) W2 - W3 (g)	6.2	8.2	9.7	3.3
Moisture Content (w)= a/b x 100 (%)	30.65	28.05	25.77	18.18



LL= 28.15% **PL=** 18.18% **PI=** 9.97%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

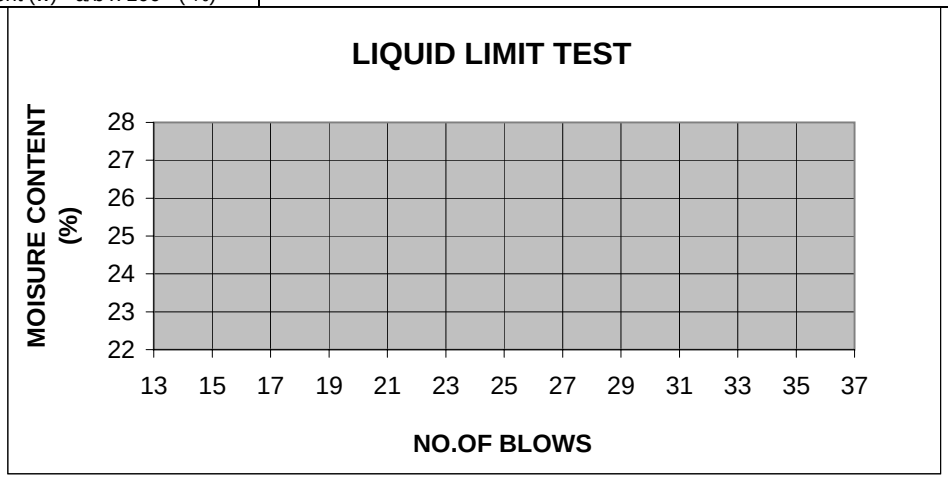
MATERIAL TESTING LAB

Omran Geotechnic Company

ATTERBERG LIMITS
ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	79
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A22	Depth: m	1

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

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2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

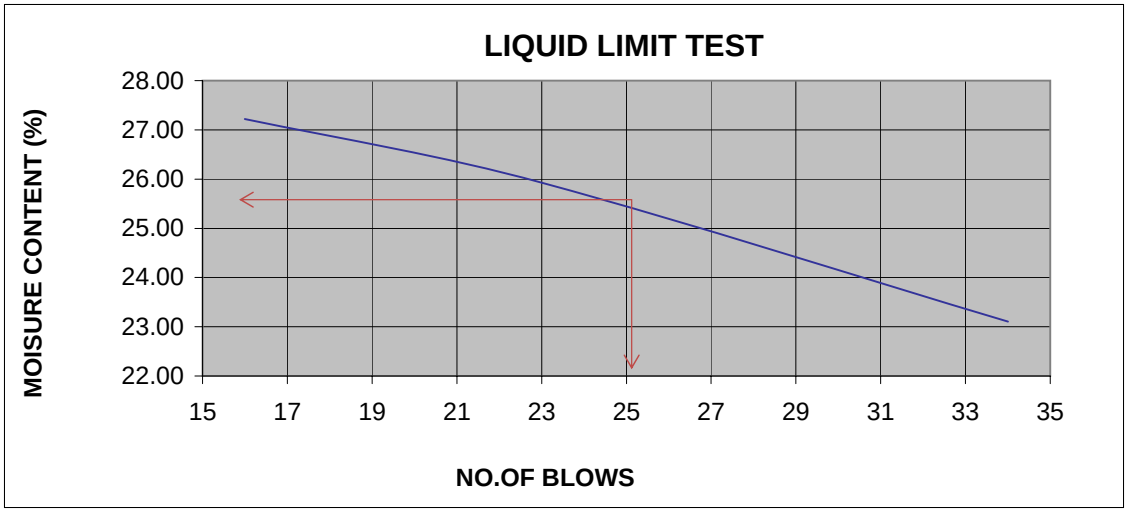
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	80
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A22	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	23	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	46.6	30.4	55.4	28.4
Wt of Dry soil + Container W2 (g)	41.7	26.9	49.3	27.6
Wt of container W3 (g)	23.7	13.4	22.9	23.9
Wt. of water (a) W1 - W2 (g)	4.9	3.5	6.1	0.8
Wt. of Dry soil (b) W2 - W3 (g)	18	13.5	26.4	3.7
Moisture Content (w)= a/b x 100 (%)	27.22	25.93	23.11	21.62



LL= 25.42% **PL=** 21.62% **PI=** 3.80%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

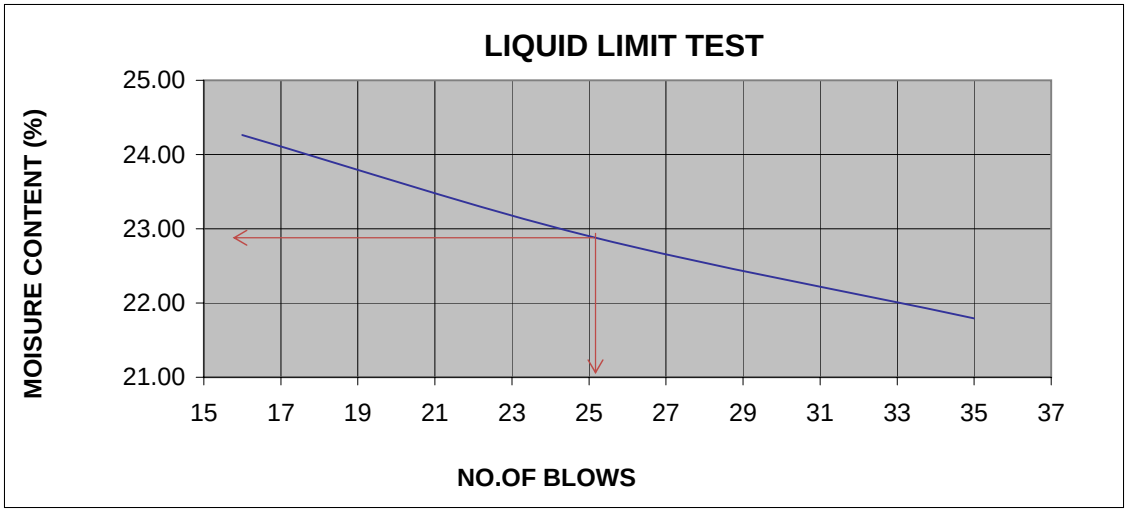
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	81
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	07.04.2010
Location:	BH # A22	Depth: m	5.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	25	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	40.6	29.5	51.4	29.3
Wt of Dry soil + Container W2 (g)	37.3	26.5	46.3	28.5
Wt of container W3 (g)	23.7	13.4	22.9	23.8
Wt. of water (a) W1 - W2 (g)	3.3	3.0	5.1	0.8
Wt. of Dry soil (b) W2 - W3 (g)	13.6	13.1	23.4	4.7
Moisture Content (w)= a/b x 100 (%)	24.26	22.90	21.79	17.02



LL= 22.98% **PL=** 17.02% **PI=** 5.96%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

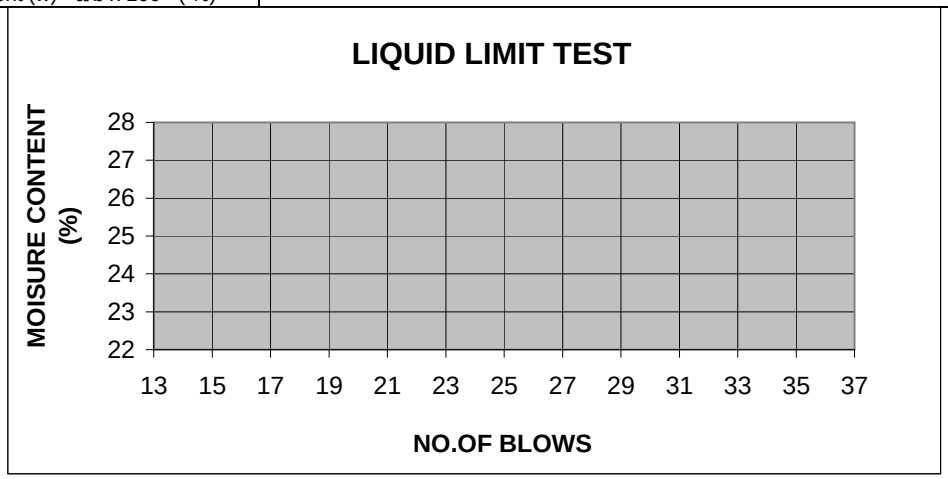
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	82
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	1

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

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2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

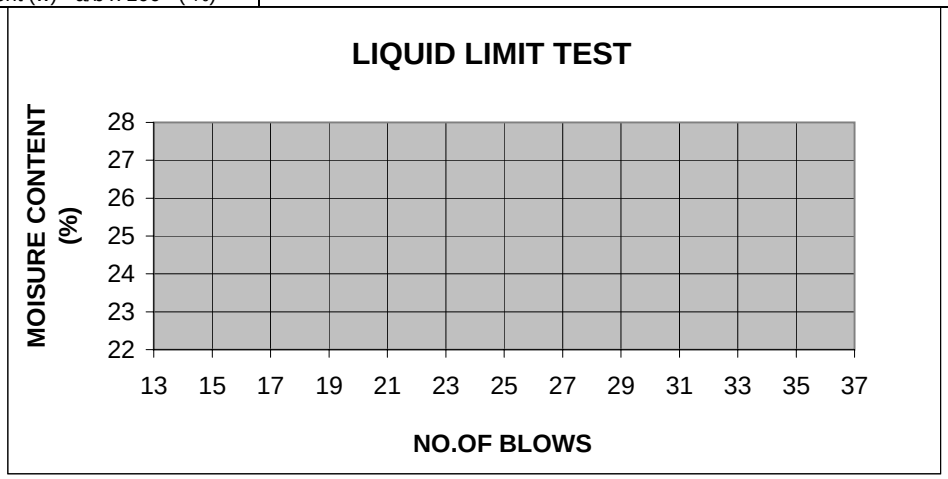
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	83
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	2

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

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3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

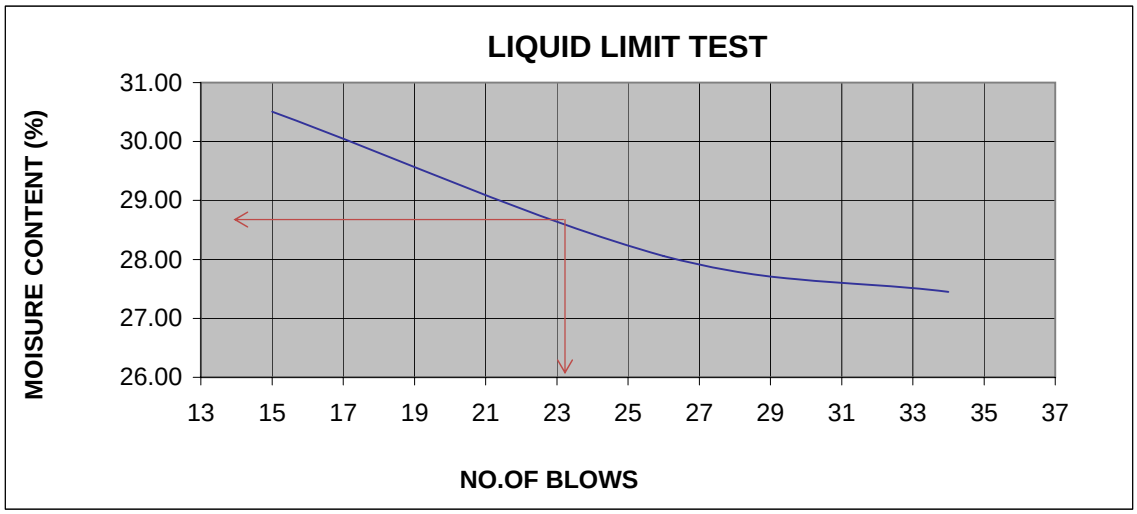
MATERIAL TESTING LAB

Omran Geotechnic Company

ATTERBERG LIMITS
ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	84
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	4

Description	Liquid Limit			Plastic Limit
No of Blows	15	26	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	38.4	40.9	37.3	29
Wt of Dry soil + Container W2 (g)	34.8	37.0	34.5	28
Wt of container W3 (g)	23	23.1	24.3	23.4
Wt. of water (a) W1 - W2 (g)	3.6	3.9	2.8	1
Wt. of Dry soil (b) W2 - W3 (g)	11.8	13.9	10.2	4.6
Moisture Content (w)= a/b x 100 (%)	30.51	28.06	27.45	21.74



LL= 28.67% **PL=** 21.74% **PI=** 6.93%

Remarks:

Tested by:	Hayat		
Checked by:	Jafari	E-mail:	
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com	

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

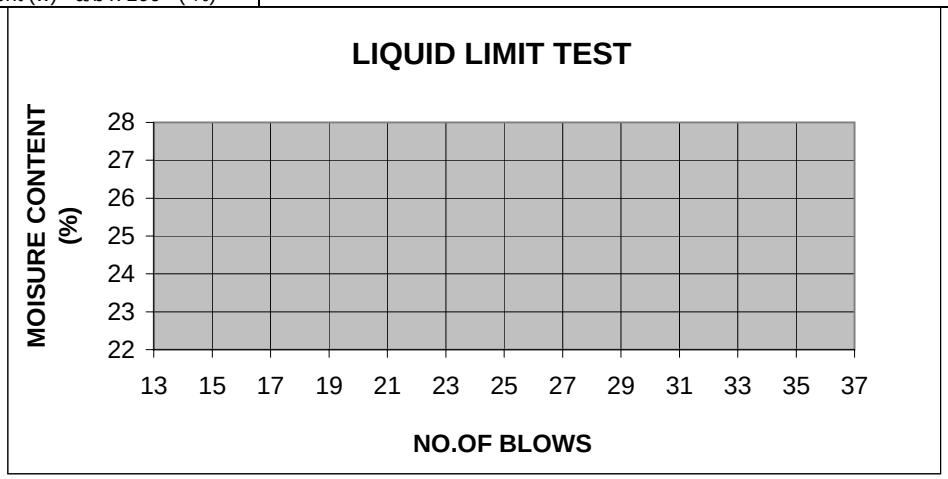
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	85
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

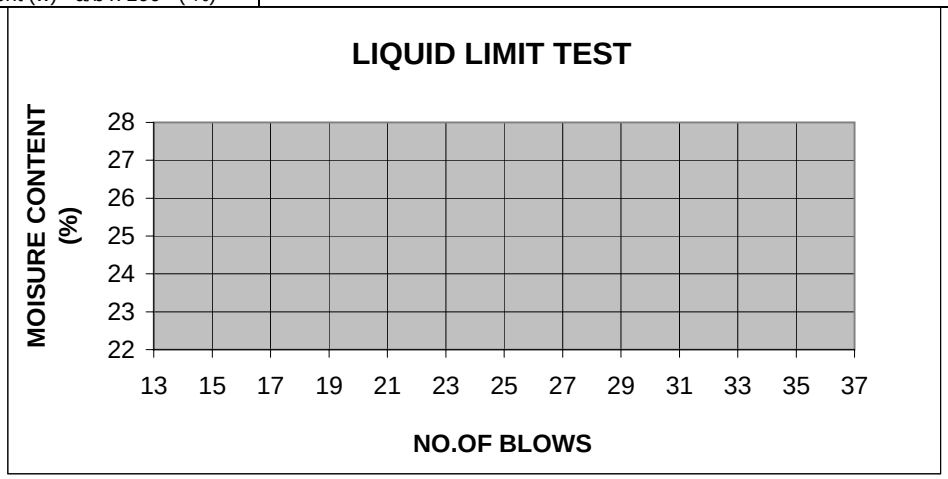
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	86
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	7

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

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3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

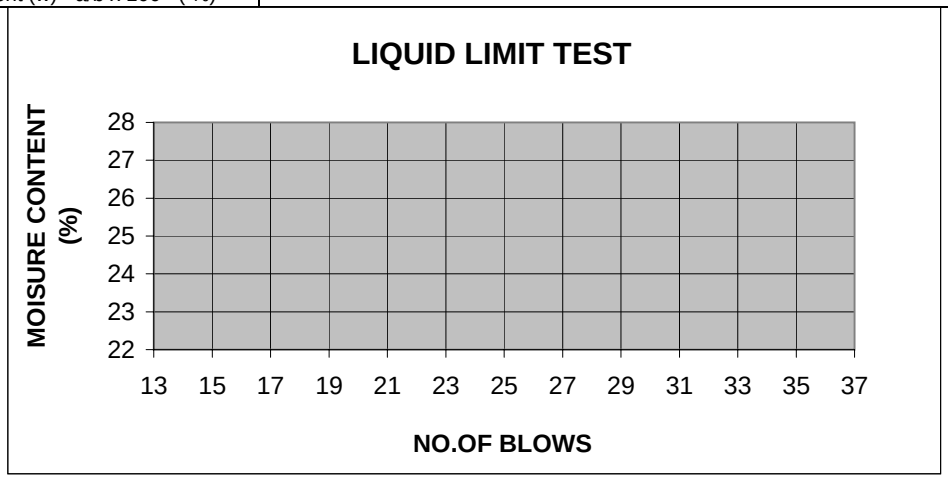
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	87
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	8

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

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6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

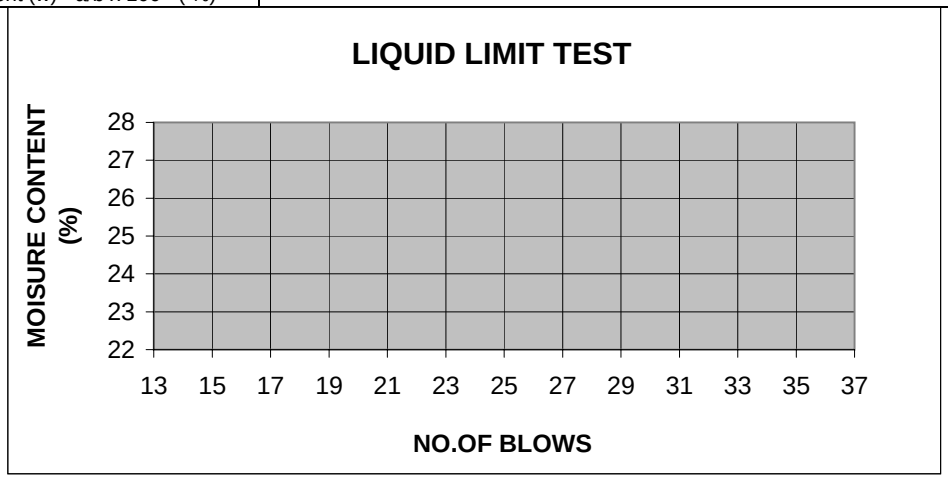
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	88
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	9.5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

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5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

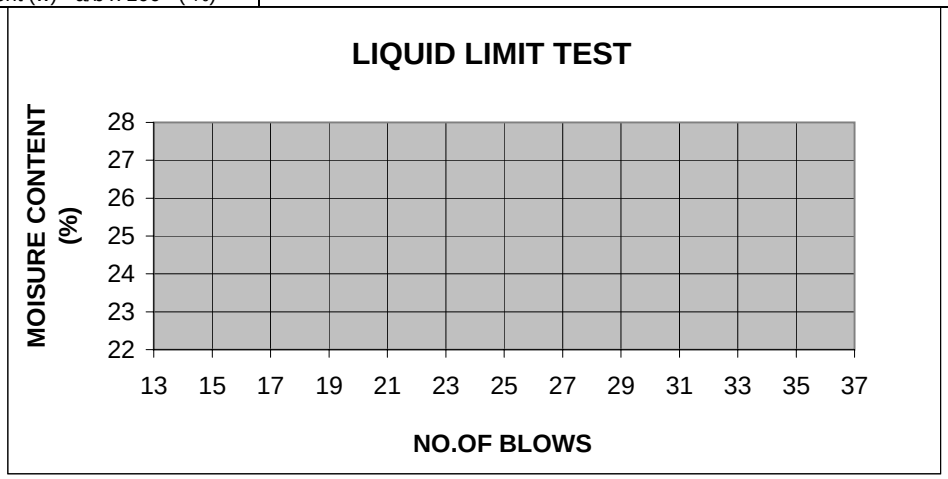
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	89
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	11

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

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3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

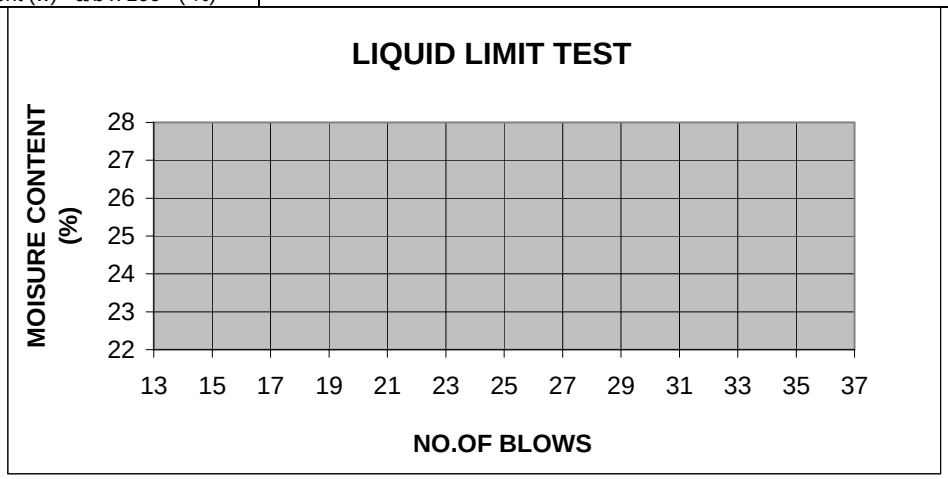
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	90
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	11.5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

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3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

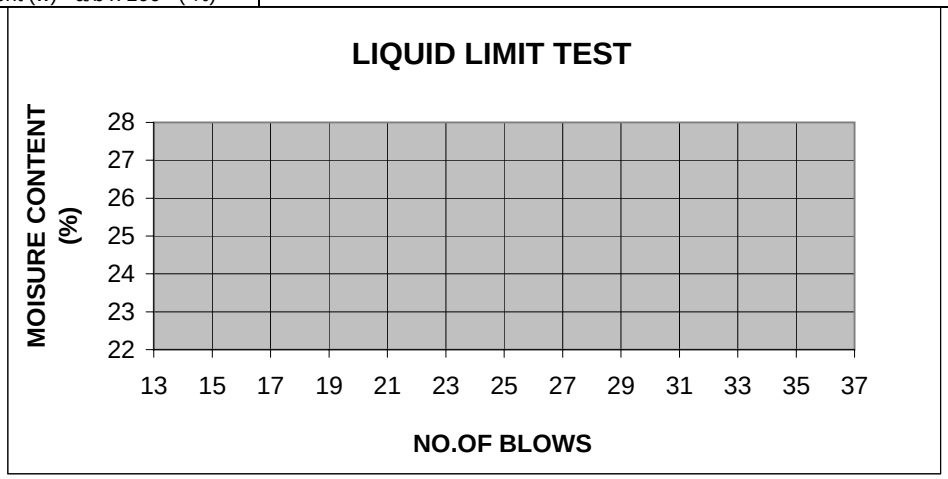
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	91
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	12.5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

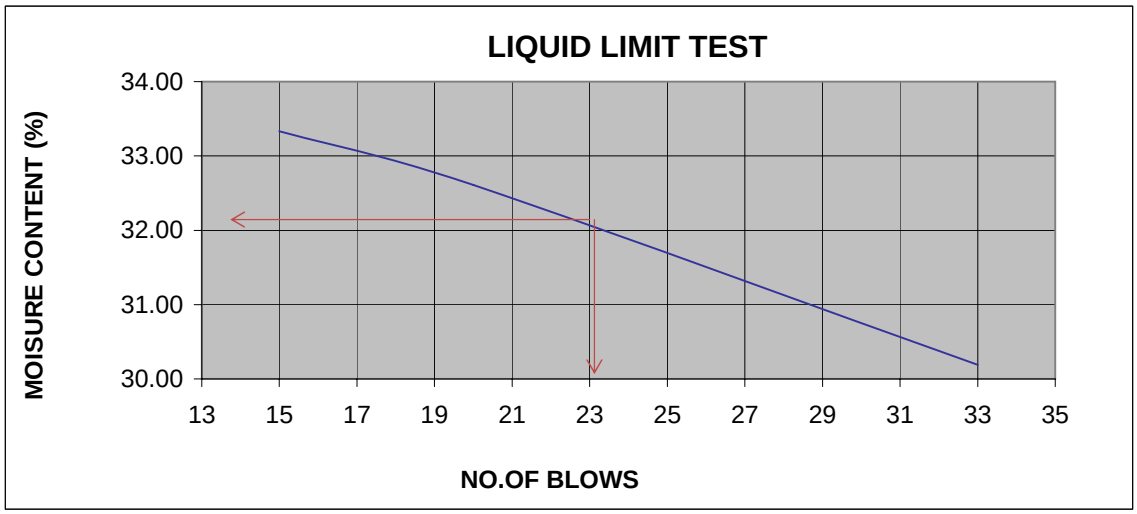
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	92
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	14

Description	Liquid Limit			Plastic Limit
No of Blows	15	20	33	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	42.2	36.5	30.9	31.2
Wt of Dry soil + Container W2 (g)	37.6	33.5	29.3	29.6
Wt of container W3 (g)	23.8	24.3	24	23.8
Wt. of water (a) W1 - W2 (g)	4.6	3.0	1.6	1.6
Wt. of Dry soil (b) W2 - W3 (g)	13.8	9.2	5.3	5.8
Moisture Content (w)= a/b x 100 (%)	33.33	32.61	30.19	27.59



LL= 32.04% **PL=** 27.59% **PI=** 4.45%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

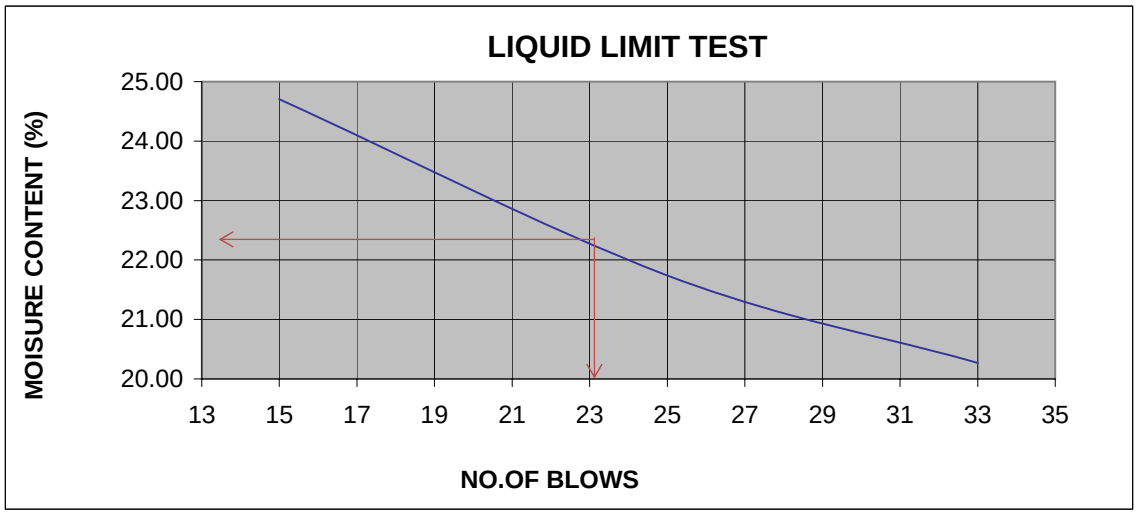
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	93
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	16

Description	Liquid Limit			Plastic Limit
No of Blows	15	25	33	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	33.6	34.3	33.2	30.8
Wt of Dry soil + Container W2 (g)	31.5	32.3	31.7	29.6
Wt of container W3 (g)	23	23.1	24.3	23.2
Wt. of water (a) W1 - W2 (g)	2.1	2.0	1.5	1.2
Wt. of Dry soil (b) W2 - W3 (g)	8.5	9.2	7.4	6.4
Moisture Content (w)= a/b x 100 (%)	24.71	21.74	20.27	18.75



LL= 22.24% **PL=** 18.75% **PI=** 3.49%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

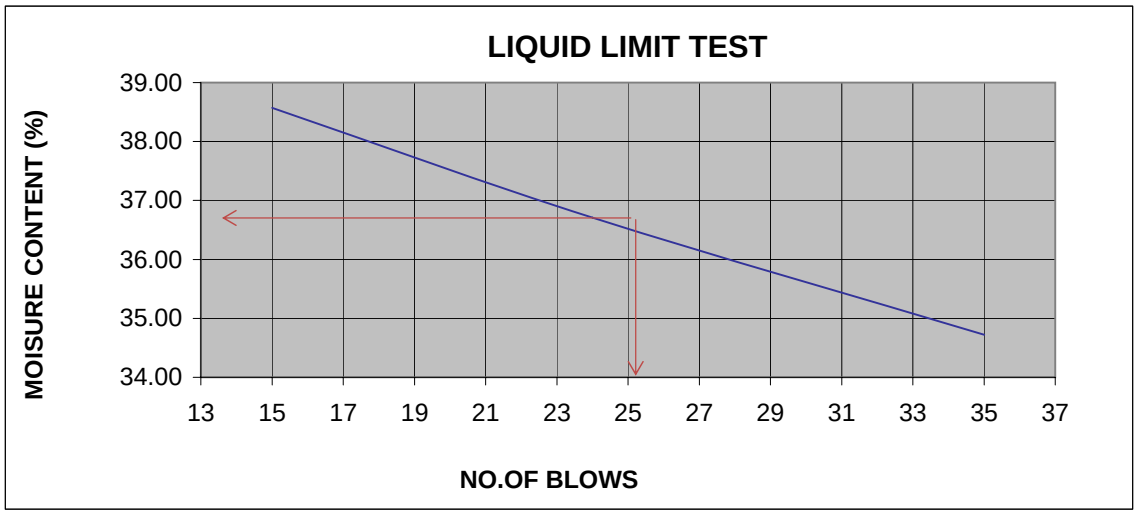
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	94
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	16.5

Description	Liquid Limit			Plastic Limit
No of Blows	15	24	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	23.8	24.2	22.5	18.4
Wt of Dry soil + Container W2 (g)	21.1	21.3	20	17.2
Wt of container W3 (g)	14.1	13.4	12.8	13.4
Wt. of water (a) W1 - W2 (g)	2.7	2.9	2.5	1.2
Wt. of Dry soil (b) W2 - W3 (g)	7	7.9	7.2	3.8
Moisture Content (w)= a/b x 100 (%)	38.57	36.71	34.72	31.58



LL= 36.66% **PL=** 31.58% **PI=** 5.08%

Remarks:

Tested by:	Hayat		
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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

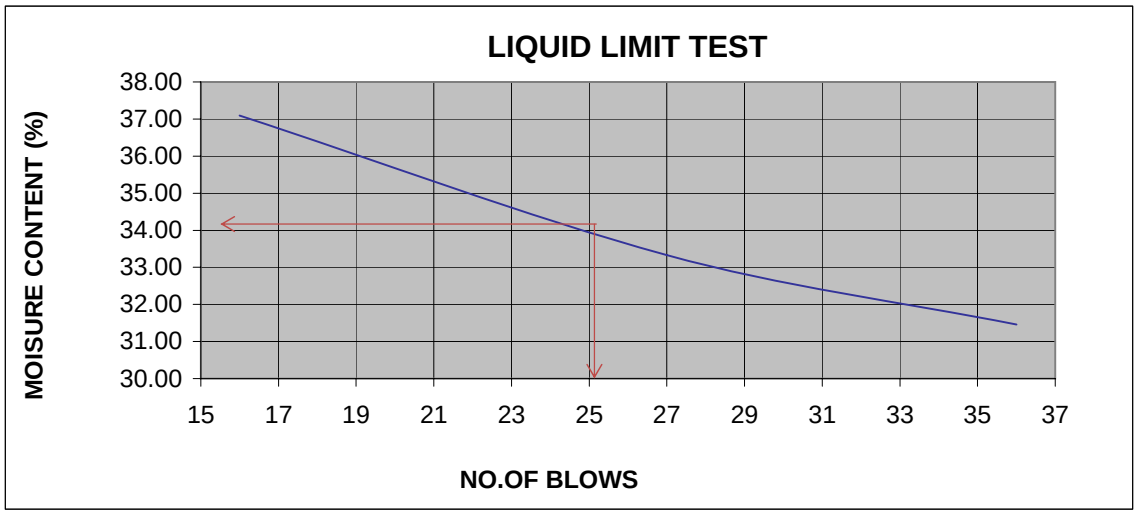
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	95
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	17.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	27	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	31.3	36.1	34.7	26.5
Wt of Dry soil + Container W2 (g)	29	33.0	31.9	25.8
Wt of container W3 (g)	22.8	23.7	23	23.4
Wt. of water (a) W1 - W2 (g)	2.3	3.1	2.8	0.7
Wt. of Dry soil (b) W2 - W3 (g)	6.2	9.3	8.9	2.4
Moisture Content (w)= a/b x 100 (%)	37.10	33.33	31.46	29.17



LL= 33.96% **PL=** 29.17% **PI=** 4.79%

Remarks:

Tested by:	Hayat	
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MATERIAL TESTING LAB

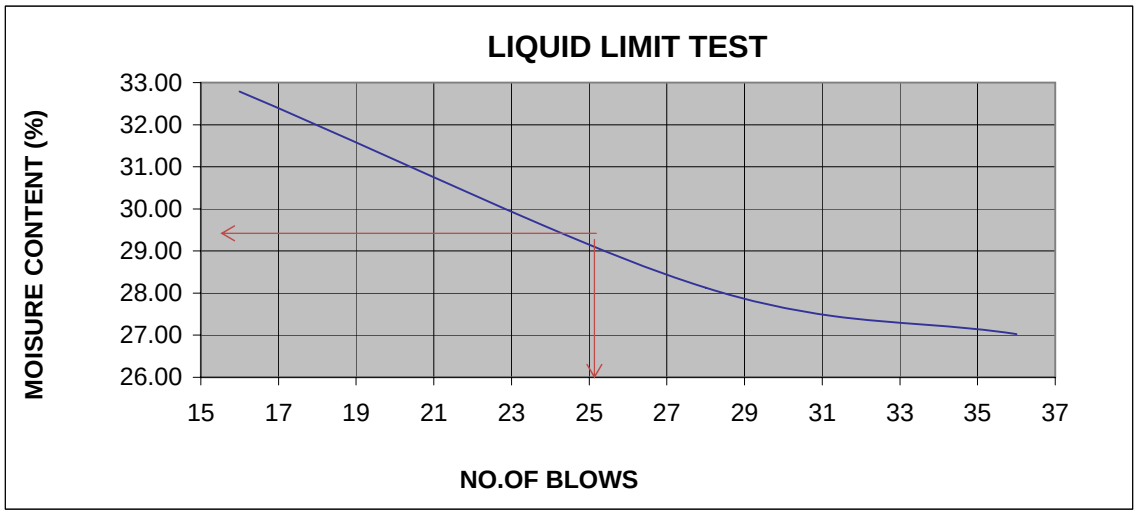
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	96
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A23	Depth: m	18.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	28	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	21.6	22.3	23.8	18.6
Wt of Dry soil + Container W2 (g)	19.6	20.5	21.8	17.3
Wt of container W3 (g)	13.5	14.1	14.4	11.8
Wt. of water (a) W1 - W2 (g)	2	1.8	2	1.3
Wt. of Dry soil (b) W2 - W3 (g)	6.1	6.4	7.4	5.5
Moisture Content (w)= a/b x 100 (%)	32.79	28.13	27.03	23.64



LL= 29.31% **PL=** 23.64% **PI=** 5.67%

Remarks:

Tested by:	Hayat	
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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

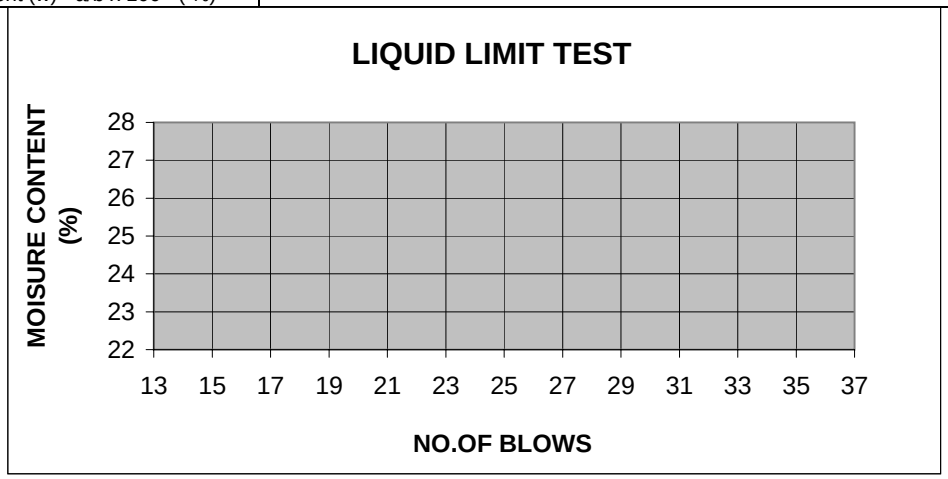
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	97
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A24	Depth: m	0.5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

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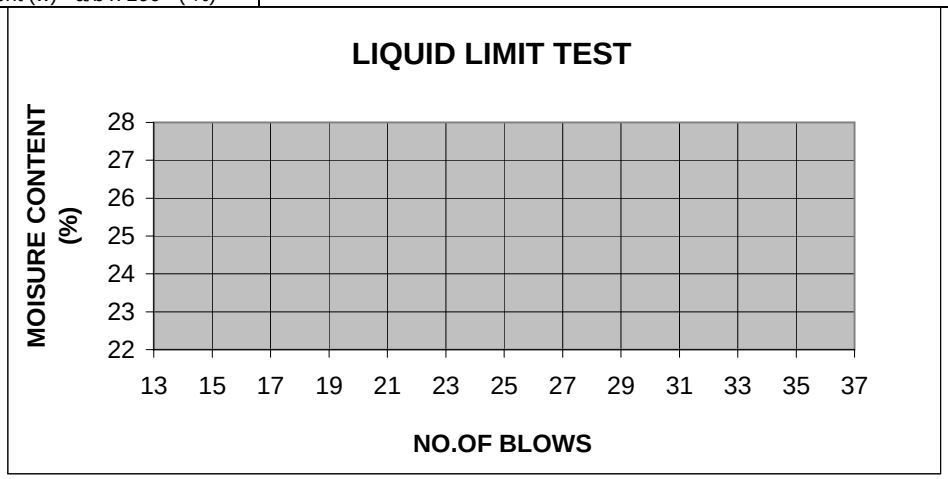
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	98
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A24	Depth: m	2.5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



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4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

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Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

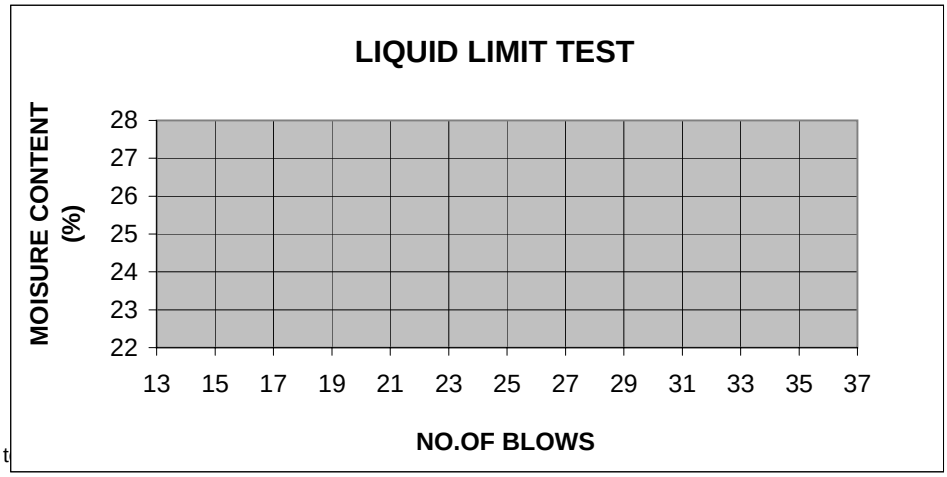
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	99
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A24	Depth: m	4

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



Remarks:

1- According t

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

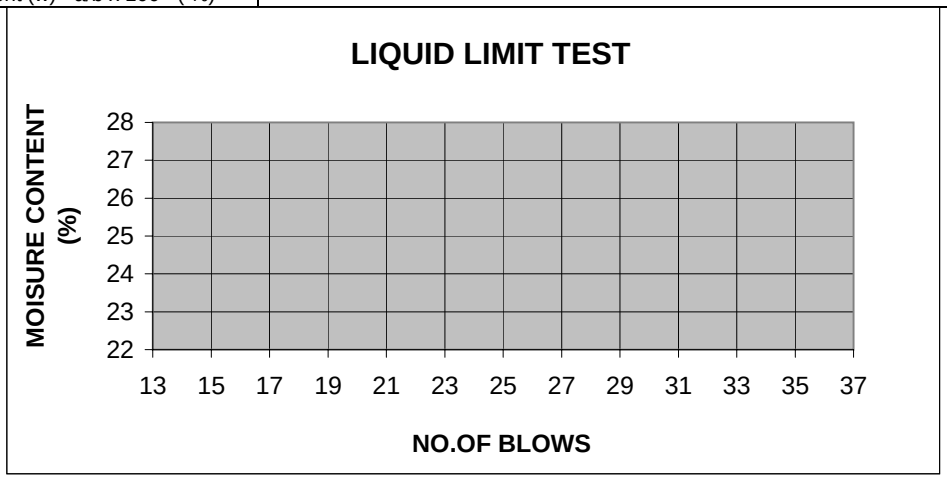
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	100
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A24	Depth: m	5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

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3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

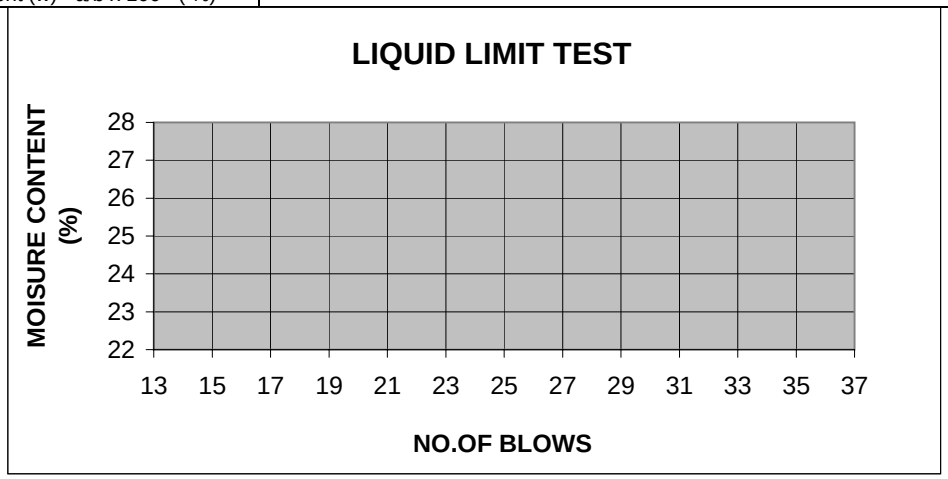
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	101
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A24	Depth: m	5.5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

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3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

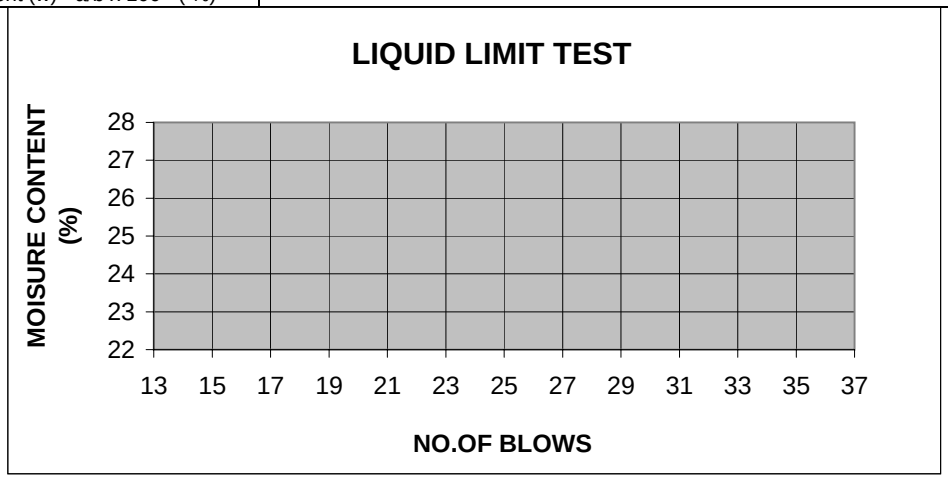
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	102
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A25	Depth: m	1

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

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2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

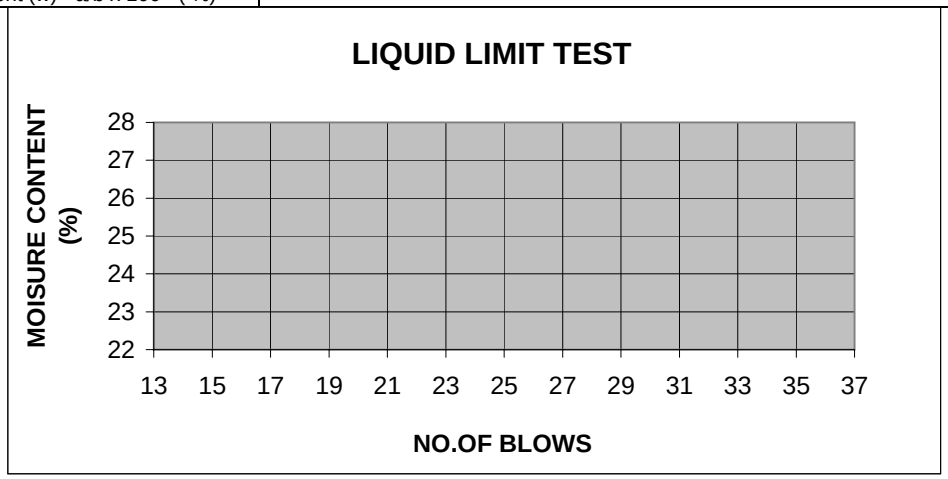
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	103
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A25	Depth: m	2.2

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



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4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

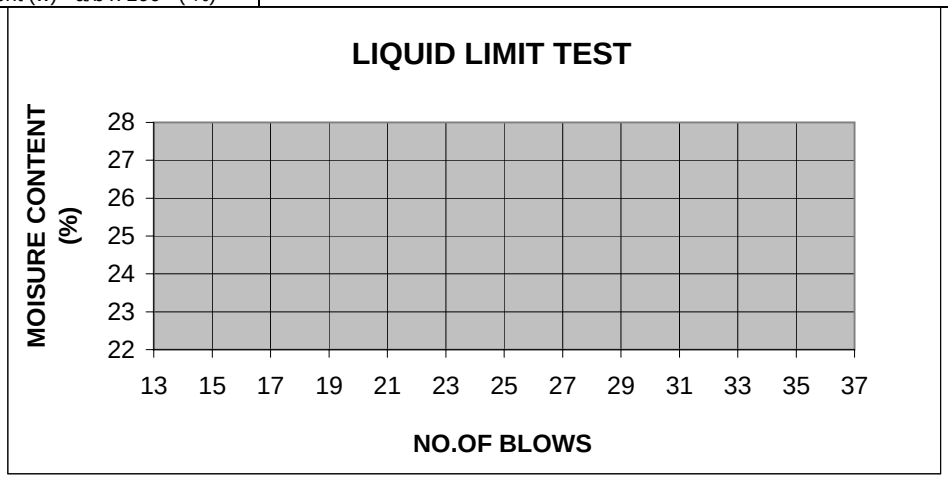
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	104
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A25	Depth: m	3

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

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3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

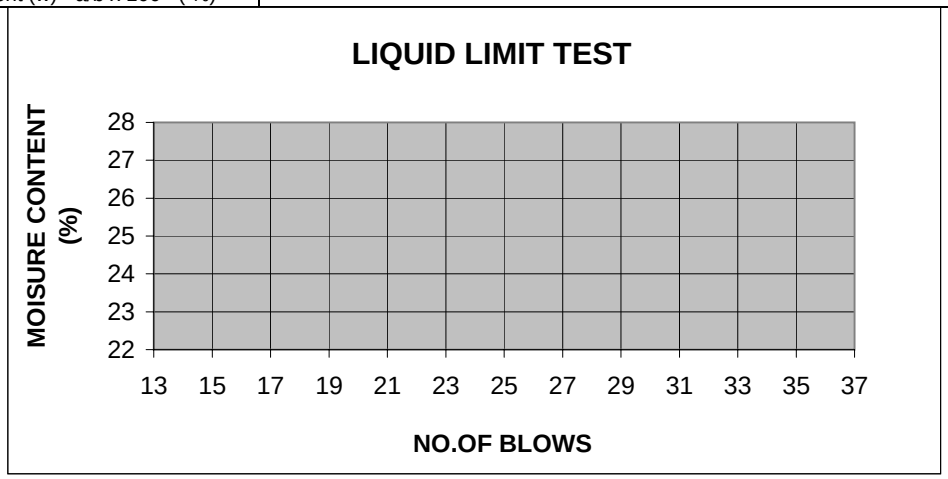
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	105
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A25	Depth: m	3.6

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



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Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

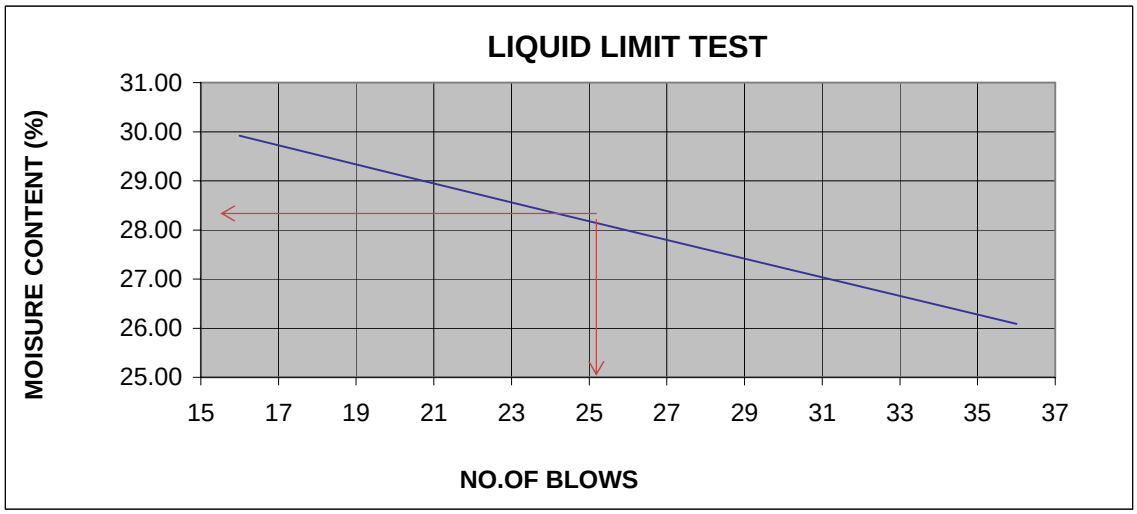
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	106
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A25	Depth: m	4.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	24	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	26.5	28.2	27.5	17.4
Wt of Dry soil + Container W2 (g)	22.7	24.2	23.9	15.9
Wt of container W3 (g)	10	10.1	10.1	10.1
Wt. of water (a) W1 - W2 (g)	3.8	4.0	3.6	1.5
Wt. of Dry soil (b) W2 - W3 (g)	12.7	14.1	13.8	5.8
Moisture Content (w)= a/b x 100 (%)	29.92	28.37	26.09	25.86



LL= 28.12% **PL=** 25.86% **PI=** 2.26%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

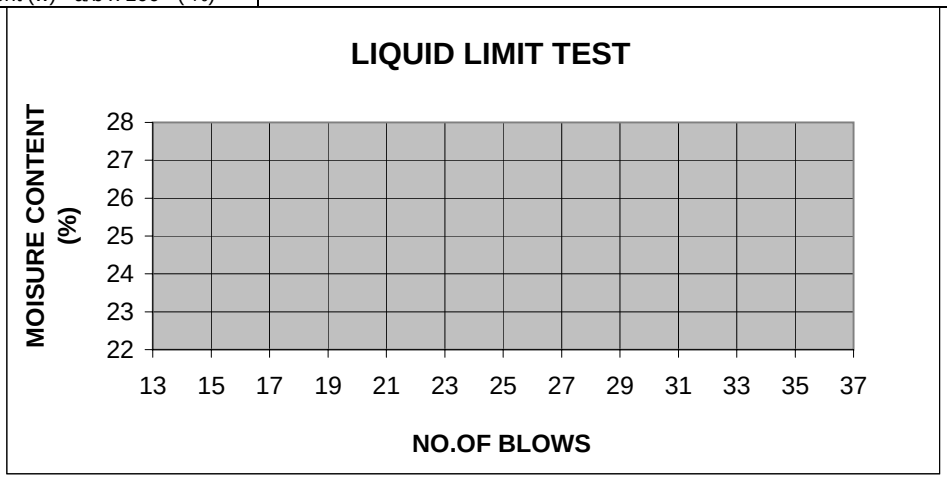
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	107
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A25	Depth: m	5.5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

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MATERIAL TESTING LAB

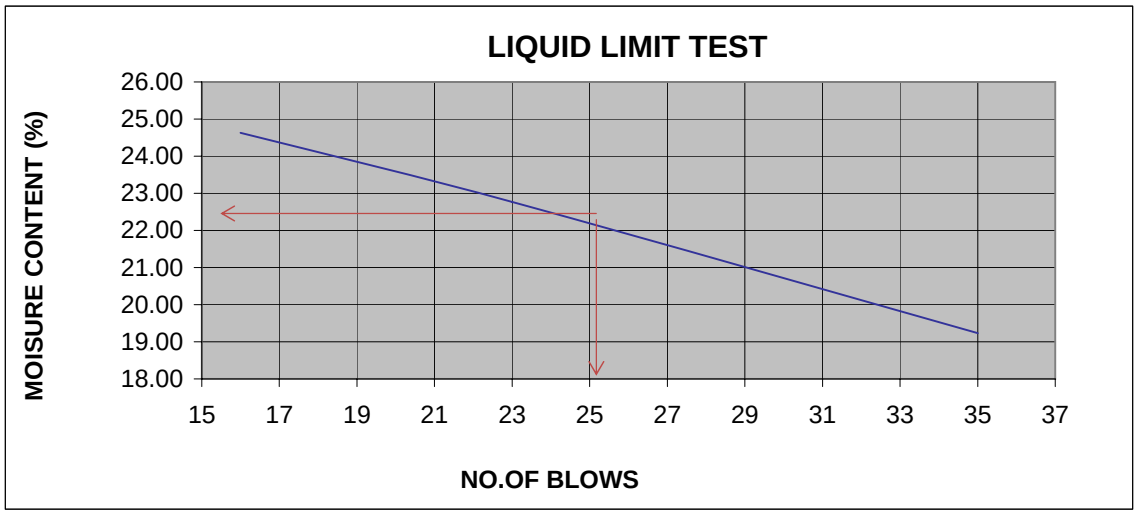
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	108
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A26	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	23	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	30.2	28.5	28.3	18
Wt of Dry soil + Container W2 (g)	26.9	25.7	25.8	17.1
Wt of container W3 (g)	13.5	13.4	12.8	11.8
Wt. of water (a) W1 - W2 (g)	3.3	2.8	2.5	0.9
Wt. of Dry soil (b) W2 - W3 (g)	13.4	12.3	13	5.3
Moisture Content (w)= a/b x 100 (%)	24.63	22.76	19.23	16.98



LL= 22.20% **PL=** 16.98% **PI=** 5.22%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

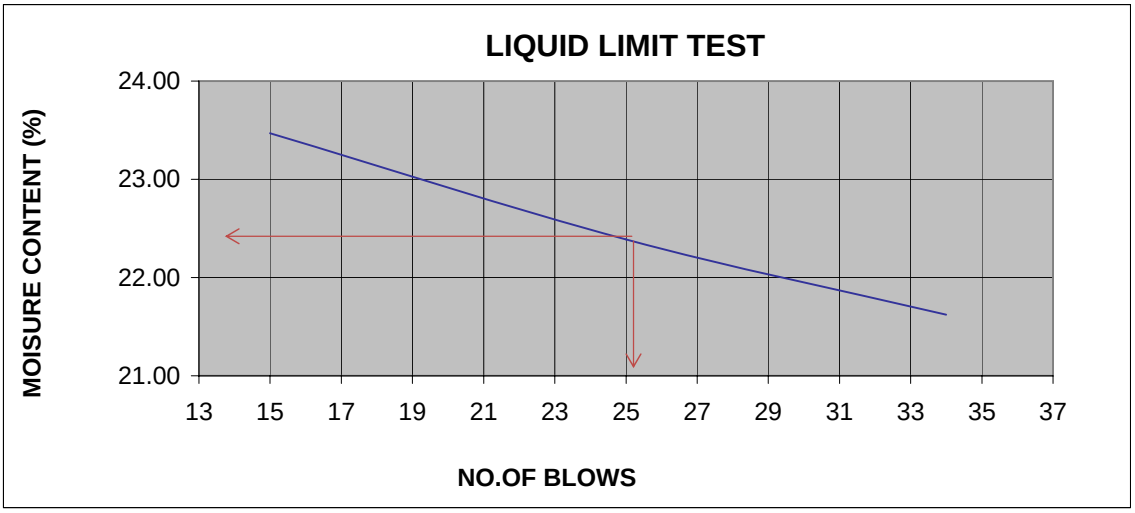
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	109
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A26	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	15	25	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	26.8	33.2	35.6	19.5
Wt of Dry soil + Container W2 (g)	24.5	30.2	32.4	18.8
Wt of container W3 (g)	14.7	16.8	17.6	14.3
Wt. of water (a) W1 - W2 (g)	2.3	3.0	3.2	0.7
Wt. of Dry soil (b) W2 - W3 (g)	9.8	13.4	14.8	4.5
Moisture Content (w)= a/b x 100 (%)	23.47	22.39	21.62	15.56



LL= 22.49% **PL=** 15.56% **PI=** 6.93%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

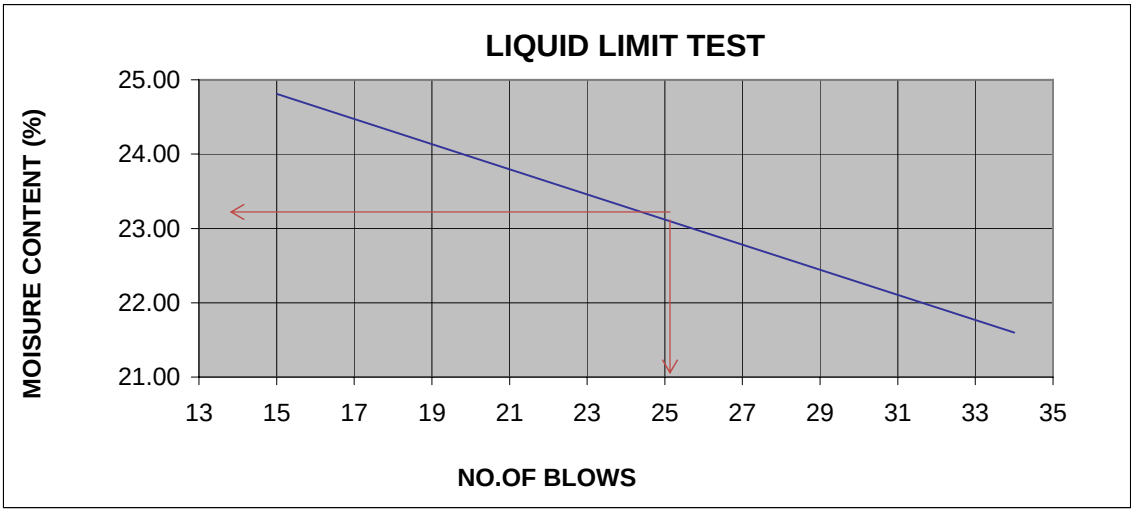
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	110
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	12.04.2010
Location:	BH # A26	Depth: m	5

Description	Liquid Limit			Plastic Limit
No of Blows	15	26	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	30.1	28.4	28	17
Wt of Dry soil + Container W2 (g)	26.8	25.6	25.3	16.3
Wt of container W3 (g)	13.5	13.4	12.8	11.8
Wt. of water (a) W1 - W2 (g)	3.3	2.8	2.7	0.7
Wt. of Dry soil (b) W2 - W3 (g)	13.3	12.2	12.5	4.5
Moisture Content (w)= a/b x 100 (%)	24.81	22.95	21.60	15.56



LL= 23.12% **PL=** 15.56% **PI=** 7.56%

Remarks:

Tested by:	Hayat		
Checked by:	Jafari	E-mail:	
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com	

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

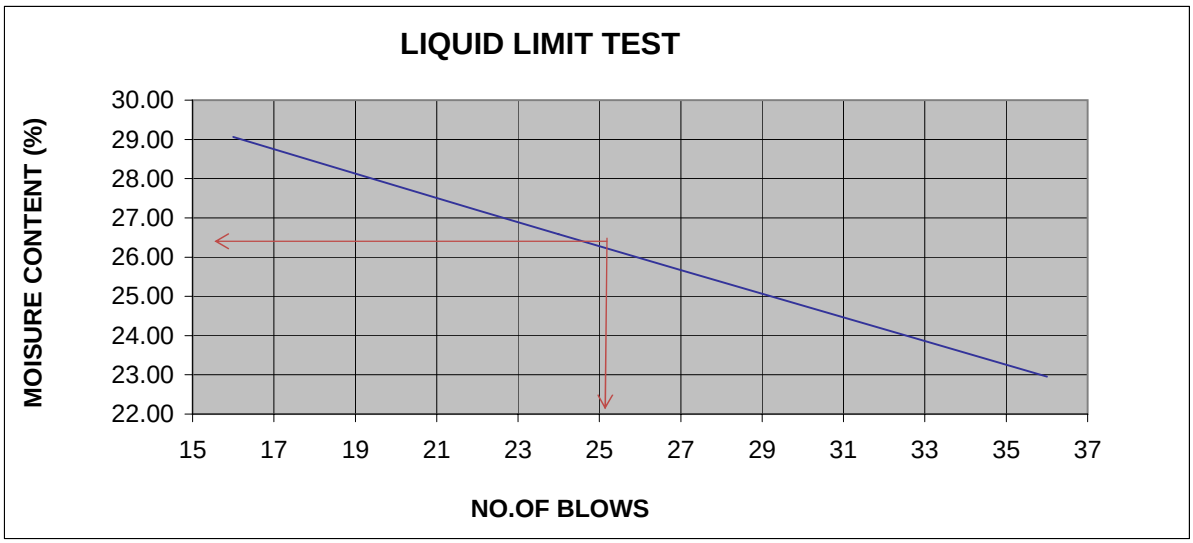
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	111
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A27	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	24	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	39.5	32.9	42.3	28
Wt of Dry soil + Container W2 (g)	36.1	30.8	39.5	27.5
Wt of container W3 (g)	24.4	22.9	27.3	24.3
Wt. of water (a) W1 - W2 (g)	3.4	2.1	2.8	0.5
Wt. of Dry soil (b) W2 - W3 (g)	11.7	7.9	12.2	3.2
Moisture Content (w)= a/b x 100 (%)	29.06	26.58	22.95	15.63



LL= 26.19% **PL=** 15.63% **PI=** 10.57%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

Omran Geotechnic Company

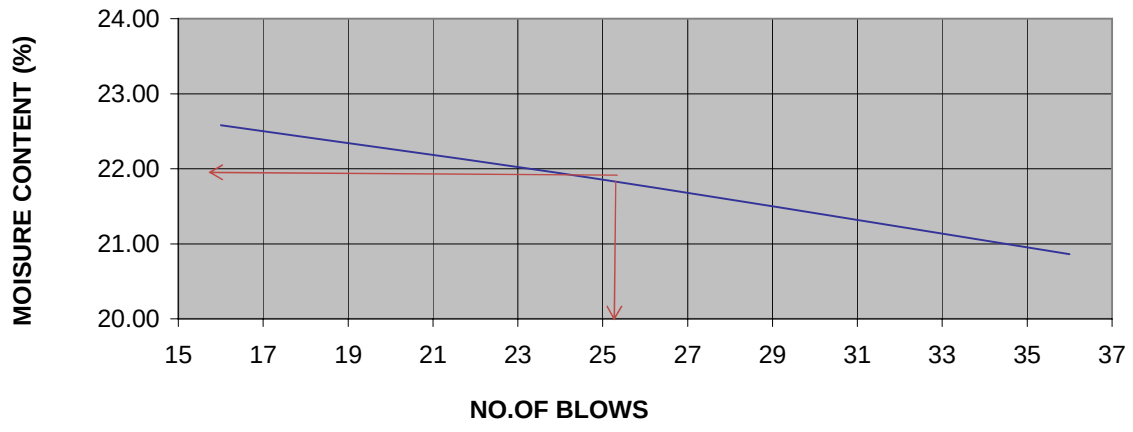
ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	112
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A27	Depth: m	2.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	25	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	29.3	32.4	31	17.7
Wt of Dry soil + Container W2 (g)	26.5	29.1	28.1	16.9
Wt of container W3 (g)	14.1	14	14.2	11.8
Wt. of water (a) W1 - W2 (g)	2.8	3.3	2.9	0.8
Wt. of Dry soil (b) W2 - W3 (g)	12.4	15.1	13.9	5.1
Moisture Content (w)= a/b x 100 (%)	22.58	21.85	20.86	15.69

LIQUID LIMIT TEST



LL= 21.76% **PL=** 15.69% **PI=** 6.07%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

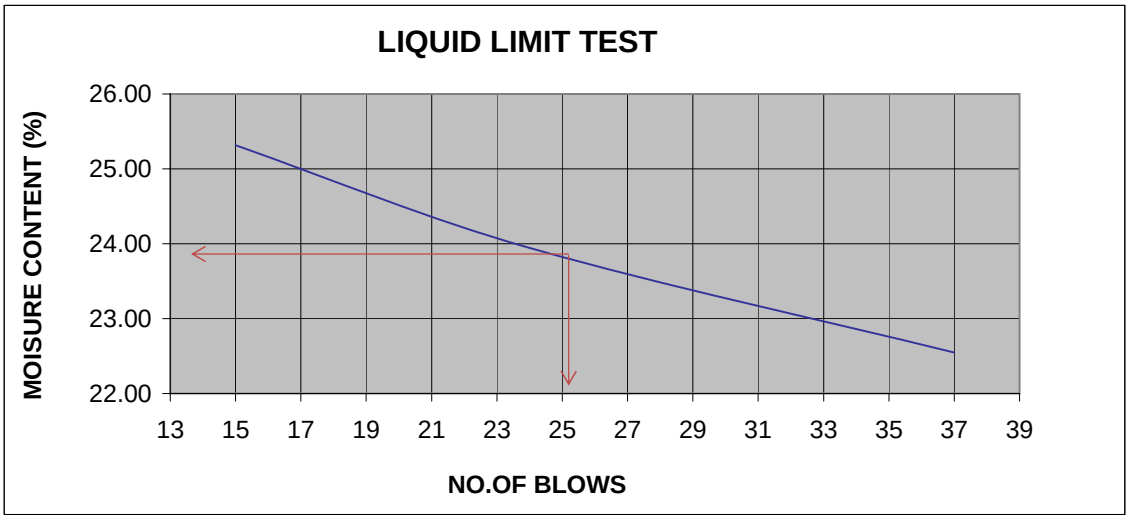
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	113
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A27	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	15	24	37	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	33.8	32.1	35.9	28.8
Wt of Dry soil + Container W2 (g)	31.8	30.4	33.6	28
Wt of container W3 (g)	23.9	23.3	23.4	23.7
Wt. of water (a) W1 - W2 (g)	2	1.7	2.3	0.8
Wt. of Dry soil (b) W2 - W3 (g)	7.9	7.1	10.2	4.3
Moisture Content (w)= a/b x 100 (%)	25.32	23.94	22.55	18.60



LL= 23.93% **PL=** 18.60% **PI=** 5.33%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

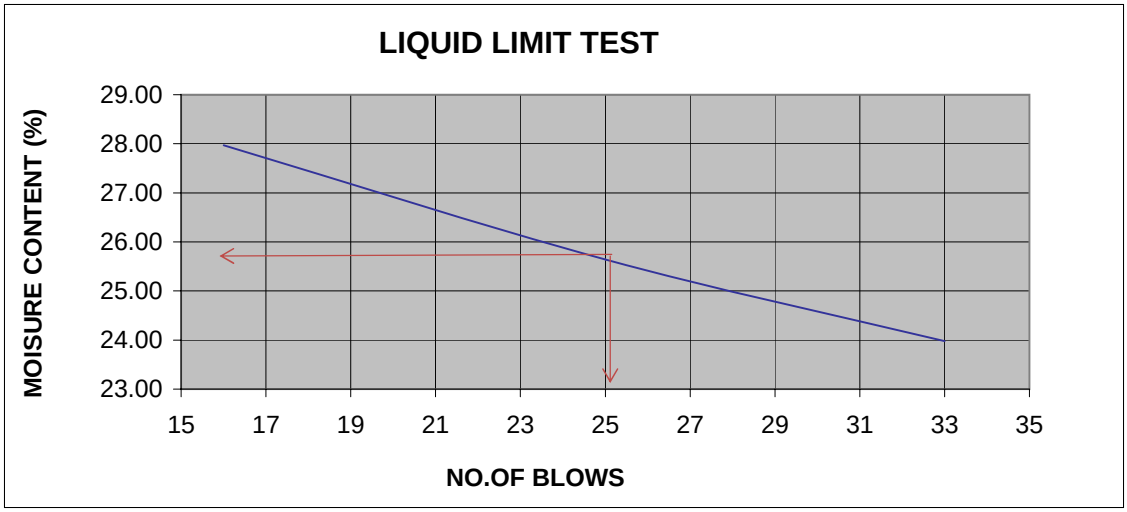
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	114
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A27	Depth: m	4.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	25	33	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	42.3	43	44.7	30.1
Wt of Dry soil + Container W2 (g)	38.3	39.0	40.6	29.1
Wt of container W3 (g)	24	23.4	23.5	23.8
Wt. of water (a) W1 - W2 (g)	4	4.0	4.1	1
Wt. of Dry soil (b) W2 - W3 (g)	14.3	15.6	17.1	5.3
Moisture Content (w)= a/b x 100 (%)	27.97	25.64	23.98	18.87



LL= 25.68% **PL=** 18.87% **PI=** 6.81%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

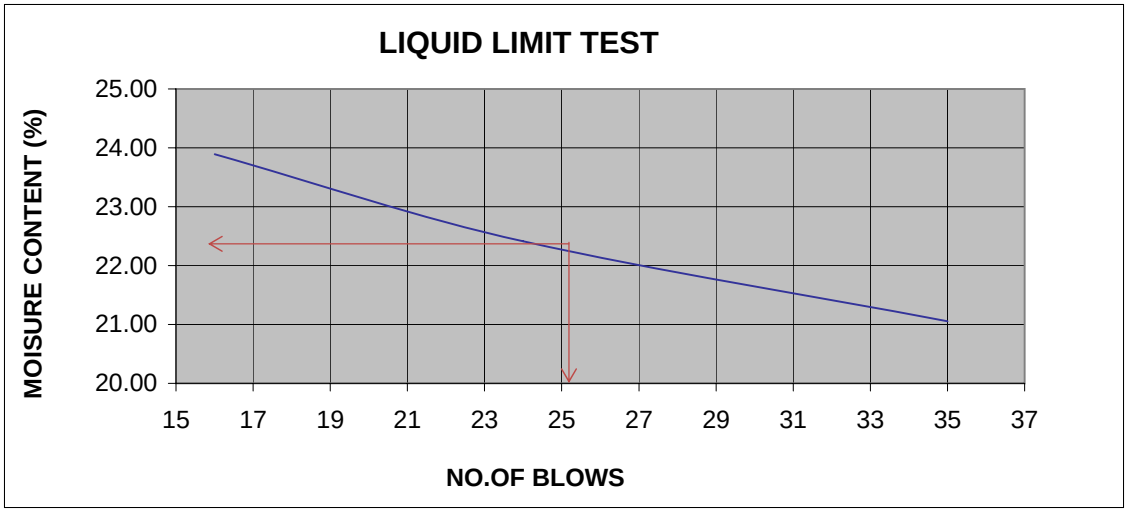
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	115
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A27	Depth: m	5.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	24	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	36.8	37.3	39.1	28.3
Wt of Dry soil + Container W2 (g)	34.1	34.7	36.3	27.6
Wt of container W3 (g)	22.8	23.1	23	23.8
Wt. of water (a) W1 - W2 (g)	2.7	2.6	2.8	0.7
Wt. of Dry soil (b) W2 - W3 (g)	11.3	11.6	13.3	3.8
Moisture Content (w)= a/b x 100 (%)	23.89	22.41	21.05	18.42



LL= 22.45% **PL=** 18.42% **PI=** 4.03%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

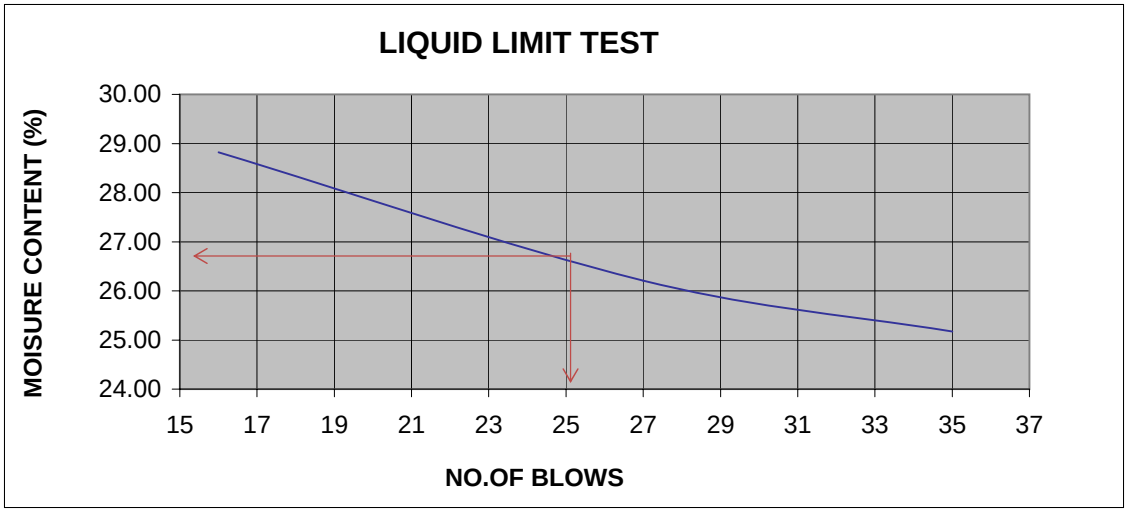
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	116
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A28	Depth: m	2

Description	Liquid Limit			Plastic Limit
No of Blows	16	27	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	45.9	41.7	41.4	31
Wt of Dry soil + Container W2 (g)	41	37.9	37.8	29.7
Wt of container W3 (g)	24	23.4	23.5	23.7
Wt. of water (a) W1 - W2 (g)	4.9	3.8	3.6	1.3
Wt. of Dry soil (b) W2 - W3 (g)	17	14.5	14.3	6
Moisture Content (w)= a/b x 100 (%)	28.82	26.21	25.17	21.67



LL= 26.73% **PL=** 21.67% **PI=** 5.06%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

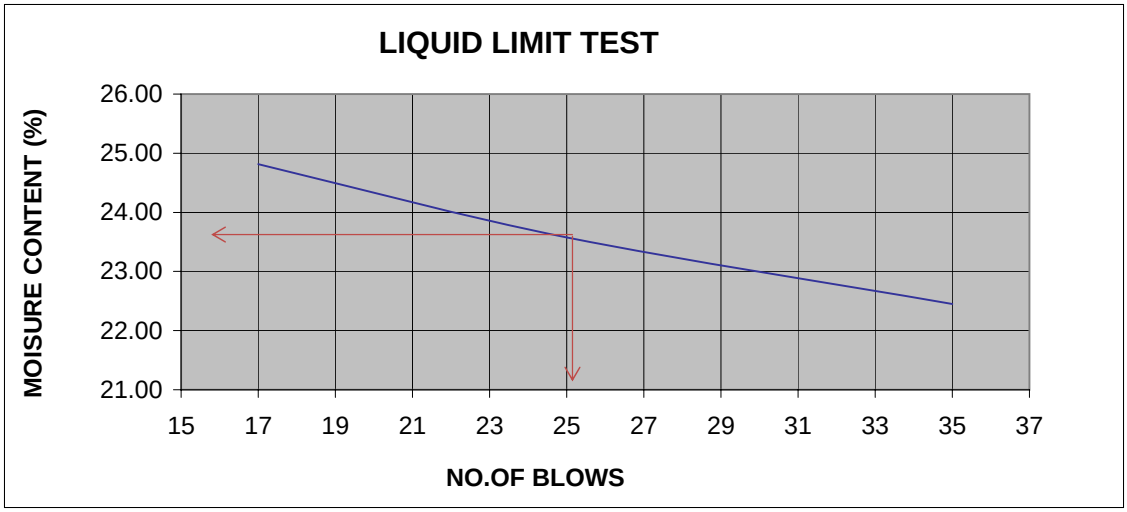
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	117
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A28	Depth: m	2.7

Description	Liquid Limit			Plastic Limit
No of Blows	17	25	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	34.1	31.9	35.6	23.1
Wt of Dry soil + Container W2 (g)	30.7	29.0	32.3	22.5
Wt of container W3 (g)	17	16.7	17.6	19.4
Wt. of water (a) W1 - W2 (g)	3.4	2.9	3.3	0.6
Wt. of Dry soil (b) W2 - W3 (g)	13.7	12.3	14.7	3.1
Moisture Content (w)= a/b x 100 (%)	24.82	23.58	22.45	19.35



LL= 23.61% **PL=** 19.35% **PI=** 4.26%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

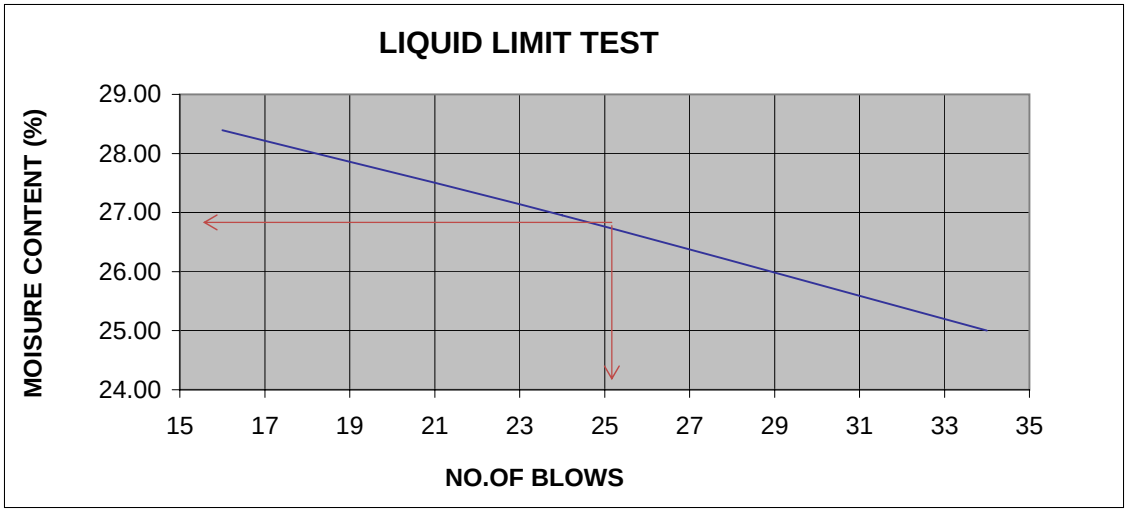
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	118
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A28	Depth: m	3.7

Description	Liquid Limit			Plastic Limit
No of Blows	16	24	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	43.8	42.2	33.2	31.2
Wt of Dry soil + Container W2 (g)	39.2	38.4	31.3	30
Wt of container W3 (g)	23	24.3	23.7	24.3
Wt. of water (a) W1 - W2 (g)	4.6	3.8	1.9	1.2
Wt. of Dry soil (b) W2 - W3 (g)	16.2	14.1	7.6	5.7
Moisture Content (w)= a/b x 100 (%)	28.40	26.95	25.00	21.05



LL= 26.78% **PL=** 21.05% **PI=** 5.73%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

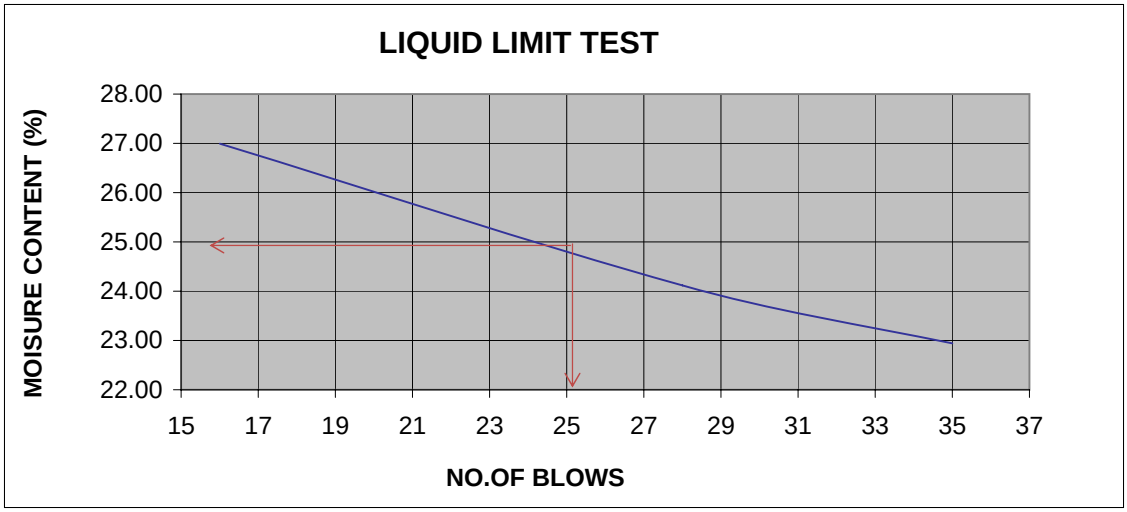
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	119
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A28	Depth: m	4.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	28	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	43.5	45	43.8	31.1
Wt of Dry soil + Container W2 (g)	39.1	40.9	39.9	29.9
Wt of container W3 (g)	22.8	23.9	22.9	23.8
Wt. of water (a) W1 - W2 (g)	4.4	4.1	3.9	1.2
Wt. of Dry soil (b) W2 - W3 (g)	16.3	17.0	17	6.1
Moisture Content (w)= a/b x 100 (%)	26.99	24.12	22.94	19.67



LL= 24.68% **PL=** 19.67% **PI=** 5.01%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

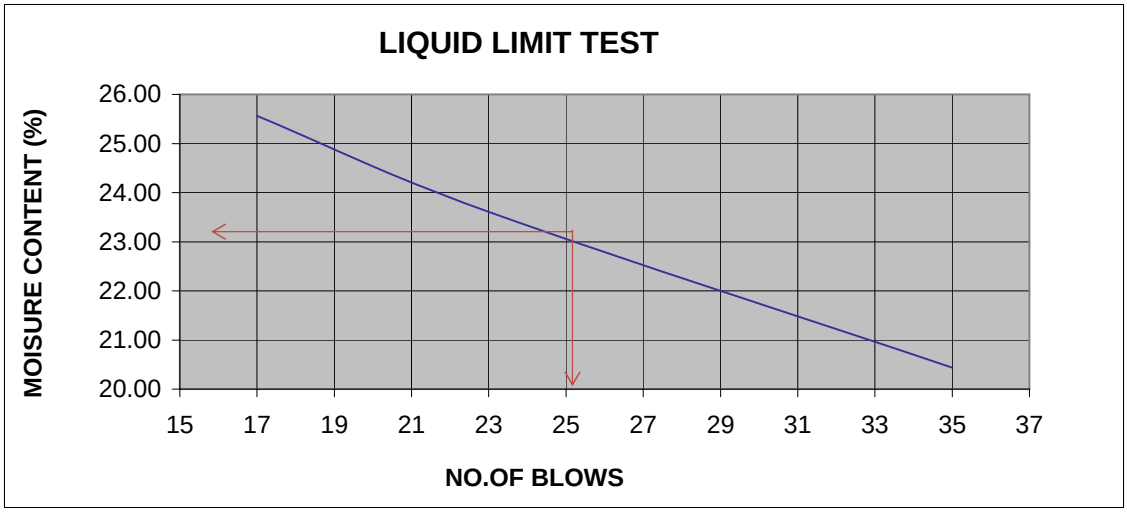
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	120
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A28	Depth: m	5.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	23	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	39.4	40.9	39.5	31.6
Wt of Dry soil + Container W2 (g)	36	37.5	36.7	30.5
Wt of container W3 (g)	22.7	23.1	23	23.8
Wt. of water (a) W1 - W2 (g)	3.4	3.4	2.8	1.1
Wt. of Dry soil (b) W2 - W3 (g)	13.3	14.4	13.7	6.7
Moisture Content (w)= a/b x 100 (%)	25.56	23.61	20.44	16.42



LL= 23.20% **PL=** 16.42% **PI=** 6.78%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

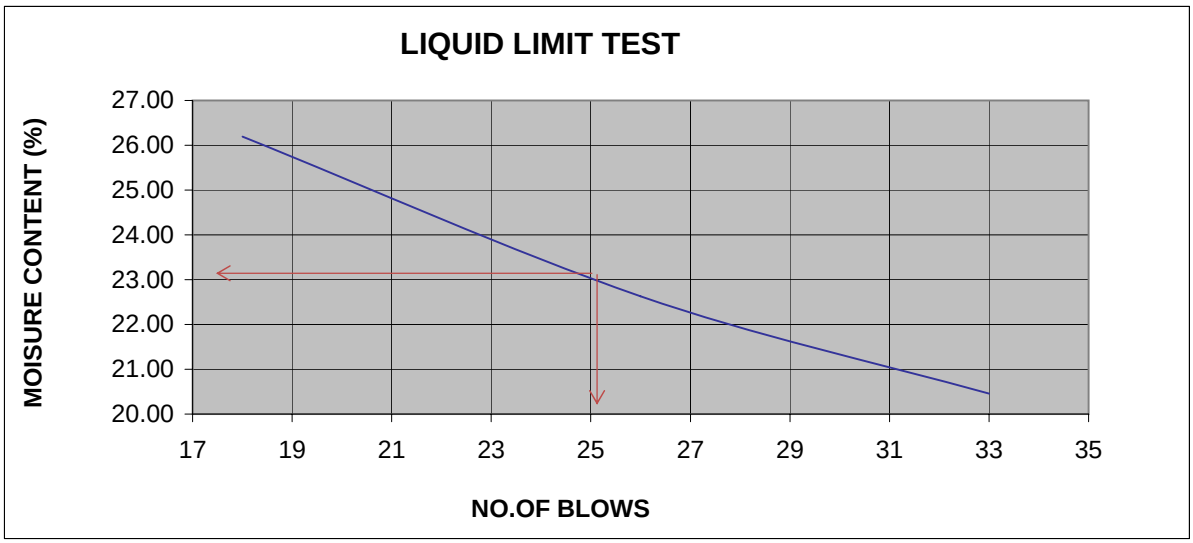
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	121
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A29	Depth: m	2.5

Description	Liquid Limit			Plastic Limit
No of Blows	18	26	33	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	34.7	35.2	26.6	21.9
Wt of Dry soil + Container W2 (g)	30.3	30.9	23.9	20.9
Wt of container W3 (g)	13.5	11.9	10.7	13.4
Wt. of water (a) W1 - W2 (g)	4.4	4.3	2.7	1
Wt. of Dry soil (b) W2 - W3 (g)	16.8	19.0	13.2	7.5
Moisture Content (w)= a/b x 100 (%)	26.19	22.63	20.45	13.33



LL= 23.09% **PL=** 13.33% **PI=** 9.76%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

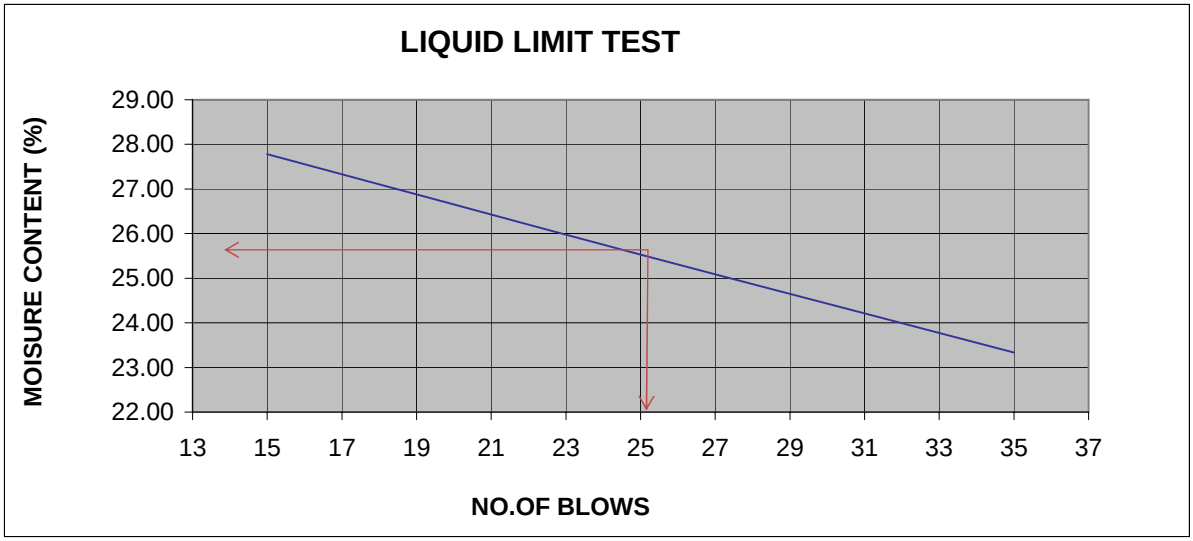
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	122
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A29	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	15	25	35	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	41.2	41.7	36.8	28.4
Wt of Dry soil + Container W2 (g)	37.2	38.1	34	27.7
Wt of container W3 (g)	22.8	24	22	23.8
Wt. of water (a) W1 - W2 (g)	4	3.6	2.8	0.7
Wt. of Dry soil (b) W2 - W3 (g)	14.4	14.1	12	3.9
Moisture Content (w)= a/b x 100 (%)	27.78	25.53	23.33	17.95



LL= 25.54% **PL=** 17.95% **PI=** 7.59%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

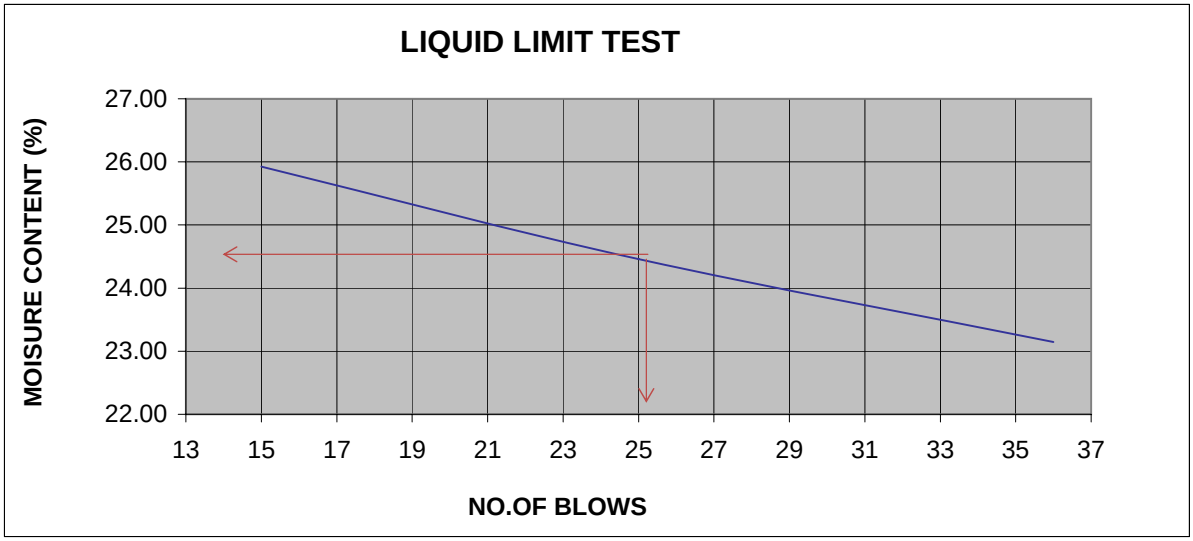
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	123
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A29	Depth: m	4.5

Description	Liquid Limit			Plastic Limit
No of Blows	15	25	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	40	41.6	37	30.2
Wt of Dry soil + Container W2 (g)	36.5	38.2	34.5	29.3
Wt of container W3 (g)	23	24.3	23.7	24.2
Wt. of water (a) W1 - W2 (g)	3.5	3.4	2.5	0.9
Wt. of Dry soil (b) W2 - W3 (g)	13.5	13.9	10.8	5.1
Moisture Content (w)= a/b x 100 (%)	25.93	24.46	23.15	17.65



LL= 24.51% **PL=** 17.65% **PI=** 6.86%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

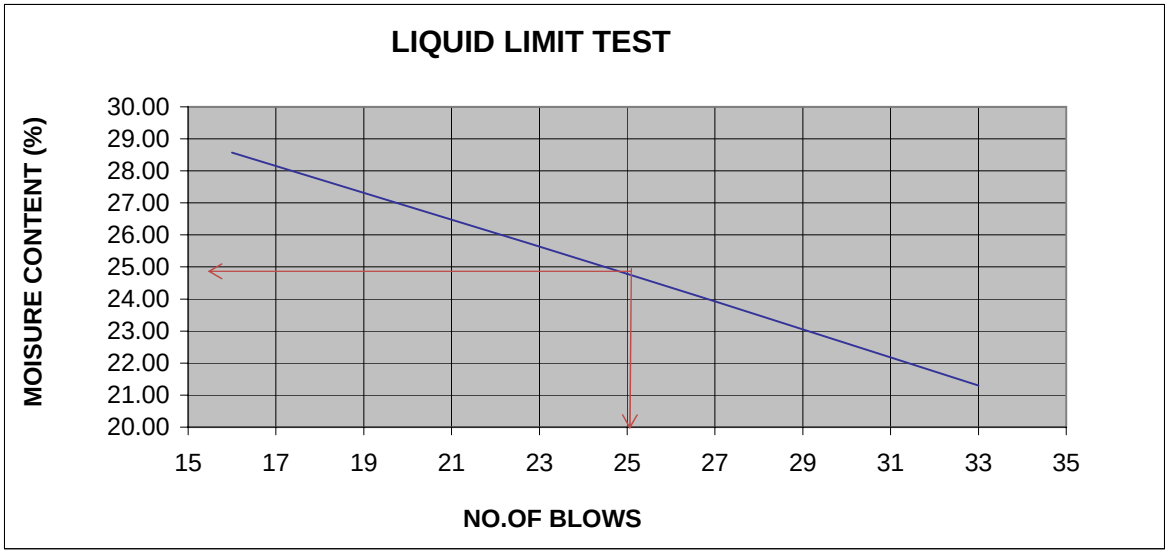
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	124
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	01.04.2010
Location:	BH # A29	Depth: m	5.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	25	33	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	39.6	38.6	36.6	31.5
Wt of Dry soil + Container W2 (g)	36	35.7	34.3	30.2
Wt of container W3 (g)	23.4	24	23.5	23.8
Wt. of water (a) W1 - W2 (g)	3.6	2.9	2.3	1.3
Wt. of Dry soil (b) W2 - W3 (g)	12.6	11.7	10.8	6.4
Moisture Content (w)= a/b x 100 (%)	28.57	24.79	21.30	20.31



LL= 24.88% **PL=** 20.31% **PI=** 4.57%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

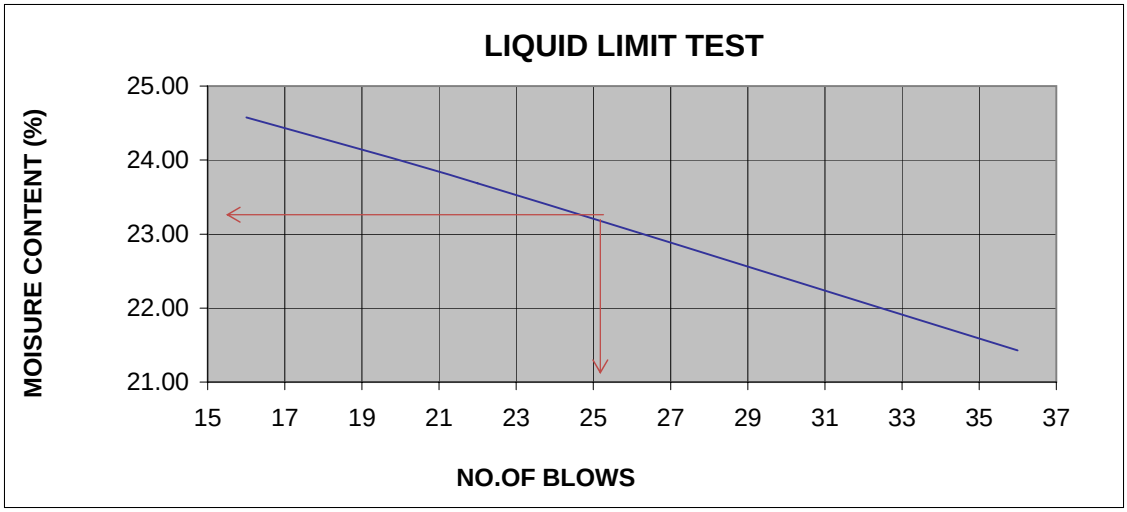
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	125
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A30	Depth: m	1.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	22	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	29.4	26.5	31.6	19.6
Wt of Dry soil + Container W2 (g)	26.5	23.8	28.6	18.8
Wt of container W3 (g)	14.7	12.4	14.6	14.4
Wt. of water (a) W1 - W2 (g)	2.9	2.7	3	0.8
Wt. of Dry soil (b) W2 - W3 (g)	11.8	11.4	14	4.4
Moisture Content (w)= a/b x 100 (%)	24.58	23.68	21.43	18.18



LL= 23.23% **PL=** 18.18% **PI=** 5.05%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

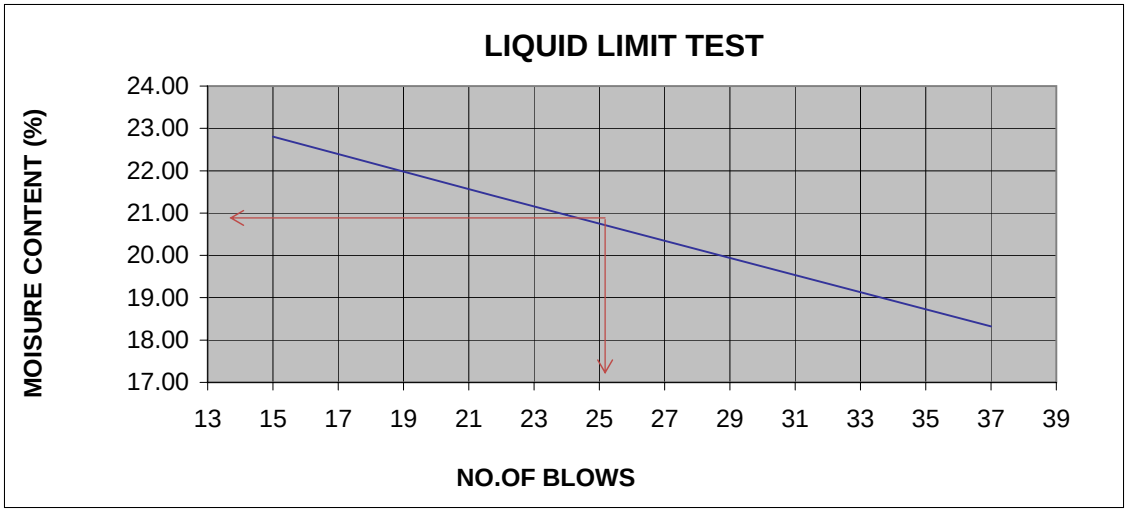
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	126
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A30	Depth: m	3.5

Description	Liquid Limit			Plastic Limit
No of Blows	15	24	37	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	29.8	35.8	38.4	27.9
Wt of Dry soil + Container W2 (g)	28.5	33.6	36	27.3
Wt of container W3 (g)	22.8	23.1	22.9	23.7
Wt. of water (a) W1 - W2 (g)	1.3	2.2	2.4	0.6
Wt. of Dry soil (b) W2 - W3 (g)	5.7	10.5	13.1	3.6
Moisture Content (w)= a/b x 100 (%)	22.81	20.95	18.32	16.67



LL= 20.69% **PL=** 16.67% **PI=** 4.02%

Remarks:

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
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OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

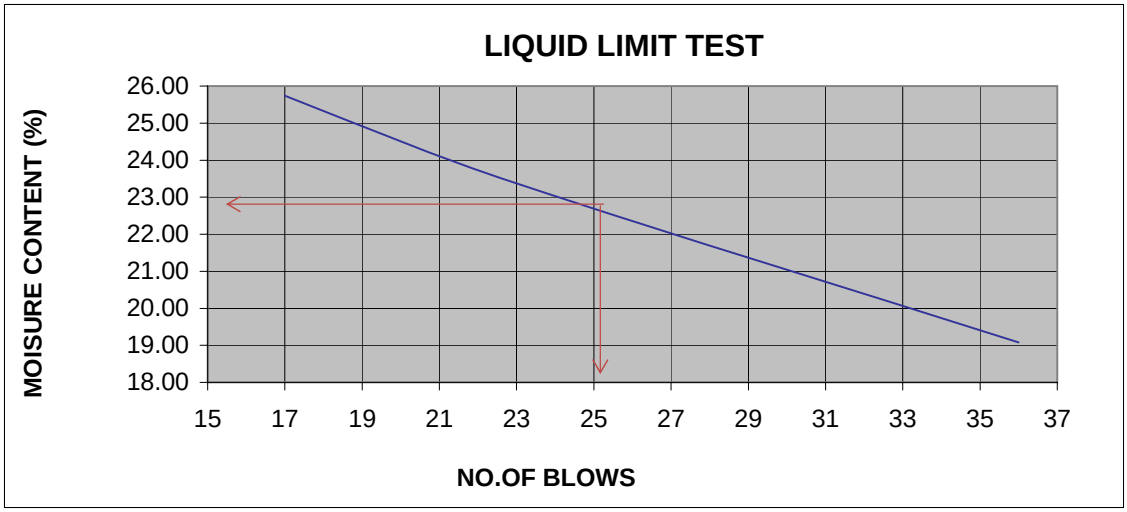
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	127
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A30	Depth: m	4.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	23	36	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	35.6	33.7	39.3	28.6
Wt of Dry soil + Container W2 (g)	33	31.9	36.8	27.9
Wt of container W3 (g)	22.9	24.2	23.7	24.2
Wt. of water (a) W1 - W2 (g)	2.6	1.8	2.5	0.7
Wt. of Dry soil (b) W2 - W3 (g)	10.1	7.7	13.1	3.7
Moisture Content (w)= a/b x 100 (%)	25.74	23.38	19.08	18.92



LL= 22.73% **PL=** 18.92% **PI=** 3.81%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

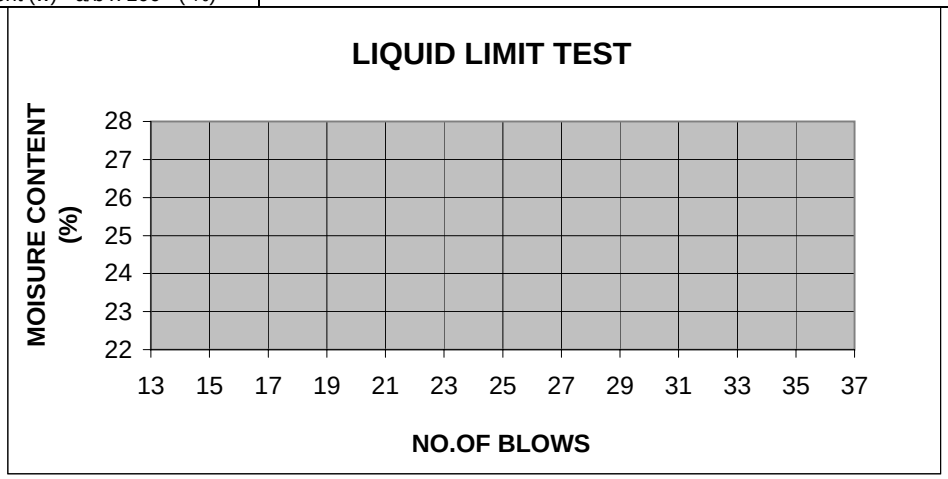
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	128
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A30	Depth: m	7

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

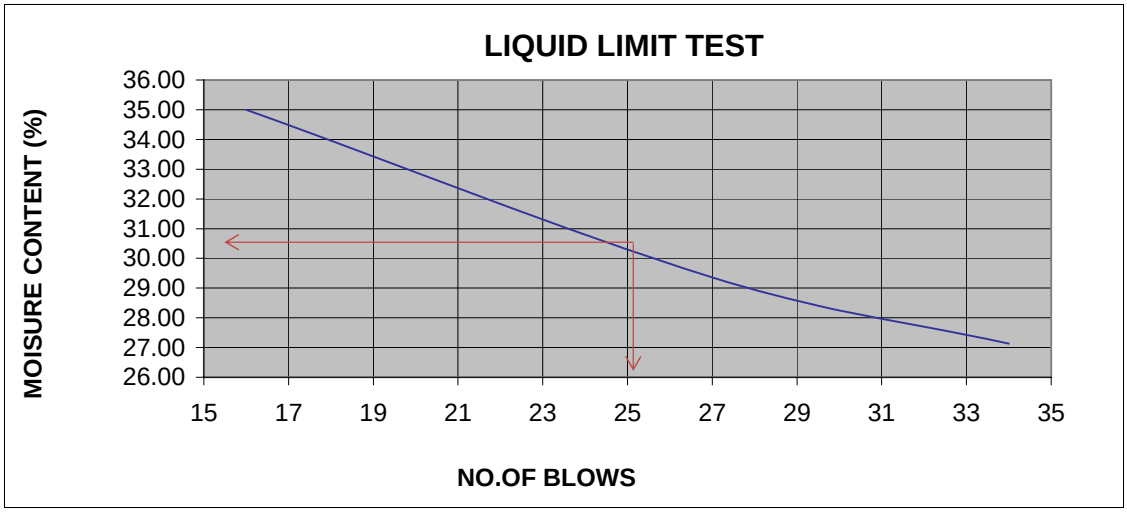
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	129
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A30	Depth: m	9.5

Description	Liquid Limit			Plastic Limit
No of Blows	16	27	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	34.2	38.1	40.2	29.1
Wt of Dry soil + Container W2 (g)	31.4	34.9	36.7	28
Wt of container W3 (g)	23.4	24	23.8	23.5
Wt. of water (a) W1 - W2 (g)	2.8	3.2	3.5	1.1
Wt. of Dry soil (b) W2 - W3 (g)	8	10.9	12.9	4.5
Moisture Content (w)= a/b x 100 (%)	35.00	29.36	27.13	24.44



LL= 30.49% **PL=** 24.44% **PI=** 6.05%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

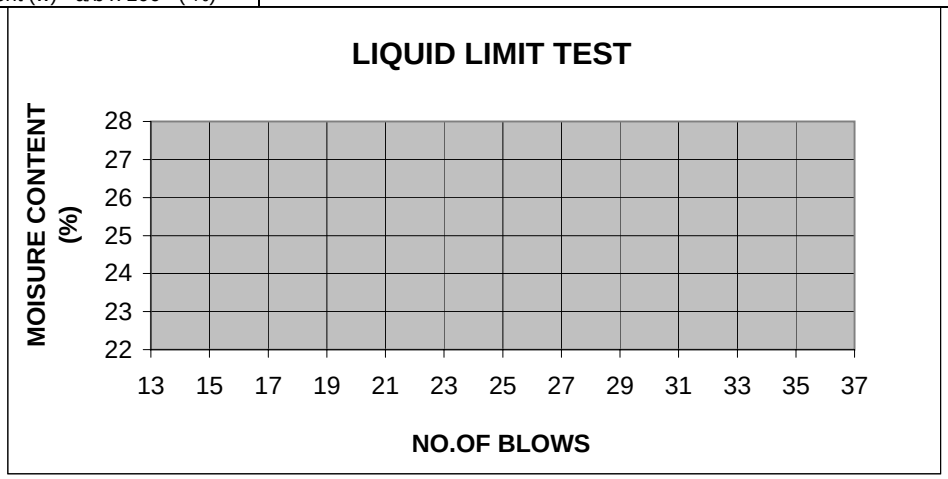
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	130
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A30	Depth: m	11

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

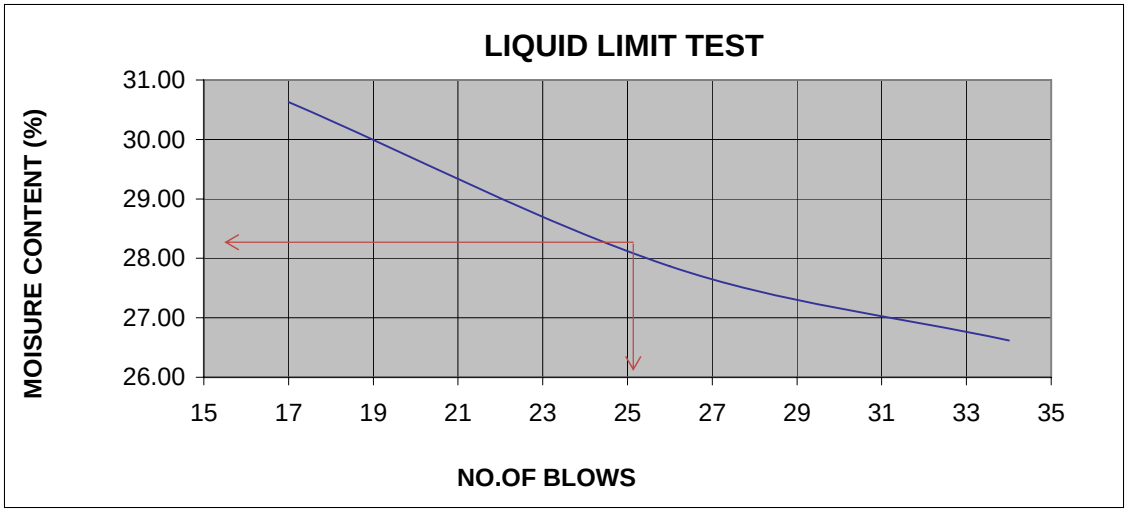
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	131
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A30	Depth: m	12.5

Description	Liquid Limit			Plastic Limit
No of Blows	17	26	34	
Container No	1	2	3	4
Wt. of wet soil + Container W1 (g)	38.3	38.9	41.5	28.9
Wt of Dry soil + Container W2 (g)	34.9	35.5	37.8	27.9
Wt of container W3 (g)	23.8	23.3	23.9	23.5
Wt. of water (a) W1 - W2 (g)	3.4	3.4	3.7	1
Wt. of Dry soil (b) W2 - W3 (g)	11.1	12.2	13.9	4.4
Moisture Content (w)= a/b x 100 (%)	30.63	27.87	26.62	22.73



LL= 28.37% **PL=** 22.73% **PI=** 5.64%

Remarks:

Tested by: Hayat

Checked by: Jafari E-mail:

Lab manager: A.Najafi Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

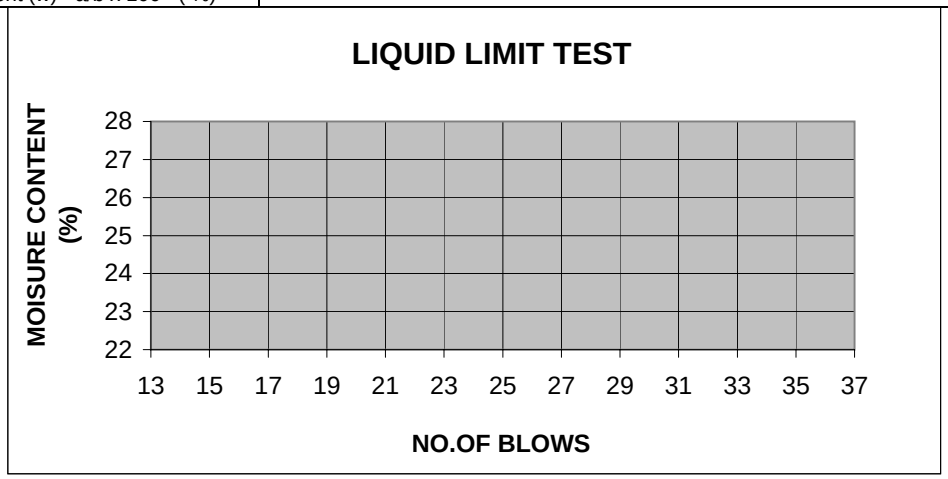
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	132
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A30	Depth: m	14

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

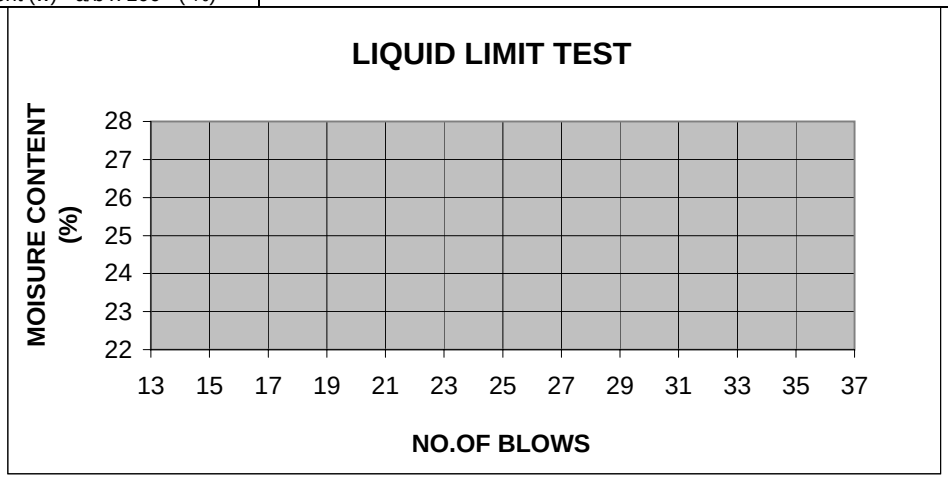
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	133
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A30	Depth: m	15.5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

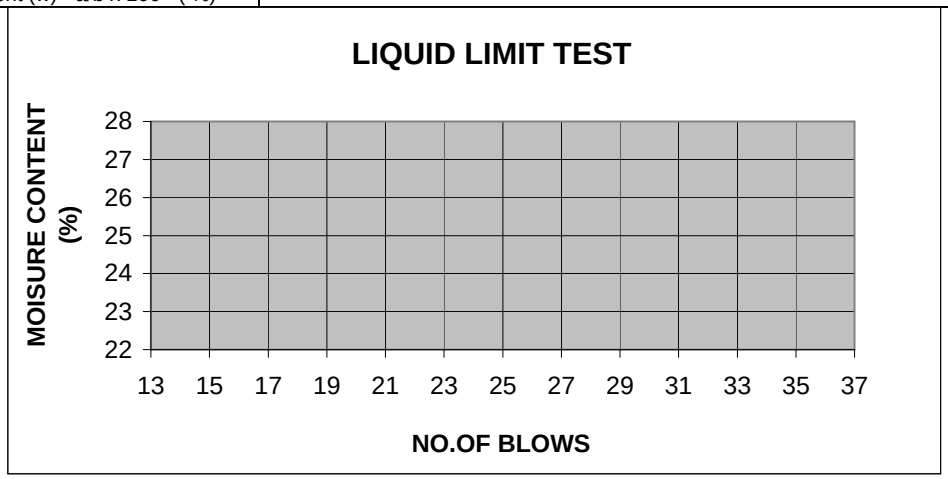
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	134
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A30	Depth: m	16.5

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

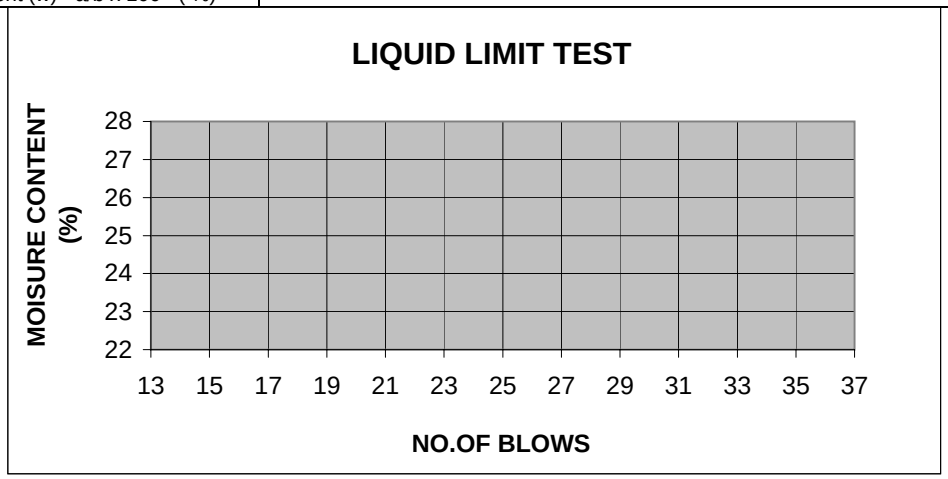
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	135
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A30	Depth: m	18

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

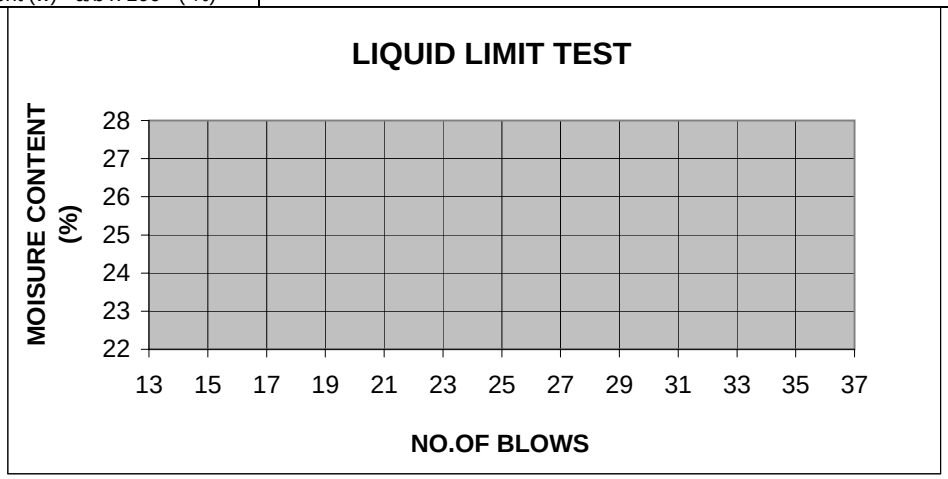
Omran Geotechnic Company

ATTERBERG LIMITS

ASTM D4318

Client :	USAID	Date Sampled :	27.03.2010
Contractor:	Tetra Tech	Sample No :	136
Project:	Ministry of Public Health Facility, Kabul Province	Date of Test :	04.04.2010
Location:	BH # A30	Depth: m	20

Description	Liquid Limit	Plastic Limit
	NON PLASTIC	
No of Blows		
Container No		
Wt. of wet soil + Container W1 (g)		
Wt of Dry soil + Container W2 (g)		
Wt of container W3 (g)		
Wt. of water (a) W1 - W2 (g)		
Wt. of Dry soil (b) W2 - W3 (g)		
Moisture Content (w)= a/b x 100 (%)		



LL= _____ **PL=** _____ **PI=** _____

Remarks:

1- According to test procedure, 150 grams soil sample has taken after passed from Sieve No. 40 (0.425mm).

2- Plasticity test procedure per ASTM D-4318 followed for this soil sample.

3- 150 grams of selected soil sample inputted in special dish of atterberg test.

4- Enough clean watre added to soil sample and mix them to suitable for Atterberg Limit test.

5- Soil sample is Non-cohesive and we can not make rolled sample with 2-3 mm diameter.

6- In result, the soil sample is Non Plastic sample.

Tested by:	Hayat	
Checked by:	Jafari	E-mail:
Lab manager:	A.Najafi	Omran.geotechnic@yahoo.com

Omran Geotechnical Company

Appendix F

Lab Test Results of Boreholes

Specific Gravity Test Results

Professional Geotechnical Services

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

Omran Geotechnic Company

Specific Gravity

ASTM D - 854

Email	Omran.geotechnic@yahoo.com	Add:	Karte 3, Kabul, Afghanistan
To :	**USAID**	**Sampling Date:**	27.03.2010
Contractor:	**Tetra Tech**	**Location:**	Kabul - Province
Project:	**Ministry of Public Health Facility, Kabul Province**		

Bore Hole No.	A1	A1	A2	A7	A8	A8
Depth (m)	1.0	3.0	6.0	2.0	2.0	4.0
Sample No.	1	2	3	4	5	6
Weight of Flask Plus Water (gr)	663.40	668.00	668.80	664.10	664.90	664.30
Weight of Flask Plus Water Plus Material (gr)	726.20	731.30	732.00	727.80	728.60	727.20
Weight of Dry Oven Soil (gr)	100.00	100.00	100.00	100.00	100.00	100.00
Specific Gravity (GS)	2.69	2.72	2.72	2.75	2.68	2.70
Testing Date	7/4/2010	7/4/2010	7/4/2010	7/4/2010	7/4/2010	7/4/2010

Remarks:

Tested By	Hayat
Checked By	Jafari
Lab manager	A.Najafi

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

Omran Geotechnic Company

Specific Gravity

ASTM D - 854

Email	Omran.geotechnic@yahoo.com	Add:	Karte 3, Kabul, Afghanistan
To :	**USAID**	**Sampling Date:**	27.03.2010
Contractor:	**Tetra Tech**	**Location:**	Kabul - Province
Project:	**Ministry of Public Health Facility, Kabul Province**		

Bore Hole No.	A11	A12	A12	A13	A14
Depth (m)	6.0	1.3	4.0	1.5	3.5
Sample No.	7	8	9	10	11
Weight of Flask Plus Water (gr)	667.50	670.00	667.80	664.00	668.20
Weight of Flask Plus Water Plus Material (gr)	731.10	733.80	731.40	727.10	731.50
Weight of Dry Oven Soil (gr)	100.00	100.00	100.00	100.00	100.00
Specific Gravity (GS)	2.75	2.76	2.75	2.71	2.72
Testing Date	7/4/2010	7/4/2010	7/4/2010	7/4/2010	7/4/2010

Remarks:

Tested By	Hayat
Checked By	Jafari
Lab manager	A.Najafi

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

Omran Geotechnic Company

Specific Gravity

ASTM D - 854

Email	Omran.geotechnic@yahoo.com	Add:	Karte 3, Kabul, Afghanistan
To :	**USAID**	**Sampling Date:**	27.03.2010
Contractor:	**Tetra Tech**	**Location:**	Kabul - Province
Project:	**Ministry of Public Health Facility, Kabul Province**		

Bore Hole No.	A14	A15	A15	A16	A18
Depth (m)	2.0	1.5	3.5	3.5	2.5
Sample No.	12	13	14	15	16
Weight of Flask Plus Water (gr)	667.50	668.20	664.20	669.00	667.70
Weight of Flask Plus Water Plus Material (gr)	730.20	731.50	727.10	731.80	731.00
Weight of Dry Oven Soil (gr)	100.00	100.00	100.00	100.00	100.00
Specific Gravity (GS)	2.68	2.72	2.70	2.69	2.72
Testing Date	7/4/2010	7/4/2010	7/4/2010	7/4/2010	7/4/2010

Remarks:

Tested By	Hayat
Checked By	Jafari
Lab manager	A.Najafi

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

Omran Geotechnic Company

Specific Gravity

ASTM D - 854

Email	Omran.geotechnic@yahoo.com	Add:	Karte 3, Kabul, Afghanistan
To :	**USAID**	**Sampling Date:**	27.03.2010
Contractor:	**Tetra Tech**	**Location:**	Kabul - Province
Project:	**Ministry of Public Health Facility, Kabul Province**		

Bore Hole No.	A20	A20	A20	A21	A21
Depth (m)	1.0	3.5	4.0	4.0	6.0
Sample No.	17	18	19	20	21
Weight of Flask Plus Water (gr)	693.40	692.60	668.30	666.00	665.50
Weight of Flask Plus Water Plus Material (gr)	756.40	756.20	732.20	729.00	728.60
Weight of Dry Oven Soil (gr)	100.00	100.00	100.00	100.00	100.00
Specific Gravity (GS)	2.70	2.75	2.77	2.70	2.71
Testing Date	13/4/2010	13/4/2010	13/4/2010	13/4/2010	13/4/2010

Remarks:

Tested By	Hayat
Checked By	Jafari
Lab manager	A.Najafi

OMRAN GEOTECHNICAL COMPANY

MATERIAL TESTING LAB

Omran Geotechnic Company

Specific Gravity

ASTM D - 854

Email	Omran.geotechnic@yahoo.com	Add:	Karte 3, Kabul, Afghanistan
To :	**USAID**	**Sampling Date:**	27.03.2010
Contractor:	**Tetra Tech**	**Location:**	Kabul - Province
Project:	**Ministry of Public Health Facility, Kabul Province**		

Bore Hole No.	A23	A27	A27	A30	A30
Depth (m)	16.5	1.5	3.5	2.0	9.5
Sample No.	22	23	24	25	26
Weight of Flask Plus Water (gr)	669.00	693.4	664.30	692.90	663.90
Weight of Flask Plus Water Plus Material (gr)	731.50	755.4	727.40	756.30	727.50
Weight of Dry Oven Soil (gr)	100.00	100	100.00	100.00	100.00
Specific Gravity (GS)	2.67	2.63	2.71	2.73	2.75
Testing Date	13/4/2010	13/4/2010	13/4/2010	13/4/2010	13/4/2010

Remarks:

Tested By	Hayat
Checked By	Jafari
Lab manager	A.Najafi

Omran Geotechnical Company

Appendix F

Lab Test Results of Boreholes

Consolidation Test Results

Professional Geotechnical Services

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

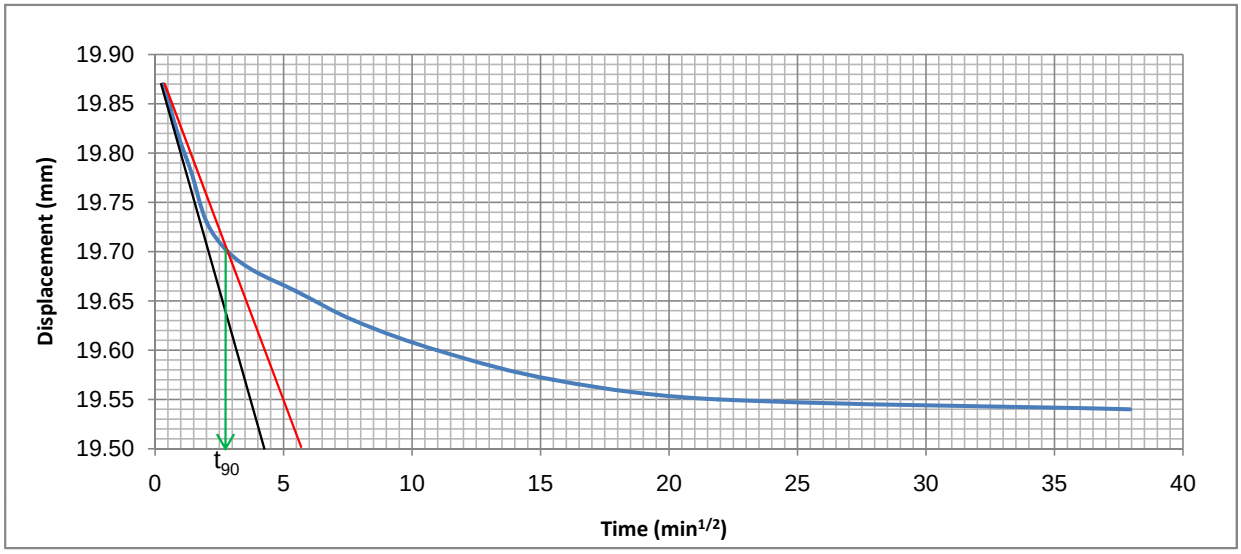
One-Dimensionla Consolidation Preperties of Soils

ASTM D 2435-96

Client	USAID	Sample No.	3
Project	Ministry of Public Health (MOPH) Facility, Kabul Province	Location	Kabul BH # A14 (2m)
Contractor	Tetra Tech	Testing Date	1/4/2010

Applied pressure : 47.88 Kpa

Time(minutes)	Dial Reading(0.01mm)
0.1	13
0.25	14.5
0.5	16.5
1	19
2	22
4	27
8	30
15	32
30	34
60	37
120	40
240	43
480	45
1440	46



t90=7.84

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

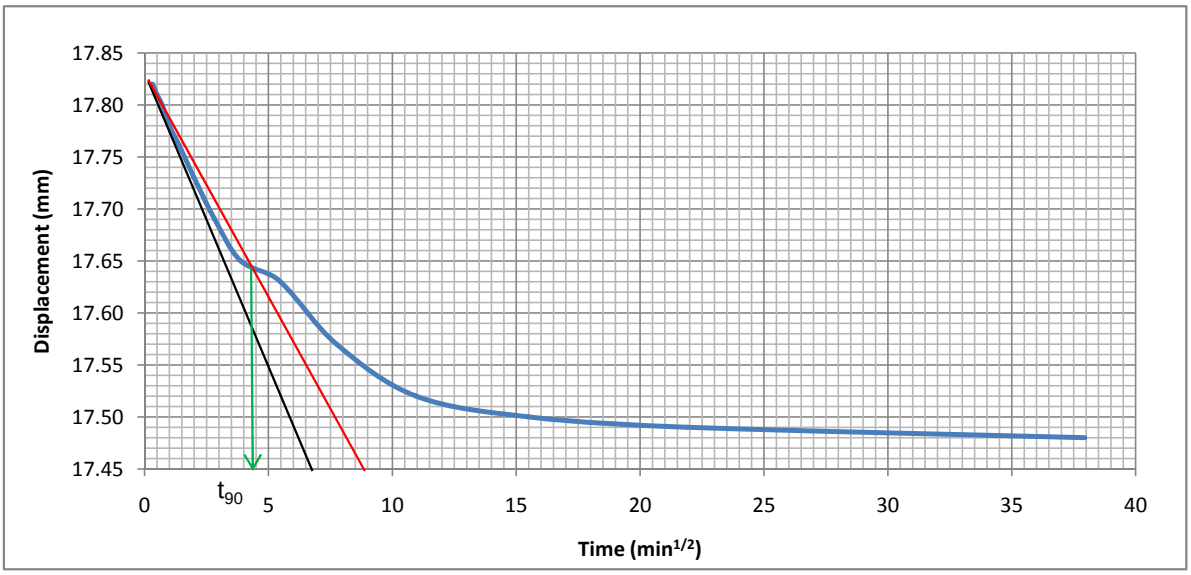
One-Dimensionla Consolidation Preperties of Soils

ASTM D 2435-96

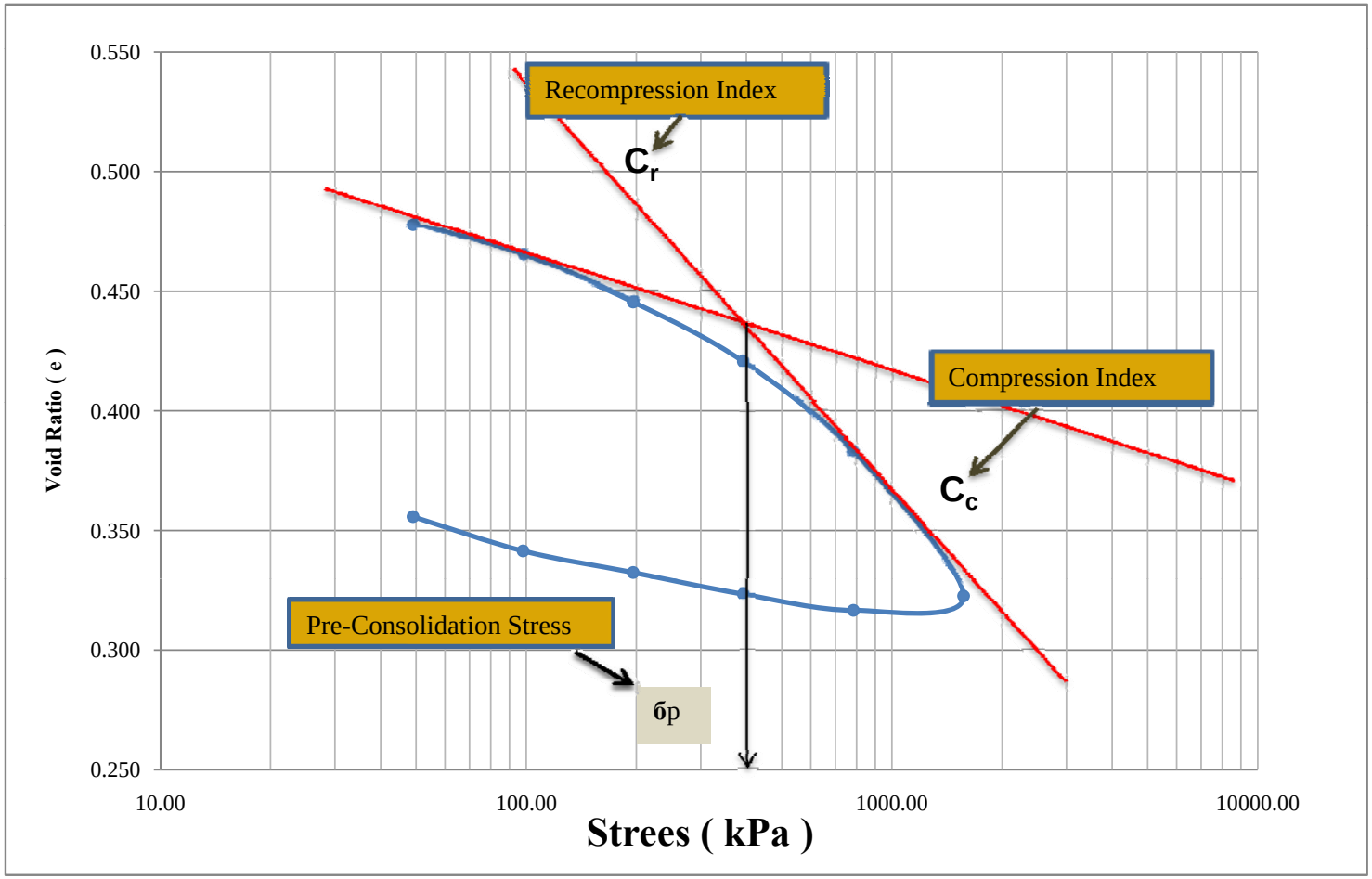
Client	USAID	Sample No.	3
Project	Ministry of Public Health (MOPH) Facility, Kabul Province	Location	Kabul BH # A14 (2m)
Contractor	Tetra Tech	Testing Date	1/4/2010

Applied pressure : 1532 Kpa

Time(minutes)	Dial Reading(0.01mm)
0.1	218
0.25	219
0.5	220
1	222
2	224
4	227
8	231
15	235
30	237
60	243
120	248
240	250
480	251
1440	252



t_{90}=19.36


Recompression Index
C_r
Compression Index
C_c
Pre-Consolidation Stress
бp
0.550
0.500
0.450
0.400
0.350
0.300
0.250
Void Ratio (e)
10.00
100.00
1000.00
10000.00
Strees (kPa)

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

One-Dimensionla Consolidation Preperties of Soils

ASTM D 2435-96

Client	USAID	Sample No	3
Project	Ministry of Public Health (MOPH) Facility, Kabul Province	Locattion	Kabul BH # A14 (2m)
Contractor	Tetra Tech	Testing Date	1/4/2010

Analysis of Consolidation Test Data- Sample BH # A14 - Depth 2 m

Applied pressure kPa	Final Dail Reading 0.01mm	Change in Specimen Height Cm	Final Specimen Height Hi Cm	Void Height Hv=Hi-Hs	Void Ratio e=Hv/Hs	Average Height during Condolidation Cm	Time (T90) min	Coefficient of Consolidation Cm2/min
0	7	0	2					
49.03	46	0.039	1.961	0.634	0.478	1.981	7.84	0.4243
98.06	63	0.056	1.944	0.617	0.465	1.953	9	0.3592
196.13	89	0.082	1.918	0.591	0.445	1.931	12	0.2635
392.27	122	0.115	1.885	0.558	0.421	1.902	13	0.2359
784.53	172	0.165	1.835	0.508	0.383	1.860	16	0.1834
1569.06	252	0.245	1.755	0.428	0.323	1.795	19.36	0.1411
Unloading								
784.53	246	0.253	1.747	0.420	0.317	1.751	18.5	0.1405
392.27	237	0.244	1.756	0.429	0.323	1.752	16	0.1626
196.13	225	0.232	1.768	0.441	0.332	1.762	12	0.2194
98.06	213	0.22	1.78	0.453	0.341	1.774	10	0.2669
49.03	194	0.201	1.799	0.472	0.356	1.790	8	0.3394

Sample+Mould (gr)	191.5
mould (gr)	110.2
Sample (gr)	81.3
Dried Sample (gr)	69.7
Gs	2.68
Height (cm)	2
Diameter (cm)	5
A (cm2)	19.60
V (cm3)	39.20
Hs(cm)=	$Ms/A*Gs*\rho_w$
Hs(cm)= 1.3269	

Final Results:

Compression Index=0.1548

Recompression Index=0.0408

Preconsolidation Pressure (Pc) (δvmax) =400Kpa

Coefficient of Consolidation Cv=0.1411 to 0.4243 (Cm^2/Min)

Tested By	Hayat
Checked By	Jafari

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

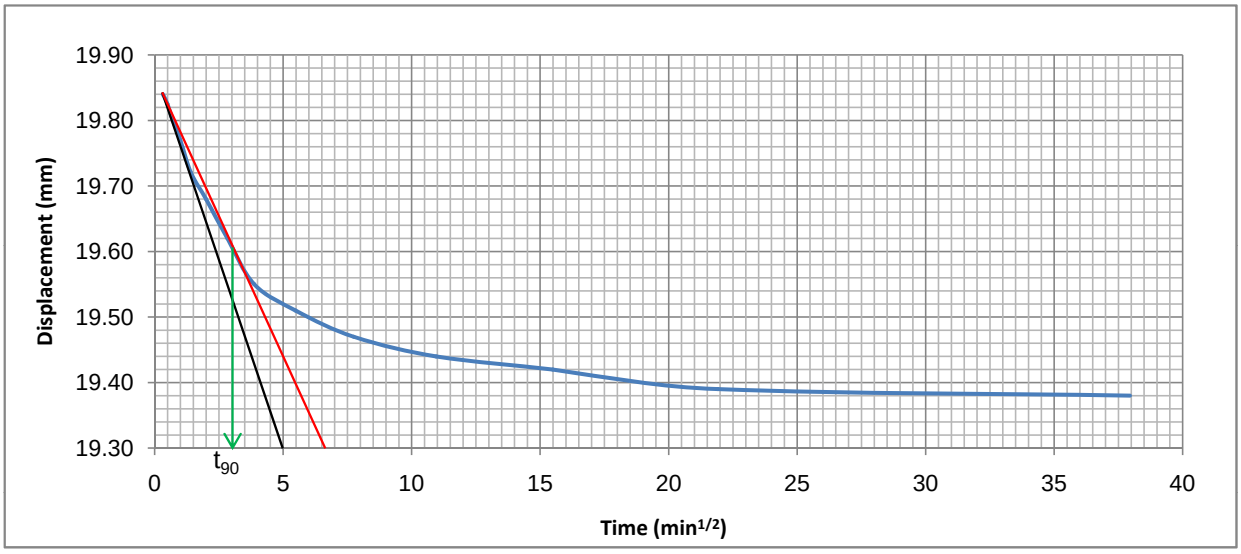
One-Dimensionla Consolidation Preperties of Soils

ASTM D 2435-96

Client	USAID	Sample No.	2
Project	Ministry of Public Health (MOPH) Facility, Kabul Province	Location	Kabul BH # A20 (4m)
Contractor	Tetra Tech	Testing Date	1/4/2010

Applied pressure : 47.88 Kpa

Time(minutes)	Dial Reading(0.01mm)
0.1	16
0.25	17.5
0.5	20
1	23
2	28
4	32
8	38
15	45
30	49
60	53
120	56
240	58
480	61
1440	62



t90=9

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

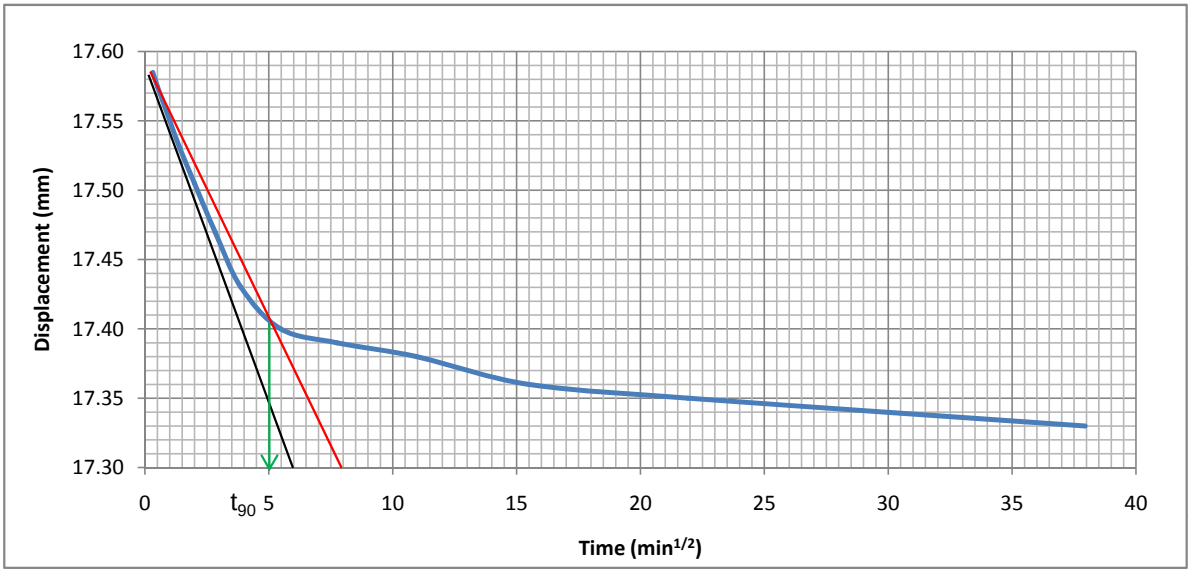
One-Dimensionla Consolidation Preperties of Soils

ASTM D 2435-96

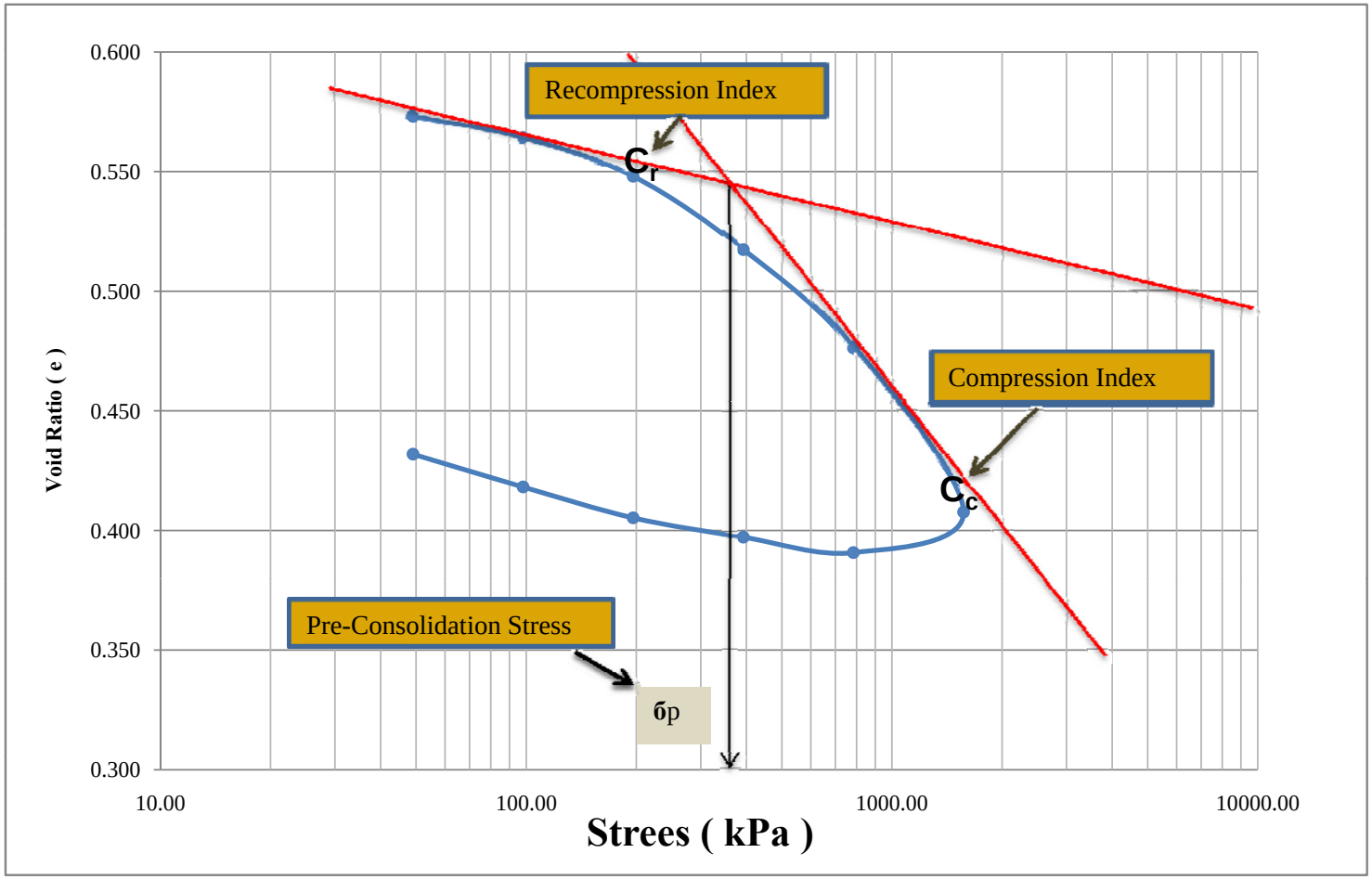
Client	USAID	Sample No.	2
Project	Ministry of Public Health (MOPH) Facility, Kabul Province	Location	Kabul BH # A20 (4m)
Contractor	Tetra Tech	Testing Date	1/4/2010

Applied pressure : 1532 Kpa

Time(minutes)	Dial Reading(0.01mm)
0.1	241.5
0.25	242.5
0.5	243.5
1	245
2	247
4	249.5
8	253
15	257
30	260
60	261
120	262
240	264
480	265
1440	267



t_{90}=25


Recompression Index
Cr
Compression Index
Cc
Pre-Consolidation Stress
бp
0.600
0.550
0.500
0.450
0.400
0.350
0.300
Void Ratio (e)
10.00
100.00
1000.00
10000.00
Strees (kPa)

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

One-Dimensionla Consolidation Preperties of Soils

ASTM D 2435-96

Client	USAID	Sample No	2
Project	Ministry of Public Health (MOPH) Facility, Kabul Province	Locattion	Kabul BH # A20 (4m)
Contractor	Tetra Tech	Testing Date	1/4/2010

Analysis of Consolidation Test Data- Sample BH # A20 - Depth 4 m

Applied pressure kPa	Final Dail Reading 0.01mm	Change in Specimen Height Cm	Final Specimen Height Hi Cm	Void Height Hv=Hi-Hs	Void Ratio e=Hv/Hs	Average Height during Condolidation Cm	Time (T90) min	Coefficient of Consolidation Cm2/min
0	12	0	2					
49.03	62	0.05	1.95	0.710	0.573	1.975	9	0.3675
98.06	73	0.061	1.939	0.699	0.564	1.945	11	0.2915
196.13	93	0.081	1.919	0.679	0.548	1.929	13	0.2427
392.27	131	0.119	1.881	0.641	0.517	1.900	17	0.1801
784.53	182	0.17	1.83	0.590	0.476	1.856	21	0.1390
1569.06	267	0.255	1.745	0.505	0.408	1.788	25	0.1084
Unloading								
784.53	264	0.276	1.724	0.484	0.391	1.735	23	0.1109
392.27	256	0.268	1.732	0.492	0.397	1.728	20	0.1266
196.13	246	0.258	1.742	0.502	0.405	1.737	17	0.1505
98.06	230	0.242	1.758	0.518	0.418	1.750	14	0.1855
49.03	213	0.225	1.775	0.535	0.432	1.767	11	0.2406

Sample+Mould (gr)	208.1
mould (gr)	127.3
Sample (gr)	80.8
Dried Sample (gr)	67.3
Gs	2.77
Height (cm)	2
Diameter (cm)	5
A (cm2)	19.60
V (cm3)	39.20
Hs(cm)=	$Ms/A*Gs*\rho_w$
Hs(cm)=	1.2396

Final Results:

Compression Index=0.2103

Recompression Index=0.0444

Preconsolidation Pressure (Pc) (δvmax) =375Kpa

Coefficient of Consolidation Cv=0.1084 to 0.3675 (Cm^2/Min)

Tested By	Hayat
Checked By	Jafari

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

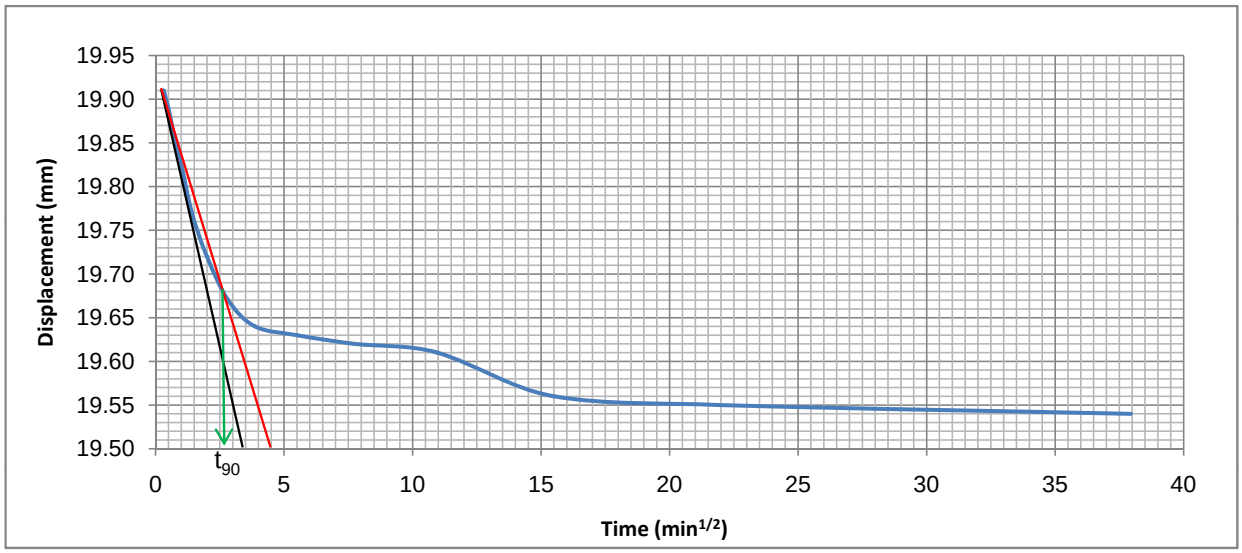
One-Dimensionla Consolidation Preperties of Soils

ASTM D 2435-96

Client	USAID	Sample No.	1
Project	Ministry of Public Health (MOPH) Facility, Kabul Province	Location	Kabul BH # A27 (1.5m)
Contractor	Tetra Tech	Testing Date	1/4/2010

Applied pressure : 47.88 Kpa

Time(minutes)	Dial Reading(0.01mm)
0.1	9
0.25	11
0.5	14
1	17.5
2	23
4	28
8	33
15	36
30	37
60	38
120	39
240	44
480	45
1440	46



t90=6.76

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

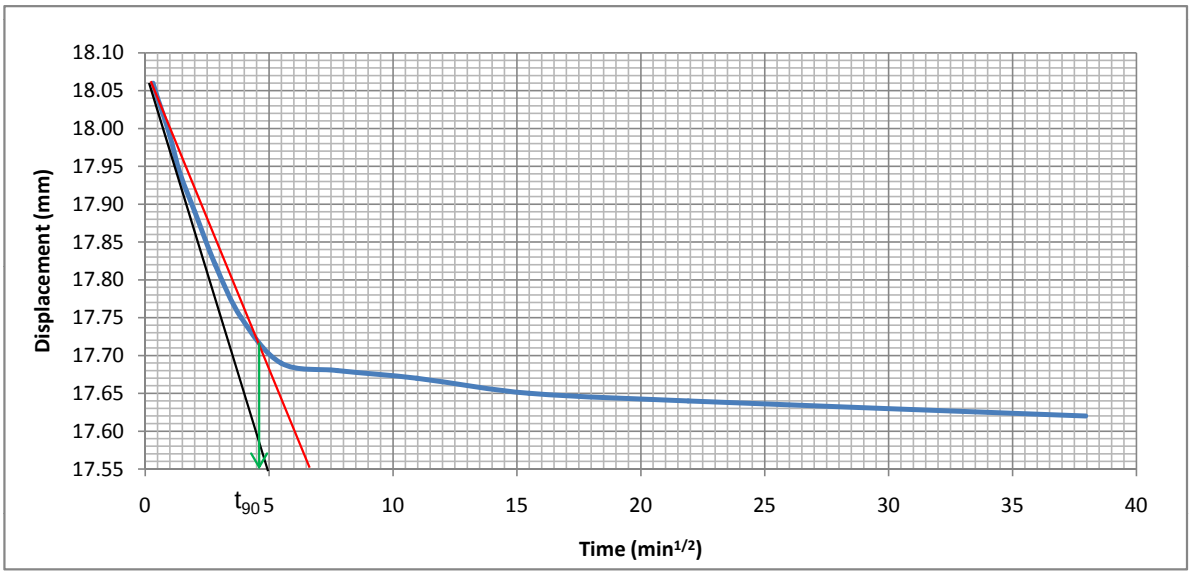
One-Dimensionla Consolidation Preperties of Soils

ASTM D 2435-96

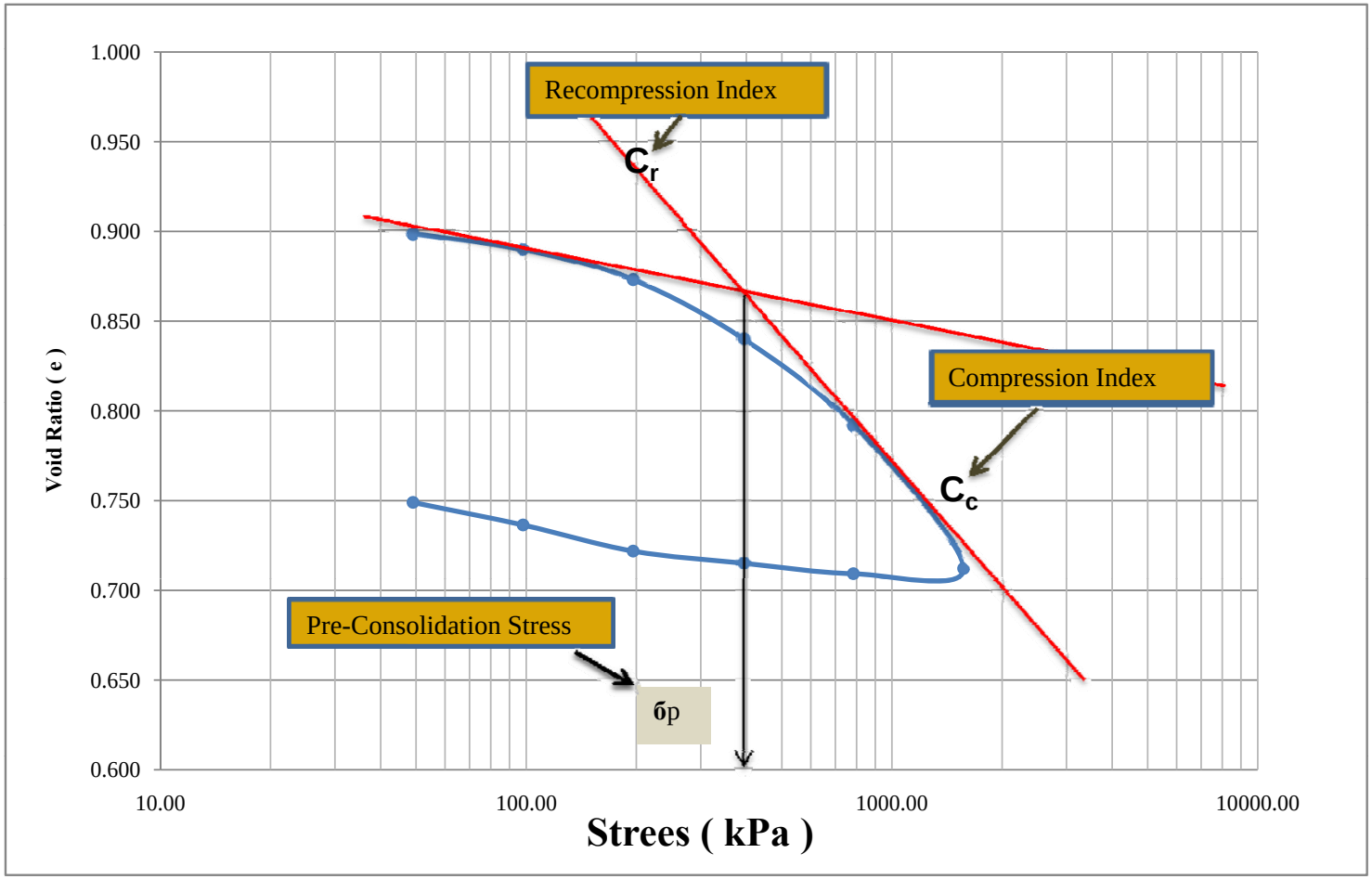
Client	USAID	**Sample No.**	**1**
Project	Ministry of Public Health (MOPH) Facility, Kabul Province	**Location**	**Kabul BH # A27 (1.5m)**
Contractor	Tetra Tech	**Testing Date**	**1/4/2010**

Applied pressure : 1532 Kpa

Time(minutes)	Dial Reading(0.01mm)
0.1	194
0.25	196
0.5	198
1	201
2	206
4	211
8	218
15	225
30	231
60	232
120	233
240	235
480	236
1440	238



t_{90}=21.16


Recompression Index
C_r
Compression Index
C_c
Pre-Consolidation Stress
бp
1.000
0.950
0.900
0.850
0.800
0.750
0.700
0.650
0.600
Void Ratio (e)
10.00
100.00
1000.00
10000.00
Strees (kPa)

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

One-Dimensionla Consolidation Preperties of Soils

ASTM D 2435-96

Client	USAID	Sample No	1
Project	Ministry of Public Health (MOPH) Facility, Kabul Province	Locattion	Kabul BH # A27 (1.5m)
Contractor	Tetra Tech	Testing Date	1/4/2010

Analysis of Consolidation Test Data- Sample BH # A27 - Depth 1.5 m

Applied pressure kPa	Final Dail Reading 0.01mm	Change in Specimen Height Cm	Final Specimen Height Hi Cm	Void Height Hv=Hi-Hs	Void Ratio e=Hv/Hs	Average Height during Condolidation Cm	Time (T90) min	Coefficient of Consolidation Cm2/min
0	5	0	2					
49.03	46	0.041	1.959	0.927	0.898	1.980	6.76	0.4915
98.06	55	0.05	1.95	0.918	0.890	1.955	8.5	0.3811
196.13	72	0.067	1.933	0.901	0.873	1.942	11	0.2906
392.27	106	0.101	1.899	0.867	0.840	1.916	13.5	0.2306
784.53	156	0.151	1.849	0.817	0.792	1.874	17	0.1752
1569.06	238	0.233	1.767	0.735	0.712	1.808	21.16	0.1310
Unloading								
784.53	231	0.236	1.764	0.732	0.709	1.766	19.1	0.1384
392.27	225	0.23	1.77	0.738	0.715	1.767	16.3	0.1624
196.13	218	0.223	1.777	0.745	0.722	1.774	14	0.1905
98.06	203	0.208	1.792	0.760	0.736	1.785	11.2	0.2411
49.03	190	0.195	1.805	0.773	0.749	1.799	8	0.3429

Sample+Mould (gr)	144.5
mould (gr)	95.3
Sample (gr)	49.2
Dried Sample (gr)	53.2
Gs	2.63
Height (cm)	2
Diameter (cm)	5
A (cm2)	19.60
V (cm3)	39.20
Hs(cm)=	$Ms/A*Gs*\rho_w$
Hs(cm)=	1.0320

Final Results:

Compression Index=0.2192

Recompression Index=0.0424

Preconsolidation Pressure (Pc) (δvmax) =400Kpa

Coefficient of Consolidation Cv=0.1311 to 0.4915 (Cm^2/Min)

Tested By	Hayat
Checked By	Jafari

Omran Geotechnical Company

Appendix F

Lab Test Results of Boreholes

Direct Shear Test Results

Professional Geotechnical Services

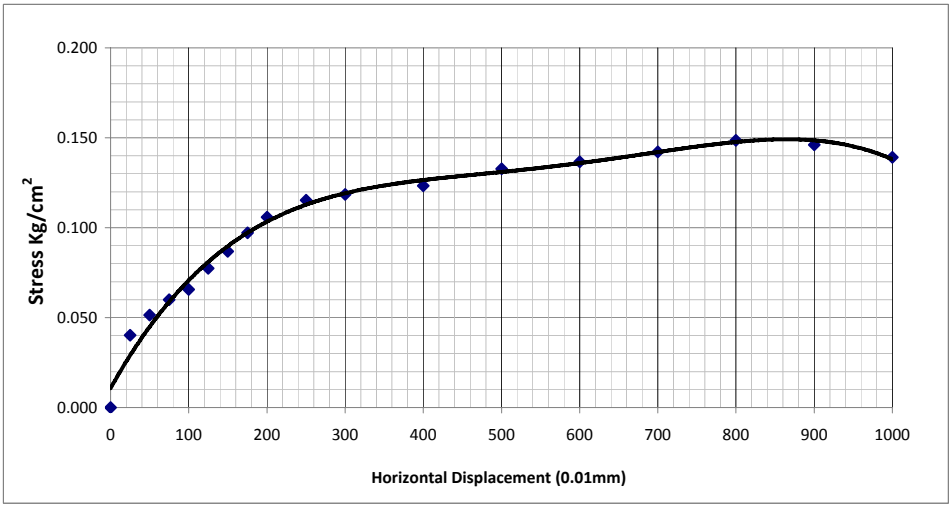
OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	1.3m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.245	Borehole # A12				
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	0	102.01	0	0
2	25	5.1	102.01	4.1106	0.040296049
3	50	6.5	102.01	5.239	0.05135771
4	75	7.6	102.01	6.1256	0.060049015
5	100	8.3	102.01	6.6898	0.065579845
6	125	9.8	102.01	7.8988	0.077431624
7	150	11	102.01	8.866	0.086913048
8	175	12.3	102.01	9.9138	0.09718459
9	200	13.4	102.01	10.8004	0.105875895
10	250	14.6	102.01	11.7676	0.115357318
11	300	15	102.01	12.09	0.118517792
12	400	15.6	102.01	12.5736	0.123258504
13	500	16.8	102.01	13.5408	0.132739927
14	600	17.3	102.01	13.9438	0.136690521
15	700	18	102.01	14.508	0.142221351
16	800	18.8	102.01	15.1528	0.1485423
17	900	18.5	102.01	14.911	0.146171944
18	1000	17.6	102.01	14.1856	0.139060876



OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	1.3m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.490		Borehole # A12			
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	**0**	102.01	0	**0**
2	25	6.6	102.01	5.3196	0.052147829
3	50	9	102.01	7.254	0.071110675
4	75	12.2	102.01	9.8332	0.096394471
5	100	15.8	102.01	12.7348	0.124838741
6	125	18.2	102.01	14.6692	0.143801588
7	150	20.3	102.01	16.3618	0.160394079
8	175	23.2	102.01	18.6992	0.183307519
9	200	25.4	102.01	20.4724	0.200690128
10	250	27.3	102.01	22.0038	0.215702382
11	300	29	102.01	23.374	0.229134399
12	400	31.2	102.01	25.1472	0.246517008
13	500	33	102.01	26.598	0.260739143
14	600	35	102.01	28.21	0.276541516
15	700	36.3	102.01	29.2578	0.286813058
16	800	35	102.01	28.21	0.276541516
17	900	33	102.01	26.598	0.260739143
18	1000	32	102.01	25.792	0.252837957

OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	1.3m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.735		Borehole # A12			
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	**0**	102.01	0	**0**
2	25	8.2	102.01	6.6092	0.064789726
3	50	11	102.01	8.866	0.086913048
4	75	13.6	102.01	10.9616	0.107456132
5	100	16	102.01	12.896	0.126418979
6	125	19.3	102.01	15.5558	0.152492893
7	150	23	102.01	18.538	0.181727282
8	175	25.6	102.01	20.6336	0.202270366
9	200	28	102.01	22.568	0.221233212
10	250	33	102.01	26.598	0.260739143
11	300	38	102.01	30.628	0.300245074
12	400	44	102.01	35.464	0.347652191
13	500	49.5	102.01	39.897	0.391108715
14	600	54	102.01	43.524	0.426664053
15	700	59	102.01	47.554	0.466169983
16	800	60.6	102.01	48.8436	0.478811881
17	900	58	102.01	46.748	0.458268797
18	1000	56	102.01	45.136	0.442466425

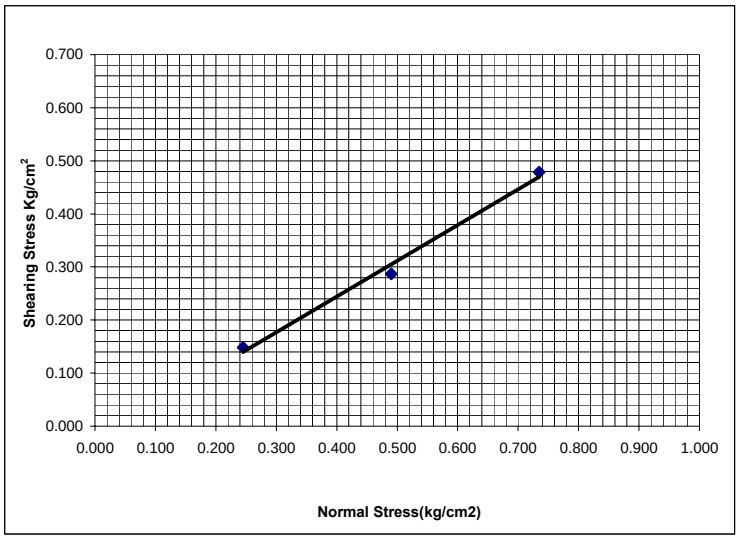
OMRAN GEOTECHNICAL COMPANY

Material Testing Laboratory

Direct Shear Test T-236 / D-6528

Client : USAID		Type of Test : CU
Contractor : Tetra Tech		Sampled By :OGC
Project Name : Ministry of Public Health (MOPH) Facility, Kabul Province		Depth # 1.3m
Proving Ring Calibration Factor 1 div : 0.806		Wet Unit Weight g/Cm^3 : 1.95
Discription of Soil : Sandy Silt		Moisture Contant% : 14.85
Min of Friction Angle Φ : 30.34º	Borehole # A12	Dry Unit Weight g/Cm^3 : 1.7
Cohesion : 0	Void Ratio : o.624	Specific Gravity : 2.76

No	Normal Stress Applied Kg/cm^2	Stress Dial Gauge Observation at Failure	Shear force Kg	Area (cm^2)	Shear Stress kg/cm^2	Calculate Φ
1	0.245	18.8	15.1528	102.01	0.1485	31.22°
2	0.490	36.3	29.2578	102.01	0.2868	30.34°
3	0.735	60.6	48.8436	102.01	0.4788	33.08°



Tested By	**Hayat**	
Checked By	**Jafari**	

OMRAN GEOTECHNICAL COMPANY

Material Testing Laboratory

Direct Shear Test
(ASTM D3080)

Client	**USAID**	**Location**	Kabul Province, BH # A12, 1.3m
Contractor	**Tetra Tech**	**Date**	11/4/2010
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Description of Soil	Sandy Silt		
Type of Test	CU		
Strain Rate	0.5 mm/min		
Load Scale K	0.81 kg/Div		
Sample No.	1	2	3
Normal Stress, kg/cm2	0.245	0.49	0.735

Sample No.	Water Content (%)		Normal Stress (kg/cm2)	Max. Shearing Stress (kg/cm^2)
	berfor test	after test		
1	14.73	18	0.245	0.1485
2	15.30	19	0.49	0.2868
3	14.53	17.5	0.735	0.4788

Soil Specimen Measurements			
Length (cm)	10.1	10.1	10.1
Height (cm)	2	2	2
Area (cm)	102.01	102.01	102.01
Volume (cm3)	204.02	204.02	204.02
Weight of Soil + Split Former (gr)	532.2	517	525
Weight of Split Former (gr)	127	127	127
Weight of Soil (gr)	405.2	390	398
Wet Unit Weight (gr/cm3)	1.99	1.91	1.95
Dry Unit Weight (gr/cm3)	1.73	1.66	1.70

Water Content Determination			
Container No.	1	2	3
Weight of Wet Soil + Container	81.9	92.9	82.3
Weight of Dry Soil + Container	76.2	86.2	77.1
Weight of Water	5.7	6.7	5.2
Weight of Container	37.5	42.4	41.3
Weight of Dry Soil	38.7	43.8	35.8
Water Content	14.73	15.30	14.53

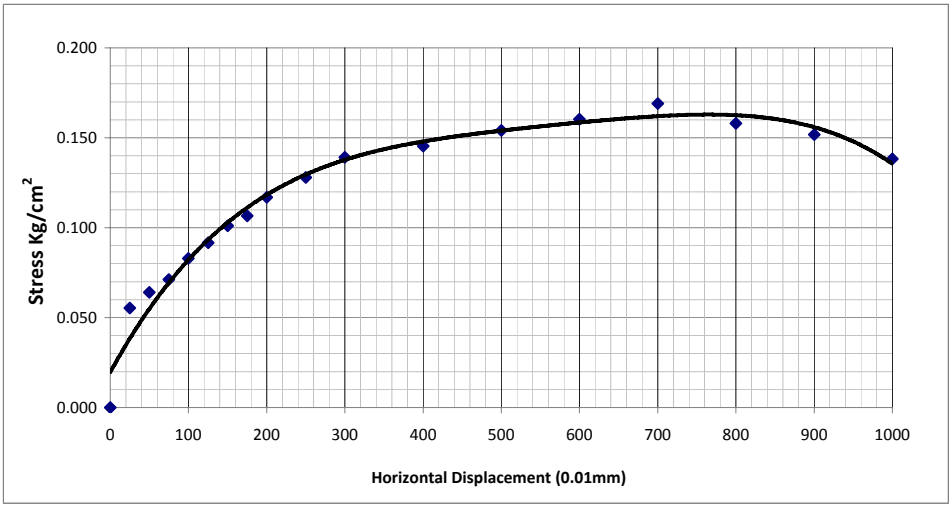
OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	1.5m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.245	Borehole # A14				
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	0	102.01	0	0
2	25	7	102.01	5.642	0.055308303
3	50	8.1	102.01	6.5286	0.063999608
4	75	9	102.01	7.254	0.071110675
5	100	10.5	102.01	8.463	0.082962455
6	125	11.6	102.01	9.3496	0.091653759
7	150	12.8	102.01	10.3168	0.101135183
8	175	13.5	102.01	10.881	0.106666013
9	200	14.8	102.01	11.9288	0.116937555
10	250	16.2	102.01	13.0572	0.127999216
11	300	17.6	102.01	14.1856	0.139060876
12	400	18.4	102.01	14.8304	0.145381825
13	500	19.5	102.01	15.717	0.15407313
14	600	20.3	102.01	16.3618	0.160394079
15	700	21.4	102.01	17.2484	0.169085384
16	800	20	102.01	16.12	0.158023723
17	900	19.2	102.01	15.4752	0.151702774
18	1000	17.5	102.01	14.105	0.138270758



OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	1.5m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.490		Borehole # A14			
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	**0**	102.01	0	**0**
2	25	10	102.01	8.06	0.079011862
3	50	13	102.01	10.478	0.10271542
4	75	17.2	102.01	13.8632	0.135900402
5	100	20.2	102.01	16.2812	0.15960396
6	125	22.5	102.01	18.135	0.177776689
7	150	24	102.01	19.344	0.189628468
8	175	26.8	102.01	21.6008	0.211751789
9	200	28.3	102.01	22.8098	0.223603568
10	250	30.1	102.01	24.2606	0.237825703
11	300	32	102.01	25.792	0.252837957
12	400	35.3	102.01	28.4518	0.278911871
13	500	38	102.01	30.628	0.300245074
14	600	41.2	102.01	33.2072	0.32552887
15	700	43	102.01	34.658	0.339751005
16	800	45.3	102.01	36.5118	0.357923733
17	900	44	102.01	35.464	0.347652191
18	1000	43.2	102.01	34.8192	0.341331242

OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	1.5m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.735		Borehole # A14			
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	**0**	102.01	0	**0**
2	25	14	102.01	11.284	0.110616606
3	50	19	102.01	15.314	0.150122537
4	75	25	102.01	20.15	0.197529654
5	100	29.5	102.01	23.777	0.233084992
6	125	36	102.01	29.016	0.284442702
7	150	41.5	102.01	33.449	0.327899226
8	175	46	102.01	37.076	0.363454563
9	200	50.2	102.01	40.4612	0.396639545
10	250	54.9	102.01	44.2494	0.43377512
11	300	59	102.01	47.554	0.466169983
12	400	64.8	102.01	52.2288	0.511996863
13	500	66	102.01	53.196	0.521478286
14	600	68	102.01	54.808	0.537280659
15	700	70.2	102.01	56.5812	0.554663268
16	800	72	102.01	58.032	0.568885403
17	900	73	102.01	58.838	0.57678659
18	1000	72	102.01	58.032	0.568885403

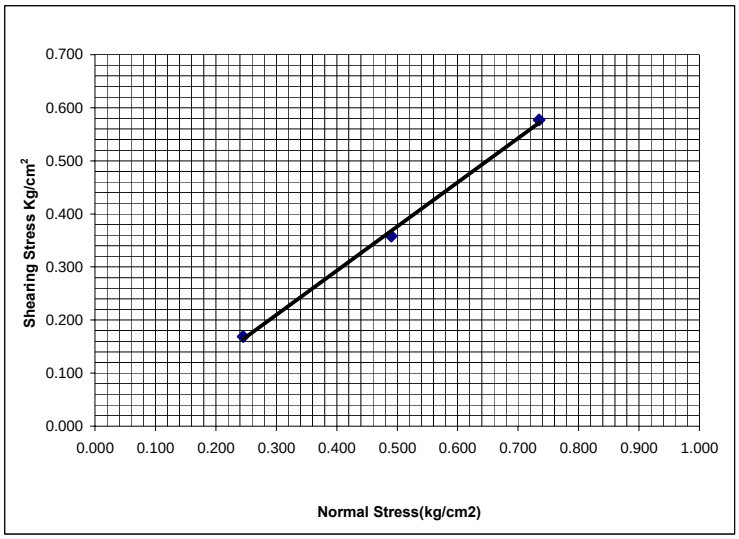
OMRAN GEOTECHNICAL COMPANY

Material Testing Laboratory

Direct Shear Test T-236 / D-6528

Client : USAID		Type of Test : CU
Contractor : Tetra Tech		Sampled By :OGC
Project Name : Ministry of Public Health (MOPH) Facility, Kabul Province		Depth # 1.5m
Proving Ring Calibration Factor 1 div : 0.806		Wet Unit Weight g/Cm^3 : 2.12
Discription of Soil : Silty Sand with Gravel		Moisture Contant% : 12.9
Min of Friction Angle Φ : 34.61º	Borehole # A14	Dry Unit Weight g/Cm^3 : 1.88
Cohesion : 0	Void Ratio : o.436	Specific Gravity : 2.70

No	Normal Stress Applied Kg/cm^2	Stress Dial Gauge Observation at Failure	Shear force Kg	Area (cm^2)	Shear Stress kg/cm^2	Calculate Φ
1	0.245	21.4	17.2484	102.01	0.1691	34.61°
2	0.490	45.3	36.5118	102.01	0.3579	36.14°
3	0.735	73	58.838	102.01	0.5768	38.12°



Tested By	**Hayat**	
Checked By	**Jafari**	

OMRAN GEOTECHNICAL COMPANY

Material Testing Laboratory

Omran Geotechnic Company

Direct Shear Test
(ASTM D3080)

Client	**USAID**	**Location**	Kabul Province, BH # A14, 1.5m
Contractor	**Tetra Tech**	**Date**	10/4/2010
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Description of Soil	Silty Sand with Gravel		
Type of Test	CU		
Strain Rate	0.5 mm/min		
Load Scale K	0.81 kg/Div		
Sample No.	1	2	3
Normal Stress, kg/cm2	0.245	0.49	0.735

Sample No.	Water Content (%)		Normal Stress (kg/cm2)	Max. Shearing Stress (kg/cm^2)
	berfor test	after test		
1	12.88	20	0.245	0.1691
2	13.00	19.5	0.49	0.3579
3	12.82	21.2	0.735	0.5768

Soil Specimen Measurements			
Length (cm)	10.1	10.1	10.1
Height (cm)	2	2	2
Area (cm)	102.01	102.01	102.01
Volume (cm3)	204.02	204.02	204.02
Weight of Soil + Split Former (gr)	551.7	560.2	565.7
Weight of Split Former (gr)	127	127	127
Weight of Soil (gr)	424.7	433.2	438.7
Wet Unit Weight (gr/cm3)	2.08	2.12	2.15
Dry Unit Weight (gr/cm3)	1.84	1.88	1.91

Water Content Determination			
Container No.	1	2	3
Weight of Wet Soil + Container	173.3	214.5	167.9
Weight of Dry Soil + Container	158.1	195	153.8
Weight of Water	15.2	19.5	14.1
Weight of Container	40.1	45	43.8
Weight of Dry Soil	118	150	110
Water Content	12.88	13.00	12.82

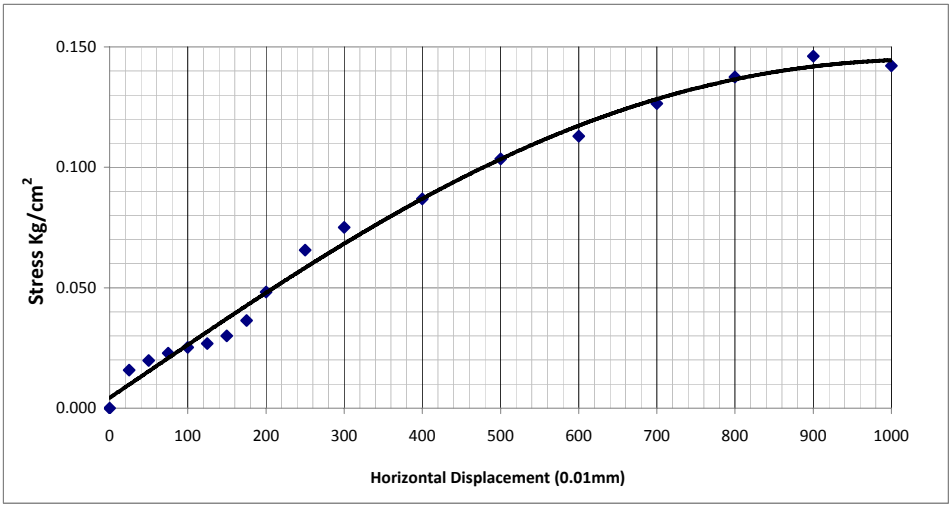
OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	2.5m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.245	Borehole # A18				
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	0	102.01	0	0
2	25	2	102.01	1.612	0.015802372
3	50	2.5	102.01	2.015	0.019752965
4	75	2.9	102.01	2.3374	0.02291344
5	100	3.2	102.01	2.5792	0.025283796
6	125	3.4	102.01	2.7404	0.026864033
7	150	3.8	102.01	3.0628	0.030024507
8	175	4.6	102.01	3.7076	0.036345456
9	200	6.1	102.01	4.9166	0.048197236
10	250	8.3	102.01	6.6898	0.065579845
11	300	9.5	102.01	7.657	0.075061269
12	400	11	102.01	8.866	0.086913048
13	500	13.1	102.01	10.5586	0.103505539
14	600	14.3	102.01	11.5258	0.112986962
15	700	16	102.01	12.896	0.126418979
16	800	17.4	102.01	14.0244	0.137480639
17	900	18.5	102.01	14.911	0.146171944
18	1000	18	102.01	14.508	0.142221351



OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	2.5m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.490		Borehole # A18			
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	**0**	102.01	0	**0**
2	25	3.6	102.01	2.9016	0.02844427
3	50	5	102.01	4.03	0.039505931
4	75	7.3	102.01	5.8838	0.057678659
5	100	9	102.01	7.254	0.071110675
6	125	11.5	102.01	9.269	0.090863641
7	150	13.2	102.01	10.6392	0.104295657
8	175	15.6	102.01	12.5736	0.123258504
9	200	17.6	102.01	14.1856	0.139060876
10	250	20.5	102.01	16.523	0.161974316
11	300	23	102.01	18.538	0.181727282
12	400	26	102.01	20.956	0.20543084
13	500	28.5	102.01	22.971	0.225183806
14	600	30	102.01	24.18	0.237035585
15	700	31.1	102.01	25.0666	0.24572689
16	800	32.2	102.01	25.9532	0.254418194
17	900	32	102.01	25.792	0.252837957
18	1000	30	102.01	24.18	0.237035585

OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	2.5m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.735		Borehole # A18			
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	**0**	102.01	0	**0**
2	25	6	102.01	4.836	0.047407117
3	50	8.5	102.01	6.851	0.067160082
4	75	11	102.01	8.866	0.086913048
5	100	15	102.01	12.09	0.118517792
6	125	19.2	102.01	15.4752	0.151702774
7	150	22.8	102.01	18.3768	0.180147044
8	175	25	102.01	20.15	0.197529654
9	200	29.5	102.01	23.777	0.233084992
10	250	34.5	102.01	27.807	0.272590922
11	300	38	102.01	30.628	0.300245074
12	400	41.6	102.01	33.5296	0.328689344
13	500	45	102.01	36.27	0.355553377
14	600	49.2	102.01	39.6552	0.388738359
15	700	50	102.01	40.3	0.395059308
16	800	50.8	102.01	40.9448	0.401380257
17	900	49.2	102.01	39.6552	0.388738359
18	1000	48	102.01	38.688	0.379256936

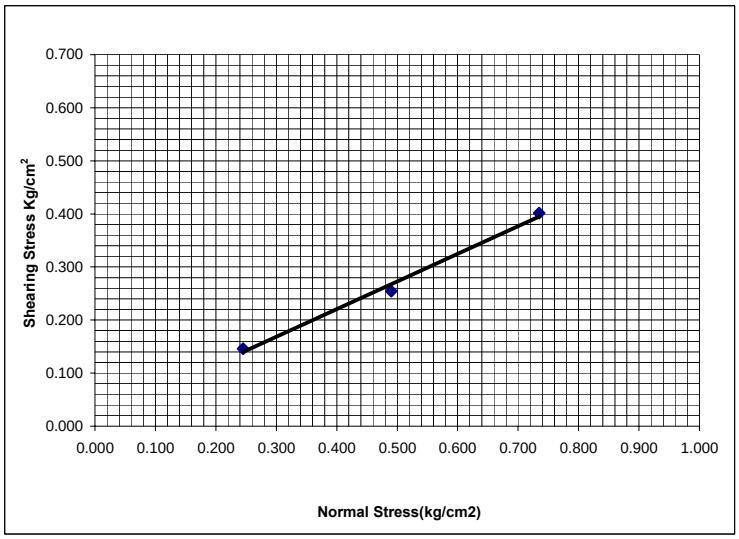
OMRAN GEOTECHNICAL COMPANY

Material Testing Laboratory

Direct Shear Test T-236 / D-6528

Client : USAID	Type of Test : CU
Contractor : Tetra Tech	Sampled By :OGC
Project Name : Ministry of Public Health (MOPH) Facility, Kabul Province	Depth # 2.5m
Proving Ring Calibration Factor 1 div : 0.806	Wet Unit Weight g/Cm^3 : 1.82
Discription of Soil : Lean Clay	Moisture Contant% : 16.29
Min of Friction Angle Φ : 27.44º Borehole # A18	Dry Unit Weight g/Cm^3 : 1.56
Cohesion : 0 Void Ratio : o.744	Specific Gravity : 2.72

No	Normal Stress Applied Kg/cm^2	Stress Dial Gauge Observation at Failure	Shear force Kg	Area (cm^2)	Shear Stress kg/cm^2	Calculate Φ
1	0.245	18.5	14.911	102.01	0.1462	30.83°
2	0.490	32.2	25.9532	102.01	0.2544	27.44°
3	0.735	50.8	40.9448	102.01	0.4014	28.64°



Tested By	**Hayat**	
Checked By	**Jafari**	

OMRAN GEOTECHNICAL COMPANY

Material Testing Laboratory

Omran Geotechnic Company

Direct Shear Test
(ASTM D3080)

Client	**USAID**	**Location**	Kabul Province, BH # A18, 2.5m
Contractor	**Tetra Tech**	**Date**	10/4/2010
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Description of Soil	Lean Clay		
Type of Test	CU		
Strain Rate	0.5 mm/min		
Load Scale K	0.81 kg/Div		
Sample No.	1	2	3
Normal Stress, kg/cm2	0.245	0.49	0.735

Sample No.	Water Content (%)		Normal Stress (kg/cm2)	Max. Shearing Stress (kg/cm^2)
	berfor test	after test		
1	16.40	26	0.245	0.1462
2	17.09	27	0.49	0.2544
3	15.38	25.3	0.735	0.4014

Soil Specimen Measurements			
Length (cm)	10.1	10.1	10.1
Height (cm)	2	2	2
Area (cm)	102.01	102.01	102.01
Volume (cm3)	204.02	204.02	204.02
Weight of Soil + Split Former (gr)	498	495.8	499.5
Weight of Split Former (gr)	127	127	127
Weight of Soil (gr)	371	368.8	372.5
Wet Unit Weight (gr/cm3)	1.82	1.81	1.83
Dry Unit Weight (gr/cm3)	1.56	1.54	1.58

Water Content Determination			
Container No.	1	2	3
Weight of Wet Soil + Container	75.2	82.7	72
Weight of Dry Soil + Container	72.1	78	70
Weight of Water	3.1	4.7	2
Weight of Container	53.2	50.5	57
Weight of Dry Soil	18.9	27.5	13
Water Content	16.40	17.09	15.38

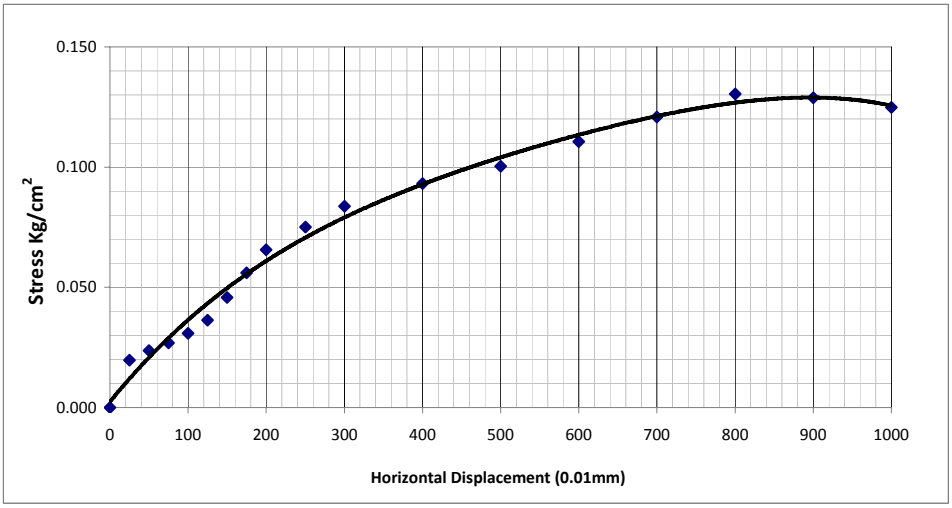
OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	4m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.245	Borehole # A20				
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	0	102.01	0	0
2	25	2.5	102.01	2.015	0.019752965
3	50	3	102.01	2.418	0.023703558
4	75	3.4	102.01	2.7404	0.026864033
5	100	3.9	102.01	3.1434	0.030814626
6	125	4.6	102.01	3.7076	0.036345456
7	150	5.8	102.01	4.6748	0.04582688
8	175	7.1	102.01	5.7226	0.056098422
9	200	8.3	102.01	6.6898	0.065579845
10	250	9.5	102.01	7.657	0.075061269
11	300	10.6	102.01	8.5436	0.083752573
12	400	11.8	102.01	9.5108	0.093233997
13	500	12.7	102.01	10.2362	0.100345064
14	600	14	102.01	11.284	0.110616606
15	700	15.3	102.01	12.3318	0.120888148
16	800	16.5	102.01	13.299	0.130369572
17	900	16.3	102.01	13.1378	0.128789334
18	1000	15.8	102.01	12.7348	0.124838741



OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	4m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.490		Borehole # A20			
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	**0**	102.01	0	**0**
2	25	4.6	102.01	3.7076	0.036345456
3	50	6.5	102.01	5.239	0.05135771
4	75	8.7	102.01	7.0122	0.06874032
5	100	11	102.01	8.866	0.086913048
6	125	13.5	102.01	10.881	0.106666013
7	150	16	102.01	12.896	0.126418979
8	175	18.2	102.01	14.6692	0.143801588
9	200	22	102.01	17.732	0.173826095
10	250	25.9	102.01	20.8754	0.204640721
11	300	28.5	102.01	22.971	0.225183806
12	400	34	102.01	27.404	0.268640329
13	500	36.5	102.01	29.419	0.288393295
14	600	37.7	102.01	30.3862	0.297874718
15	700	37	102.01	29.822	0.292343888
16	800	36	102.01	29.016	0.284442702
17	900	34	102.01	27.404	0.268640329
18	1000	33	102.01	26.598	0.260739143

OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	4m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.735		Borehole # A20			
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	**0**	102.01	0	**0**
2	25	8	102.01	6.448	0.063209489
3	50	11	102.01	8.866	0.086913048
4	75	14	102.01	11.284	0.110616606
5	100	18.2	102.01	14.6692	0.143801588
6	125	22	102.01	17.732	0.173826095
7	150	25.8	102.01	20.7948	0.203850603
8	175	30	102.01	24.18	0.237035585
9	200	32	102.01	25.792	0.252837957
10	250	34.2	102.01	27.5652	0.270220567
11	300	39	102.01	31.434	0.30814626
12	400	44	102.01	35.464	0.347652191
13	500	48.5	102.01	39.091	0.383207529
14	600	53	102.01	42.718	0.418762866
15	700	54.1	102.01	43.6046	0.427454171
16	800	53	102.01	42.718	0.418762866
17	900	51	102.01	41.106	0.402960494
18	1000	49	102.01	39.494	0.387158122

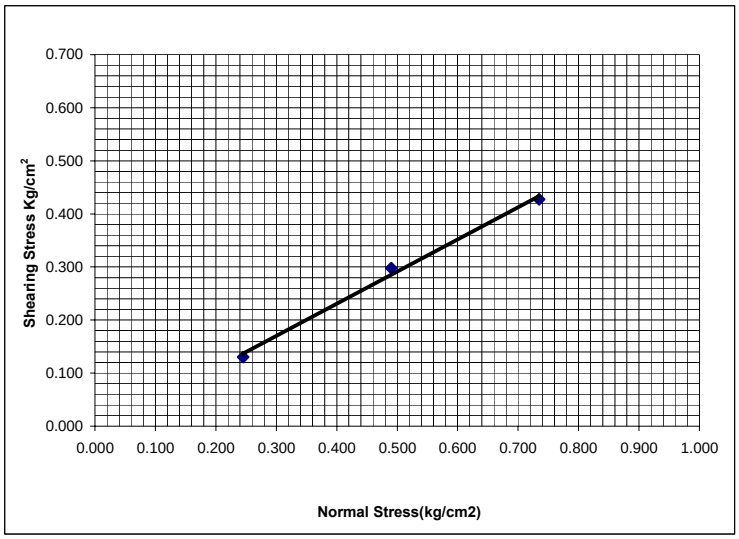
OMRAN GEOTECHNICAL COMPANY

Material Testing Laboratory

Direct Shear Test T-236 / D-6528

Client : USAID		Type of Test : CU
Contractor : Tetra Tech		Sampled By :OGC
Project Name : Ministry of Public Health (MOPH) Facility, Kabul Province		Depth # 4m
Proving Ring Calibration Factor 1 div : 0.806		Wet Unit Weight g/Cm^3 : 1.94
Discription of Soil : Silty Clay		Moisture Contant% : 19.41
Min of Friction Angle Φ : 28.02º	Borehole # A20	Dry Unit Weight g/Cm^3 : 1.62
Cohesion : 0	Void Ratio : o.71	Specific Gravity : 2.77

No	Normal Stress Applied Kg/cm^2	Stress Dial Gauge Observation at Failure	Shear force Kg	Area (cm^2)	Shear Stress kg/cm^2	Calculate Φ
1	0.245	16.5	13.299	102.01	0.1304	28.02°
2	0.490	37.7	30.3862	102.01	0.2979	31.3°
3	0.735	54.1	43.6046	102.01	0.4275	30.18°



Tested By	**Hayat**	
Checked By	**Jafari**	

OMRAN GEOTECHNICAL COMPANY

Material Testing Laboratory

Omran Geotechnic Company

Direct Shear Test
(ASTM D3080)

Client	**USAID**	**Location**	Kabul Province, BH # A20, 4m
Contractor	**Tetra Tech**	**Date**	6/4/2010
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Description of Soil	Silty Clay		
Type of Test	CU		
Strain Rate	0.5 mm/min		
Load Scale K	0.81 kg/Div		
Sample No.	1	2	3
Normal Stress, kg/cm2	0.245	0.49	0.735

Sample No.	Water Content (%)		Normal Stress (kg/cm2)	Max. Shearing Stress (kg/cm^2)
	berfor test	after test		
1	19.52	31	0.245	0.1304
2	19.32	32	0.49	0.2979
3	19.38	31.5	0.735	0.4275

Soil Specimen Measurements			
Length (cm)	10.1	10.1	10.1
Height (cm)	2	2	2
Area (cm)	102.01	102.01	102.01
Volume (cm3)	204.02	204.02	204.02
Weight of Soil + Split Former (gr)	523	519	526.1
Weight of Split Former (gr)	127	127	127
Weight of Soil (gr)	396	392	399.1
Wet Unit Weight (gr/cm3)	1.94	1.92	1.96
Dry Unit Weight (gr/cm3)	1.62	1.61	1.64

Water Content Determination			
Container No.	1	2	3
Weight of Wet Soil + Container	64.65	66	68.52
Weight of Dry Soil + Container	62.6	64.3	66
Weight of Water	2.05	1.7	2.52
Weight of Container	52.1	55.5	53
Weight of Dry Soil	10.5	8.8	13
Water Content	19.52	19.32	19.38

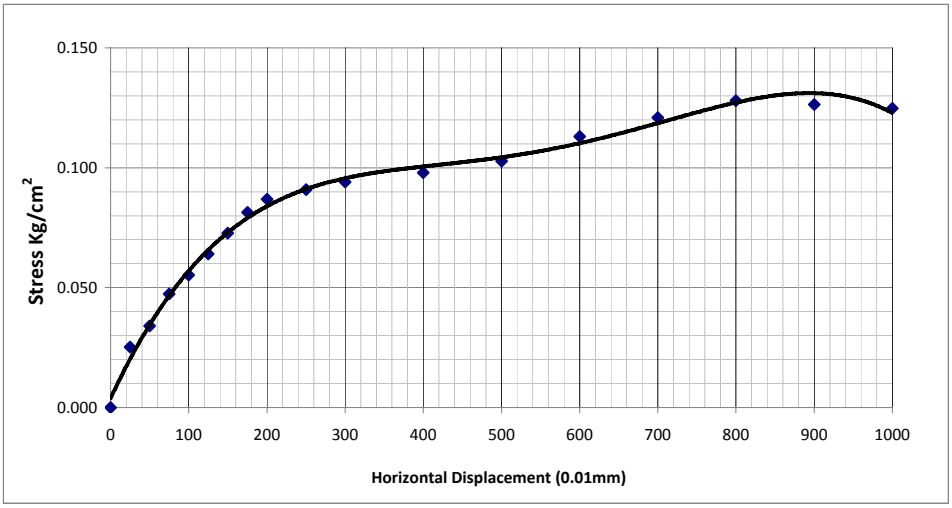
OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	1.5m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.245	Borehole # A27				
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	0	102.01	0	0
2	25	3.2	102.01	2.5792	0.025283796
3	50	4.3	102.01	3.4658	0.0339751
4	75	6	102.01	4.836	0.047407117
5	100	7	102.01	5.642	0.055308303
6	125	8.1	102.01	6.5286	0.063999608
7	150	9.2	102.01	7.4152	0.072690913
8	175	10.3	102.01	8.3018	0.081382217
9	200	11	102.01	8.866	0.086913048
10	250	11.5	102.01	9.269	0.090863641
11	300	11.9	102.01	9.5914	0.094024115
12	400	12.4	102.01	9.9944	0.097974708
13	500	13	102.01	10.478	0.10271542
14	600	14.3	102.01	11.5258	0.112986962
15	700	15.3	102.01	12.3318	0.120888148
16	800	16.2	102.01	13.0572	0.127999216
17	900	16	102.01	12.896	0.126418979
18	1000	15.8	102.01	12.7348	0.124838741



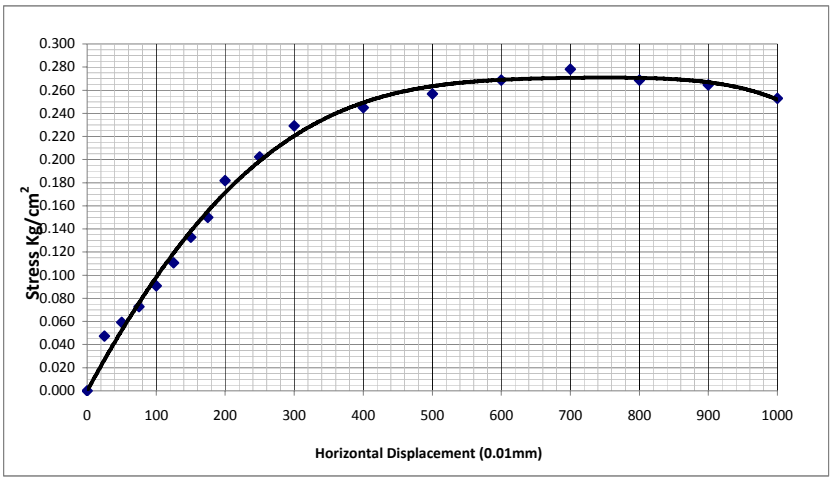
OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	1.5m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.490		Borehole # A27			
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	**0**	102.01	0	**0**
2	25	6	102.01	4.836	0.047407117
3	50	7.5	102.01	6.045	0.059258896
4	75	9.2	102.01	7.4152	0.072690913
5	100	11.5	102.01	9.269	0.090863641
6	125	14	102.01	11.284	0.110616606
7	150	16.8	102.01	13.5408	0.132739927
8	175	19	102.01	15.314	0.150122537
9	200	23	102.01	18.538	0.181727282
10	250	25.6	102.01	20.6336	0.202270366
11	300	29	102.01	23.374	0.229134399
12	400	31	102.01	24.986	0.244936771
13	500	32.5	102.01	26.195	0.25678855
14	600	34	102.01	27.404	0.268640329
15	700	35.2	102.01	28.3712	0.278121753
16	800	34	102.01	27.404	0.268640329
17	900	33.5	102.01	27.001	0.264689736
18	1000	32	102.01	25.792	0.252837957



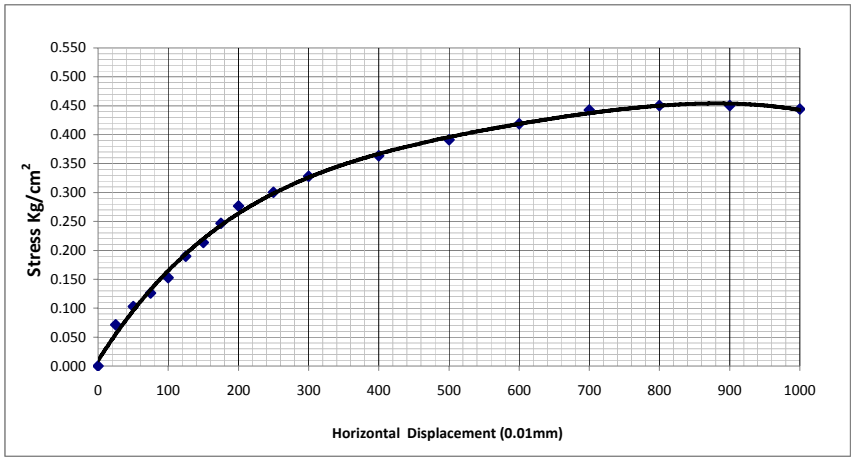
OMRAN GEOTECHNICAL COMPANY

DIRECT SHEAR TEST

ASTM D-3080

Client	USAID	Sampled By	OGC
Contractor	Tetra Tech	Depth	1.5m
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Normal Stress (kg/cm^2) : 0.735		Borehole # A27			
Sr No	**Horizontal Gage Reading (0.01 mm)**	**Proving Ring Reading**	**Area(Cm²)**	**Shear Force (Kg)**	**Shear Stress (Kg/Cm²)**
1	**2**	**3**	**4**	**5**	**6**
1	0	**0**	102.01	0	**0**
2	25	9	102.01	7.254	0.071110675
3	50	13	102.01	10.478	0.10271542
4	75	16	102.01	12.896	0.126418979
5	100	19.3	102.01	15.5558	0.152492893
6	125	24	102.01	19.344	0.189628468
7	150	27	102.01	21.762	0.213332026
8	175	31.2	102.01	25.1472	0.246517008
9	200	35	102.01	28.21	0.276541516
10	250	38	102.01	30.628	0.300245074
11	300	41.5	102.01	33.449	0.327899226
12	400	46	102.01	37.076	0.363454563
13	500	49.5	102.01	39.897	0.391108715
14	600	53	102.01	42.718	0.418762866
15	700	56	102.01	45.136	0.442466425
16	800	57	102.01	45.942	0.450367611
17	900	57	102.01	45.942	0.450367611
18	1000	56.2	102.01	45.2972	0.444046662



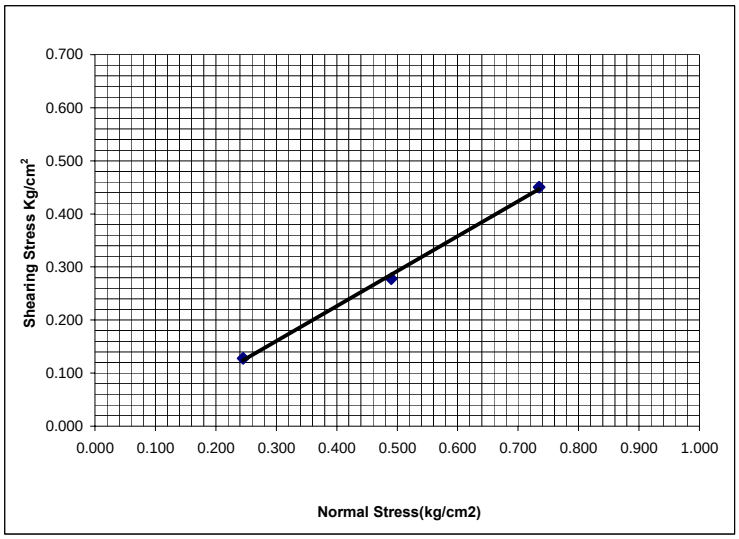
OMRAN GEOTECHNICAL COMPANY

Material Testing Laboratory

Direct Shear Test T-236 / D-6528

Client : USAID		Type of Test : CU
Contractor : Tetra Tech		Sampled By :OGC
Project Name : Ministry of Public Health (MOPH) Facility, Kabul Province		Depth # 1.5m
Proving Ring Calibration Factor 1 div : 0.806		Wet Unit Weight g/Cm^3 : 1.91
Discription of Soil : Lean Clay with Sand		Moisture Contant% : 14.92
Min of Friction Angle Φ : 27.58º	Borehole # A27	Dry Unit Weight g/Cm^3 : 1.66
Cohesion : 0	Void Ratio : o.633	Specific Gravity : 2.71

No	Normal Stress Applied Kg/cm^2	Stress Dial Gauge Observation at Failure	Shear force Kg	Area (cm^2)	Shear Stress kg/cm^2	Calculate Φ
1	0.245	16.2	13.0572	102.01	0.1280	27.58°
2	0.490	35.2	28.3712	102.01	0.2781	29.58°
3	0.735	57	45.942	102.01	0.4504	31.5°



Tested By	**Hayat**	
Checked By	**Jafari**	

OMRAN GEOTECHNICAL COMPANY

Material Testing Laboratory

Omran Geotechnic Company

Direct Shear Test
(ASTM D3080)

Client	**USAID**	**Location**	Kabul Province, BH # A27, 1.5m
Contractor	**Tetra Tech**	**Date**	3/4/2010
Project	Ministry of Public Health (MOPH) Facility, Kabul Province		

Description of Soil	Lean Clay with Sand		
Type of Test	CU		
Strain Rate	0.5 mm/min		
Load Scale K	0.81 kg/Div		
Sample No.	1	2	3
Normal Stress, kg/cm2	0.245	0.49	0.735

Sample No.	Water Content (%)		Normal Stress (kg/cm2)	Max. Shearing Stress (kg/cm^2)
	berfor test	after test		
1	14.88	26	0.245	0.1280
2	15.18	27	0.49	0.2781
3	14.70	25.2	0.735	0.4504

Soil Specimen Measurements			
Length (cm)	10.1	10.1	10.1
Height (cm)	2	2	2
Area (cm)	102.01	102.01	102.01
Volume (cm3)	204.02	204.02	204.02
Weight of Soil + Split Former (gr)	519.2	515.6	516
Weight of Split Former (gr)	127	127	127
Weight of Soil (gr)	392.2	388.6	389
Wet Unit Weight (gr/cm3)	1.92	1.90	1.91
Dry Unit Weight (gr/cm3)	1.67	1.65	1.66

Water Content Determination			
Container No.	1	2	3
Weight of Wet Soil + Container	71.3	88.1	73.8
Weight of Dry Soil + Container	67.7	84.2	69.7
Weight of Water	3.6	3.9	4.1
Weight of Container	43.5	58.5	41.8
Weight of Dry Soil	24.2	25.7	27.9
Water Content	14.88	15.18	14.70

Omran Geotechnical Company

Appendix F

Lab Test Results of Boreholes

Permeability Test Results

Professional Geotechnical Services

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

CONSTANT HEAD PERMEABILITY TEST

ASTM D 2434-68

PROJECT	Ministry of Public Health	**LOCATION**	kabul	**BORING NO.**	A2
SOIL DESCRIPTION	Silty Clay			**SAMPLE DEPTH**	1
TEST BY	OGC	**DATE**	9/4/2010	**SAMPLE NO.**	1

SOIL SAMPLE DATA:

DIAMETER ,cm		INITIAL WT. OF SOIL + PAN ,g	
AREA ,cm^2		FINAL WT. OF SOIL + PAN ,g	
HEIGHT ,cm		WT. OF SAMPLE IN CELL ,g	
VOLUME ,cm^3		WET UNIT WEIGHT ,g/cm^3	
% WATER CONTENT		DRY UNIT WEIGHT ,g/cm^3	
MANOMETER DISTANCE (L) ,cm			

CONSTANT HEAD TEST DATA :

TEST NO.	HEAD (cm)	TIME (second)	WATER QUANTITY (cm^3)	Δh (cm)	TEMPERATURE (C)	k_T (cm/sec)
1						
2						
3						
4						

k_T (average) _____ cm/sec

k_{20} _____ cm/sec

FALLING HEAD PERMEABILITY TEST

PROJECT	Ministry of Public Health	**LOCATION**	kabul	**BORING NO.**	A2
SOIL DESCRIPTION	Silty Clay			**SAMPLE DEPTH**	1
TEST BY	OGC	**DATE**	9/4/2010	**SAMPLE NO.**	1

SOIL SAMPLE DATA

DIAMETER ,cm	10.00	INITIAL WT. OF SOIL + PAN ,g	4121
AREA ,cm^2	78.50	FINAL WT. OF SOIL + PAN ,g	4321
HEIGHT (L) ,cm	7.90	WT. OF SAMPLE IN CELL ,g	1201
VOLUME ,cm^3	620.15	WET UNIT WEIGHT ,g/cm^3	1.94
% WATER CONTENT	19.98	DRY UNIT WEIGHT ,g/cm^3	1.61
AREA OF STANDPIPE (a) ,cm^2	0.64 - 0.28	Q cm^3/s	0.0134

FALLING HEAD TEST DATA :

TEST NO.	h1(cm)	h2(cm)	TIME (sec)	TEMPERATURE (C)	k_T (cm/sec)
1	100	50	1800	20°C	$2.570X10^{-5}$
2	100	39	1200	20°C	$1.501X10^{-5}$
3					
4					

k_T (average) $1.285X10^{-5}$ cm/sec

k_{20} $1.285X10^{-5}$ cm/sec

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

CONSTANT HEAD PERMEABILITY TEST

ASTM D 2434-68

PROJECT	Ministry of Public Health	**LOCATION**	kabul	**BORING NO.**	A7
SOIL DESCRIPTION	Silty Clay with Sand	**OWNER**		**SAMPLE DEPTH**	2
TEST BY	OGC	**DATE**	10/4/2010	**SAMPLE NO.**	2

SOIL SAMPLE DATA:

DIAMETER ,cm		INITIAL WT. OF SOIL + PAN ,g	
AREA ,cm^2		FINAL WT. OF SOIL + PAN ,g	
HEIGHT ,cm		WT. OF SAMPLE IN CELL ,g	
VOLUME ,cm^3		WET UNIT WEIGHT ,g/cm^3	
% WATER CONTENT		DRY UNIT WEIGHT ,g/cm^3	
MANOMETER DISTANCE (L) ,cm			

CONSTANT HEAD TEST DATA :

TEST NO.	HEAD (cm)	TIME (second)	WATER QUANTITY (cm^3)	Δh (cm)	TEMPERATURE (C)	k_T (cm/sec)
1						
2						
3						
4						

k_T (average) _____ cm/sec

k_{20} _____ cm/sec

FALLING HEAD PERMEABILITY TEST

PROJECT	Ministry of Public Health	**LOCATION**	kabul	**BORING NO.**	A7
SOIL DESCRIPTION	Silty Clay with Sand	**OWNER**		**SAMPLE DEPTH**	2
TEST BY	OGC	**DATE**	10/4/2010	**SAMPLE NO.**	2

SOIL SAMPLE DATA

DIAMETER ,cm	10.00	INITIAL WT. OF SOIL + PAN ,g	4144
AREA ,cm^2	78.50	FINAL WT. OF SOIL + PAN ,g	4364
HEIGHT (L) ,cm	8.80	WT. OF SAMPLE IN CELL ,g	1244
VOLUME ,cm^3	690.80	WET UNIT WEIGHT ,g/cm^3	1.80
% WATER CONTENT	21.48	DRY UNIT WEIGHT ,g/cm^3	1.48
AREA OF STANDPIPE (a) ,cm^2	0.64 - 0.28	Q cm^3/s	0.0156

FALLING HEAD TEST DATA :

TEST NO.	h1(cm)	h2(cm)	TIME (sec)	TEMPERATURE (C)	k_T (cm/sec)
1	100	61	1792	20°C	$4.498X10^{-5}$
2	100	43	1256	20°C	$1.8841X10^{-5}$
3					
4					

k_T (average) $3.191X10^{-5}$ cm/sec

k_{20} $3.191X10^{-5}$ cm/sec

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MATERIAL TESTING LAB

CONSTANT HEAD PERMEABILITY TEST

ASTM D 2434-68

PROJECT	Ministry of Public Health	**LOCATION**	kabul	**BORING NO.**	A12
SOIL DESCRIPTION	Silty Clay with sand	**OWNER**		**SAMPLE DEPTH**	4.5
TEST BY	OGC	**DATE**	13/4/2010	**SAMPLE NO.**	3

SOIL SAMPLE DATA:

DIAMETER ,cm		INITIAL WT. OF SOIL + PAN ,g	
AREA ,cm^2		FINAL WT. OF SOIL + PAN ,g	
HEIGHT ,cm		WT. OF SAMPLE IN CELL ,g	
VOLUME ,cm^3		WET UNIT WEIGHT ,g/cm^3	
% WATER CONTENT		DRY UNIT WEIGHT ,g/cm^3	
MANOMETER DISTANCE (L) ,cm			

CONSTANT HEAD TEST DATA :

TEST NO.	HEAD (cm)	TIME (second)	WATER QUANTITY (cm^3)	Δh (cm)	TEMPERATURE (C)	k_T (cm/sec)
1						
2						
3						
4						

k_T (average) _____ cm/sec

k_{20} _____ cm/sec

FALLING HEAD PERMEABILITY TEST

PROJECT	Ministry of Public Health	**LOCATION**	kabul	**BORING NO.**	A12
SOIL DESCRIPTION	Silty Clay with sand	**OWNER**		**SAMPLE DEPTH**	4.5
TEST BY	OGC	**DATE**	13/4/2010	**SAMPLE NO.**	3

SOIL SAMPLE DATA

DIAMETER ,cm	10.00	INITIAL WT. OF SOIL + PAN ,g	4199
AREA ,cm^2	78.50	FINAL WT. OF SOIL + PAN ,g	4365
HEIGHT (L) ,cm	10.10	WT. OF SAMPLE IN CELL ,g	1245
VOLUME ,cm^3	792.85	WET UNIT WEIGHT ,g/cm^3	1.57
% WATER CONTENT	15.3	DRY UNIT WEIGHT ,g/cm^3	1.36
AREA OF STANDPIPE (a) ,cm^2	0.64 - 0.28	Q cm^3/s	0.0125

FALLING HEAD TEST DATA :

TEST NO.	h1(cm)	h2(cm)	TIME (sec)	TEMPERATURE (C)	k_T (cm/sec)
1	100	49	1500	20°C	$5.272X10^{-5}$
2	100	28	1860	20°C	$7.53X10^{-6}$
3					
4					

k_T (average) $3.01X10^{-5}$ cm/sec

k_{20} $3.01X10^{-5}$ cm/sec

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

CONSTANT HEAD PERMEABILITY TEST

ASTM D 2434-68

PROJECT	Ministry of Public Health	**LOCATION**	kabul	**BORING NO.**	A28
SOIL DESCRIPTION	Silty Clay	**OWNER**		**SAMPLE DEPTH**	3
TEST BY	OGC	**DATE**	14/4/2010	**SAMPLE NO.**	4

SOIL SAMPLE DATA:

DIAMETER ,cm		INITIAL WT. OF SOIL + PAN ,g	
AREA ,cm^2		FINAL WT. OF SOIL + PAN ,g	
HEIGHT ,cm		WT. OF SAMPLE IN CELL ,g	
VOLUME ,cm^3		WET UNIT WEIGHT ,g/cm^3	
% WATER CONTENT		DRY UNIT WEIGHT ,g/cm^3	
MANOMETER DISTANCE (L) ,cm			

CONSTANT HEAD TEST DATA :

TEST NO.	HEAD (cm)	TIME (second)	WATER QUANTITY (cm^3)	Δh (cm)	TEMPERATURE (C)	k_T (cm/sec)
1						
2						
3						
4						

k_T (average) _____ cm/sec

k_{20} _____ cm/sec

FALLING HEAD PERMEABILITY TEST

PROJECT	Ministry of Public Health	**LOCATION**	kabul	**BORING NO.**	A28
SOIL DESCRIPTION	Silty Clay	**OWNER**		**SAMPLE DEPTH**	3
TEST BY	OGC	**DATE**	14/4/2010	**SAMPLE NO.**	4

SOIL SAMPLE DATA

DIAMETER ,cm	10.00	INITIAL WT. OF SOIL + PAN ,g	4055
AREA ,cm^2	78.50	FINAL WT. OF SOIL + PAN ,g	4300
HEIGHT (L) ,cm	7.50	WT. OF SAMPLE IN CELL ,g	1180
VOLUME ,cm^3	588.75	WET UNIT WEIGHT ,g/cm^3	2.00
% WATER CONTENT	26.2	DRY UNIT WEIGHT ,g/cm^3	1.59
AREA OF STANDPIPE (a) ,cm^2	0.64 - 0.28	Q cm^3/s	0.0124

FALLING HEAD TEST DATA :

TEST NO.	h1(cm)	h2(cm)	TIME (sec)	TEMPERATURE (C)	k_T (cm/sec)
1	100	45	1800	20°C	$3.825X10^{-5}$
2	100	38	1200	20°C	$1.548X10^{-5}$
3					
4					

k_T (average) $2.686X10^{-5}$ cm/sec

k_{20} $2.686X10^{-5}$ cm/sec

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

CONSTANT HEAD PERMEABILITY TEST

ASTM D 2434-68

PROJECT	Ministry of Public Health	**LOCATION**	kabul	**BORING NO.**	A30
SOIL DESCRIPTION	Silty Clay with Sand	**OWNER**		**SAMPLE DEPTH**	3.5
TEST BY	OGC	**DATE**	15/4/2010	**SAMPLE NO.**	5

SOIL SAMPLE DATA:

DIAMETER ,cm		INITIAL WT. OF SOIL + PAN ,g	
AREA ,cm^2		FINAL WT. OF SOIL + PAN ,g	
HEIGHT ,cm		WT. OF SAMPLE IN CELL ,g	
VOLUME ,cm^3		WET UNIT WEIGHT ,g/cm^3	
% WATER CONTENT		DRY UNIT WEIGHT ,g/cm^3	
MANOMETER DISTANCE (L) ,cm			

CONSTANT HEAD TEST DATA :

TEST NO.	HEAD (cm)	TIME (second)	WATER QUANTITY (cm^3)	Δh (cm)	TEMPERATURE (C)	k_T (cm/sec)
1						
2						
3						
4						

k_T (average) _____ cm/sec

FALLING HEAD PERMEABILITY TEST

PROJECT	Ministry of Public Health	**LOCATION**	kabul	**BORING NO.**	A30
SOIL DESCRIPTION	Silty Clay with Sand	**OWNER**		**SAMPLE DEPTH**	3.5
TEST BY	OGC	**DATE**	15/4/2010	**SAMPLE NO.**	5

SOIL SAMPLE DATA

DIAMETER ,cm	10.00	INITIAL WT. OF SOIL + PAN ,g	4180
AREA ,cm^2	78.50	FINAL WT. OF SOIL + PAN ,g	4388
HEIGHT (L) ,cm	9.00	WT. OF SAMPLE IN CELL ,g	1268
VOLUME ,cm^3	706.50	WET UNIT WEIGHT ,g/cm^3	1.79
% WATER CONTENT	19.62	DRY UNIT WEIGHT ,g/cm^3	1.50
AREA OF STANDPIPE (a) ,cm^2	0.64 - 0.28	Q cm^3/s	0.0184

FALLING HEAD TEST DATA :

TEST NO.	h1(cm)	h2(cm)	TIME (sec)	TEMPERATURE (C)	k_T (cm/sec)
1	100	67	1560	20°C	$9.55X10^{-5}$
2	100	40	1200	20°C	$1.79X10^{-5}$
3					
4					

k_T (average) $5.67X10^{-5}$cm/sec

k_{20} $5.67X10^{-5}$cm/sec

Omran Geotechnical Company

Appendix F

Lab Test Results of Boreholes

Hydrometery Test Results

Professional Geotechnical Services

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

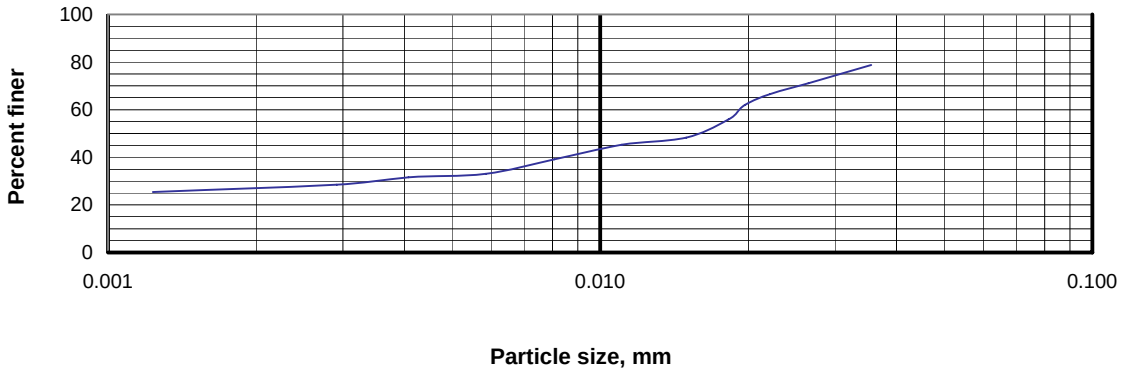
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A1	Depth :	1 (m)	Weight of Soil : 65 gr
Temperature :	24 c°	Specific Gravity		2.76

Time observation start: 9:35		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
9:36	**1**	55	51.70	78.74	56	7.9	7.9000	0.01264	0.0355
9:37	**2**	50	46.70	71.13	51	8.8	4.4000	0.01264	0.0265
9:38	**3**	47	43.70	66.56	48	9.2	3.0667	0.01264	0.0221
9:39	**4**	44	40.70	61.99	45	9.7	2.4250	0.01264	0.0197
9:40	**5**	40	36.70	55.90	41	10.4	2.0800	0.01264	0.0182
9:43	**8**	35	31.70	48.28	36	11.2	1.4000	0.01264	0.0150
9:50	**15**	33	29.70	45.24	34	11.5	0.7667	0.01264	0.0111
10:05	**30**	29	25.70	39.14	30	12.2	0.4067	0.01264	0.0081
10:35	**60**	25	21.70	33.05	26	12.9	0.2150	0.01264	0.0059
11:40	**125**	24	20.70	31.53	25	13.0	0.1040	0.01264	0.0041
13:45	**250**	22	18.70	28.48	23	13.3	0.0532	0.01264	0.0029
9:36	**1440**	20	16.70	25.44	21	13.7	0.0095	0.01264	0.0012

Grain size distribution curve



Precent of Silt : 67%	Percent of Clay and Colloide : 33 %
Checked By :	Jafari
Date :	10/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

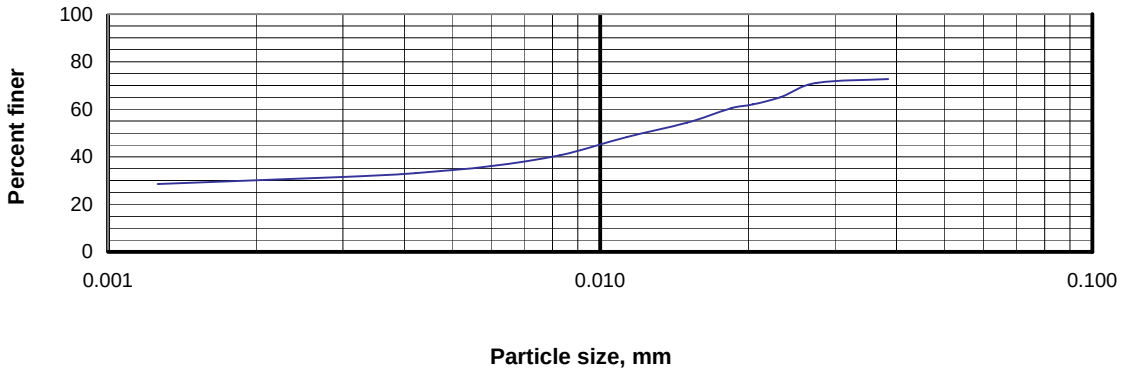
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A2	Depth :	6 (m)	Weight of Soil : 65 gr
Temperature :	22 c°	Specific Gravity		2.72

Time observation start: 10:12		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
10:13	**1**	51	47.70	72.65	52	8.6	8.6000	0.01312	0.0385
10:14	**2**	50	46.70	71.13	51	8.8	4.4000	0.01312	0.0275
10:15	**3**	46	42.70	65.04	47	9.4	3.1333	0.01312	0.0232
10:16	**4**	44	40.70	61.99	45	9.7	2.4250	0.01312	0.0204
10:17	**5**	43	39.70	60.47	44	9.9	1.9800	0.01312	0.0185
10:20	**8**	39	35.70	54.37	40	10.5	1.3125	0.01312	0.0150
10:27	**15**	35	31.70	48.28	36	11.2	0.7467	0.01312	0.0113
10:42	**30**	30	26.70	40.67	31	12.0	0.4000	0.01312	0.0083
11:12	**60**	27	23.70	36.10	28	12.5	0.2083	0.01312	0.0060
12:17	**125**	25	21.70	33.05	26	12.9	0.1032	0.01312	0.0042
14:22	**250**	24	20.70	31.53	25	13.0	0.0520	0.01312	0.0030
10:12	**1440**	22	18.70	28.48	23	13.3	0.0092	0.01312	0.0013

Grain size distribution curve



Precent of Silt : 66%	Percent of Clay and Colloide : 34 %
Checked By :	Jafari
Date :	10/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

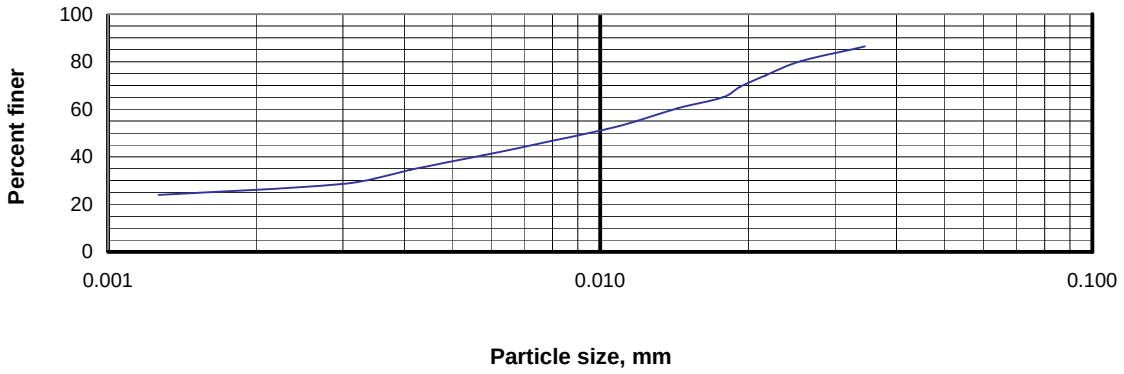
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A7	Depth :	2 (m)	Weight of Soil : 65 gr
Temperature :	22 c°	Specific Gravity		2.75

Time observation start: 1:27		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
1:28	**1**	60	56.70	86.36	61	7.1	7.1000	0.01294	0.0345
1:29	**2**	56	52.70	80.27	57	7.8	3.9000	0.01294	0.0256
1:30	**3**	52	48.70	74.17	53	8.4	2.8000	0.01294	0.0217
1:31	**4**	49	45.70	69.60	50	8.9	2.2250	0.01294	0.0193
1:32	**5**	46	42.70	65.04	47	9.4	1.8800	0.01294	0.0177
1:35	**8**	43	39.70	60.47	44	9.9	1.2375	0.01294	0.0144
1:42	**15**	38	34.70	52.85	39	10.7	0.7133	0.01294	0.0109
1:57	**30**	34	30.70	46.76	35	11.4	0.3800	0.01294	0.0080
2:27	**60**	30	26.70	40.67	31	12.0	0.2000	0.01294	0.0058
3:32	**125**	26	22.70	34.57	27	12.7	0.1016	0.01294	0.0041
5:37	**250**	22	18.70	28.48	23	13.3	0.0532	0.01294	0.0030
1:27	**1440**	19	15.70	23.91	20	13.8	0.0096	0.01294	0.0013

Grain size distribution curve



Precent of Silt : 62%	Percent of Clay and Colloide : 38 %
Checked By :	Jafari
Date :	10/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

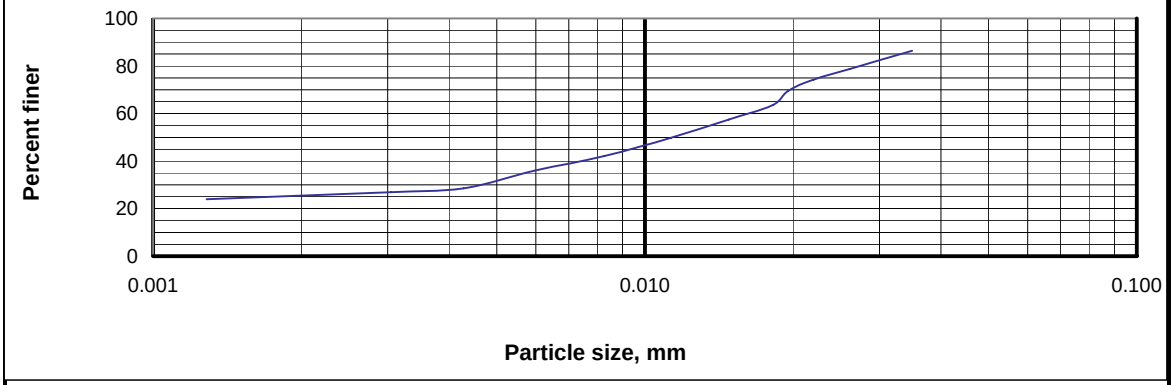
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A8	Depth :	4 (m)	Weight of Soil : 65 gr
Temperature :	22 c°	Specific Gravity		2.70

Time observation start: 2:13		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
2:14	**1**	60	56.70	86.36	61	7.1	7.1000	0.01312	0.0350
2:15	**2**	55	51.70	78.74	56	7.9	3.9500	0.01312	0.0261
2:16	**3**	52	48.70	74.17	53	8.4	2.8000	0.01312	0.0220
2:17	**4**	49	45.70	69.60	50	8.9	2.2250	0.01312	0.0196
2:18	**5**	45	41.70	63.51	46	9.6	1.9200	0.01312	0.0182
2:21	**8**	41	37.70	57.42	42	10.2	1.2750	0.01312	0.0148
2:28	**15**	36	32.70	49.80	37	11.1	0.7400	0.01312	0.0113
2:43	**30**	31	27.70	42.19	32	11.9	0.3967	0.01312	0.0083
3:13	**60**	27	23.70	36.10	28	12.5	0.2083	0.01312	0.0060
4:18	**125**	22	18.70	28.48	23	13.3	0.1064	0.01312	0.0043
6:23	**250**	21	17.70	26.96	22	13.5	0.0540	0.01312	0.0030
2:13	**1440**	19	15.70	23.91	20	13.8	0.0096	0.01312	0.0013

Grain size distribution curve



Precent of Silt : 68%	Percent of Clay and Colloide : 32 %
Checked By :	Jafari
Date :	10/4/2010

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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

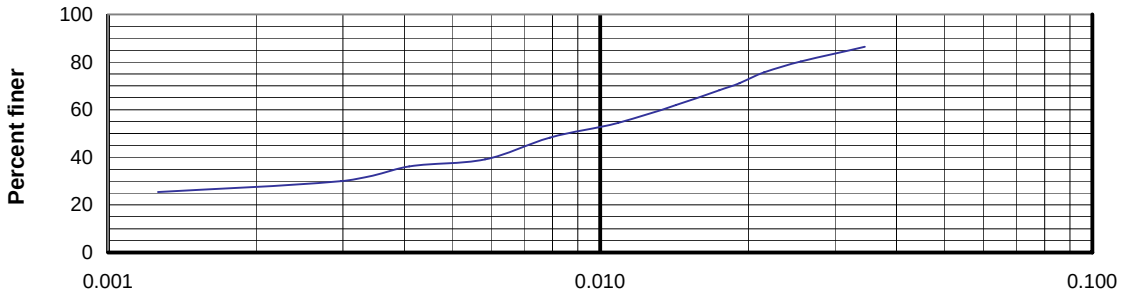
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A11	Depth :	6 (m)	Weight of Soil : 65 gr
Temperature :	22 c°	Specific Gravity		2.75

Time observation start: 2:06		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
2:07	**1**	60	56.70	86.36	61	7.1	7.1000	0.01294	0.0345
2:08	**2**	56	52.70	80.27	57	7.8	3.9000	0.01294	0.0256
2:09	**3**	53	49.70	75.70	54	8.3	2.7667	0.01294	0.0215
2:10	**4**	50	46.70	71.13	51	8.8	2.2000	0.01294	0.0192
2:11	**5**	48	44.70	68.08	49	9.1	1.8200	0.01294	0.0175
2:14	**8**	44	40.70	61.99	45	9.7	1.2125	0.01294	0.0142
2:21	**15**	39	35.70	54.37	40	10.6	0.7067	0.01294	0.0109
2:36	**30**	35	31.70	48.28	36	11.2	0.3733	0.01294	0.0079
3:06	**60**	29	25.70	39.14	30	12.2	0.2033	0.01294	0.0058
4:11	**125**	27	23.70	36.10	28	12.5	0.1000	0.01294	0.0041
6:16	**250**	23	19.70	30.00	24	13.2	0.0528	0.01294	0.0030
2:06	**1440**	20	16.70	25.44	21	13.7	0.0095	0.01294	0.0013

Grain size distribution curve



Particle size, mm

Precent of Silt : 63%	Percent of Clay and Colloide : 37 %
Checked By :	Jafari
Date :	10/4/2010

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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

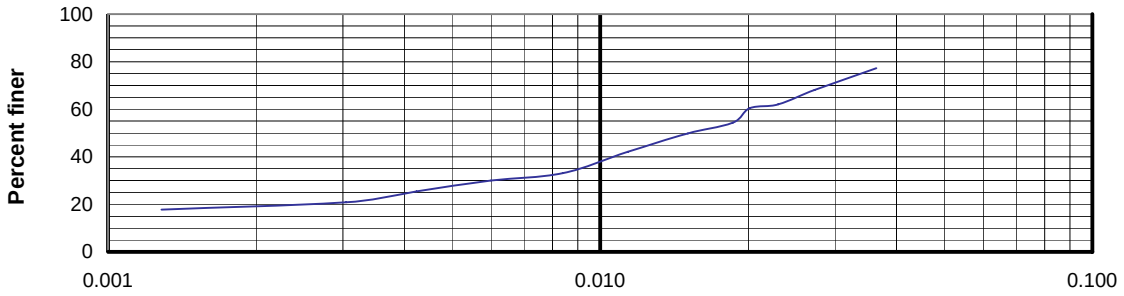
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A12	Depth :	4 (m)	Weight of Soil : 65 gr
Temperature :	23 c°	Specific Gravity		2.75

Time observation start: 9:59		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
10:00	**1**	54	50.70	77.22	55	8.1	8.1000	0.01279	0.0364
10:01	**2**	48	44.70	68.08	49	9.1	4.5500	0.01279	0.0273
10:02	**3**	44	40.70	61.99	45	9.7	3.2333	0.01279	0.0230
10:03	**4**	43	39.70	60.47	44	9.9	2.4750	0.01279	0.0201
10:04	**5**	39	35.70	54.37	40	10.6	2.1200	0.01279	0.0186
10:07	**8**	36	32.70	49.80	37	11.1	1.3875	0.01279	0.0151
10:14	**15**	31	27.70	42.19	32	11.9	0.7933	0.01279	0.0114
10:29	**30**	25	21.70	33.05	26	12.9	0.4300	0.01279	0.0084
10:59	**60**	23	19.70	30.00	24	13.2	0.2200	0.01279	0.0060
12:05	**125**	20	16.70	25.44	21	13.7	0.1096	0.01279	0.0042
14:09	**250**	17	13.70	20.87	18	14.2	0.0568	0.01279	0.0030
9:59	**1440**	15	11.70	17.82	16	14.5	0.0101	0.01279	0.0013

Grain size distribution curve



Particle size, mm

Precent of Silt : 73%	Percent of Clay and Colloide : 27 %
Checked By :	Jafari
Date :	10/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

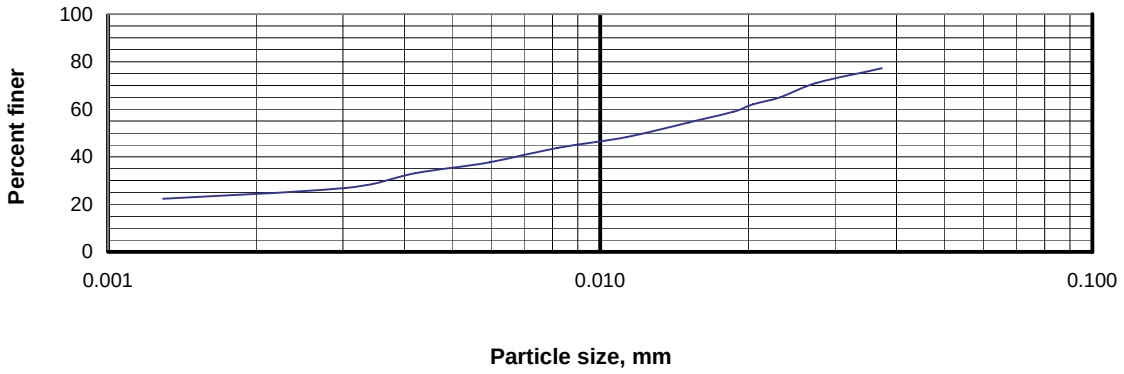
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A13	Depth :	1.5 (m)	Weight of Soil : 65 gr
Temperature :	22 c°	Specific Gravity		2.71

Time observation start: 1:45		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
1:46	**1**	54	50.70	77.22	55	8.1	8.1000	0.01312	0.0373
1:47	**2**	50	46.70	71.13	51	8.8	4.4000	0.01312	0.0275
1:48	**3**	46	42.70	65.04	47	9.4	3.1333	0.01312	0.0232
1:49	**4**	44	40.70	61.99	45	9.7	2.4250	0.01312	0.0204
1:50	**5**	42	38.70	58.94	43	10.1	2.0200	0.01312	0.0186
1:53	**8**	39	35.70	54.37	40	10.6	1.3250	0.01312	0.0151
2:00	**15**	35	31.70	48.28	36	11.2	0.7467	0.01312	0.0113
2:15	**30**	32	28.70	43.71	33	11.7	0.3900	0.01312	0.0082
2:45	**60**	28	24.70	37.62	29	12.4	0.2067	0.01312	0.0060
3:50	**125**	25	21.70	33.05	26	12.9	0.1032	0.01312	0.0042
5:55	**250**	21	17.70	26.96	22	13.5	0.0540	0.01312	0.0030
1:45	**1440**	18	14.70	22.39	19	14.0	0.0097	0.01312	0.0013

Grain size distribution curve



Precent of Silt : 65%	Percent of Clay and Colloide : 35 %
Checked By :	Jafari
Date :	10/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

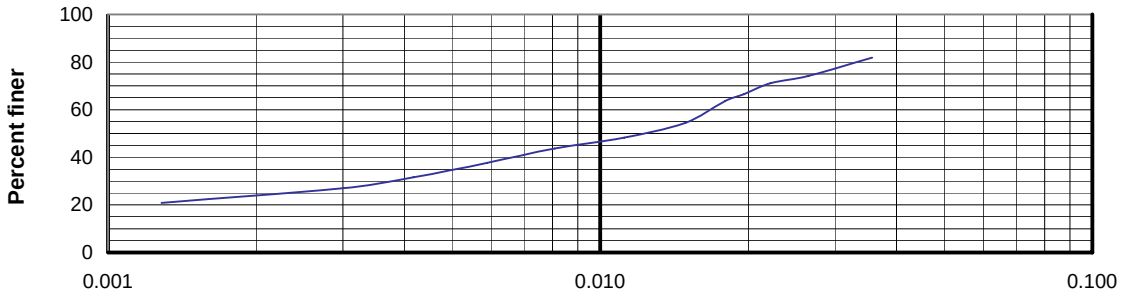
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A13	Depth :	5.5 (m)	Weight of Soil : 65 gr
Temperature :	22 c°	Specific Gravity		2.75

Time observation start: 1:34		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
1:35	**1**	57	53.70	81.79	58	7.6	7.6000	0.01294	0.0357
1:36	**2**	52	48.70	74.17	53	8.4	4.2000	0.01294	0.0265
1:37	**3**	50	46.70	71.13	51	8.8	2.9333	0.01294	0.0222
1:38	**4**	47	43.70	66.56	48	9.2	2.3000	0.01294	0.0196
1:39	**5**	45	41.70	63.51	46	9.6	1.9200	0.01294	0.0179
1:42	**8**	39	35.70	54.37	40	10.6	1.3250	0.01294	0.0149
1:49	**15**	35	31.70	48.28	36	11.2	0.7467	0.01294	0.0112
2:04	**30**	32	28.70	43.71	33	11.7	0.3900	0.01294	0.0081
2:34	**60**	28	24.70	37.62	29	12.4	0.2067	0.01294	0.0059
3:39	**125**	24	20.70	31.53	25	13.0	0.1040	0.01294	0.0042
5:44	**250**	21	17.70	26.96	22	13.5	0.0540	0.01294	0.0030
1:34	**1440**	17	13.70	20.87	18	14.2	0.0099	0.01294	0.0013

Grain size distribution curve



Particle size, mm

Precent of Silt : 66%	Percent of Clay and Colloide : 34 %
Checked By :	Jafari
Date :	13/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

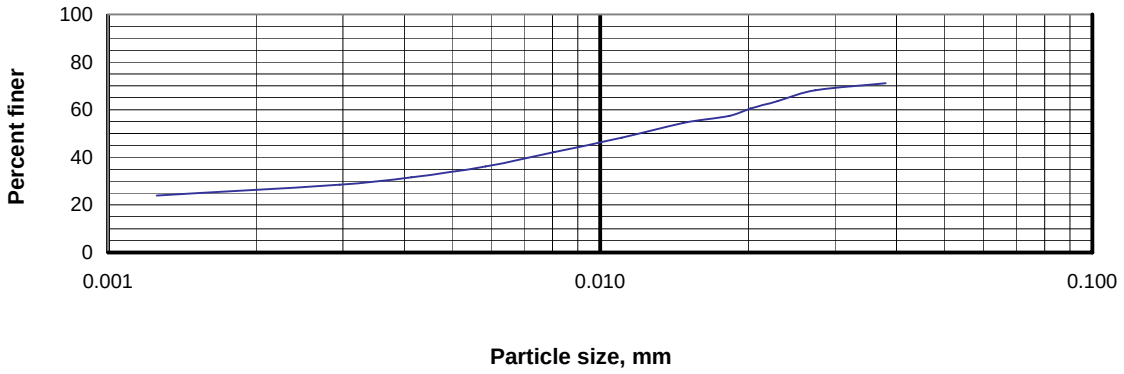
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A14	Depth :	3.5 (m)	Weight of Soil : 65 gr
Temperature :	24 c°	Specific Gravity		2.72

Time observation start: 10:04		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
10:05	**1**	50	46.70	71.13	51	8.8	8.8000	0.01282	0.0380
10:06	**2**	48	44.70	68.08	49	9.1	4.5500	0.01282	0.0273
10:07	**3**	45	41.70	63.51	46	9.6	3.2000	0.01282	0.0229
10:08	**4**	43	39.70	60.47	44	9.9	2.4750	0.01282	0.0202
10:09	**5**	41	37.70	57.42	42	10.2	2.0400	0.01282	0.0183
10:12	**8**	39	35.70	54.37	40	10.6	1.3250	0.01282	0.0148
10:19	**15**	35	31.70	48.28	36	11.2	0.7467	0.01282	0.0111
10:34	**30**	31	27.70	42.19	32	11.9	0.3967	0.01282	0.0081
11:04	**60**	27	23.70	36.10	28	12.5	0.2083	0.01282	0.0059
12:09	**125**	24	20.70	31.53	25	13.0	0.1040	0.01282	0.0041
2:14	**250**	22	18.70	28.48	23	13.3	0.0532	0.01282	0.0030
10:04	**1440**	19	15.70	23.91	20	13.8	0.0096	0.01282	0.0013

Grain size distribution curve



Precent of Silt : 67%	Percent of Clay and Colloide : 33 %
Checked By :	Jafari
Date :	13/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

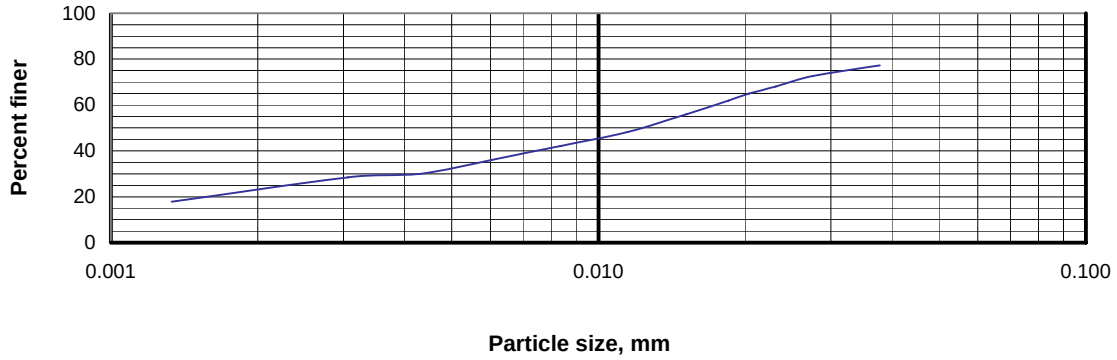
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A15	Depth :	1.5	Weight of Soil : 65 gr
Temperature :	21 c°	Specific Gravity		2.72

Time observation start: 10:10		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
10:11	**1**	54	50.70	77.22	55	8.1	8.1000	0.01328	0.0378
10:12	**2**	51	47.70	72.65	52	8.6	4.3000	0.01328	0.0275
10:13	**3**	48	44.70	68.08	49	9.1	3.0333	0.01328	0.0231
10:14	**4**	46	42.70	65.04	47	9.4	2.3500	0.01328	0.0204
10:15	**5**	44	40.70	61.99	45	9.7	1.9400	0.01328	0.0185
10:18	**8**	40	36.70	55.90	41	10.4	1.3000	0.01328	0.0151
10:25	**15**	35	31.70	48.28	36	11.2	0.7467	0.01328	0.0115
10:40	**30**	31	27.70	42.19	32	11.9	0.3967	0.01328	0.0084
11:10	**60**	27	23.70	36.10	28	12.5	0.2083	0.01328	0.0061
12:15	**125**	23	19.70	30.00	24	13.2	0.1056	0.01328	0.0043
14:20	**250**	22	18.70	28.48	23	13.3	0.0532	0.01328	0.0031
10:10	**1440**	15	11.70	17.82	16	14.5	0.0101	0.01328	0.0013

Grain size distribution curve



Precent of Silt : 67 %	Percent of Clay and Colloide : 33 %
Checked By :	Jafari
Date :	13/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

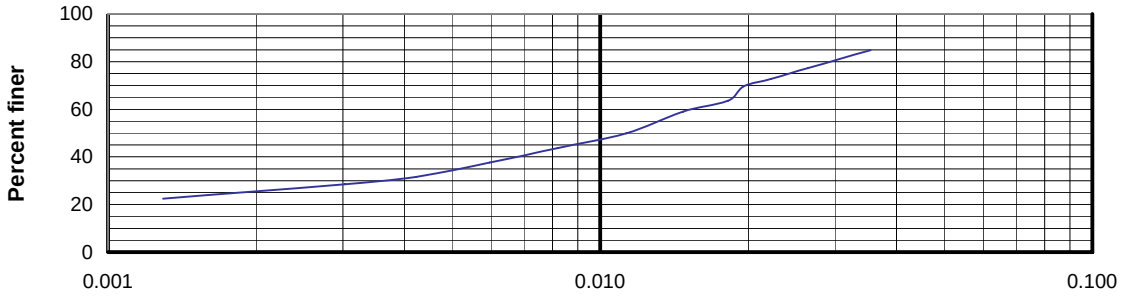
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A15	Depth :	3.5 (m)	Weight of Soil : 65 gr
Temperature :	22 c°	Specific Gravity		2.70

Time observation start: 1:52		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
1:53	**1**	59	55.70	84.84	60	7.3	7.3000	0.01312	0.0354
1:54	**2**	54	50.70	77.22	55	8.1	4.0500	0.01312	0.0264
1:55	**3**	51	47.70	72.65	52	8.6	2.8667	0.01312	0.0222
1:56	**4**	49	45.70	69.60	50	8.9	2.2250	0.01312	0.0196
1:57	**5**	45	41.70	63.51	46	9.6	1.9200	0.01312	0.0182
2:00	**8**	42	38.70	58.94	43	10.1	1.2625	0.01312	0.0147
2:07	**15**	36	32.70	49.80	37	11.1	0.7400	0.01312	0.0113
2:22	**30**	32	28.70	43.71	33	11.7	0.3900	0.01312	0.0082
2:52	**60**	28	24.70	37.62	29	12.4	0.2067	0.01312	0.0060
3:57	**125**	24	20.70	31.53	25	13.0	0.1040	0.01312	0.0042
6:02	**250**	22	18.70	28.48	23	13.3	0.0532	0.01312	0.0030
1:52	**1440**	18	14.70	22.39	19	14.0	0.0097	0.01312	0.0013

Grain size distribution curve



Particle size, mm

Precent of Silt : 66%	Percent of Clay and Colloide : 34 %
Checked By :	Jafari
Date :	13/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

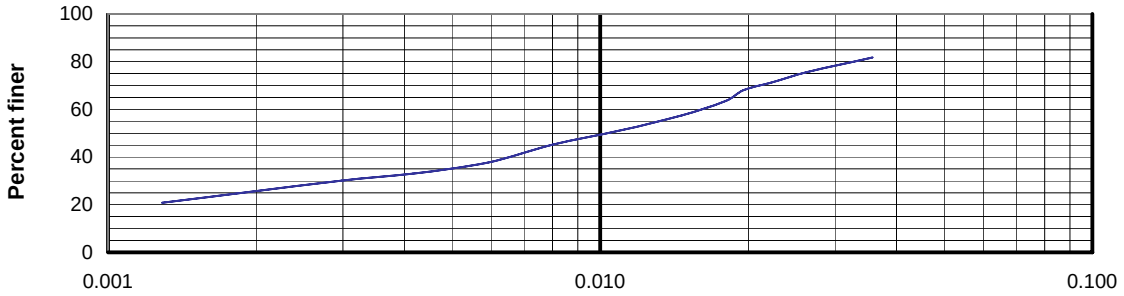
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A16	Depth :	3.5	Weight of Soil : 65 gr
Temperature :	23 c°	Specific Gravity		2.69

Time observation start: 9:37		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
9:38	**1**	57	53.70	81.79	58	7.6	7.6000	0.01297	0.0358
9:39	**2**	53	49.70	75.70	54	8.3	4.1500	0.01297	0.0264
9:40	**3**	50	46.70	71.13	51	8.8	2.9333	0.01297	0.0222
9:41	**4**	48	44.70	68.08	49	9.1	2.2750	0.01297	0.0196
9:42	**5**	45	41.70	63.51	46	9.6	1.9200	0.01297	0.0180
9:45	**8**	41	37.70	57.42	42	10.2	1.2750	0.01297	0.0146
9:52	**15**	37	33.70	51.33	38	10.9	0.7267	0.01297	0.0111
10:07	**30**	33	29.70	45.24	34	11.5	0.3833	0.01297	0.0080
10:37	**60**	28	24.70	37.62	29	12.4	0.2067	0.01297	0.0059
11:42	**125**	25	21.70	33.05	26	12.9	0.1032	0.01297	0.0042
1:47	**250**	23	19.70	30.00	24	13.2	0.0528	0.01297	0.0030
9:37	**1440**	17	13.70	20.87	18	14.2	0.0099	0.01297	0.0013

Grain size distribution curve



Particle size, mm

Precent of Silt : 66 %	Percent of Clay and Colloide : 34 %
Checked By :	Jafari
Date :	13/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

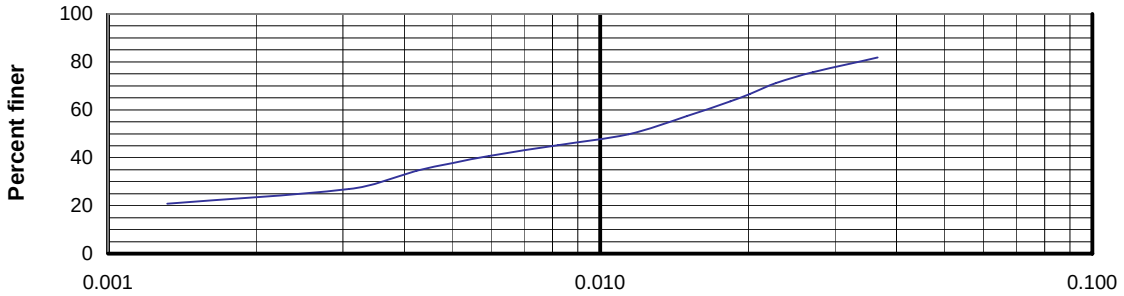
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A18	Depth :	2.5	Weight of Soil : 65 gr
Temperature :	21 c°	Specific Gravity		2.72

Time observation start: 8:52		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
8:53	**1**	57	53.70	81.79	58	7.6	7.6000	0.01328	0.0366
8:54	**2**	53	49.70	75.70	54	8.3	4.1500	0.01328	0.0271
8:55	**3**	50	46.70	71.13	51	8.8	2.9333	0.01328	0.0227
8:56	**4**	47	43.70	66.56	48	9.2	2.3000	0.01328	0.0201
8:57	**5**	45	41.70	63.51	46	9.6	1.9200	0.01328	0.0184
9:00	**8**	41	37.70	57.42	42	10.2	1.2750	0.01328	0.0150
9:07	**15**	36	32.70	49.80	37	11.1	0.7400	0.01328	0.0114
9:22	**30**	33	29.70	45.24	34	11.5	0.3833	0.01328	0.0082
9:52	**60**	30	26.70	40.67	31	12.0	0.2000	0.01328	0.0059
10:57	**125**	26	22.70	34.57	27	12.7	0.1016	0.01328	0.0042
1:02	**250**	21	17.70	26.96	22	13.5	0.0540	0.01328	0.0031
8:52	**1440**	17	13.70	20.87	18	14.2	0.0099	0.01328	0.0013

Grain size distribution curve



Particle size, mm

Precent of Silt : 62 %	Percent of Clay and Colloide : 38 %
Checked By :	Jafari
Date :	13/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

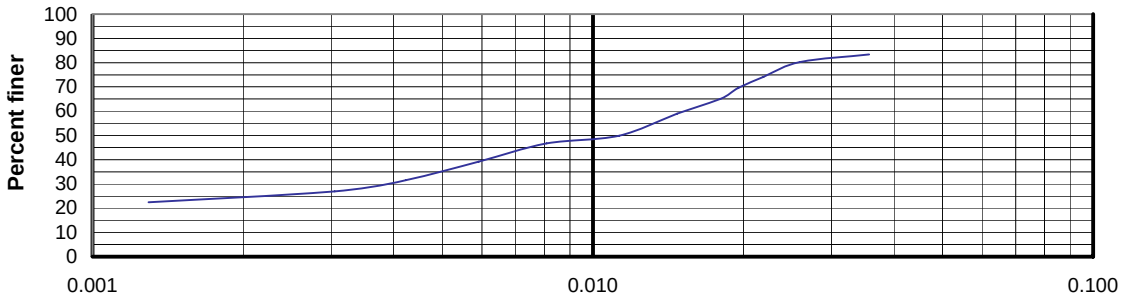
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A20	Depth :	1 (m)	Weight of Soil : 65 gr
Temperature :	22 ˚c	Specific Gravity		2.70

Time observation start: 8:34		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
8:35	**1**	58	54.70	83.31	59	7.4	7.4000	0.01312	0.0357
8:36	**2**	56	52.70	80.27	57	7.8	3.9000	0.01312	0.0259
8:37	**3**	52	48.70	74.17	53	8.4	2.8000	0.01312	0.0220
8:38	**4**	49	45.70	69.60	50	8.9	2.2250	0.01312	0.0196
8:39	**5**	46	42.70	65.04	47	9.4	1.8800	0.01312	0.0180
8:42	**8**	42	38.70	58.94	43	10.1	1.2625	0.01312	0.0147
8:49	**15**	36	32.70	49.80	37	11.1	0.7400	0.01312	0.0113
9:04	**30**	34	30.70	46.76	35	11.4	0.3800	0.01312	0.0081
9:34	**60**	29	25.70	39.14	30	12.2	0.2033	0.01312	0.0059
10:40	**125**	24	20.70	31.53	25	13.0	0.1040	0.01312	0.0042
12:45	**250**	21	17.70	26.96	22	13.5	0.0540	0.01312	0.0030
8:34	**1440**	18	14.70	22.39	19	14.0	0.0097	0.01312	0.0013

Grain size distribution curve



Particle size, mm

Precent of Silt : 66 %	Percent of Clay and Colloide : 34 %
Checked By :	Jafari
Date :	7/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

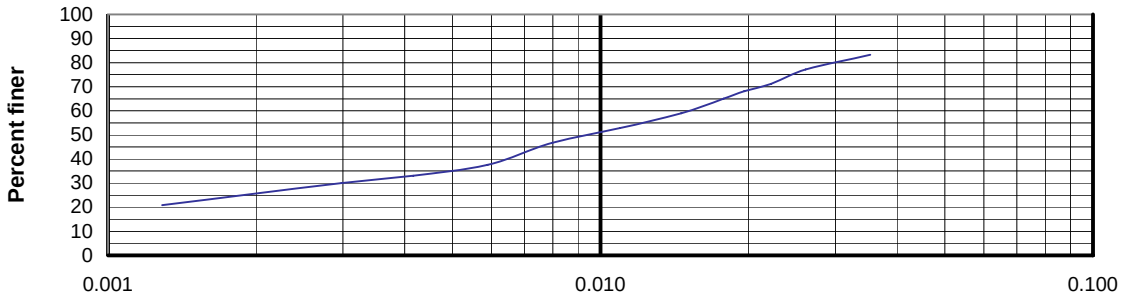
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A21	Depth :	4 (m)	Weight of Soil : 65 gr
Temperature :	23 c°	Specific Gravity		2.70

Time observation start: 9:50		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
9:51	**1**	58	54.70	83.31	59	7.4	7.4000	0.01297	0.0353
9:52	**2**	54	50.70	77.22	55	8.1	4.0500	0.01297	0.0261
9:53	**3**	50	46.70	71.13	51	8.8	2.9333	0.01297	0.0222
9:54	**4**	48	44.70	68.08	49	9.1	2.2750	0.01297	0.0196
9:55	**5**	46	42.70	65.04	47	9.4	1.8800	0.01297	0.0178
9:58	**8**	42	38.70	58.94	43	10.1	1.2625	0.01297	0.0146
9:05	**15**	38	34.70	52.85	39	10.7	0.7133	0.01297	0.0110
10:20	**30**	34	30.70	46.76	35	11.4	0.3800	0.01297	0.0080
10:50	**60**	28	24.70	37.62	29	12.4	0.2067	0.01297	0.0059
11:55	**125**	25	21.70	33.05	26	12.9	0.1032	0.01297	0.0042
12:00	**250**	23	19.70	30.00	24	13.2	0.0528	0.01297	0.0030
9:50	**1440**	17	13.70	20.87	18	14.2	0.0099	0.01297	0.0013

Grain size distribution curve



Particle size, mm

Precent of Silt : 66 %	Percent of Clay and Colloide : 34 %
Checked By :	Jafari
Date :	7/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

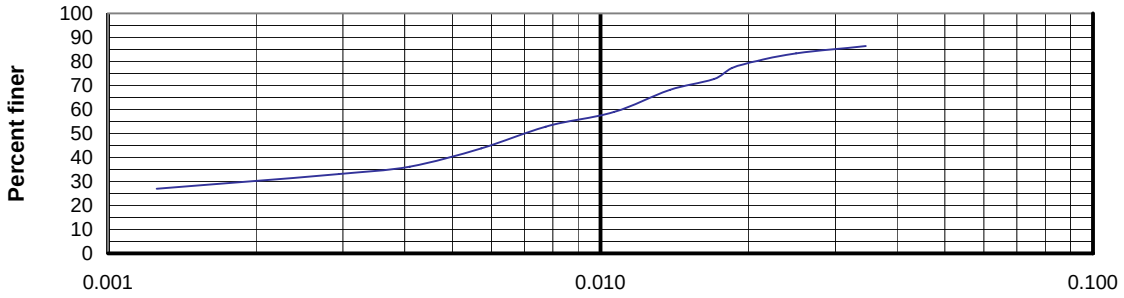
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A21	Depth :	6 (m)	Weight of Soil : 65 gr
Temperature :	23 c°	Specific Gravity		2.71

Time observation start: 9:13		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
9:14	**1**	60	56.70	86.36	61	7.1	7.1000	0.01297	0.0346
9:15	**2**	58	54.70	83.31	59	7.4	3.7000	0.01297	0.0249
9:16	**3**	56	52.70	80.27	57	7.8	2.6000	0.01297	0.0209
9:17	**4**	54	50.70	77.22	55	8.1	2.0250	0.01297	0.0185
9:18	**5**	51	47.70	72.65	52	8.6	1.7200	0.01297	0.0170
9:21	**8**	48	44.70	68.08	49	9.1	1.1375	0.01297	0.0138
9:29	**15**	42	38.70	58.94	43	10.1	0.6733	0.01297	0.0106
9:59	**30**	38	34.70	52.85	39	10.7	0.3567	0.01297	0.0077
10:14	**60**	32	28.70	43.71	33	11.7	0.1950	0.01297	0.0057
11:19	**125**	27	23.70	36.10	28	12.5	0.1000	0.01297	0.0041
1:25	**250**	25	21.70	33.05	26	12.9	0.0516	0.01297	0.0029
9:13	**1440**	21	17.70	26.96	22	13.5	0.0094	0.01297	0.0013

Grain size distribution curve



Particle size, mm

Precent of Silt : 61 %	Percent of Clay and Colloide : 39 %
Checked By :	Jafari
Date :	7/4/2010

Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

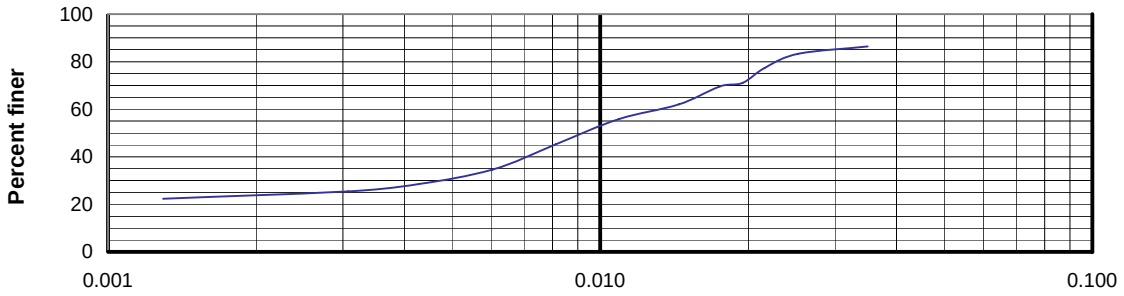
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A23	Depth :	4 (m)	Weight of Soil : 65 gr
Temperature :	22 c°	Specific Gravity		2.71

Time observation start: 8:30		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
8:31	**1**	60	56.70	86.36	61	7.1	7.1000	0.01312	0.0350
8:32	**2**	58	54.70	83.31	59	7.4	3.7000	0.01312	0.0252
8:33	**3**	54	50.70	77.22	55	8.1	2.7000	0.01312	0.0216
8:34	**4**	50	46.70	71.13	51	8.8	2.2000	0.01312	0.0195
8:35	**5**	49	45.70	69.60	50	8.9	1.7800	0.01312	0.0175
8:38	**8**	44	40.70	61.99	45	9.7	1.2125	0.01312	0.0144
8:45	**15**	40	36.70	55.90	41	10.4	0.6933	0.01312	0.0109
9:00	**30**	33	29.70	45.24	34	11.5	0.3833	0.01312	0.0081
9:30	**60**	26	22.70	34.57	27	12.7	0.2117	0.01312	0.0060
10:35	**125**	22	18.70	28.48	23	13.3	0.1064	0.01312	0.0043
12:40	**250**	20	16.70	25.44	21	13.7	0.0548	0.01312	0.0031
8:30	**1440**	18	14.70	22.39	19	14.0	0.0097	0.01312	0.0013

Grain size distribution curve



Particle size, mm

Precent of Silt : 69%	Percent of Clay and Colloide : 31 %
Checked By :	Jafari
Date :	7/4/2010

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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

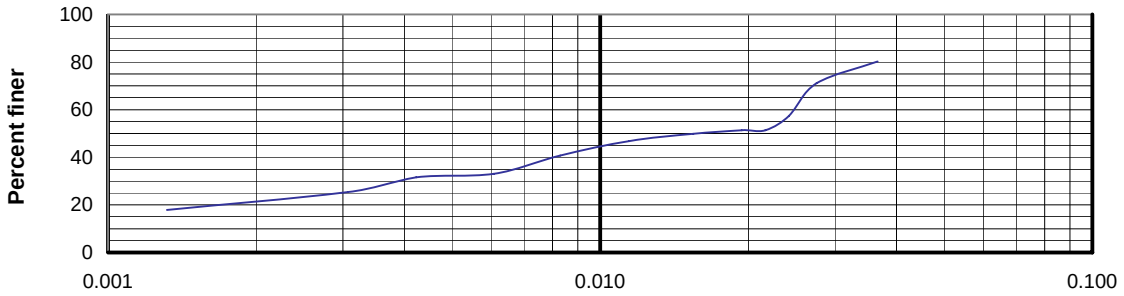
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A23	Depth :	16.5 (m)	Weight of Soil : 65 gr
Temperature :	22 c°	Specific Gravity		2.67

Time observation start: 9:10		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
9:11	**1**	56	52.70	80.27	57	7.8	7.8000	0.01312	0.0366
9:12	**2**	50	46.70	71.13	51	8.8	4.4000	0.01312	0.0275
9:13	**3**	41	37.70	57.42	42	10.2	3.4000	0.01312	0.0242
9:14	**4**	37	33.70	51.33	38	10.9	2.7250	0.01312	0.0217
9:15	**5**	37	33.70	51.33	38	10.9	2.1800	0.01312	0.0194
9:18	**8**	36	32.70	49.80	37	11.1	1.3875	0.01312	0.0155
9:25	**15**	34	30.70	46.76	35	11.4	0.7600	0.01312	0.0114
9:40	**30**	30	26.70	40.67	31	12.0	0.4000	0.01312	0.0083
10:10	**60**	25	21.70	33.05	26	12.9	0.2150	0.01312	0.0061
11:15	**125**	24	20.70	31.53	25	13.0	0.1040	0.01312	0.0042
13:20	**250**	20	16.70	25.44	21	13.7	0.0548	0.01312	0.0031
9:10	**1440**	15	11.70	17.82	16	14.5	0.0101	0.01312	0.0013

Grain size distribution curve



Particle size, mm

Precent of Silt : 67%	Percent of Clay and Colloide : 33 %
Checked By :	Jafari
Date :	7/4/2010

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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

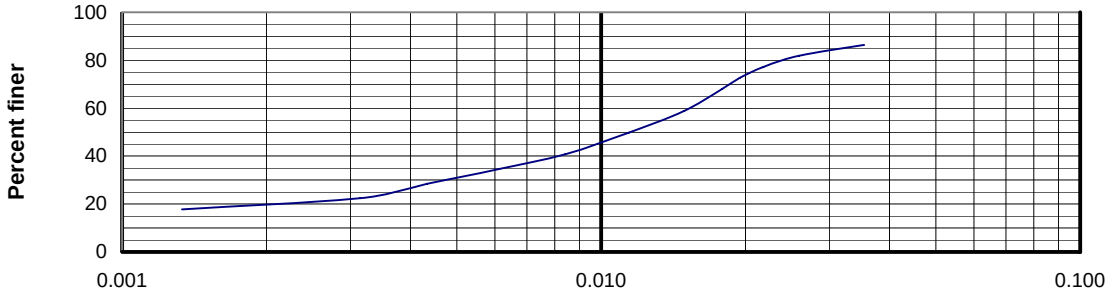
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A27	Depth :	3.5 (m)	Weight of Soil : 65 gr
Temperature :	21 c°	Specific Gravity		2.71

Time observation start: 8:48		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
8:49	**1**	60	56.70	86.36	61	7.1	7.1000	0.01328	0.0354
8:50	**2**	57	53.70	81.79	58	7.6	3.8000	0.01328	0.0259
8:51	**3**	54	50.70	77.22	55	8.1	2.7000	0.01328	0.0218
8:52	**4**	51	47.70	72.65	52	8.6	2.1500	0.01328	0.0195
8:53	**5**	48	44.70	68.08	49	9.1	1.8200	0.01328	0.0179
8:56	**8**	42	38.70	58.94	43	10.1	1.2625	0.01328	0.0149
9:03	**15**	36	32.70	49.80	37	11.1	0.7400	0.01328	0.0114
9:18	**30**	30	26.70	40.67	31	12.0	0.4000	0.01328	0.0084
9:48	**60**	26	22.70	34.57	27	12.7	0.2117	0.01328	0.0061
10:53	**125**	22	18.70	28.48	23	13.3	0.1064	0.01328	0.0043
12:58	**250**	18	14.70	22.39	19	14.0	0.0560	0.01328	0.0031
8:48	**1440**	15	11.70	17.82	16	14.5	0.0101	0.01328	0.0013

Grain size distribution curve



Particle size, mm

Precent of Silt : 69 %	Percent of Clay and Colloide : 31 %
Checked By :	Jafari
Date :	7/4/2010

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MATERIAL TESTING LAB

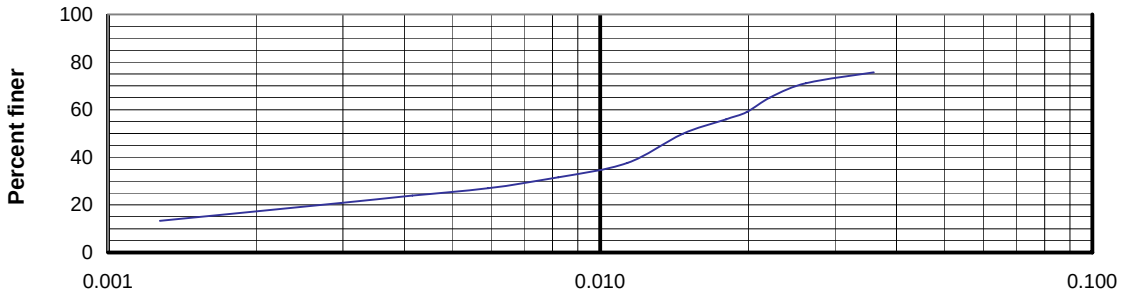
Hydrometer Analysis

ASTM D 422-63

Client	USAID			
Contractor	Tetra Tech			
Project	Ministry of Public Health Facility, Kabul Province			
Location :	BH # A30	Depth :	9.5 (m)	Weight of Soil : 65 gr
Temperature :	25 c°	Specific Gravity		2.75

Time observation start: 9:48		Ra hydrometer	Rc hydrometer correction	Fine grain percent	Hydrometer observed correction	L	L/t	K	D (mm)
9:49	**1**	53	49.70	75.70	54	8.3	8.3000	0.01249	0.0360
9:50	**2**	50	46.70	71.13	51	8.8	4.4000	0.01249	0.0262
9:51	**3**	46	42.70	65.04	47	9.4	3.1333	0.01249	0.0221
9:52	**4**	42	38.70	58.94	43	10.1	2.5250	0.01249	0.0198
9:53	**5**	40	36.70	55.90	41	10.4	2.0800	0.01249	0.0180
9:56	**8**	36	32.70	49.80	37	11.1	1.3875	0.01249	0.0147
10:03	**15**	28	24.70	37.62	29	12.4	0.8267	0.01249	0.0114
10:18	**30**	24	20.70	31.53	25	13.0	0.4333	0.01249	0.0082
10:48	**60**	21	17.70	26.96	22	13.5	0.2250	0.01249	0.0059
11:55	**125**	19	15.70	23.91	20	13.8	0.1104	0.01249	0.0041
13:58	**250**	17	13.70	20.87	18	14.2	0.0568	0.01249	0.0030
9:48	**1440**	12	8.70	13.25	13	15.0	0.0104	0.01249	0.0013

Grain size distribution curve



Particle size, mm

Precent of Silt : 75%	Percent of Clay and Colloide : 25 %
Checked By :	Jafari
Date :	7/4/2010

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Omran Geotechnical Company

Appendix F

Lab Test Results of Boreholes

Expansion Test Results

Professional Geotechnical Services

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Expansion Index
ASTM D- 4829

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry Of Public Health Facility**	**Sample No.**	1
Location	**BH # A2**	**Depth (m)**	1

Percent Passing # 4 Sieve		**Moisture Content**		
Total Weight	612		Initial	Final
Wt. Retained on # 4 Sieve	0.5	Wt. of Can+wet sample (gr)	125.5	122.5
% Retaind	0.08	Wt. of Can+dry samle (gr)	114.8	107.4
% Passing # 4 Sieve	99.92	Wt. of Can	40.5	52.7
Sample Dimensions		Wt. of dry sample (gr)	74.3	54.7
Hight(cm)	2.5	Wt.of Water (gr)	10.7	15.1
Diameter(cm)	10.2	Water content (%)	14.40	27.61

Tamp Two lifts, 15 blows/lift slightly below optimum moisture content

	Initial	Final
Ring&Sample(gr)	3795	3828
Ring(gr)	3460	3460
Remolded Wet Wt(gr)	335	368
Wet Density (Mg/m3)	1.641	1.802
Dry Density (Mg/m3)	1.434	1.412
%Sat	44.04	81.74

Expansion Test

Date	Time	Dial(0.01mm)	Δh%
5/4/2010	10:30	0.00	
	10:33	9.00	0.36
	13:33	12.00	0.48
	16:33	20.00	0.8
6/4/2010	7:20	101.00	4.04
	8:20	109.00	4.36
	10:20	111.00	4.44
Total Dial		4.44	

Expension Index: 44.4

Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Expansion Index
ASTM D- 4829

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry Of Public Health Facility**	**Sample No.**	2
Location	**BH # A3**	**Depth (m)**	1.5

Percent Passing # 4 Sieve		**Moisture Content**		
Total Weight	505		Initial	Final
Wt. Retained on # 4 Sieve	13.00	Wt. of Can+wet sample (gr)	126	161.3
% Retaind	2.57	Wt. of Can+dry samle (gr)	114.8	134.8
% Passing # 4 Sieve	97.43	Wt. of Can	45.2	42.5
Sample Dimensions		Wt. of dry sample (gr)	69.6	92.3
Hight(cm)	2.5	Wt.of Water (gr)	11.2	26.5
Diameter(cm)	10.2	Water content (%)	16.09	28.71

Tamp Two lifts, 15 blows/lift slightly below optimum moisture content

	Initial	Final
Ring&Sample(gr)	3802	3834
Ring(gr)	3460	3460
Remolded Wet Wt(gr)	342	374
Wet Density (Mg/m3)	1.675	1.832
Dry Density (Mg/m3)	1.443	1.423
%Sat	49.44	85.68

Expansion Test

Date	Time	Dial(0.01mm)	Δh%
6/4/2010	9:00	0.00	0.00
	9:05	5.00	0.2
	12:05	12.00	0.48
	15:05	22.00	0.88
	18:05	33.00	1.32
7/4/2010	7:20	99.00	3.96
	9:00	101.00	4.04
Total Dial		4.04	

Expension Index: 40.4

Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Expansion Index
ASTM D- 4829

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry Of Public Health Facility**	**Sample No.**	3
Location	**BH # A4**	**Depth (m)**	2

Percent Passing # 4 Sieve		**Moisture Content**		
Total Weight	777		Initial	Final
Wt. Retained on # 4 Sieve	5.10	Wt. of Can+wet sample (gr)	136.6	171.3
% Retaind	0.66	Wt. of Can+dry samle (gr)	125.8	144.8
% Passing # 4 Sieve	99.34	Wt. of Can	48.2	42.5
Sample Dimensions		Wt. of dry sample (gr)	77.6	102.3
Hight(cm)	2.5	Wt.of Water (gr)	10.8	26.5
Diameter(cm)	10.2	Water content (%)	13.92	25.90

Tamp Two lifts, 15 blows/lift slightly below optimum moisture content

	Initial	Final
Ring&Sample(gr)	3795	3830
Ring(gr)	3460	3460
Remolded Wet Wt(gr)	335	370
Wet Density (Mg/m3)	1.641	1.812
Dry Density (Mg/m3)	1.440	1.439
%Sat	42.77	79.50

Expansion Test

Date	Time	Dial(0.01mm)	Δh%
8/4/2010	8:15	0.00	
	8:20	7.00	0.28
	11:20	16.00	0.64
	14:20	29.00	1.16
	17:20	44.00	1.76
9/4/2010	6:20	102.00	4.08
	8:20	121.00	4.84
Total Dial		4.84	

Expension Index: 48.4

Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Expansion Index
ASTM D- 4829

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry Of Public Health Facility**	**Sample No.**	4
Location	**BH # A5**	**Depth (m)**	0.7

Percent Passing # 4 Sieve		**Moisture Content**		
Total Weight	583		Initial	Final
Wt. Retained on # 4 Sieve	8.60	Wt. of Can+wet sample (gr)	156.5	161.5
% Retaind	1.48	Wt. of Can+dry samle (gr)	141.7	135.6
% Passing # 4 Sieve	98.52	Wt. of Can	48.2	42.5
Sample Dimensions		Wt. of dry sample (gr)	93.5	93.1
Hight(cm)	2.5	Wt.of Water (gr)	14.8	25.9
Diameter(cm)	10.2	Water content (%)	15.83	27.82

Tamp Two lifts, 15 blows/lift slightly below optimum moisture content

	Initial	Final
Ring&Sample(gr)	3804	3846
Ring(gr)	3460	3460
Remolded Wet Wt(gr)	344	386
Wet Density (Mg/m3)	1.685	1.890
Dry Density (Mg/m3)	1.454	1.479
%Sat	49.69	90.56

Expansion Test

Date	Time	Dial(0.01mm)	Δh%
9/4/2010	9:20	0.00	
	9:26	11.00	0.44
	12:26	20.00	0.8
	15:26	67.00	2.68
10/4/2010	6:15	111.00	4.44
	9:20	136.00	5.44
Total Dial		5.44	

Expension Index: 54.4

Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Expansion Index
ASTM D- 4829

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry Of Public Health Facility**	**Sample No.**	5
Location	**BH # A6**	**Depth (m)**	1.5

Percent Passing # 4 Sieve		**Moisture Content**		
Total Weight	589		Initial	Final
Wt. Retained on # 4 Sieve	9.70	Wt. of Can+wet sample (gr)	146.3	180.7
% Retaind	1.65	Wt. of Can+dry samle (gr)	132.8	149.2
% Passing # 4 Sieve	98.35	Wt. of Can	48.2	42.5
Sample Dimensions		Wt. of dry sample (gr)	84.6	106.7
Hight(cm)	2.5	Wt.of Water (gr)	13.5	31.5
Diameter(cm)	10.2	Water content (%)	15.96	29.52

Tamp Two lifts, 15 blows/lift slightly below optimum moisture content

	Initial	Final
Ring&Sample(gr)	3780	3812
Ring(gr)	3460	3460
Remolded Wet Wt(gr)	320	352
Wet Density (Mg/m3)	1.567	1.724
Dry Density (Mg/m3)	1.351	1.331
%Sat	43.18	77.48

Expansion Test

Date	Time	Dial(0.01mm)	Δh%
11/10/2010	9:47	0.00	
	9:55	9.50	0.38
	12:55	23.00	0.92
	15:55	63.50	2.54
12/10/2010	6:45	106.50	4.26
	9:32	128.50	5.14
Total Dial		5.14	

Expension Index: 51.4

Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Expansion Index
ASTM D- 4829

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry Of Public Health Facility**	**Sample No.**	6
Location	**BH # A7**	**Depth (m)**	2

Percent Passing # 4 Sieve		**Moisture Content**		
Total Weight	441		Initial	Final
Wt. Retained on # 4 Sieve	3.80	Wt. of Can+wet sample (gr)	158.3	175.6
% Retaind	0.86	Wt. of Can+dry samle (gr)	144.8	148.8
% Passing # 4 Sieve	99.14	Wt. of Can	48.2	42.5
Sample Dimensions		Wt. of dry sample (gr)	96.6	106.3
Hight(cm)	2.5	Wt.of Water (gr)	13.5	26.8
Diameter(cm)	10.2	Water content (%)	13.98	25.21

Tamp Two lifts, 15 blows/lift slightly below optimum moisture content

	Initial	Final
Ring&Sample(gr)	3814	3843
Ring(gr)	3460	3460
Remolded Wet Wt(gr)	354	383
Wet Density (Mg/m3)	1.734	1.876
Dry Density (Mg/m3)	1.521	1.498
%Sat	47.56	82.95

Expansion Test

Date	Time	Dial(0.01mm)	Δh%
12/4/2010	10:23	0.00	
	10:31	8.50	0.34
	13:31	20.50	0.82
	16:31	69.00	2.76
13/10/2010	7:29	99.50	3.98
	10:32	116.50	4.66
Total Dial		4.66	

Expension Index: 46.6

Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Expansion Index
ASTM D- 4829

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry Of Public Health Facility**	**Sample No.**	7
Location	**BH # A8**	**Depth (m)**	2

Percent Passing # 4 Sieve		**Moisture Content**		
Total Weight	445.3		Initial	Final
Wt. Retained on # 4 Sieve	4.40	Wt. of Can+wet sample (gr)	223.4	231.4
% Retaind	0.99	Wt. of Can+dry samle (gr)	204.2	194.2
% Passing # 4 Sieve	99.01	Wt. of Can	48.2	42.5
Sample Dimensions		Wt. of dry sample (gr)	156	151.7
Hight(cm)	2.5	Wt.of Water (gr)	19.2	37.2
Diameter(cm)	10.2	Water content (%)	12.31	24.52

Tamp Two lifts, 15 blows/lift slightly below optimum moisture content

	Initial	Final
Ring&Sample(gr)	3798	3833
Ring(gr)	3460	3460
Remolded Wet Wt(gr)	338	373
Wet Density (Mg/m3)	1.655	1.827
Dry Density (Mg/m3)	1.474	1.467
%Sat	40.31	79.47

Expansion Test

Date	Time	Dial(0.01mm)	Δh%
13/4/2010	8:35	0.00	
	8:44	12.00	0.48
	11:44	28.00	1.12
	14:44	73.00	2.92
14/10/2010	5:23	103.00	4.12
	8:35	119.50	4.78
Total Dial		4.78	

Expension Index: 47.8

Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Expansion Index
ASTM D- 4829

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry Of Public Health Facility**	**Sample No.**	8
Location	**BH # A13**	**Depth (m)**	1.5

Percent Passing # 4 Sieve		**Moisture Content**		
Total Weight	451.6		Initial	Final
Wt. Retained on # 4 Sieve	2.80	Wt. of Can+wet sample (gr)	188.3	193.1
% Retaind	0.62	Wt. of Can+dry samle (gr)	172.6	162.3
% Passing # 4 Sieve	99.38	Wt. of Can	48.2	42.5
Sample Dimensions		Wt. of dry sample (gr)	124.4	119.8
Hight(cm)	2.5	Wt.of Water (gr)	15.7	30.8
Diameter(cm)	10.2	Water content (%)	12.62	25.71

Tamp Two lifts, 15 blows/lift slightly below optimum moisture content

	Initial	Final
Ring&Sample(gr)	3806	3843
Ring(gr)	3460	3460
Remolded Wet Wt(gr)	346	383
Wet Density (Mg/m3)	1.694	1.876
Dry Density (Mg/m3)	1.505	1.492
%Sat	42.69	85.35

Expansion Test

Date	Time	Dial(0.01mm)	Δh%
14/4/2010	9:05	0.00	
	9:11	13.50	0.54
	12:11	25.50	1.02
	15.11	70.00	2.8
15/4/2010	6:02	105.00	4.2
	9:05	124.00	4.96
Total Dial		4.96	

Expension Index: 49.6

Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Expansion Index
ASTM D- 4829

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry Of Public Health Facility**	**Sample No.**	9
Location	**BH # A15**	**Depth (m)**	1.5

Percent Passing # 4 Sieve		**Moisture Content**		
Total Weight	497.3		Initial	Final
Wt. Retained on # 4 Sieve	1.30	Wt. of Can+wet sample (gr)	221.2	214.3
% Retaind	0.26	Wt. of Can+dry samle (gr)	203.3	179.9
% Passing # 4 Sieve	99.74	Wt. of Can	48.2	42.5
Sample Dimensions		Wt. of dry sample (gr)	155.1	137.4
Hight(cm)	2.5	Wt.of Water (gr)	17.9	34.4
Diameter(cm)	10.2	Water content (%)	11.54	25.04

Tamp Two lifts, 15 blows/lift slightly below optimum moisture content

	Initial	Final
Ring&Sample(gr)	3795	3833
Ring(gr)	3460	3460
Remolded Wet Wt(gr)	335	373
Wet Density (Mg/m3)	1.641	1.827
Dry Density (Mg/m3)	1.471	1.461
%Sat	36.96	79.01

Expansion Test

Date	Time	Dial(0.01mm)	Δh%
15/4/2010	11:34	0.00	
	11:40	7.00	0.28
	14:40	19.00	0.76
	17:40	63.00	2.52
16/4/2010	8:22	95.00	3.8
	11:34	128.00	5.12
Total Dial		5.12	

Expension Index: 51.2

Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Expansion Index
ASTM D- 4829

Client	**USAID**	**Sampled By**	OGC
Contractor	**Tetra Tech**	**Location**	Kabul Province
Project	**Ministry Of Public Health Facility**	**Sample No.**	10
Location	**BH # A17**	**Depth (m)**	1.5

Percent Passing # 4 Sieve		**Moisture Content**		
Total Weight	502		Initial	Final
Wt. Retained on # 4 Sieve	2.00	Wt. of Can+wet sample (gr)	172.3	193.6
% Retaind	0.4	Wt. of Can+dry samle (gr)	157.6	162.3
% Passing # 4 Sieve	99.6	Wt. of Can	48.2	42.5
Sample Dimensions		Wt. of dry sample (gr)	109.4	119.8
Hight(cm)	2.5	Wt.of Water (gr)	14.7	31.3
Diameter(cm)	10.2	Water content (%)	13.44	26.13

Tamp Two lifts, 15 blows/lift slightly below optimum moisture content

	Initial	Final
Ring&Sample(gr)	3798	3830
Ring(gr)	3460	3460
Remolded Wet Wt(gr)	338	370
Wet Density (Mg/m3)	1.655	1.812
Dry Density (Mg/m3)	1.459	1.437
%Sat	43.04	80.90

Expansion Test

Date	Time	Dial(0.01mm)	Δh%
17/4/2010	10:30	0.00	
	10:33	10.50	0.42
	13:33	15.00	0.6
	16:33	53.00	2.12
18/4/2010	7:20	85.00	3.4
	8:20	104.00	4.16
	10:20	118.00	4.72
Total Dial		4.72	

Expension Index: 47.2

Checked by :	**Jafari**	Omran.geotechnic@yahoo.com

Omran Geotechnical Company

Appendix F

Lab Test Results of Boreholes

Moisture Test Results

Professional Geotechnical Services

OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

Omran Geotechnic Company

ASTM D 2216

Moisture Content Test

Client	**USAID**	**Sampled by**	OGC
Contractor	**Tetra Tech**	**Sampling Date**	27.03.2010
Project	**Ministry of Public Health Facility, Kabul Province**		
Location	**Kabul - Province**	**Testing Date**	04.04.2010

Bore Hole No.	Depth (m)	Wt. of Can	Wt. of Can+wet sample (gr)	Wt. of Can+dry sample (gr)	Wt. of dry sample (gr)	Wt.of moist (gr)	Water content (%)
A1	4.5	58.4	169.1	151.6	93.2	17.5	18.78
A1	5	40.6	152	139.5	98.9	12.5	12.64
A2	1	41.3	114.7	111.1	69.8	3.6	5.16
A2	5.8	47	139.7	130.3	83.3	9.4	11.28
A2	4.5	52.2	186.7	175	122.8	11.7	9.53
A2	6	37.5	185.3	164.2	126.7	21.1	16.65
A4	5	42.8	154.7	138	95.2	16.7	17.54
A4	6	41.5	124.6	112.7	71.2	11.9	16.71
A6	1.5	59.2	175	167.1	107.9	7.9	7.32
A6	3	40.1	167.8	160.3	120.2	7.5	6.24
A6	4.5	55.2	167.6	158.7	103.5	8.9	8.60
A6	6	58.4	149.1	143.3	84.9	5.8	6.83
A8	1.5	43.7	168.3	160.1	116.4	8.2	7.04
A8	3	58.4	215.1	205.6	147.2	9.5	6.45
A8	4.5	41.3	144.7	138.6	97.3	6.1	6.27
A8	6	40.6	147	138.9	98.3	8.1	8.24
A11	3	52.7	153.2	146.1	93.4	7.1	7.60
A11	4.5	53.3	165.5	158.1	104.8	7.4	7.06
A11	6	56.2	182.7	171.8	115.6	10.9	9.43

Remarks:

Checked by :	Jafari
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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

ASTM D 2216

Moisture Content Test

Client	**USAID**	**Sampled by**	OGC
Contractor	**Tetra Tech**	**Sampling Date**	27.03.2010
Project	**Ministry of Public Health Facility, Kabul Province**		
Location	**Kabul - Province**	**Testing Date**	04.04.2010

Bore Hole No.	Depth (m)	Wt. of Can	Wt. of Can+wet sample (gr)	Wt. of Can+dry sample (gr)	Wt. of dry sample (gr)	Wt.of moist (gr)	Water content (%)
A12	1.5	41.4	164.9	155.2	113.8	9.7	8.52
A12	3	46.9	155.7	149.5	102.6	6.2	6.04
A12	4.5	39.9	150.3	142.2	102.3	8.1	7.92
A12	6	51.9	165.9	155.8	103.9	10.1	9.72
A13	1.5	12.4	102.4	94	81.6	8.4	10.29
A14	4.5	37.5	112.8	103.4	65.9	9.4	14.26
A15	1.5	40.6	145.7	141.9	101.3	3.8	3.75
A16	3	39.8	108.8	104.7	64.9	4.1	6.32
A17	4.5	70.7	140.2	134.9	64.2	5.3	8.26
A19	3	41.4	147.9	141.3	99.9	6.6	6.61
A21	4.5	46.9	182.3	172.3	125.4	10	7.97
A22	3	42.8	100.9	99.8	57	1.1	1.93
A22	6	59.5	160.3	153.3	93.8	7	7.46
A23	1	46.3	204.8	195.3	149	9.5	6.38
A23	4	53.2	148.8	139.3	86.1	9.5	11.03
A23	6	57.6	176.4	165.7	108.1	10.7	9.90
A23	8	59.5	225.8	220	160.5	5.8	3.61
A23	9	48.1	155.6	153.1	105	2.5	2.38
A23	16.5	40.6	166.8	141.8	101.2	25	24.70

Remarks:

Checked by :	Jafari
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OMRAN GEOTECHNIC COMPANY

MATERIAL TESTING LAB

ASTM D 2216

sture Content Test

Client	USAID	Sampled by	OGC
Contractor	Tetra Tech	Sampling Date	27.03.2010
Project	Ministry of Public Health Facility, Kabul Province		
Location	Kabul - Province	Testing Date	04.04.2010

Bore Hole No.	Depth (m)	Wt. of Can	Wt. of Can+wet sample (gr)	Wt. of Can+dry sample (gr)	Wt. of dry sample (gr)	Wt.of moist (gr)	Water content (%)
A23	19.5	56.3	191.7	170.3	114	21.4	18.77
A24	1.5	34.8	120.3	115.7	80.9	4.6	5.69
A24	3	58.4	178.5	171.2	112.8	7.3	6.47
A27	3	40.3	155.3	139.3	99	16	16.16
A27	6	55.6	152.5	138.2	82.6	14.3	17.31
A29	4.5	104.9	152.2	143.9	39	8.3	21.28
A29	6	65.6	134.1	123.6	58	10.5	18.10
A30	1.5	52.7	175.7	156.5	103.8	19.2	18.50
A30	7.5	49	161.4	148.1	99.1	13.3	13.42
A30	10.5	52	186.9	165.6	113.6	21.3	18.75

Remarks:

Checked by :	Jafari
E-Mail :	Omran.geotechnic@yahoo.com

Omran Geotechnical Company

Appendix F

Lab Test Results of Boreholes

Moisture/Density Test Results

Professional Geotechnical Services

OMRAN GEOTECHNIC COMPANY
MATERIAL TESTING LAB

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry Of Public Health Facility**

Density Of Soil in Place by the Drive Cylinder Method

ASTM D 2937

Sample No.		Location	Kabul Province	Date of Sampled:	27/3/2010
Material				Date of Test:	12/4/2010
Method	In Place by the Drive Cylinder	Mould Wt. g	**2375**	Mould vol cm^3	424.7

Borhole No.		**A1**	**A2**	**A3**	**A4**	**A5**	**6**	**7**
Depth		**1**	**1.5**	**1.5**	**2**	**0.7**		
Wt. of wet soil + Container	g	3085	3075	3060	3073	3070		
Wt. of wet soil	g	710	700	685	698	695		
Wet density	Mg/m^3	1.672	1.648	1.613	1.644	1.636		
Dry density (γ)	Mg/m^3	1.422	1.525	1.421	1.490	1.566		
Moisture Content %								
Container No.		**1**	**2**	**3**	**4**	**5**		
Wt. of container	g	45.2	34.9	41.5	44	37.4		
Wt. of wet soil + Container	g	126.8	119.5	135.4	165.3	139.9		
Wt. of dry soil + Container	g	114.6	113.2	124.2	154	135.5		
Wt. of dry soil	g	69.4	78.3	82.7	110.0	98.1		
Wt. of water	g	12.2	6.3	11.2	11.3	4.4		
Moisture content %		17.6	8.0	13.5	10.3	4.5		

Remarks :

Checked by : **Jafari**

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OMRAN GEOTECHNIC COMPANY
MATERIAL TESTING LAB

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry Of Public Health Facility**

Density Of Soil in Place by the Drive Cylinder Method

ASTM D 2937

Sample No.		Location	Kabul Province	Date of Sampled:	27/3/2010
Material				Date of Test:	12/4/2010
Method	In Place by the Drive Cylinder	Mould Wt. g	**2375**	Mould vol cm^3	424.7

Borhole No.		**A6**	**A7**	**A8**	**A9**	**A10**	**6**	**7**
Depth		**2**	**1.5**	**1.5**	**1**	**2**		
Wt. of wet soil + Container	g	3065	3045	3105	3165	3085		
Wt. of wet soil	g	690	670	730	790	710		
Wet density	Mg/m^3	1.625	1.578	1.719	1.860	1.672		
Dry density (γ)	Mg/m^3	1.460	1.456	1.578	1.716	1.523		
Moisture Content %								
Container No.		**1**	**2**	**3**	**4**	**5**		
Wt. of container	g	41.4	42.4	42.8	46.3	50.2		
Wt. of wet soil + Container	g	129.3	129.5	119.1	161	145.5		
Wt. of dry soil + Container	g	122.5	122.8	113.6	152.1	137		
Wt. of dry soil	g	81.1	80.4	70.8	105.8	86.8		
Wt. of water	g	6.8	6.7	5.5	8.9	8.5		
Moisture content %		8.4	8.3	7.8	8.4	9.8		

Remarks :

Checked by : **Jafari**

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OMRAN GEOTECHNIC COMPANY
MATERIAL TESTING LAB

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry Of Public Health Facility**

Density Of Soil in Place by the Drive Cylinder Method

ASTM D 2937

Sample No.		Location	Kabul Province	Date of Sampled:	27/3/2010
Material				Date of Test:	13/4/2010
Method	In Place by the Drive Cylinder	Mould Wt. g	**2375**	Mould vol cm^3	424.7

Borhole No.		**A11**	**A12**	**A13**	**A14**	**A15**	**6**	**7**
Depth		**1.5**	**1.3**	**1.5**	**1.5**	**1.5**		
Wt. of wet soil + Container	g	3145	3102	3045	3145	3048		
Wt. of wet soil	g	770	727	670	770	673		
Wet density	Mg/m^3	1.813	1.712	1.578	1.813	1.585		
Dry density (γ)	Mg/m^3	1.635	1.574	1.424	1.640	1.470		
Moisture Content %								
Container No.		**1**	**2**	**3**	**4**	**5**		
Wt. of container	g	42.8	53.2	42.4	46.3	50.2		
Wt. of wet soil + Container	g	119.1	142.6	129.5	177	145.5		
Wt. of dry soil + Container	g	111.6	135.4	121	164.5	138.6		
Wt. of dry soil	g	68.8	82.2	78.6	118.2	88.4		
Wt. of water	g	7.5	7.2	8.5	12.5	6.9		
Moisture content %		10.9	8.8	10.8	10.6	7.8		

Remarks :

Checked by : **Jafari**

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OMRAN GEOTECHNIC COMPANY
MATERIAL TESTING LAB

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry Of Public Health Facility**

Density Of Soil in Place by the Drive Cylinder Method

ASTM D 2937

Sample No.		Location	Kabul Province	Date of Sampled:	27/3/2010
Material				Date of Test:	13/4/2010
Method	In Place by the Drive Cylinder	Mould Wt. g	**2375**	Mould vol cm^3	424.7

Borhole No.		**A16**	**A17**	**A18**	**A19**	**A20**	**6**	**7**
Depth		**1.3**	**1.5**	**2.5**	**2**	**1**		
Wt. of wet soil + Container	g	3090	3099	3043	3064	3085		
Wt. of wet soil	g	715	724	668	689	710		
Wet density	Mg/m^3	1.684	1.705	1.573	1.622	1.672		
Dry density (γ)	Mg/m^3	1.540	1.566	1.420	1.513	1.514		
Moisture Content %								
Container No.		**1**	**2**	**3**	**4**	**5**		
Wt. of container	g	40.6	42.4	46.2	45.2	50.2		
Wt. of wet soil + Container	g	126.5	155.2	161.2	170	153.8		
Wt. of dry soil + Container	g	119.2	146	150	161.6	144		
Wt. of dry soil	g	78.6	103.6	103.8	116.4	93.8		
Wt. of water	g	7.3	9.2	11.2	8.4	9.8		
Moisture content %		9.3	8.9	10.8	7.2	10.4		

Remarks :

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OMRAN GEOTECHNIC COMPANY
MATERIAL TESTING LAB

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry Of Public Health Facility**

Density Of Soil in Place by the Drive Cylinder Method

ASTM D 2937

Sample No.		Location	Kabul Province	Date of Sampled:	27/3/2010
Material				Date of Test:	14/4/2010
Method	In Place by the Drive Cylinder	Mould Wt. g	**2375**	Mould vol cm^3	424.7

Borhole No.		**A21**	**A22**	**A23**	**A24**	**A25**	**6**	**7**
Depth		**1.5**	**1**	**1**	**2.5**	**1**		
Wt. of wet soil + Container	g	3101	3115	3158	3099	3165		
Wt. of wet soil	g	726	740	783	724	790		
Wet density	Mg/m^3	1.709	1.742	1.844	1.705	1.860		
Dry density (γ)	Mg/m^3	1.552	1.654	1.727	1.605	1.713		
Moisture Content %								
Container No.		**1**	**2**	**3**	**4**	**5**		
Wt. of container	g	45	45.2	50	44	50.2		
Wt. of wet soil + Container	g	131	141.7	110	136.4	162.8		
Wt. of dry soil + Container	g	123.1	136.8	106.2	131	153.9		
Wt. of dry soil	g	78.1	91.6	56.2	87.0	103.7		
Wt. of water	g	7.9	4.9	3.8	5.4	8.9		
Moisture content %		10.1	5.3	6.8	6.2	8.6		

Remarks :

Checked by : **Jafari**

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OMRAN GEOTECHNIC COMPANY
MATERIAL TESTING LAB

Client	**USAID**
Contractor	**Tetra Tech**
Project	**Ministry Of Public Health Facility**

Density Of Soil in Place by the Drive Cylinder Method

ASTM D 2937

Sample No.		Location	Kabul Province	Date of Sampled:	27/3/2010
Material				Date of Test:	15/4/2010
Method	In Place by the Drive Cylinder	Mould Wt. g	**2375**	Mould vol cm^3	424.7

Borhole No.		**A26**	**A27**	**A28**	**A29**	**A30**	**6**	**7**
Depth		**1.5**	**1.5**	**2**	**2.5**	**1.5**		
Wt. of wet soil + Container	g	3079	3045	3075	3033	3080		
Wt. of wet soil	g	704	670	700	658	705		
Wet density	Mg/m^3	1.658	1.578	1.648	1.549	1.660		
Dry density (γ)	Mg/m^3	1.533	1.415	1.500	1.364	1.472		
Moisture Content %								
Container No.		**1**	**2**	**3**	**4**	**5**		
Wt. of container	g	34.7	41.5	50.2	44	45		
Wt. of wet soil + Container	g	135.6	148	139	142.8	161.4		
Wt. of dry soil + Container	g	128	137	131	131	148.2		
Wt. of dry soil	g	93.3	95.5	80.8	87.0	103.2		
Wt. of water	g	7.6	11	8	11.8	13.2		
Moisture content %		8.1	11.5	9.9	13.6	12.8		

Remarks :

Checked by : **Jafari**

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Omran Geotechnical Company

Appendix F

Lab Test Results of Boreholes

Chemical Test Results

Professional Geotechnical Services

WATER/WASTE WATER LABORATORY

Greentec

Greentec Design & Consulting Co.

Analytical Report

Client name: **USAID** Contractor: **Tetra Tec** Sub Contractor: **OGC** Project: **Ministry of Public Health (moph) Facility,** Location: **Kabul Province**	request no; **S /3** sample no :**18-4** Depth: **1.5 m** Bore hole number A11 sample collected by: **OGC** sample collected time: **3:00PM** sample collected date: **10-4-2010**
Source location; well river other √ Source type; municipal industrial	lab receipt time: **9:00 AM** lab receipt date:**1 3-4-2010**
Sample description:	

Chemical analysis

Test	result	unit	method	*MCL as Per USEPA (for water sample only)	Remarks
Sulfate	1	mg/l	ASTM- C1580	250	
PH	8.88	-	ASTM-G51	6.5-8.5	
Chloride	6.9	mg/l	ASTM-D4327	250	

Analyzed by: **Mohammadi**
Analysis started: **10:00 AM**

Analysis completion date:**13-4-2010**
Approved by: **Mosavi**

Green tech

Remarks:
Dilution rate for every sample: 1:50

The water/soil sample collected and delivered to Greentec Lab by client representative
*MCL-Maximum contaminant level Drinking purpose

Add: Karte 3 – Kabul – Afghanistan
Mob :+93 (0)779 523 567 -078633025
Email: lab@greentech.af
Website: www.greentech.af

WATER/WASTE WATER LABORATORY

Greentec

Greentec Design & Consulting Co.

Analytical Report

Client name: **USAID** Contractor: **Tetra Tec** Sub Contractor: **OGC** Project: **Ministry of Public Health (moph) Facility,** Location: **Kabul Province**	request no; **S /3** sample no :**17-4** Depth: **1.5 m** Bore hole number:. A17 sample collected by: **OGC** sample collected time: **3:00PM** sample collected date: **10-4-2010**
Source location; well river other √ Source type; municipal industrial	lab receipt time: **9:00 AM** lab receipt date: 1**3-4-2010**

Sample description:

Chemical analysis

Test	result	unit	method	*MCL as Per USEPA (for water sample only)	Remarks
Sulfate	2	mg/l	ASTM- C1580	250	
PH	8.65	-	ASTM-G51	6.5-8.5	
Chloride	19.1	mg/l	ASTM-D4327	250	

Analyzed by: **Mohammadi**
Analysis started: **10:00 AM**

Analysis completion date:1 **3-4-2010**
Approved by: **Mosavi**

Green tech

Remarks:
Dilution rate for every sample: 1:50

The water/soil sample collected and delivered to Greentec Lab by client representative
*MCL-Maximum contaminant level Drinking purpose

Add: Karte 3 – Kabul – Afghanistan
Mob :+93 (0)779 523 567 -078633025
Email: lab@greentech.af
Website: www.greentech.af

WATER/WASTE WATER LABORATORY

Greentec

Greentec Design & Consulting Co.

Analytical Report

Clicnt name: **USAID** Contractor: **Tetra Tec** Sub Contractor: **OGC** Project: **Ministry of Public Health (moph) Facility,** Location: **Kabul Province**	request no; **S /3** sample no :**1 6-4** Depth: **2 m** Bore hole number: A29 sample collected by: **OGC** sample collected time: **3:00PM** sample collected date: **10-4-2010**
Source location; well river other √ Source type; municipal industrial	lab receipt time: **9:00 AM** lab receipt date:**13-4-2010**

Sample description:

Chemical analysis

Test	result	unit	method	*MCL as Per USEPA (for water sample only)	Remarks
Sulfate	5	mg/l	ASTM- C1580	250	
PH	9.22	-	ASTM-G51	6.5-8.5	
Chloride	10.1	mg/l	ASTM-D4327	250	

Analyzed by: **Mohammadi**
Analysis started: **10:00 AM**

Analysis completion date:1 **3-4-2010**
Approved by: **Mosavi**

Remarks:
Dilution rate for every sample: 1:50

The water/soil sample collected and delivered to Greentec Lab by client representative
*MCL-Maximum contaminant level Drinking purpose

Add: Karte 3 – Kabul – Afghanistan
Mob :+93 (0)779 523 567 -078633025
Email: lab@greentech.af
Website: www.greentech.af

Omran Geotechnical Company

Appendix G

Soil Resistivity Report

Professional Geotechnical Services

1. Geographical Location of the Site:

MOPH area that carried out Soil Resistivity investigation is located at Afshar, Kabul.

Figure 1: Geographical location of project site on satellite images

2. Geoelecteric investigation (Resistivity method)

In the resistivity method, electrical currents are inserted to the ground and the potential differences between the points are measured. The diversity from the potential difference in the homogenous zones can give us information regarding the electric properties of the underground heterogeneous layers

Specific resistivity of a material as a resistivity between opposite surfaces of a unit cubic of body is defined in ratio to ohmmeter. Resistivity is one of the physical properties of stones that have a lot of variations. Specific mineral, just like natural metals and graphite, by passing electrons, leads the electrical currents, but most specific minerals forming stones and rocks are impermeable and the electrical currents are charges by water ions existing in the cracks and fissures of the rocks and stones.

Thus, most rocks lead the electricity in the form of electrolytic other than electronic and this means that porosity is prominent controller of rocks resistivity and changes the rocks resistivity to a high extent. And thus, a remarkable overlap exists between the electrical resistivity of different type of rocks making the determination of the rocks impossible by obtaining data by resistivity soundings. And the said factors should be considered as well.

In practice, the resistivity sounding is measured by inserting (A, B) currents via two electrodes through the ground and the obtained potential difference between the two electrodes the (M, N) potential of the ground are measured. And the resistivity is calculated by applying P=K.V/I formula. Where V is the measured potential difference and I is the intensity of the current inserted to the ground and K is the geometric factor of arrangement. Although each arrangement has its own unique formula, the general calculation formula is as in the following.

$$K = 2\pi . \frac{1}{\frac{1}{AM} - \frac{1}{AN} - \frac{1}{BM} + \frac{1}{BN}}$$

When the earth material is similar, the calculated resistivity is stable based on this formula and is independent of the electrodes distances. However, if unevenness exists under the ground, the resistivity and relative location of the electrodes change. And the calculated value is called

(a) as an apparent resistivity and will be based on the related unevenness. Three common arrangements applied in electric sounding are:

1. Dipole-Dipole Arrays
2. Electrical Profiling
3. Vertical Electrical Sounding

3. Vertical Electrical sounding (carried out at Generator and fuel tank area)

In general, the resistivity method involves measuring the electrical resistivity of earth materials by introducing an electrical current into the ground and monitoring the potential field developed by the current. The most commonly used electrode configuration for geoelectrical soundings, which was used in this field survey, is the Wenner array. Four electrodes (two current A and B and two potential M and N) are placed along a straight line on the land surface such that the outside (current) electrode distance (AB) is equal to two times the inside (potential) electrode distance (MN). Vertical sounding, in Wenner array, were performed by keeping the electrode array centered over a field station while increasing the spacing between the current electrodes, thus increasing the depth of investigation. The potential difference (ΔV) and the electrical current (I) are measured for electrode spacing and the apparent resistivity (ρa) is calculated by the equation:

$$\rho_a = K\frac{\Delta V}{I} \qquad (\text{ohm-m})$$

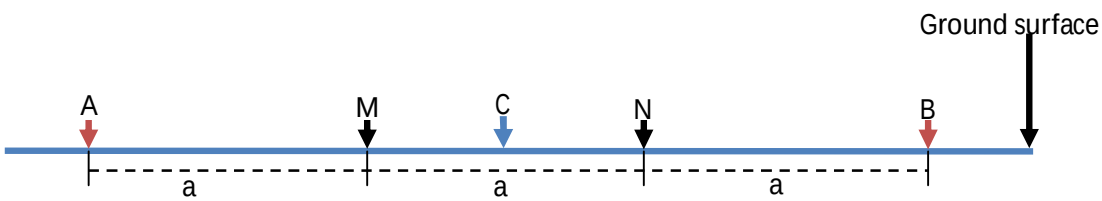

Figure2: Schematic electrode arrangement according to Wenner
Where: AB (current electrodes), MN (potential electrodes), C (Sounding), a (electrode space)

4. Field investigation:

Soil resistivity carried out at MOPH area with 3 soundings on the Generator and fuel tank site, three points is marked by our client on the site plan as R1, R2 and R3 (see in the below site plan)

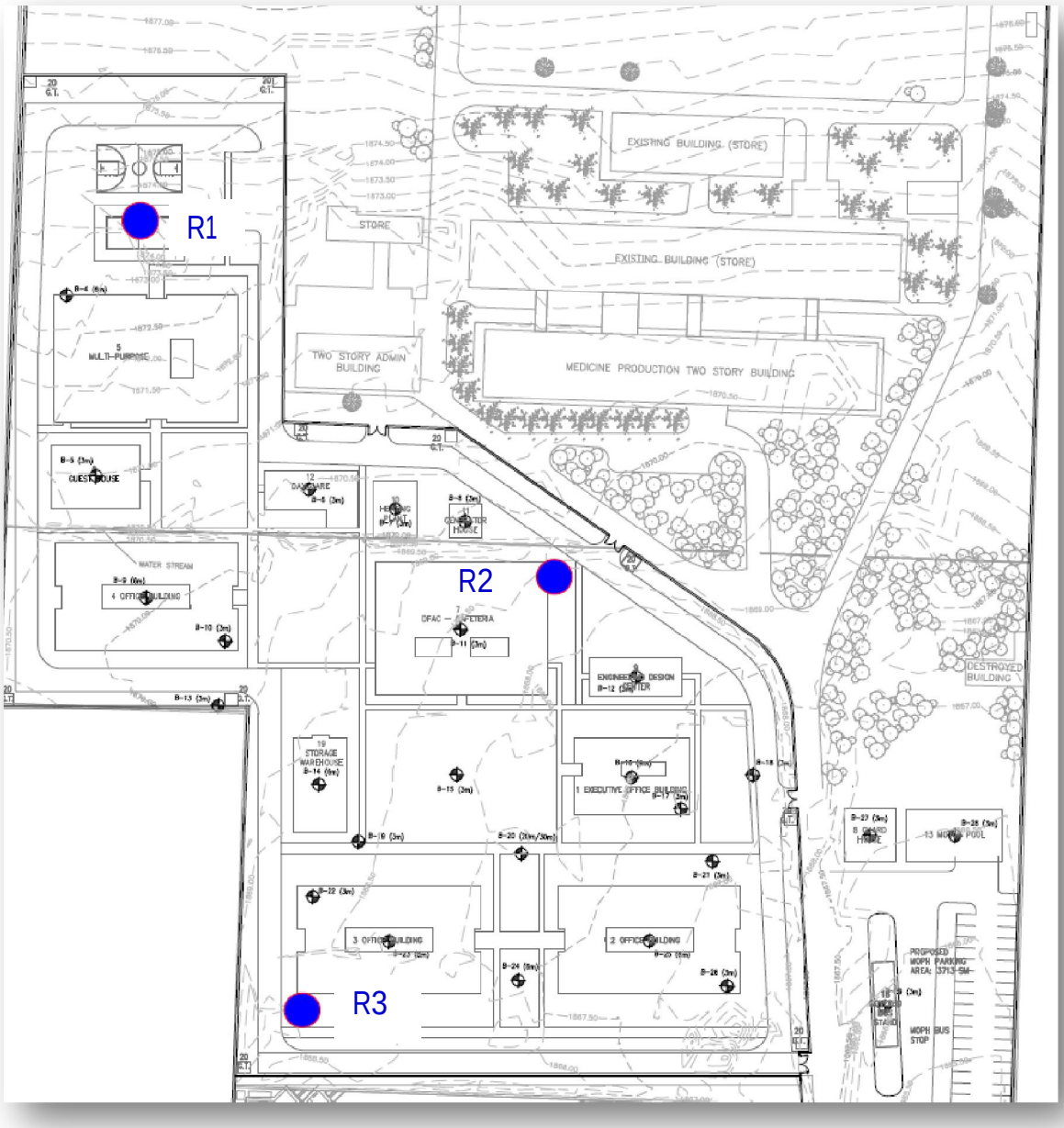

Figure3. Sounding locations on the Generator and fuel tank Site (MOPH)

4. Apparent resistivity results:

Three soundings surveyed totally by Italian earth resistivity meter, model "16GL" serial number: 08123212 on the MOPH sites. This survey performed by Wenner electrode arrangement, with 18m penetration in depth. After field data collection we calculated apparent resistivity and plotted apparent resistivity versus AB/2(depth) that showed results in next graphs:

Project name				Date
MOPH Soil Resistivity				April 18. 2010
Profile N		Sound N	R1	
AB/2	MN(a)	K	R(Ω)	$\rho_a(\Omega.m)$
1.125	0.75	2.355	39.2	92.316
2.25	1.5	4.71	32.6	153.546
4.5	3	9.42	340.7	3209.394
6.75	4.5	14.13	7.6	107.388
9	6	18.84	6.3	118.692
13.5	9	28.26	2.6	73.476
18	12	37.68	0.876	33.00768

Note: T= 18°, Time: 90:00 - 9:45 AM, weather: semi cloudy

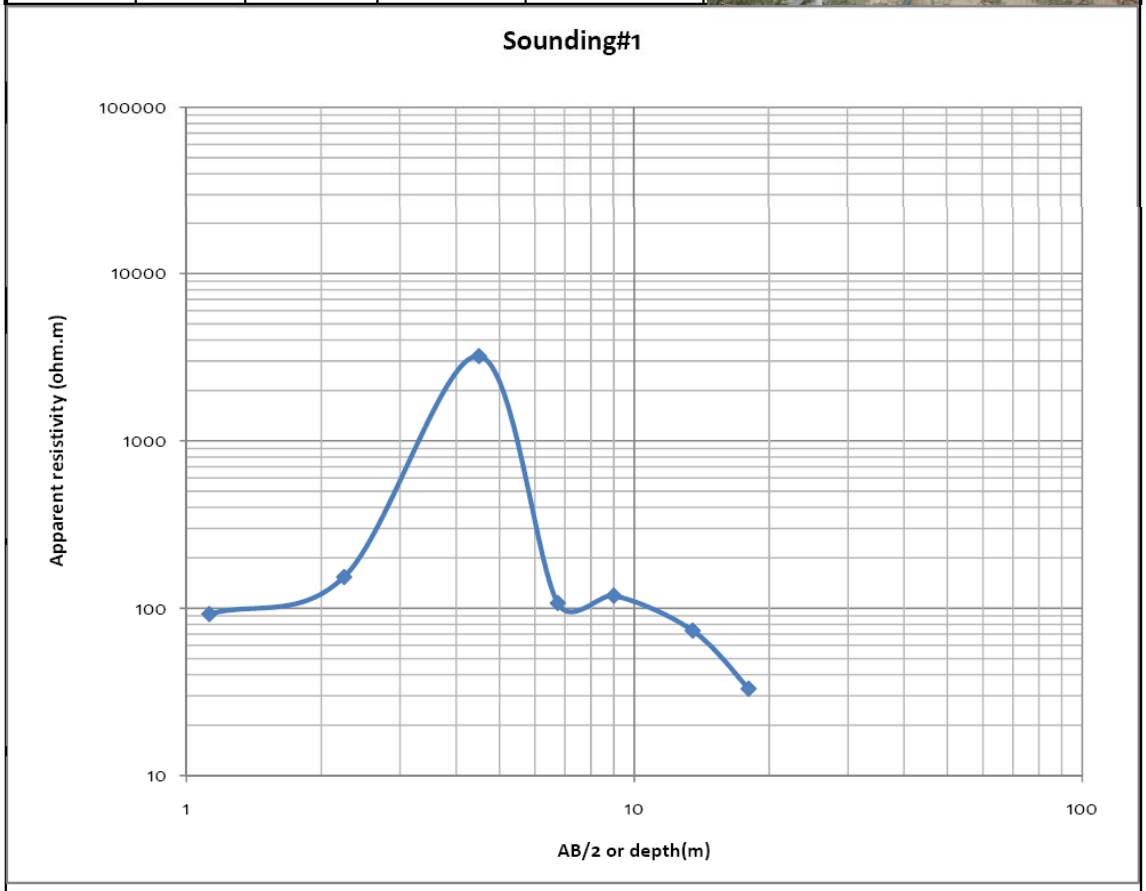

Figure 4: Data and log-log graph Sounding 1

Project name				Date
MOPH Soil Resistivity				April 18. 2010
Profile N		Sound N	R2	
AB/2	MN(a)	K	R(Ω)	$\rho_a(\Omega.m)$
1.125	0.75	2.355	40.7	95.8485
2.25	1.5	4.71	20.8	97.968
4.5	3	9.42	6.8	64.056
6.75	4.5	14.13	280.4	3962.052
9	6	18.84	3.4	64.056
13.5	9	28.26	1.6	45.216
18	12	37.68	0.578	21.77904

Note: T= 18°, Time: 10:00 - 10:45 AM, weather: semi clody

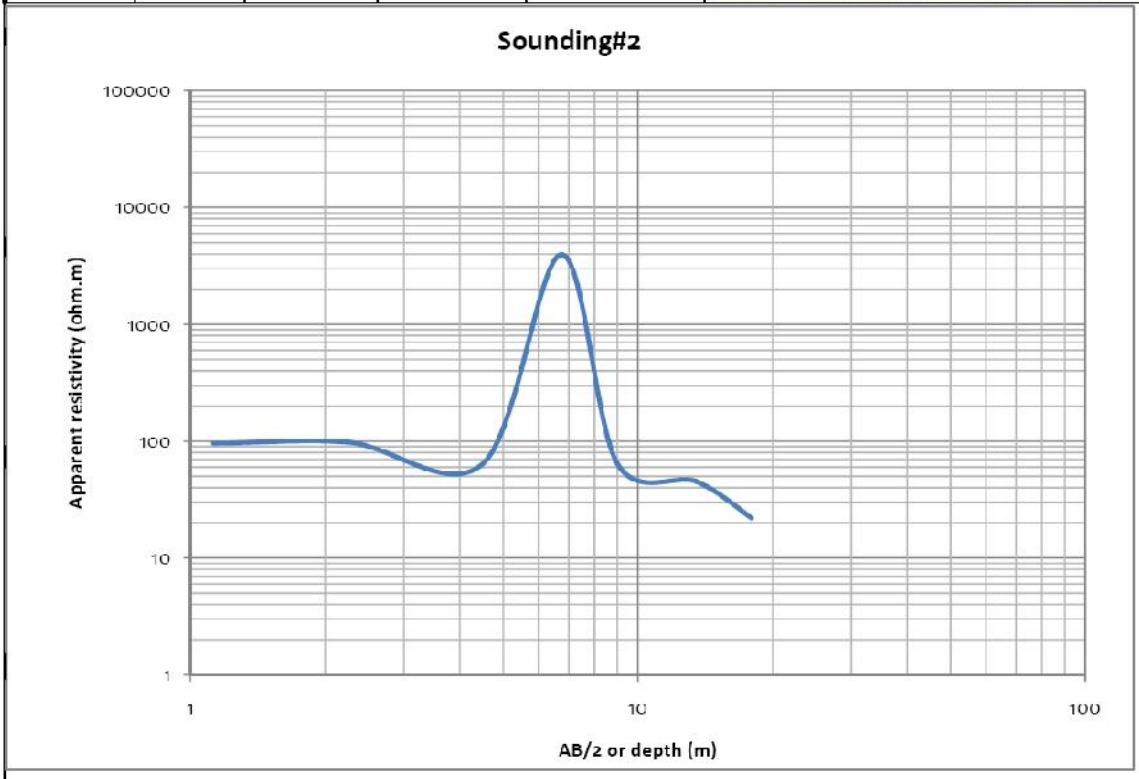

Figure 5: Data and log-log graph Sounding 2

Project name				Date	
MOPH Soil Resistivity				April 18. 2010	Note: T= 18°, Time: 11:00 - 11:45 AM, weather: semi clody
Profile N		Sound N	R3		
AB/2	MN(a)	K	R(Ω)	$\rho_a(\Omega.m)$	
1.125	0.75	2.355	18.7	44.0385	
2.25	1.5	4.71	13.2	62.172	
4.5	3	9.42	6.6	62.172	
6.75	4.5	14.13	263	3716.19	
9	6	18.84	3.2	60.288	
13.5	9	28.26	1.6	45.216	
18	12	37.68	0.484	18.23712	

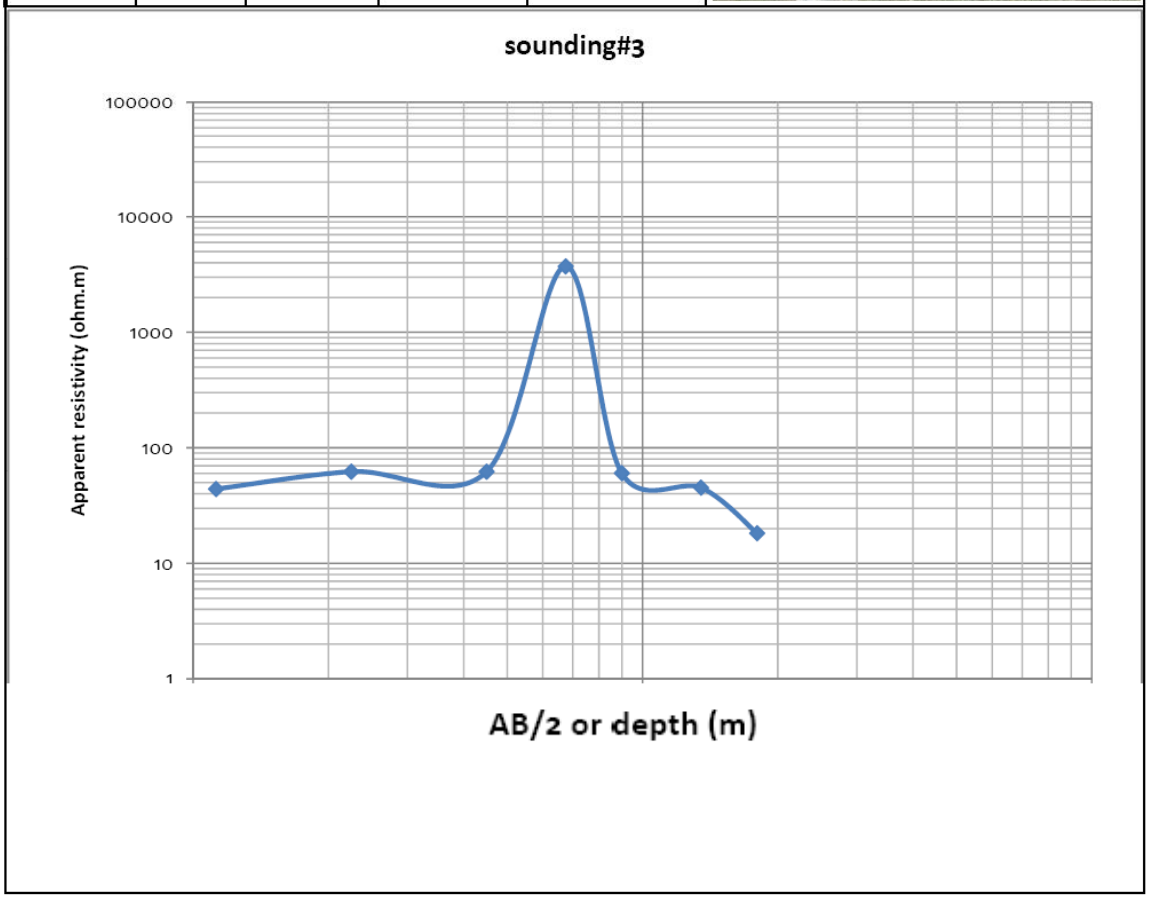

Figure 6: Data and log-log graph Sounding 3

Omran Geotechnical Company

Professional Geotechnical Services

Appendix F

Photos

Geotechnical, Geophysical & Material Testing Services

A) General View of Ministry of Public Health (MPOH) Facility, Kabul

B) Field Equipment Photos

Drilling of 30 No. Boreholes with Geotechnical Rotary core drill machine

Split Spoon Soil sampler per ASTM D-1586

Standard Auto trip SPT Hammer per ASTM D-1586 (140 lbs or 63.5 kg)

Undisturbed Sampling by Shelby Tubes (ASTM D-1587)

Sealing the Shelby Tubes by Wax at Site

C) Photos from Boreholes drilling for soil sampling

D) Photos from Soil Sample

BH#A5, Depth 0-4m

BH#A8, Depth 0-4m

BH#A15, Depth 0-4m

BH#A16, Depth 0-4m

BH#A26, Depth 0-4m

BH#A28, Depth 0-4m

BH#A30, Depth 12-16m

BH#A30, Depth 16-20m

E) Percolation Photos

Select Average Results of 3Points (2A, 2B, 2C) for TP#2

F) Field Density Photos

Field Density Test by Sand Cone ASTM D1556

G) OGC Laboratory Equipment Photos

Laboratory Photos (Soil)

Laboratory Photos (Concrete)

Laboratory Photos (Asphalt Mixed design)

Laboratory Photos (Equipment)

Omran Geotechnical Company

Appendix K

Lab Certificate

Professional Geotechnical Services

DEPARTMENT OF THE ARMY

AFGHANISTAN ENGINEER DISTRICT
U.S. ARMY CORPS OF ENGINEERS
KABUL, AFGHANISTAN
APO, AE 09356

REPLY TO
ATTENTION OF:

CEAEN 20 DECEMBER 2009

LABORATORY CERTIFICATION FOR THE

OMRAN GEOTECHNICAL COMPANY

This letter confirms the completion of inspection and certification for the Omran Geotechnical Company construction materials laboratories at the following locations in Afghanistan: Kabul and Mazar-e-Sharif. While Omran's laboratories are physically located in these two cities, they can perform field tests anywhere in Afghanistan.

These laboratories should now be considered as certified for use by the Afghanistan Engineer District (AED), U.S. Army Corps of Engineers (USACE), for the construction materials tests listed in Tables 1 through 5 (attached). This certification will be included with records that are maintained at the AED Headquarters in Kabul, Afghanistan. Retaining certification will require yearly inspections by the AED. This certification is also contingent upon the continued employment of both Mr. [redacted] Business Manager, and [redacted] Lab Manager. Without the oversight of these gentlemen, the laboratory will require recertification. Also, if the laboratory is moved to a new location, it will require recertification.

The inspection and certification process for the Omran Geotechnical Company laboratory adhered to procedures outlined by the Materials Testing Center (MTC), which is located at the Geotechnical and Structures Laboratory (GSL), U.S. Army Engineer Research and Development Center (ERDC) in Vicksburg, Mississippi, USA. The MTC is the USACE-authorized agency for certifying laboratories for use in quality control testing for USACE construction projects. To facilitate construction in Afghanistan, the AED has authorized this author to conduct laboratory certifications with strict adherence to MTC protocol. Qualifications of this author for conducting these certifications include: 14 years of laboratory research experience with the GSL, ERDC, 14 years of teaching US government-sponsored classes on construction materials, and eight years of teaching university-level construction materials classes.

[redacted]

[redacted]
Chief, Quality Assurance Branch
Afghanistan Engineer District – North
U.S. Army Corps of Engineers

Certified Material Test Procedures Include:
Soils (16 test procedures)
Aggregate (19 test procedures)
Cement, Grout, Mortar, and Concrete (13 test procedures)
Asphalt Cement and Asphalt Concrete (23 test procedures)
Advanced Soils Testing (7 test procedures)

Attachment (5 pages)