



URBAN DEVELOPMENT DIRECTORATE (UDD)

Government of the People's Republic of Bangladesh

**Engineering Geological Survey and Related Other Works in
Rural Parts of MSDP Project Area**

**ENGINEERING GEOLOGICAL MAP FOR SEISMIC
HAZARDS ASSESSMENT**

February 2015

Submitted by



Environmental & Geospatial Solution (EGS)

Dr. Mohsin Complex, 2/7, Pallabi (3rd floor), Mirpur 12, Dhaka 1216, Bangladesh

Ph: +8802 902 7155, Email: info@egsbd.org, www.egsbd.org

TABLE OF CONTENTS

CONTENTS

Table of Contents	1
Executive Summary	5
Chapter 1: Geotechnical Investigation	6
1.1 Boring with Standard Penetration Test and Laboratory Test	6
1.1.1. Outline	6
1.1.2. Standard Penetration Test Procedures and Analysis	9
1.1.3. AVS 30 at Boring	12
1.2. Laboratory Test	15
Chapter 2: Geophysical Investigation	16
2.1. Outline of Survey	16
2.1.1. Purpose	16
2.1.2. Survey Types	16
2.1.3. Survey Quantity	16
2.1. PS Logging	17
2.1.1. Outline	17
2.1.2. Procedure of Field Work and Analysis	18
2.1.3. Results	21
2.2 Multi-channel Analysis of Surface Wave (MASW)	26
2.2.1 Analysis of MASW	28
2.2.2 Survey Result of MASW Survey	32
2.3. Single Microtremor Measurement (Single MT)	34
2.3.1. Methodology of Single Microtremor Measurement	34
2.3.2. Field Survey	34

2.3.3. Data Processing.....	36
2.3.4. Analysis	37
2.3.5. Survey Result of Single MT	39
2.4. Array Micro-Tremor Measurement (AMT)	42
2.4.1. Methodology and Measurement	42
Chapter 3: Engineering Geological Map.....	44
3.1. Definition of Engineering Geological Map.....	44
3.2. Geological Subsurface Model.....	44
3.2.1. Outline.....	44
3.2.2. Geological Classification	46
3.3. AVS 30 Map as an Engineering Geological Map.....	57

Appendix

Appendix I: Borehole Geotechnical Logs

Appendix II: Laboratory Test Result and Graph

- a. Grain size analysis determination
- b. Atterberg limits determination
- c. Specific gravity
- d. Unconfined compression strength determination
- e. Direct shear test
- f. Tri-axial test (Undrained Unconsolidation)
- g. Consolidation test

Appendix III: PS Logging Test Result and Velocity Profiles

Appendix IV: Multi-channel Analysis of Surface Wave (MASW) 1D and 2D Models

Appendix V: Array Microtremor Survey Results

Appendix VI: Single Microtremor Survey Results

Appendix VII: Relation between N values and Vs at each Boring

List of Figure

Figure 1- 1: The SPT sampler in place in the boring with hammer, rope and cathead (Adapted from Kovacs, et al., 1981)	9
Figure 1- 2: Engineering geotechnical log as an example.....	12
Figure 1- 3: Boring Location and Result in MSDP area.....	14
Figure 2- 1: Wooden Plank as the Vibration Source	18
Figure 2- 2: Trigger fixed to the Hammer	18
Figure 2- 3: Geophone.....	18
Figure 2- 4: Data Acquisition Unit	18
Figure 2- 5: Geophone in the Borehole	19
Figure 2- 6: Direction of Excitations	19
Figure 2- 7: Determination of the Arrival Time of S-wave	20
Figure 2- 8: Calculation of the Travel Time.....	20
Figure 2- 9: PS Logging Test Location and Result.....	22
Figure 2- 10 : Preliminary Results of PS logging.....	23
Figure 2- 11: MASW Data Acquisition	27
Figure 2- 12: Schematic Diagram for Shallow Seismic Survey	27
Figure 2- 13: Shot-Receiver Configuration for MASW.....	28
Figure 2- 14: Dispersion Curve	29
Figure 2- 15: One dimensional Velocity Structure and 2 D velocity Model	30
Figure 2- 16: Location and AVS 30 of MASW Survey in MSDP area	33
Figure 2- 17: Super-Sensitive Portable Seismometer	35
Figure 2- 18: shows the example of H/V analysis.	38
Figure 2- 19: Location and Predominant Period of Single Microtremor in MSDP area.	41
Figure 2- 20: Location and Peak Amplitude of Single Microtremor in MSDP area.	41
Figure 2- 21: Schematic diagram of AMT	42
Figure 2- 22: ample of One Dimensional Analysis (AMT)	43

Figure 3- 1: 250 m Grid in MSDP Area with Union Boundary	45
Figure 3- 2: Subsurface lithological 3D model.....	47
Figure 3- 3: Subsurface cross section along the SW-NS direction of the project area	48
Figure 3- 4: Subsurface cross section along the SW-NS direction of the project area	49
Figure 3- 5: Subsurface cross section along the NW-SE direction of the project area.....	50
Figure 3- 6: Subsurface cross section along the NW-SE direction of the project area.....	51
Figure 3- 7: Geological classification at the boring at MSDP area	53
Figure 3- 8: Thickness distribution map of the Holocene soil in the project area.	54
Figure 3- 9: Thickness distribution map of the Modhupur Clay Formation in the project area.	55
Figure 3- 10: Thickness distribution map of the Dupitila Formation in the project area.....	56
Figure 3- 11: Sample of Utilization of AVS 30 for the Amplification Analysis.....	57
Figure 3- 12: AVS 30 Map in MSDP area.	58

List of Table

Table 1- 1: Summary of boring and SPT	6
Table 1- 2: Calculated AVS 30 in each Boring	13
Table 1- 3: Work Quantities of Laboratory Test	15
Table 2- 1: Number of Survey Sites for Geophysical Survey	16
Table 2- 2: shows PS logging test locations.	17
Table 2- 3: Summary of PS Logging Test Result.....	21
Table 2- 4: MASW Survey Result in MSDP area	32
Table 2- 5: Location and Result of Single Microtremor Measurement in Dhaka	39
Table 3- 1: Tabulation of Geological Classification.....	46
Table 3- 2: Tabulation of Geological Classification (Formations).....	52

EXECUTIVE SUMMARY

In order to obtain geological / geotechnical data as basic information for analysis of the seismic hazard assessment, geotechnical investigation (Chapter 1) and geophysical exploration (Chapter 2) were carried out in Mymensingh Strategic Development Plan (MSDP) area.

In geotechnical investigation, 70 soil borings (2,100m in drilling length), 1,400 times of standard penetration test (SPT) and laboratory tests were conducted.

In geophysical exploration, 15 points of PS logging, 25 points of multi-channel analysis of surface wave measurement, 4 points of array microtremor measurement, and 40 points of single microtremor measurement were conducted.

In this study, we could use the reliable data derived from the above mentioned surveys carried out by Environmental & Geospatial Solution (EGS) under Urban Development Directorate (UDD) supervision.

Based on the results of the above surveys, AVS 30 map (Chapter 3), which 250 m grid has average S-wave velocity of ground in the top 30 m depth, was presented as an engineering geological map and this map was provided for the seismic hazard assessment.

CHAPTER 1: GEOTECHNICAL INVESTIGATION

1.1 BORING WITH STANDARD PENETRATION TEST AND LABORATORY TEST

1.1.1. OUTLINE

Geotechnical investigations have become an essential component of every construction to ensure safety of human beings and materials. It includes a detailed investigation of the soil to determine the soil strength, composition, water content, and other important soil characteristics.

Investigation borings with standard penetration test (hereinafter referred to as “SPT”) were conducted in order to know vertical geological conditions. The borings with SPT were carried out at 70 points in Mymensingh strategic development plan (hereinafter referred to as “MSDP”) area by Environmental & Geospatial Solution (hereinafter referred to as “EGS”). Table 1- 1 shows the basic information of the borings and the SPT in MSDP area.

Table 1- 1: Summary of boring and SPT

Union Name	Boring No	Coordinate		Location	Drilling Depth (m)	SPT (times)
		Latitude	Longitude			
Akua	BH-Akua-71	24.75106	90.37359	45No. Gandoapa Govt. Prainary School	30	20
	BH-Akua-32	24.74118	90.38249	Haji Jalaluddin High School	30	20
	BH-Akua-48	24.71744	90.4015	Gostagram, Vati Borra, Akua	30	20
Baera	BH-Baera-49	24.702	90.43233	Chalabondi,kicharibill	30	20
Bhabkhali	BH-Bhabkhali-57	24.6852	90.41835	Namapara, Bhabkhali	30	20
	BH-Bhabkhali-58	24.68667	90.4418	Dupipara,Notunbazar,Sutiakhali	30	20
	BH-Bhabkhali-62	24.66791	90.40524	Behind CBMC, Bhabkhali	30	20
	BH-Bhabkhali-64	24.66946	90.43459	Bhabkhali	30	20
	BH-Bhabkhali-65	24.66556	90.45798	Bhabkhali Bazar	30	20
	BH-Bhabkhali-68	24.65202	90.44378	Sarkarbari, Narayanpur, Bhabkhali	30	20
	BH-Bhabkhali-69	24.64955	90.4568	Bhabkhali Chor	30	20

Union Name	Boring No	Coordinate		Location	Drilling Depth (m)	SPT (times)
		Latitude	Longitude			
Bhangnamari	BH-Bhangnamari-50	24.70971	90.4697	Vangamasari, Anantagonj bazar	30	20
	BH-Bhangnamari-51	24.70606	90.48085	Bhangnamari	30	20
	BH-Bhangnamari-52	24.70862	90.50646	Douhakhola, kajir Panati	30	20
	BH-Bhangnamari-59	24.68806	90.46101	Bhangnamari	30	20
	BH-Bhangnamari-60	24.72194	90.49279	Bhangnamari, Barmari	30	20
	BH-Bhangnamari-66	24.66993	90.48071	Bhangnamari	30	20
	BH-Bhangnamari-67	24.68545	90.51514	Ramnogon Eyoub Alir Bari	30	20
	BH-Bhangnamari-70	24.65271	90.48034	Bhangnamari	30	20
Char Ishwardia	BH-Char Ishwardia-05	24.81196	90.4181	Aliamadrasa, Borobila	30	20
	BH-Char Ishwardia-13	24.79711	90.44176	Chorborbila, Chor-Ishwardia	30	20
	BH-Char Ishwardia-20	24.77656	90.41672	Konapara mor, Chourastar Bazar	30	20
	BH-Char Ishwardia-21	24.77642	90.44235	Chor-Ishwardia	30	20
	BH-Char Ishwardia-26	24.761	90.43897	Chinamor. Char-Ishwardia	30	20
	BH-Char Ishwardia-33	24.74389	90.43929	Chor-Ishwardia	30	20
	BH-Char Ishwardia-72	24.75651	90.42482	Beside Jute Mill	30	20
Char Nilakhshmia	BH-Char Nilakhshmia-22	24.77941	90.45697	Shabazpur Brac School	30	20
	BH-Char Nilakhshmia-27	24.76014	90.46369	Shombaganj Railgate	30	20
	BH-Char Nilakhshmia-28	24.75625	90.47675	Choranlaxmia, Raghobpur	30	20
	BH-Char Nilakhshmia-29	24.75725	90.50018	Bijoy Nagar, Chor-Nilakhshmia	30	20
	BH-Char Nilakhshmia-34	24.74188	90.45924	Ujanpara, Char Nilakhshmia	30	20
	BH-Char Nilakhshmia-35	24.74456	90.48476	Nilakkhia, Jadobpur	30	20
	BH-Char Nilakhshmia-36	24.7398	90.49944	Baishakhi Hachary, Char-Nilakkhia	30	20
	BH-Char Nilakhshmia-41	24.72418	90.46115	Nilakkhia	30	20
	BH-Char Nilakhshmia-42	24.72569	90.47783	Jugir, Agli, Char-Nilakkhia	30	20

Union Name	Boring No	Coordinate		Location	Drilling Depth (m)	SPT (times)
		Latitude	Longitude			
Dapunia	BH-Dapunia-23	24.76327	90.32159	Harti Govt. Praimary School	30	20
	BH-Dapunia-24	24.76049	90.34264	Azmatpur, Purbopara. Dapunia	30	20
	BH-Dapunia-31	24.74558	90.36187	Hargzipur	30	20
	BH-Dapunia-30	24.746021	90.350464	72No. Govt. Primary School	30	20
	BH-Dapunia-37	24.72464	90.32443	Gostagram, Dupania	30	20
	BH-Dapunia-38	24.72456	90.34252	Gostagram, Dupania	30	20
	BH-Dapunia-39	24.71979	90.35804	D.K.G.S., United College. Dapunia	30	20
	BH-Dapunia-43	24.71127	90.3031	Nama-katla-shon	30	20
	BH-Dapunia-44	24.71257	90.32443	Dapunia Mymensing	30	20
Ghagra	BH-Ghagra-40	24.72556	90.38227	Moddho Brara, Ghagra	30	20
	BH-Ghagra-45	24.70719	90.33981	Suhila west para, Ghagra	30	20
	BH-Ghagra-47	24.70654	90.37976	Char-Ghagra	30	20
	BH-Ghagra-53	24.68804	90.34284	Ghagra	30	20
	BH-Ghagra-54	24.69251	90.36999	Azmatpur, Purbopara. Dapunia	30	20
	BH-Ghagra-56	24.6851	90.40879	Churknai, Jamtoli	30	20
	BH-Ghagra-61	24.66706	90.38629	Ghagra Mohila Alia Madrasa, Abukhali	30	20
Khagdahar	BH-Khagdahar-06	24.79569	90.31357	Khagdahar	30	20
	BH-Khagdahar-07	24.79658	90.3255	Khagdahar, Kollayanpur	30	20
	BH-Khagdahar-08	24.7913	90.33908	BouBazar, Khagdahar	30	20
	BH-Khagdahar-09	24.78333	90.35092	Khagdahar Govt. Praimary School	30	20
	BH-Khagdahar-14	24.7745	90.31186	Khagdahar bazar	30	20
	BH-Khagdahar-15	24.77915	90.326	Begunbari Bazar, Khagdahar	30	20
	BH-Khagdahar-16	24.77976	90.34236	Rahamatpur, Khagdahar	30	20
	BH-Khagdahar-17	24.77533	90.36341	Behind BGB Camp, Khagdahar	30	20
	BH-Khagdahar-18	24.77709	90.37372	Dholadiya, Saleha Market	30	20
	BH-Khagdahar-25	24.76042	90.3623	Badekolpa	30	20

Union Name	Boring No	Coordinate		Location	Drilling Depth (m)	SPT (times)
		Latitude	Longitude			
Sirta	BH-Sirta-01	24.82655	90.34684	Haliamari, Sirta	30	20
	BH-Sirta-02	24.81741	90.36225	Nayapara, Sirta	30	20
	BH-Sirta-03	24.81667	90.38022	Golakatamor, Sirta	30	20
	BH-Sirta-04	24.81527	90.40294	New Charkharichar bazar	30	20
	BH-Sirta-10	24.79818	90.38428	Konapara mor, Chourastar Bazar	30	20
	BH-Sirta-11	24.79553	90.40356	Joybangla, Sirta	30	20
	BH-Sirta-12	24.79678	90.42233	Sirta	30	20
	BH-Sirta-19	24.77869	90.40235	Gobindapur, Sirta	30	20

1.1.2. STANDARD PENETRATION TEST PROCEDURES AND ANALYSIS

The Standard Penetration test (SPT) is a common in situ testing method used to determine the geotechnical engineering properties of subsurface soils. The test procedure is described in the British Standard BS EN ISO 22476-3, ASTM D1586. A short procedure of SPT N-value test is described in the following paragraph.

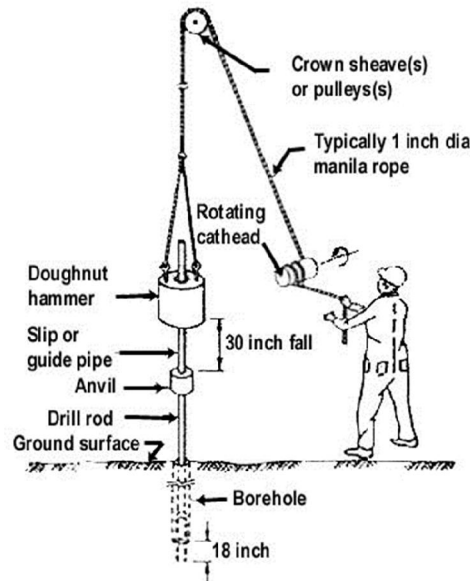


Figure 1- 1: The SPT sampler in place in the boring with hammer, rope and cathead (Adapted from Kovacs, et al., 1981)

The test in the field used a thick-walled sample tube, with an outside diameter of 50 mm and an inside diameter of 35 mm, and a length of around 650 mm. This is driven into the ground at the bottom of a borehole by blows from a slide hammer with a weight of 63.5 kg (140 lb) falling through a distance of 760 mm (30 in). The sample tube is driven 150 mm into the ground and then the number of blows needed for the tube to penetrate each 150 mm (6 in) up to a depth of 450 mm (18 in) is recorded. The sum of the number of blows required for the second and third 6 in. of penetration is termed the "standard penetration resistance" or the "N-value". The blow count provides an indication of the density of the ground, and it is used in many empirical geotechnical engineering formulae. Typically these tests are performed at 1.5 – 5 m (5 – 15 ft) intervals (1.5 m interval in this investigation).

Besides, SPT- N value also suggests the degree of density of soil. Based on N-values, other very useful soil parameters may be obtained from the co-relation charts given by different research workers. Two such useful co-relations for cohesive and non-cohesive soils after K. Terzaghi are given below:

The term consistency of the cohesive soil is generally used on the basis of the SPT values (N) in the following way.

N	...	...	0-2	...	...	Very Soft
N	...	...	2-4	...	...	Soft
N	...	...	4-8	...	...	Medium
N	...	...	8-15	...	...	Stiff
N	...	...	15-30	...	...	Very Stiff
N	...	...	30-50	...	...	Hard
N	...	...	>50	...	...	Very Hard

The term relative density for the non-cohesive soil is used on the basis of the SPT values (N) in the following way.

N	...	...	0-4	...	...	Very loose
N	...	...	4-10	...	...	Loose
N	...	...	10-30	...	...	Medium dense
N	...	...	30-50	...	...	Dense
N	...	...	>50	...	...	Very dense

Visual Soil Classification Procedure:

Soils are classified according to grain size distribution and limit tests. Size divisions for various materials are as follows:

Sieve	Soils Designations
+No 4 (4.76mm)	Gravel
No.4 to No 10(2.00mm)	Coarse sand
No. 10 to No 40 (0.42mm)	Medium Sand
No. 40 to No 200 (0.07mm)	Fine sand
-No.200	Silt or Clay

Description of the Soil Composition:

The following terms have been used in this report for description of soil composition:

Trace	1 to 10%
Little	10 to 25%
With	25 to 35%
Substantial	35 to 50%

Engineering geotechnical log are prepared by used those technics. And a sample of calculation procedure is shown in Figure 1- 2 and all the geotechnical logs are attached in the Appendix I section.

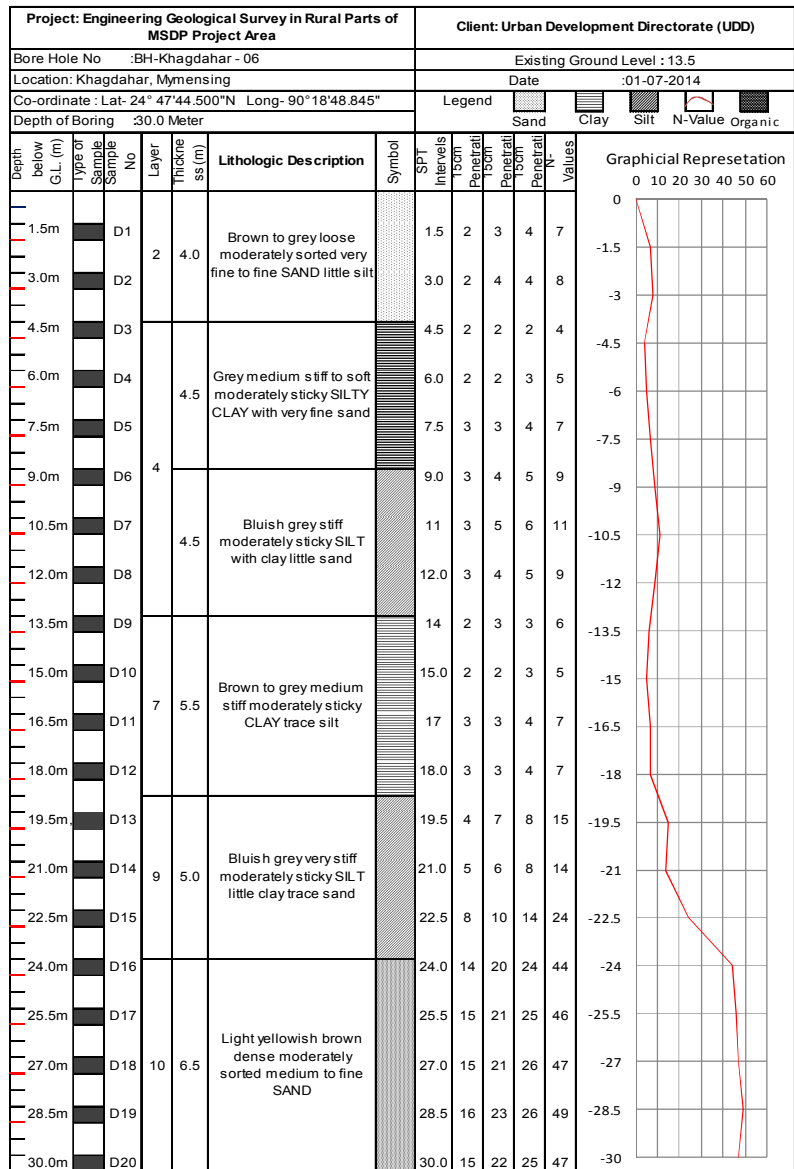


Figure 1- 2: Engineering geotechnical log as an example

1.1.3. AVS 30 AT BORING

The S-wave velocity (hereinafter referred to as “Vs”) is required to calculate amplification of subsurface soil. However, there is a little information of Vs in Bangladesh so far, and PS logging results conducted by this project is also limited (15 points in MSDP area). Hence, the relationship between Vs and N-value (hereinafter referred to as “N”) of SPT that has shown good relation most of the world is useful for estimation of the amplification.

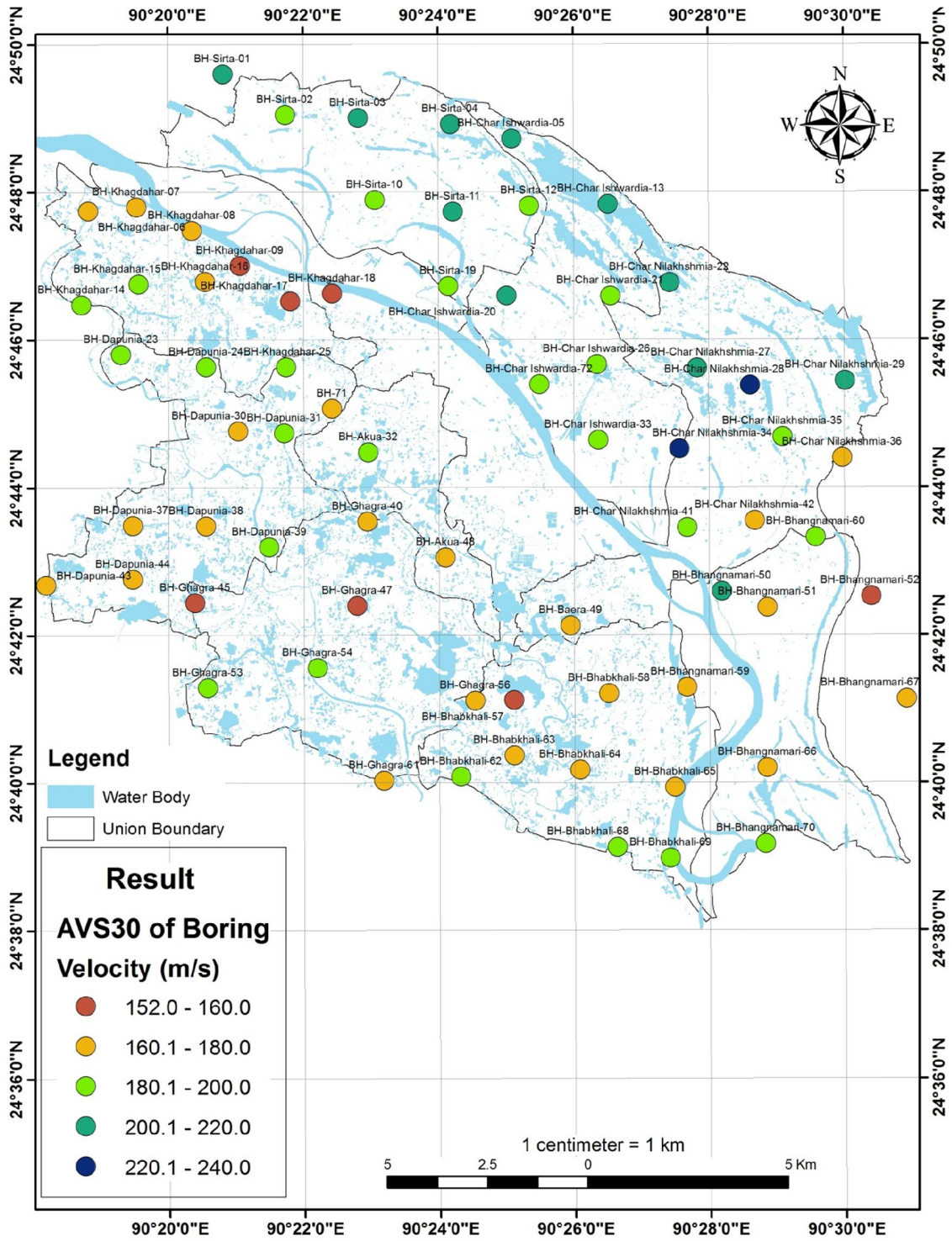
There exists number of formulae to derive shear wave velocity from N- value. In this case, formula proposed by Maheswari et al. (2010) was used, because this SPT-N value converted shear wave velocity, V_s is more or less identical with PS logging shear wave velocity. The formula is give below:

$$V_s = 95.64N^{0.301}$$

By using the above formula V_s are calculated at every boring point.

Table 1- 2: Calculated AVS 30 in each Boring

Borehole ID	Velocity (m/s)	Borehole ID	Velocity (m/s)	Borehole ID	Velocity (m/s)
BH-Sirta-01	202	BH-Dapunia-23	189	BH-Ghagra-54	191
BH-Sirta-02	193	BH-Dapunia-24	190	BH-Ghagra-56	177
BH-Sirta-03	220	BH-Dapunia-30	179	BH-Ghagra-61	175
BH-Sirta-04	215	BH-Dapunia-31	187	BH-Bhabkhali-57	160
BH-Sirta-10	184	BH-Dapunia-37	166	BH-Bhabkhali-58	178
BH-Sirta-11	209	BH-Dapunia-38	170	BH-Bhabkhali-62	182
BH-Sirta-12	194	BH-Dapunia-39	183	BH-Bhabkhali-63	176
BH-Sirta-19	185	BH-Dapunia-43	178	BH-Bhabkhali-64	163
BH-Char Ishwardia-05	213	BH-Dapunia-44	172	BH-Bhabkhali-65	163
BH-Char Ishwardia-13	211	BH-Char Nilakhshmia-22	202	BH-Bhabkhali-68	185
BH-Char Ishwardia-20	207	BH-Char Nilakhshmia-27	216	BH-Bhabkhali-69	183
BH-Char Ishwardia-21	191	BH-Char Nilakhshmia-28	222	BH-Bhangnamari-50	207
BH-Char Ishwardia-26	187	BH-Char Nilakhshmia-29	204	BH-Bhangnamari-51	169
BH-Char Ishwardia-33	192	BH-Char Nilakhshmia-34	225	BH-Bhangnamari-52	154
BH-Khagdahar-06	177	BH-Char Nilakhshmia-35	191	BH-Bhangnamari-59	179
BH-Khagdahar-07	178	BH-Char Nilakhshmia-36	166	BH-Bhangnamari-60	183
BH-Khagdahar-08	173	BH-Char Nilakhshmia-41	189	BH-Bhangnamari-66	168
BH-Khagdahar-09	160	BH-Char Nilakhshmia-42	170	BH-Bhangnamari-67	165
BH-Khagdahar-14	188	BH-Akua-32	182	BH-Bhangnamari-70	183
BH-Khagdahar-15	181	BH-Akua-48	176	BH-Baera-49	167
BH-Khagdahar-16	180	BH-Ghagra-40	178	BH-71	176
BH-Khagdahar-17	160	BH-Ghagra-45	160	BH-Char Ishwardia-72	195
BH-Khagdahar-18	152	BH-Ghagra-47	155		
BH-Khagdahar-25	198	BH-Ghagra-53	182		



[Background: Union boundary and water body edited by UDD]

Figure 1- 3: Boring Location and Result in MSDP area

1.2. LABORATORY TEST

Laboratory test was performed in order to know basic characteristics of soil for the geological classification. Results of the physical tests, and the mechanical tests were used for the soil classifications in the boring logs / clarification of the soil characteristics, and for the setup of the geotechnical properties (shear strength) for the Liquefaction and landslide analysis.

The laboratory test of physical tests and mechanical tests were carried out using disturbed samples by SPT and undisturbed samples, respectively. Table 1- 3 shows work quantities of the laboratory test.

Table 1- 3: Work Quantities of Laboratory Test

	Test Item	Execution Organization	Total
Physical Test	Grain Size Analysis	University of Dhaka	50
	Specific Gravity	University of Dhaka	50
	Natural Moisture Content	University of Dhaka	50
	Atterberg Limit	University of Dhaka	50
Mechanical test	Dry/Bulk Density	University of Dhaka	9
	Unconfined Compression Test	University of Dhaka	9
	Direct shear Test	University of Dhaka	10
	Consolidation Test	University of Dhaka	3
	Tri-axial Test	University of Dhaka	9

Laboratory test result and graph have been enclosed in the Appendix II section.

CHAPTER 2: GEOPHYSICAL INVESTIGATION

2.1. OUTLINE OF SURVEY

2.1.1. PURPOSE

The purpose of the geophysical survey in this project is below.

- (1) To provide shear wave velocity data V_s for Engineering Geological Model,
- (2) To estimate shear wave velocity V_s structure in the study area for Seismic Hazard Analysis.

2.1.2. SURVEY TYPES

The following four types of surveys are conducted.

- (1) PS Logging
To obtain the shear wave velocity profile of soil stratum.
- (2) Multi-channel Analysis of Surface Wave (MASW)
To estimate average shear wave velocity V_s up to 50 m (AVS30) combining with the result by MASW
- (3) Array Micro-Tremor Measurement (AMT)
To estimate deeper shear wave velocity V_s structure
- (4) Single Micro-Tremor Measurement (Single MT)
To estimate predominant period of the site

2.1.3. SURVEY QUANTITY

The number of survey points by survey items is shown in Table 2- 1.

Table 2- 1: Number of Survey Sites for Geophysical Survey

Location	PS Logging	MASW	Single MT	Array MT
MSDP Area	15	25	40	4

2.1. PS LOGGING

2.1.1. OUTLINE

PS Logging test is a direct measurement method for obtaining the shear wave velocity profile of soil stratum. The PS logging test aims to measure the travelling time of elastic wave from the ground surface to some arbitrary depths beneath the ground. Fifteen (15) numbers of PS logging were conducted in MSDP area.

Table 2- 2: shows PS logging test locations.

Union Name	PS ID	Location	Lat	Long
Sirta	PS Sirta-01	Holiamari, Poranganj	24.826547	90.346839
	PS-Sirta-03	Char Vabanipur, West side from Joybangla Bazar	24.795525	90.403564
Khagdahar	PS- Khagdahar-02	Kallanpur Primary School, Khagdahar	24.796579	90.325501
	PS- Khagdahar-04	Behind Engineering College, Khagdahar	24.77976	90.342361
Char-Ishwardi	PS-Char-Ishwardia-05	Beside Akashi agro mill, Char Borbila, Char Ishwardia	24.797108	90.441763
	PS-Char-Ishwardia-07	Char Borbila, Char-Ishwardia	24.811964	90.418097
Dapunia	PS-Dapunia-06	72 no. Dapunia Primary Govt. School	24.746021	90.350464
Ghagra	PS -Ghagra-09	Modhobarra, Ghagra	24.725557	90.382271
	PS-Ghagra-11	Suhila, Poschimpara, Ghagra	24.707193	90.339813
	PS-Ghagra-12	Vatipara, Vati Ghagra	24.684162	90.385597
Char Nilakshmia	PS- Char Nilakshmia-10	Zoogiragli, Char Nilakshmia	24.725689	90.477829
	PS-Char Nilakshmia-08	Raghobpur, Char Nilakshmia	24.756252	90.476746
Bhakhali	PS- Bhakhali-14	Dupipura, Nutonbazar, Shutiakhali	24.68667	90.441795
Bhangnamari	PS-Bhangnamari-13	Dhohakhola, Kagir Panati	24.708617	90.506458
	PS-Bhangnamari-15	Bhangnamari	24.669931	90.480714

2.1.2. PROCEDURE OF FIELD WORK AND ANALYSIS

- (a) A wooden plank with an approximate dimension of 0.15 m x 0.15 m x 1.5 m is fixed to the ground. Sand bags are placed on the top. The wooden plank is placed about 1m from the borehole as shown in Figure 2- 1.



Figure 2- 1: Wooden Plank as the Vibration Source

- b) A trigger is fixed to the hammer as shown in Figure 2- 2. The trigger starts data acquisition when an excitation exceeds a certain threshold.



Figure 2- 2: Trigger fixed to the Hammer

- c) Cables are wired from the geophone Figure 2- 3 and the trigger to the data acquisition unit Figure 2- 4. Signals in the vertical, radial and transverse directions are recorded by the data acquisition unit.



Figure 2- 3: Geophone



Figure 2- 4: Data Acquisition Unit

d) The geophone is lowered into the borehole as shown in Figure 2- 5. Then, air is pumped into the air bag to fix the geophone to the casing (PVC pipe) at 1 m interval in depth basically.



Figure 2- 5: Geophone in the Borehole

e) Excitations are generated by hitting the wooden plank in three directions by the hammer.



Figure 2- 6: Direction of Excitations

f) Data is recorded in the data acquisition unit. Figure 2- 7 illustrates a typical dataset in obtaining the arrival time of S-wave. Hitting the wooden plank in opposite directions generates signals as shown in the figure. The time that two curves begin to separate is the arrival time of shear wave. By doing the same analysis for every depth, S-wave profiles are obtained throughout the depth of the borehole.

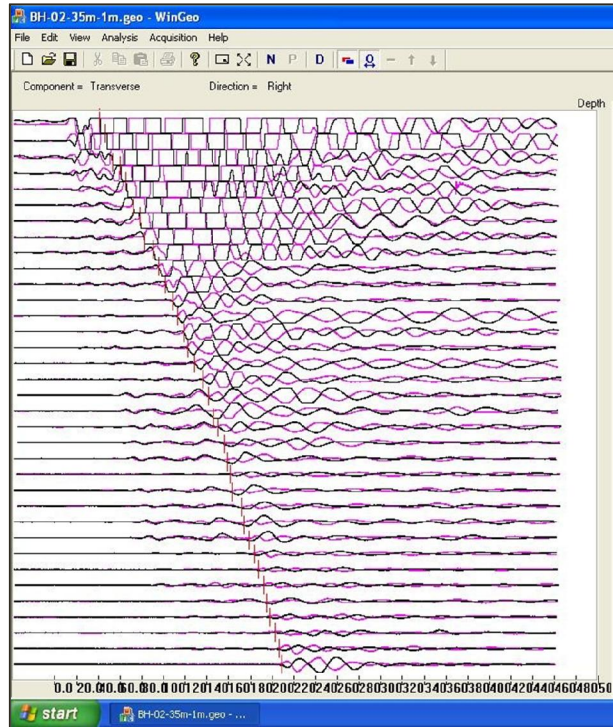
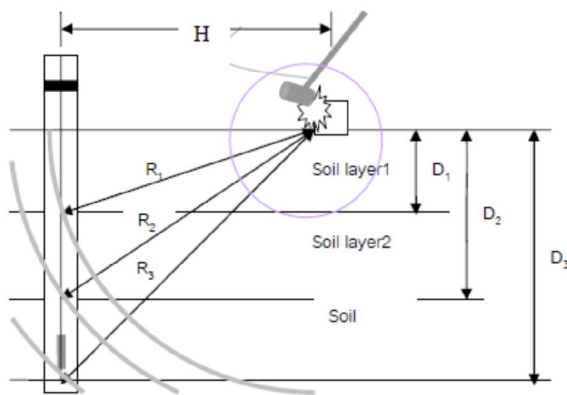


Figure 2- 7: Determination of the Arrival Time of S-wave

g) Using the raw data of the test depth (D_i), the shortest pass (R_i) and the recorded arrival time of S-wave (T_i) according to the AIT's report, the travel time at each test depth (TT_i) is calculated as shown in Figure 2- 8.



$$TT_i = T_i * D_i / R_i$$

where,

TT_i : Travel time at depth "i"

T_i : Arrival time

D_i : Recorded depth from ground surface

R_i : The shortest path from the plank to the geophone

Figure 2- 8: Calculation of the Travel Time

2.1.3. RESULTS

The AVS30 of each PS logging test are tabulated in Table 2- 3. Work plan of the test depth was 30m, however, in some locations did not reach the geophone to the 30 m in depth due to adverse conditions of PVC.

Table 2- 3: Summary of PS Logging Test Result

Union Name	PS ID	Test Depth (m)		Test Result
		From	To	AVS30 (m/s)
Sirta	PS Sirta-01	1	30	187
	PS-Sirta-03	1	30	181
Khagdahar	PS- Khagdahar-02	1	30	178
	PS- Khagdahar-04	1	30	163
Char-Ishwardi	PS-Char-Ishwardia-05	1	30	195
	PS-Char-Ishwardia-07	1	28	189
Dapunia	PS-Dapunia-06	1	30	187
Ghagra	PS -Ghagra-09	1	30	199
	PS-Ghagra-11	1	30	187
	PS-Ghagra-12	1	30	203
Char Nilakshmia	PS- Char Nilakshmia-10	1	30	197
	PS-Char Nilakshmia-08	1	30	181
Bhakhali	PS- Bhakhali-14	1	30	181
Bhangnamari	PS-Bhangnamari-13	1	30	188
	PS-Bhangnamari-15	1	30	185

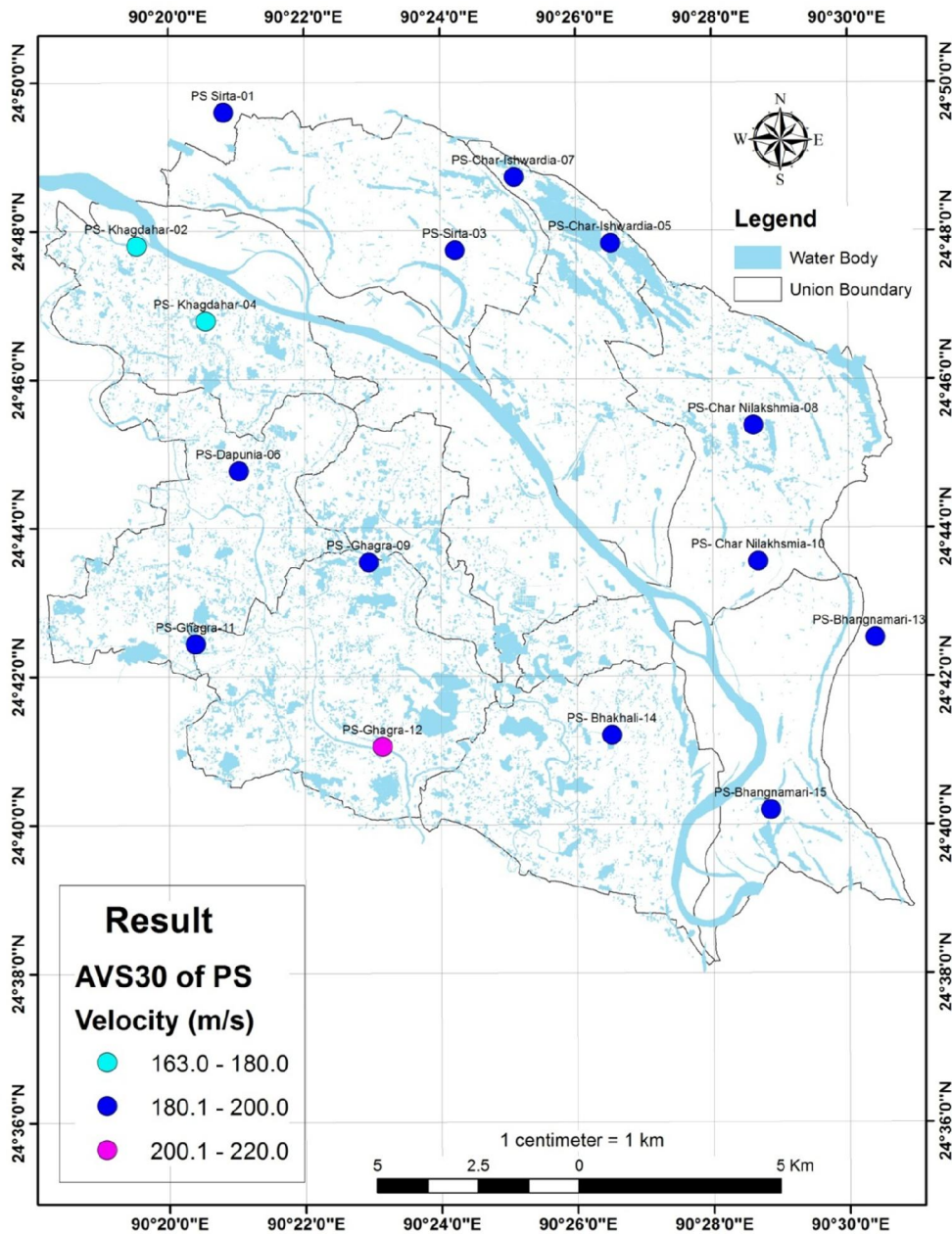


Figure 2- 9: PS Logging Test Location and Result

Preliminary results of the PS logging are as shown in Figure 2- 9.

In here, dynamic characteristics by each soil layer is required for the amplification analysis, consequently, the travel time is prepared / calculated (see Figure 2- 10) for setup of the characteristics.

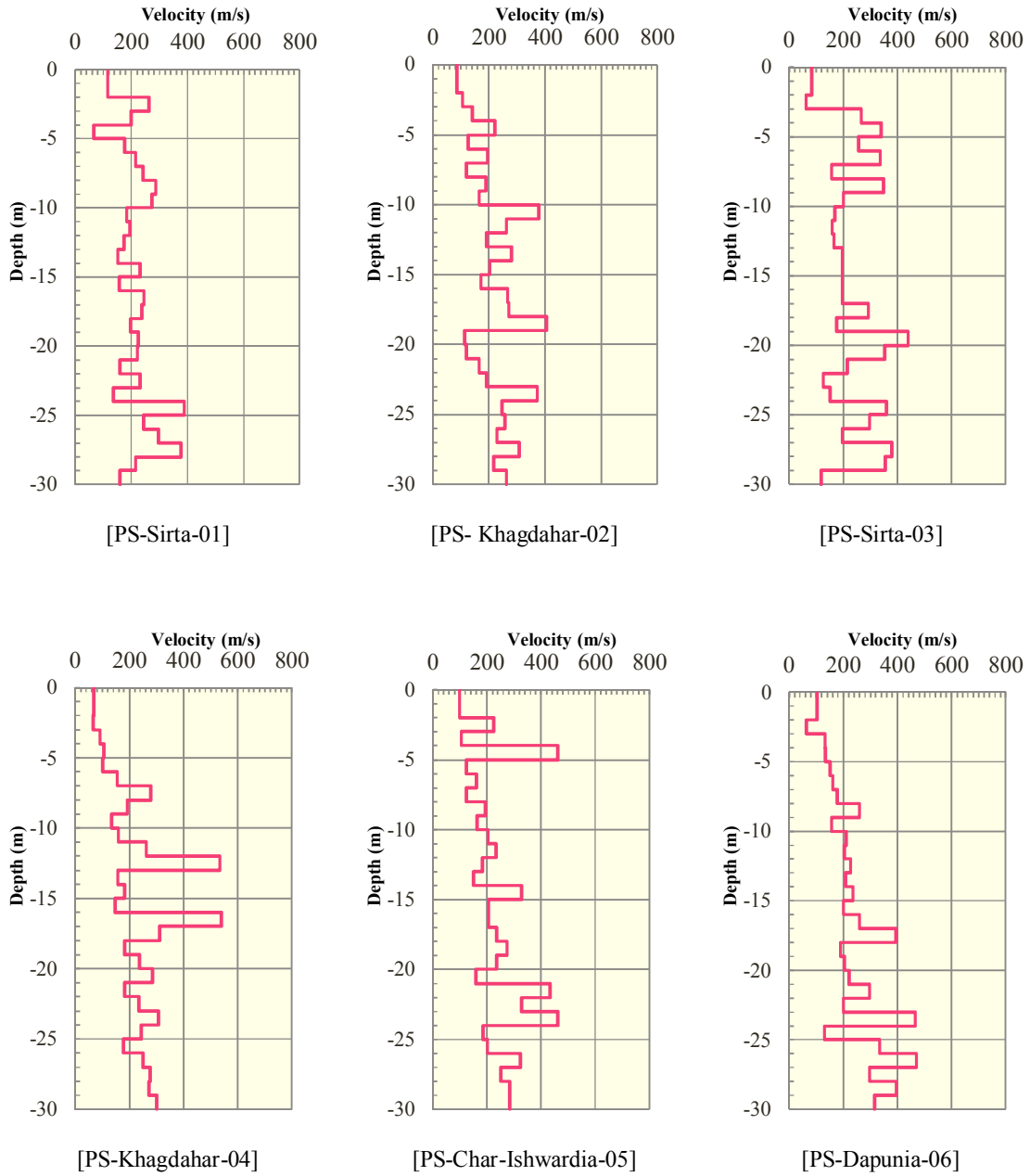


Figure 2- 10 : Preliminary Results of PS logging

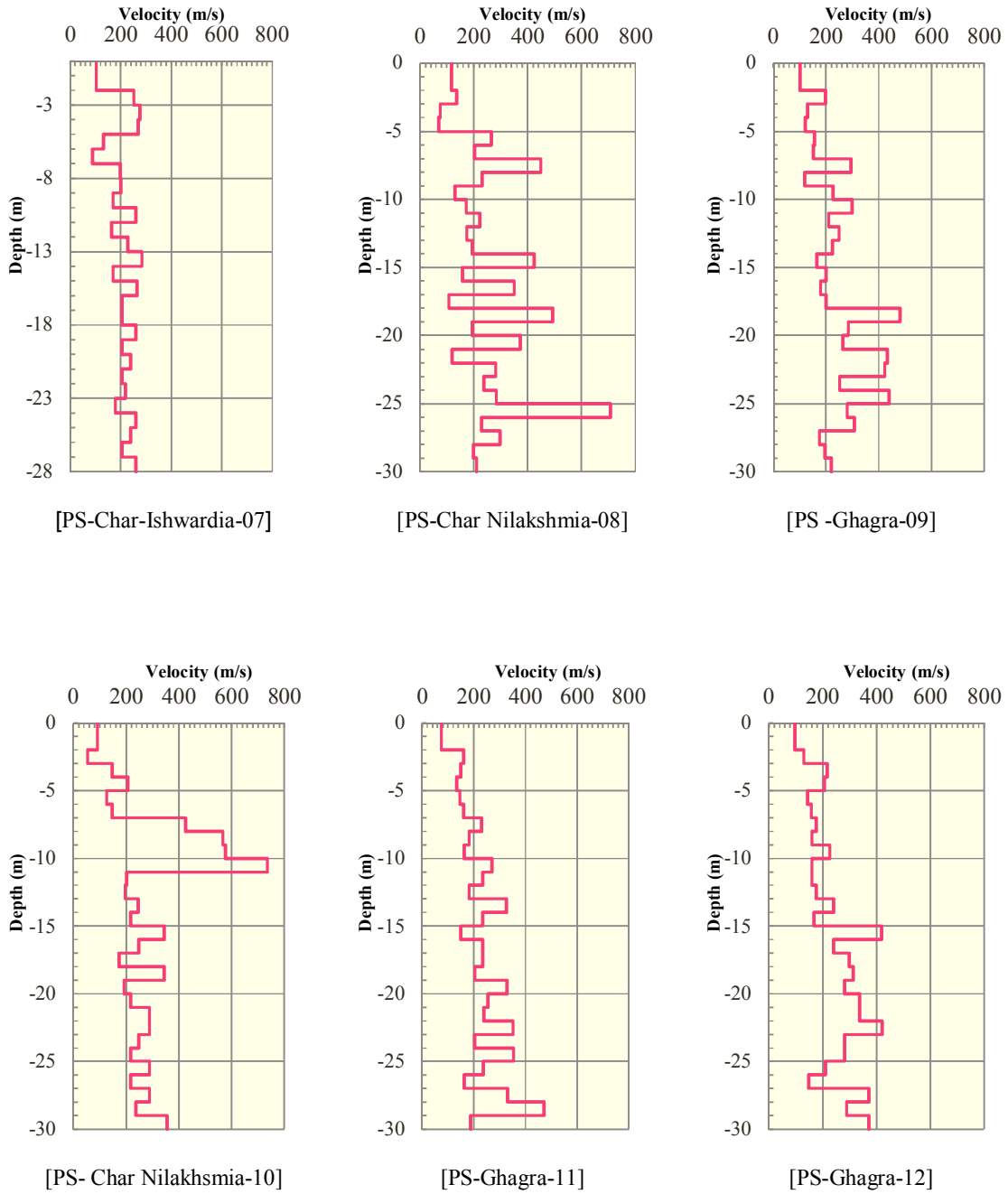


Figure 2-10 (Cont.): Preliminary Results of PS logging

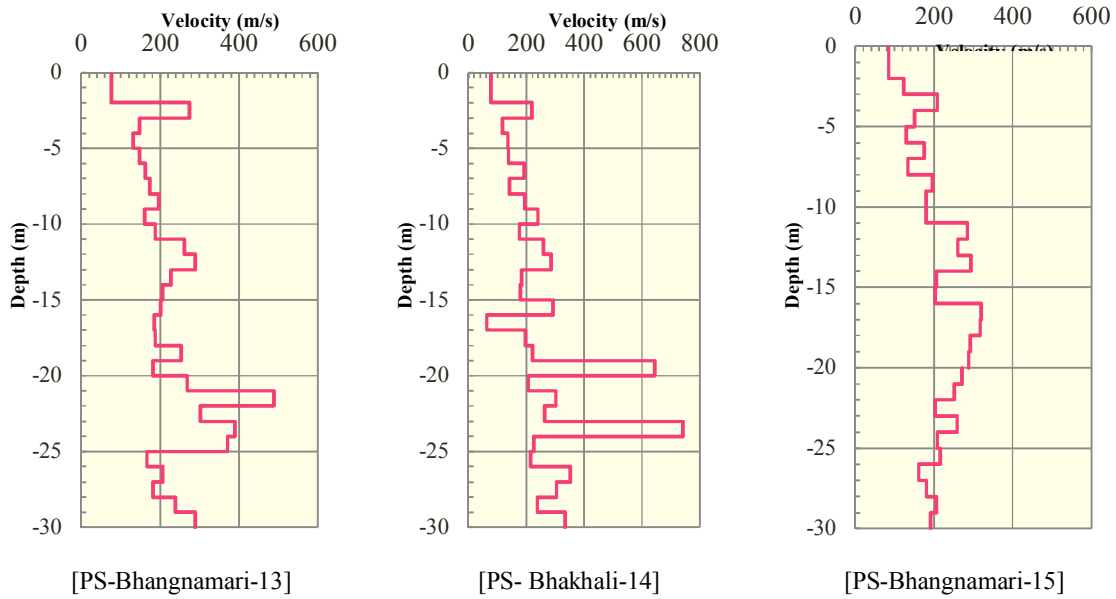


Figure 2-10 (Cont.): Preliminary Results of PS logging

Recommendation

It should be noted that PS logging results provide key properties, such as S-wave velocity, to analyze subsurface amplification, thus increasing PS logging contributes to be the higher accuracy of the geological model in the future in Bangladesh.

2.2 MULTI-CHANNEL ANALYSIS OF SURFACE WAVE (MASW)

Multi-channel Analysis of Surface Wave Survey (MASW) is one of the geophysical surveys to detect the distributions of S-wave velocity V_s profile. 24 channel seismic sensors (receivers) are installed along a line on the ground surface, and acrylic board is installed between each receiver. When shooting an acrylic board by a big hammer, generated elastic wave including different frequencies is received by receivers. In general the higher frequency elastic wave is influenced by the shallower zone of V_s distribution on the contrary; the lower frequency elastic wave is influenced by the deeper zone of V_s distribution. In this principle, the V_s distribution section is analyzed.

The measuring procedure in this project is shown as follows:

- (1) To decide the measuring line
- (2) To set receivers along the line at the ground surface. The intervals of each geophone are 3m.
- (3) To set an acrylic board at a half interval outside the line
- (4) To shoot it vertically. Then generated elastic waves are recorded by receivers.
- (5) To shift the acrylic board between second receiver and the third receiver, and shoot it vertically. Then generated elastic waves are recorded at receivers.
- (6) To iterate this procedure up to setting the acrylic boards at a half interval outside the other side of the line.

The dimension of MASW is as follows:

- Seismic source: hammering (artificial)
- Geophone spacing: 3m
- Number of Geophones: 24
- Measuring line length: 72m
- Shot number: 25 points, 23 between geophones and 2 outside of measuring line.
- Natural frequency of Geophone: 10 Hz
- Sampling rate: 500us-2000Hz
- Measurement duration: 1024ms



Figure 2- 11: MASW Data Acquisition

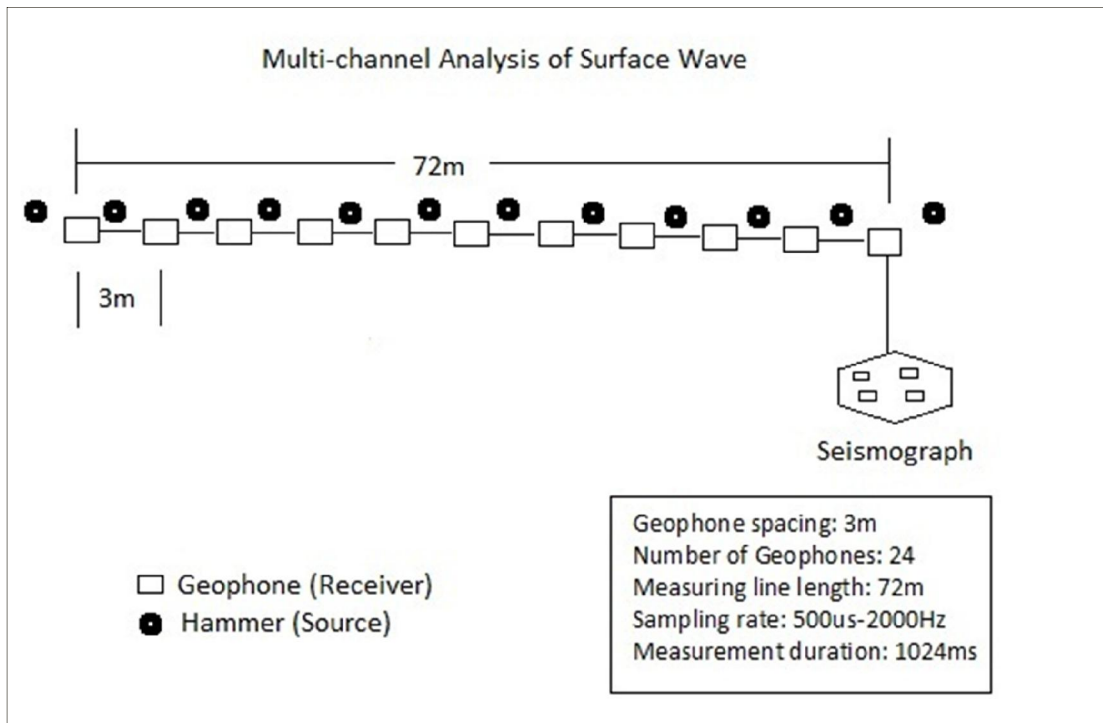


Figure 2- 12: Schematic Diagram for Shallow Seismic Survey

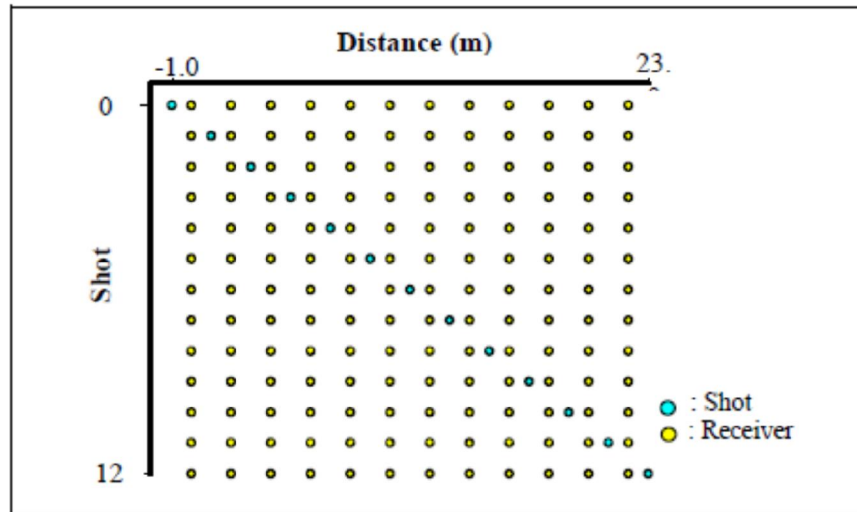


Figure 2- 13: Shot-Receiver Configuration for MASW

2.2.1 ANALYSIS OF MASW

In the phase velocity analysis, SPAC (Spatial Autocorrelation) method (Okada, 2003) is employed. Okada (2003) shows Spatial autocorrelation function $\rho(\omega, r)$ is expressed by Bessel function.

$$\rho(\omega, r) = J_0(\omega r / c(\omega)) \text{ -----(1)}$$

Where, r is the distance between receivers, ω is the angular frequency, $c(\omega)$ is the phase velocity of the waves, J_0 is the first kind of Bessel function. The phase velocity can be obtained at each frequency using equation (1). Figure 2- 14 shows an example of dispersion curve of the survey, the frequency range between 15 and 50 Hz.

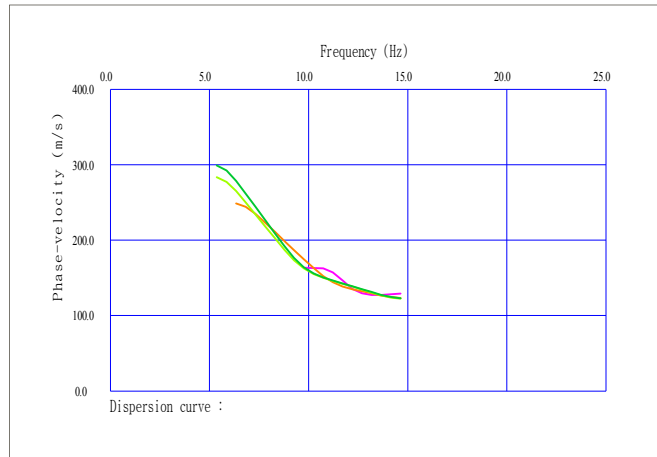


Figure 2- 14: Dispersion Curve

A one-dimensional inversion using a non-linear least square method has been applied to the phase velocity curves. In the inversion, the following relationship between P-wave velocity (V_p) and V_s (Kitsunezaki et. Al., 1990):

$$V_p = 1.29 + 1.11V_s \text{ ----- (2)}$$

Where V_p and V_s are the P-wave velocity and S-wave velocity respectively in (km/sec).

These calculations are carried out along the measuring line, and the S-wave velocity distribution section was analyzed, then summarized to one dimensional structure; SeisImager software can also give a 2-D velocity model (MASW), a sample of which is shown in Figure 2- 15

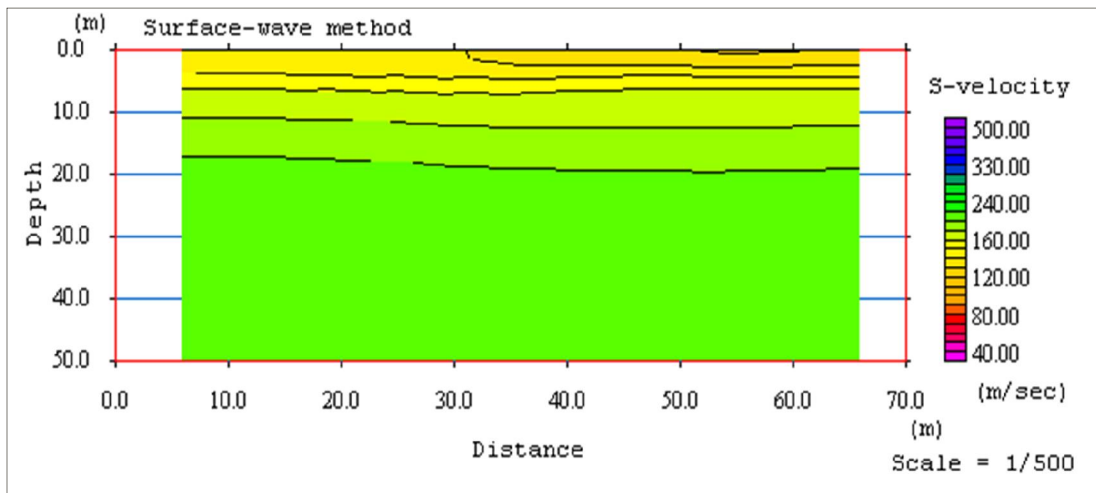
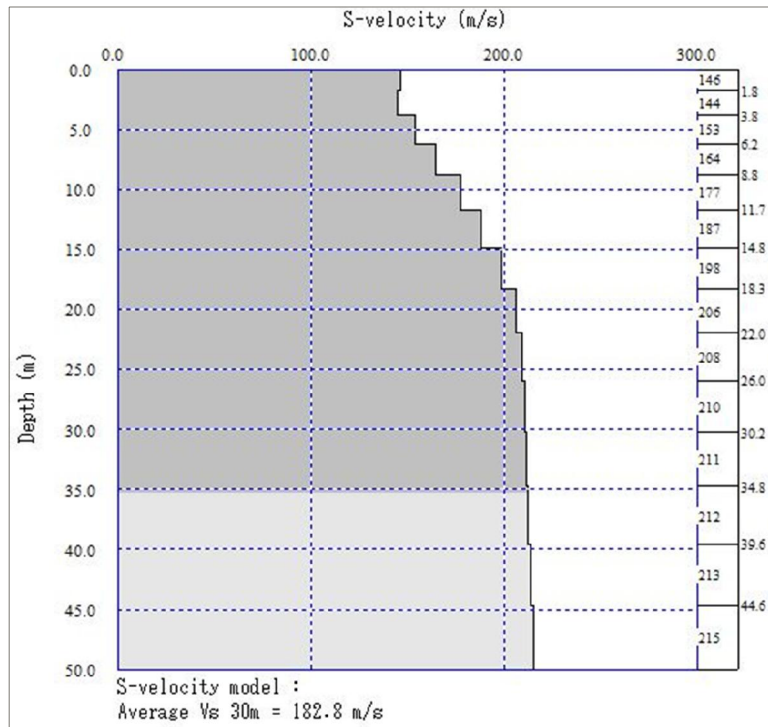


Figure 2- 15: One dimensional Velocity Structure and 2 D velocity Model

At the end of this report all the analyzed data for 25 different locations of MSDP area have been attached at the Appendix IV section

(5) Calculation of AVS 30

The one dimensional V_s structure result of SSMM is finalized combining shallow portion from the MASW result. Then, $AVS30$ can be calculated by both SSMM and MASW results as follows.

$$T_{30} = \sum Vi / Hi$$

$$AVS\ 30 = 30 / T_{30}$$

Where,

Hi : Thickness of i th layer and $30 = \sum Hi$

Vi : S-wave velocity of i th layer

2.2.2 SURVEY RESULT OF MASW SURVEY

Survey location and survey result (AVS 30) in MSDP area are shown in Table 2- 4.

Figure 2- 16 shows the location and result.

Table 2- 4: MASW Survey Result in MSDP area

SL No	Survey ID	Latitude	Longitude	Velocity (m/s)
1	Sirta- 01	24.813361	90.346639	161.2
2	Sirta- 02	24.817778	90.389417	180
3	Char Ishwardia-03	24.81025	90.432917	259
4	Khagdahar-04	24.774879	90.307571	255.8
5	Khagdahar-05	24.778903	90.342506	157.6
6	Khagdahar-06	24.774986	90.383606	161.7
7	Char Ishwardia-07	24.779556	90.420639	178.8
8	Char Nilakshmia-08	24.783028	90.460361	172.6
9	Char Nilakshmia-09	24.77875	90.498694	176.5
10	Dapunia-10	24.754792	90.354628	184.6
11	Akua-11	24.740444	90.382467	182.8
12	Char Nilakshmia-12	24.743472	90.457944	181.4
13	Char Nilakshmia-13	24.741722	90.499722	168.8
14	Dapunia-14	24.700006	90.324478	185.4
15	Ghagra-15	24.706444	90.342444	190.1
16	Ghagra-16	24.702614	90.373419	187.2
17	Baira-17	24.697667	90.424889	182.8
18	Bhangnamari-18	24.707819	90.468261	174
19	Bhangnamari-19	24.700817	90.506133	166.1
20	Ghagra-20	24.696556	90.3245	249.7
21	Ghagra-21	24.678181	90.404473	184.8
22	Bhabkhali-22	24.668828	90.436606	202.7
23	Bhabkhali-23	24.657483	90.454506	181.1
24	Bhabkhali-24	24.635017	90.462211	187.1
25	Bhangnamari-25	24.651919	90.512519	208.3

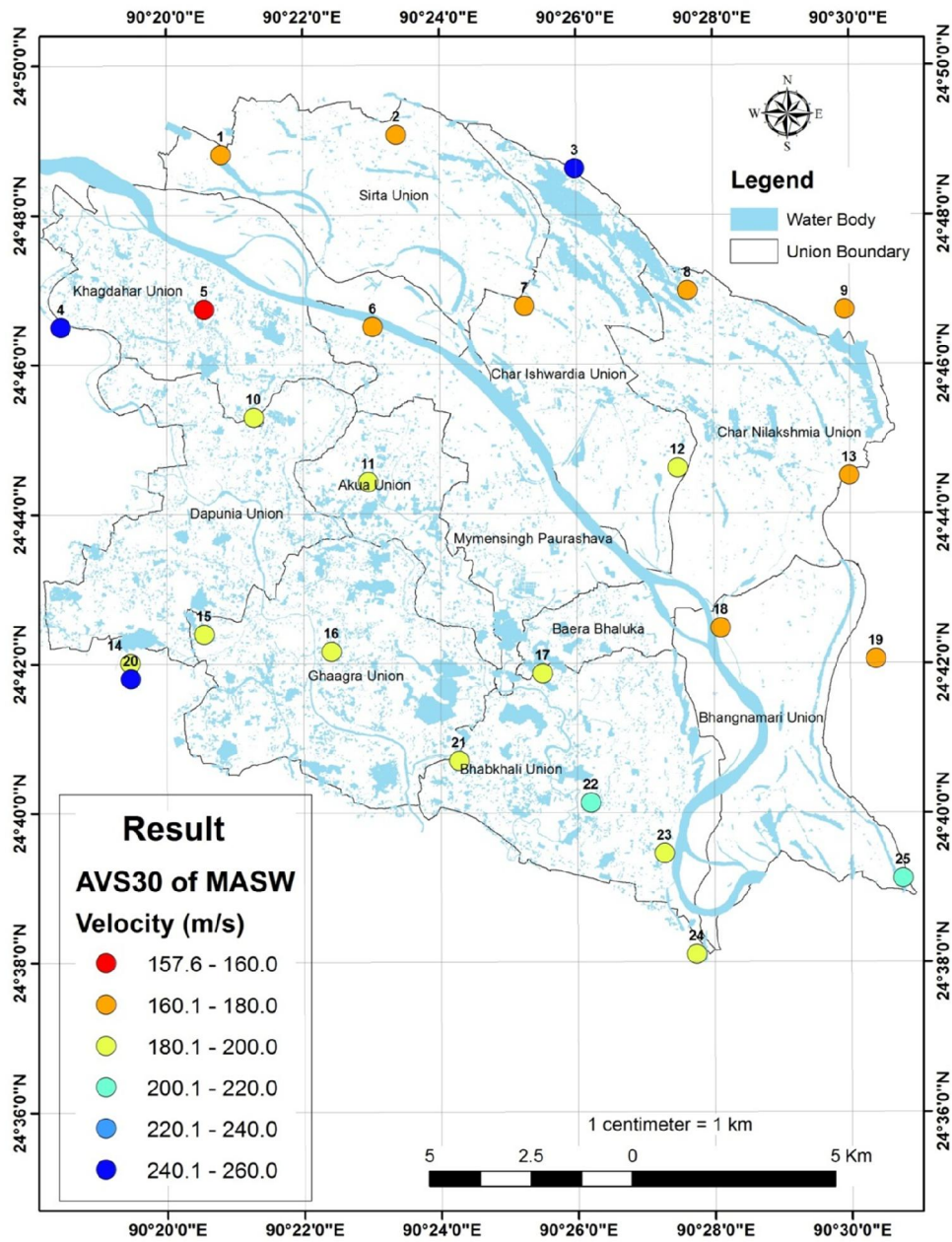


Figure 2- 16: Location and AVS 30 of MASW Survey in MSDP area

2.3. SINGLE MICROTREMOR MEASUREMENT (SINGLE MT)

2.3.1. METHODOLOGY OF SINGLE MICROTREMOR MEASUREMENT

Microtremors are the phenomenon of very small vibrations of the ground surface even during ordinary quiet time as a result of a complex stacking process of various waves propagating from remote man-made vibration sources caused by traffic systems or machinery in industrial plants and from natural vibration caused by tidal or volcanic activities.

Observation of microtremors can give useful information on dynamic properties of the site such as predominant period and amplitude. Microtremor observations are easy to perform, inexpensively and can be applied to places with low seismicity as well. Hence, Microtremor measurements can be used conveniently for seismic microzonation. More detailed information on V_s profile of the site can be obtained from microtremor array observation rather than single microtremor observation.

However, especially for single H/V microtremor measurement, there are various misunderstanding on their characteristics. The first one is that even though Microtremor must be the signal not the noise from apparent artificial and natural vibration sources. Then, the most careful and severe wave form sampling for analysis is required avoiding such noises.

Also many experts have raised the issue of amplification characteristics between during earthquakes and measured value of H/V spectra. They say sometimes H/V spectral ration cannot be used for amplification of earthquake motion analysis.

2.3.2. FIELD SURVEY

Microtremor observations are performed using portable equipment, which is equipped with a super-sensitive sensor, a wire comprising a jack in one site and USB port in another site, and a laptop computer GEODAS (Geophysical Data Acquisition System) made by Buttan Service Co. Japan (Figure 2- 17), is used for the data acquisition.



Figure 2- 17: Super-Sensitive Portable Seismometer

The microtremor equipment has been set on the free surface on the ground without any minor tilting of the equipment. The N-S and E-W directions are properly maintained following the directions arrowed on the body of the equipment. The sampling frequency for all the measurements is set at 100 Hz. The low-pass filter of 50 Hz is set in the data acquisition unit. Like the seismometer or accelerometer, the velocity sensor used can measure three components of vibration: two horizontal and one vertical. The natural period of the sensor is 2 sec. The available frequency response range for the sensor is 0.5–20 Hz.

A global positioning system (GPS) is used for recording the coordinates of observation sites.

Three-components (NS, EW, and UD) of microtremors are observed during 20 minute.

Note: Quality control of the observation in Japan

(According to “The Society of Exploration Geophysicists of Japan, 2004, Application of Geophysical Methods to Engineering and Environmental Problems, 17 Microtremor”)

(1) It is desirable to monitor waveforms of the recorded microtremors during observation, and inspect for the absence of noise, and for the presence of typical-waveforms. Postpone the measurement whenever deemed necessary, since good records may not be expected when it is windy or raining heavily.

(2) When observing microtremors, avoid noise coming from the surrounding local environment, and take detailed note of sources if local noise unavoidably occurs.

(3) At the conclusion of the observation, check if all the data are stable and noise-free for all array stations. Re-measure if poor records are observed.

(4) In order to gain information on the stationary of the microtremor signal, two to three recordings should be obtained with continuous records of for around 5-10 minutes.

For observations using longer-period microtremors, the length of record for each observation should be 30-60 minutes.

2.3.3. DATA PROCESSING

The following data processing should be conducted for microtremor measurement generally.

Unfortunately, in many cases especially for single H/V microtremor measurement, less quality data have been used due to less keeping the followings in Japan (SEGJ, 2004).

(1) Compile the records (analog or digital form) in time-series waveforms for each observation point and each azimuth orientation. Reconfirm the location, orientation, channel number, gain and filter parameters based on the field notes.

Note these parameters on a data sheet.

(2) Choose several contiguous sections with a minimum of unexpected artificial noise from the time-series waveform data, for analysis.

In this project, 3 series of 20 seconds data set are sampled for analysis.

2.3.4. ANALYSIS

After sampling appropriate waveform data for analysis followed above process, the following process is conducted.

- (1) The waveform time-series data is normally recorded as variation of voltage. It should be calibrated to velocity/acceleration equivalent as absolute values for vibration.
- (2) The essential requirement in analysis of microtremor data is to determine the predominant period of the ground from the peak frequency as recognized on the Fourier spectrum or the power spectrum. In some cases, a more stable predominant frequency can be obtained by averaging spectra from different segments of data or stacking with many data sets.
- (3) When microtremor data is acquired at several depths such as at the surface, the boundary of geological layers, and the top of the basement formation, spectral-ratio analysis should be included in the processing as consistent with the objective of the investigation.
- (4) When single H/V microtremor measurement, two spectra of horizontal components should be combined to one representative horizontal component by several methodology (ensemble average, root mean square etc.), and after then divided by vertical component spectra then, H/V spectra can be calculated.

Note: Many analysis conductors consider that in many cases, due to dividing horizontal component by vertical component, noises may be cancelled and less taken into consideration of noises for microtremors. This often provides incorrect analysis results.

- (5) When reading predominant periods or frequencies from analyzed spectra, only maximum amplitude is not the factors. It is common in geophysical exploration, the proper interpretation with other information such as geology; geomorphology etc. as well as expert's judgment must be required. In many cases only reading the maximum peaks and simply contouring provide often incorrect or strange results.

It is usual that several peaks appear in a spectrum, and these peaks are due to the effects of soil layer boundaries. Since, it is not so easy to identify which layer correlates to which peak, comprehensive interpretation is inevitable.

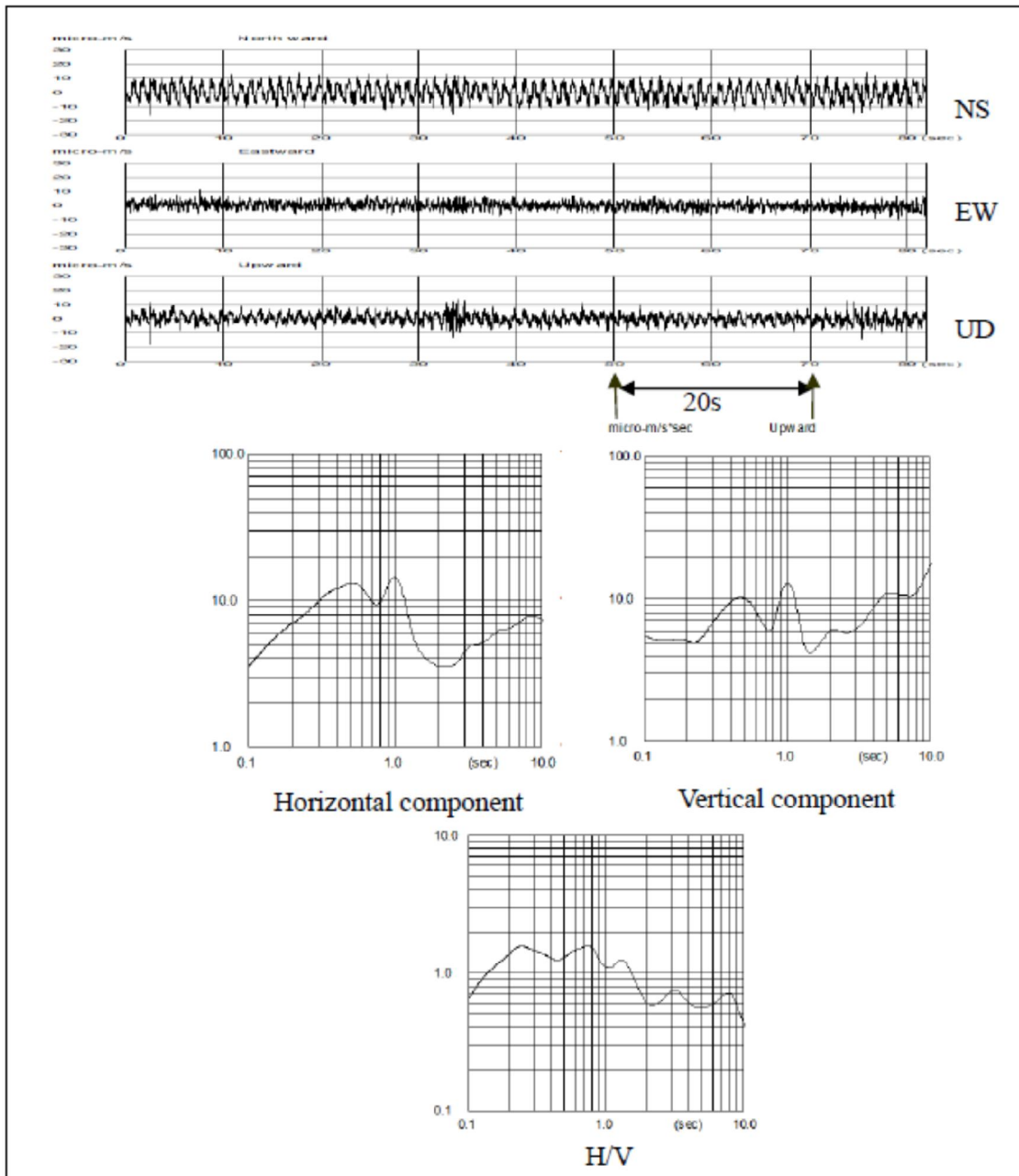


Figure 2- 18: shows the example of H/V analysis.

2.3.5. SURVEY RESULT OF SINGLE MT

Table 2- 5 show the survey locations and results in MSDP area. The location and results map in MSDP area are shown in Figure 2- 19 and Figure 2- 20.

However, these predominant periods are getting from simple reading of maximum peaks in the range of 0.1 to 2 seconds. As far as the observations so far, the waveform for analyses include various apparent artificial noises that should violate the spectra. It leads unreasonable results. Therefore, it is clear that more judgment and analyses is necessary and needs more time for getting reasonable results.

Table 2- 5: Location and Result of Single Microtremor Measurement in MSDP area.

Union Name	MT ID No	Location Name	Lat	Long	Peak Amplitude	Peak Period
Khagdahar	MT-Khagdahar-10	Montola Bazar	24.760833	90.370556	1.888	0.73
	MT-Khagdahar-05	Taragas mosque	24.794167	90.3325	0.97	0.28
	MT-Khagdahar-04	Bariyaner mor	24.799722	90.321667	2.041	0.68
	MT-Khagdahar-11	Mayis Bari	24.804167	90.313889	1.539	0.73
	MT-Khagdahar-12	Kolma	24.759722	90.365833	2.012	0.79
	MT-Khagdahar-06	Kaddura Bazar	24.780425	90.363897	1.932	0.68
Dapunia	MT-Dapunia-29	Majihati	24.701	90.3342	1.956	0.85
	MT-Dapunia-24	Katlasen	24.715072	90.319392	1.875	0.79
	MT-Dapunia-17	North Dapunia Bazar	24.744689	90.361531	1.505	0.51
	MT-Dapunia-16	Sosjomala	24.741728	90.332281	2.33	0.79
	MT-Dapunia-23	Borreri Chonder Bazar	24.710881	90.303864	1.91	0.79
Sirta	MT-Sirta-07	Vobanipur Bazar	24.796517	90.393522	2.452	0.85
	MT-Sirta-08	Anondipur	24.797269	90.437683	2.224	0.93
	MT-Sirta-03	Chor khoriccha	24.821631	90.395011	2.313	0.85
	MT-Sirta-02	Dumkona	24.822214	90.364683	1.896	0.85
Char Ishwardia	MT-Char Ishwardia-13	Chor Issordia	24.768639	90.417414	2.466	0.85
	MT-Char Ishwardia-19	Chor Kalibari	24.770281	90.423744	2.677	0.85
	MT-Char Ishwardia-09	Chor Horipur	24.796147	90.446147	2.143	0.79
	MT-Char Ishwardia-20	Kalibari	24.744861	90.451869	1.969	0.73

Union Name	MT ID No	Location Name	Lat	Long	Peak Amplitude	Peak Period
Char Nilakshmia	MT-Char Nilakshmia-14	Somuganj, Noyapara	24.769739	90.450319	1.786	0.79
	MT-Char Nilakshmia-15	Bakerganj	24.770769	90.480944	1.581	0.73
	MT-Char Nilakshmia-21	Rakobpur	24.743775	90.482122	2.15	0.85
	MT-Char Nilakshmia-22	Koltapara	24.747833	90.507033	2.178	0.6
	MT-Char Nilakshmia-27	Agricultural University	24.714556	90.449681	2.33	0.79
Akua	MT-Akua-18	Morolpara	24.743694	90.393972	0.774	0.85
Ghagra	MT-Ghagra-25	Sohila(Budbaria)	24.720903	90.358453	2.055	0.85
	MT-Ghagra-26	Ujan Ghagra	24.720644	90.394942	2.099	0.85
	MT-Ghagra-30	Gopal Nagar	24.689925	90.362286	2.073	0.57
	MT-Ghagra-31	Vati Ghagra	24.684639	90.390367	1.845	0.64
	MT-Ghagra-35	Doler Par Majihati	24.675836	90.348175	2.034	0.85
Bhabkhali	MT-Bhabkhali-38	Narayanpur Chourkai	24.6606	90.453156	2.144	0.68
	MT-Bhabkhali-33	Sutiakhali	24.690933	90.451481	2.116	0.85
	MT-Bhabkhali-36	Pawn Ghagra	24.667628	90.3899	2.286	0.57
	MT-Bhabkhali-32	Chourkai	24.685692	90.419739	1.627	0.79
	MT-Bhabkhali-37	Konaipar	24.659625	90.416964	2.061	0.68
Bhangnamari	MT-Bhangnamari-28	Dubror Chor	24.716181	90.480419	2.891	0.93
	MT-Bhangnamari-34	Gajaria	24.688456	90.480922	2.217	0.85
	MT-Bhangnamari-40	Nawvanga	24.657614	90.51035	2.165	0.68

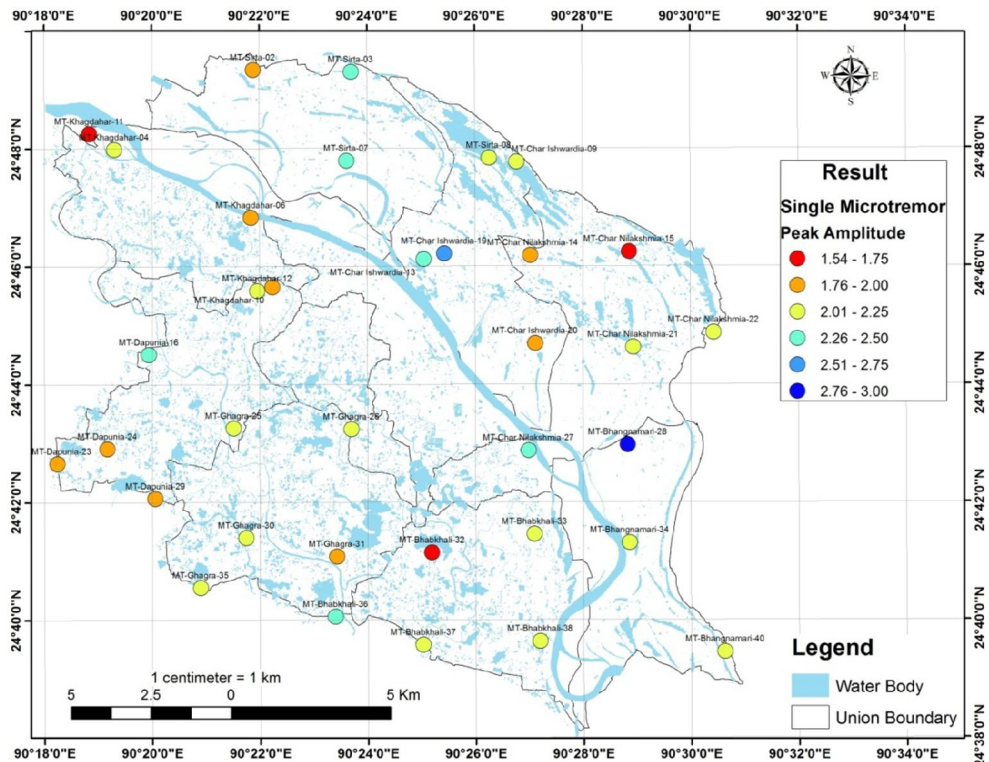


Figure 2- 19: Location and Predominant Period of Single Microtremor in MSDP area.

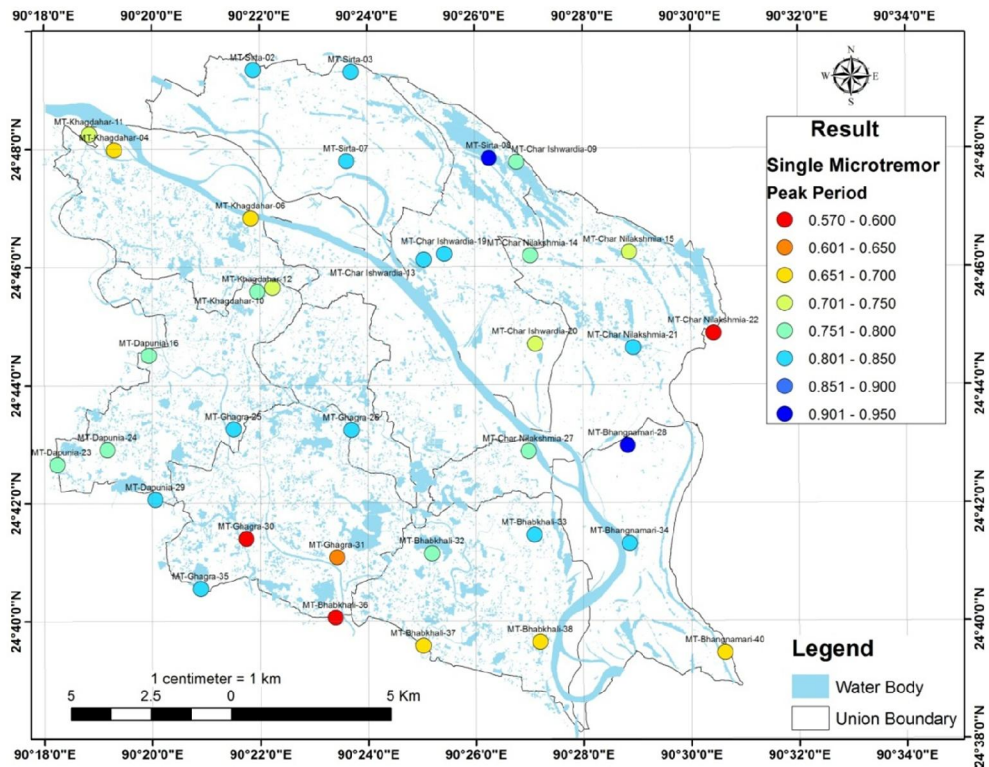


Figure 2- 20: Location and Peak Amplitude of Single Microtremor in MSDP area.

2.4. ARRAY MICRO-TREMOR MEASUREMENT (AMT)

2.4.1. METHODOLOGY AND MEASUREMENT

The purpose of Array Microtremor Survey AMT is to estimate the deeper S-wave velocity (V_s) structure.

Array microtremor measurement uses natural seismic source of microtremor as well as SSMM. Figure 2- 21 shows the schematic diagram of AMT measurement. Detail specification of the measurement is mentioned below.

- (1) Number of Seismometer: 10
- (2) Seismometer configuration: Triangle
- (3) Array size: 50m
- (4) Sampling rate: 10 msec
- (4) Natural frequency of seismometer: 0.5 Hz
- (5) Measurement duration: 45 minutes

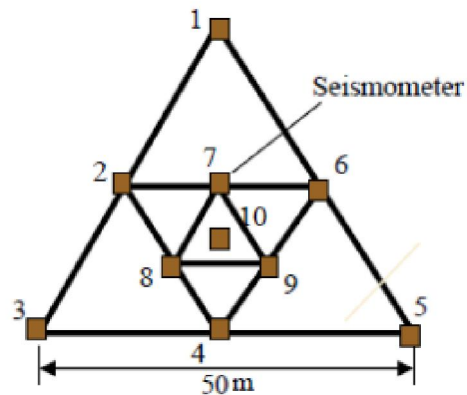


Figure 2- 21: Schematic diagram of AMT

In this survey, phase velocity curves were calculated in the frequency range between 0.5 and 5 Hz. Figure 2- 22 shows one dimensional V_s structure as a sample. A one-dimensional inversion using a non-linear least square method has been applied to the phase velocity curves and one-dimensional V_s structures down to the depth of 100 m are obtained due to array size and seismometer frequency range. The result of one-dimensional V_s structures is interpolated into a three-dimensional structure.

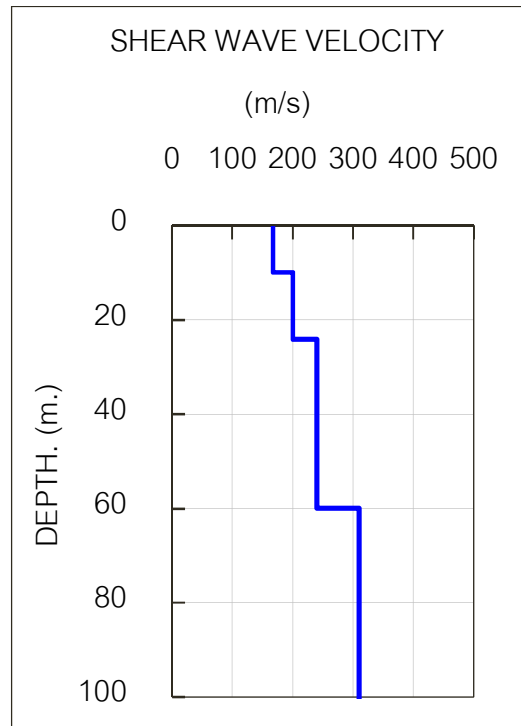


Figure 2- 22: ample of One Dimensional Analysis (AMT)

At the end of this report all the analyzed data for 4 different locations of MSDP area have been attached at the Appendix V section.

CHAPTER 3: ENGINEERING GEOLOGICAL MAP

3.1. DEFINITION OF ENGINEERING GEOLOGICAL MAP

There are many type of “Engineering Geological Map” depending on intended purpose. For instance, when the target is to know suitable foundation soil layer for a planned building, an engineering geology map should have a property of some geotechnical strength, another case, when it is necessary to know groundwater potential for a water development, a map is created on the basis of permeability of soil as a focal point.

In this study, the target is estimation / evaluation of earthquake phenomenon, and seismic characteristic of soil is required for the engineering geology map to analyze seismic hazard. Basic information for the seismic hazard is ground motion at the ground surface, and the ground motion can be usually calculated using S-wave velocity. Hence, the engineering geological map is created on the basis of S-wave velocity.

It is noted that the seismic ground motion analysis, especially calculation of amplification of soil, is examined by an empirical method that uses average S-wave velocity of ground in the top 30m depth (hereinafter referred to as “AVS 30”), because the limited point data that is boring / PS logging data should be expanded to the study area in order to make ground model.

Therefore, “AVS 30 Map” is defined as the “Engineering Geological Map” in this study.

3.2. GEOLOGICAL SUBSURFACE MODEL

3.2.1. OUTLINE

In order to estimate seismic ground motion at ground surface, geological subsurface model in target area is necessary as well as seismic source model. In this study, AVS 30 at each grid (250 m grid is adopted in this study taking into consideration with union area as shown in Figure 3- 1) and AVS 30 Map are created after setup of the geological subsurface model to calculate amplification of subsurface ground.

Using limited data of geology / boring / soil tests, geological classification, relations between Vs and N-value, AVS 30 at boring sites, Holocene deposit distribution and the relationship between Holocene thickness and AVS 30 are estimated.

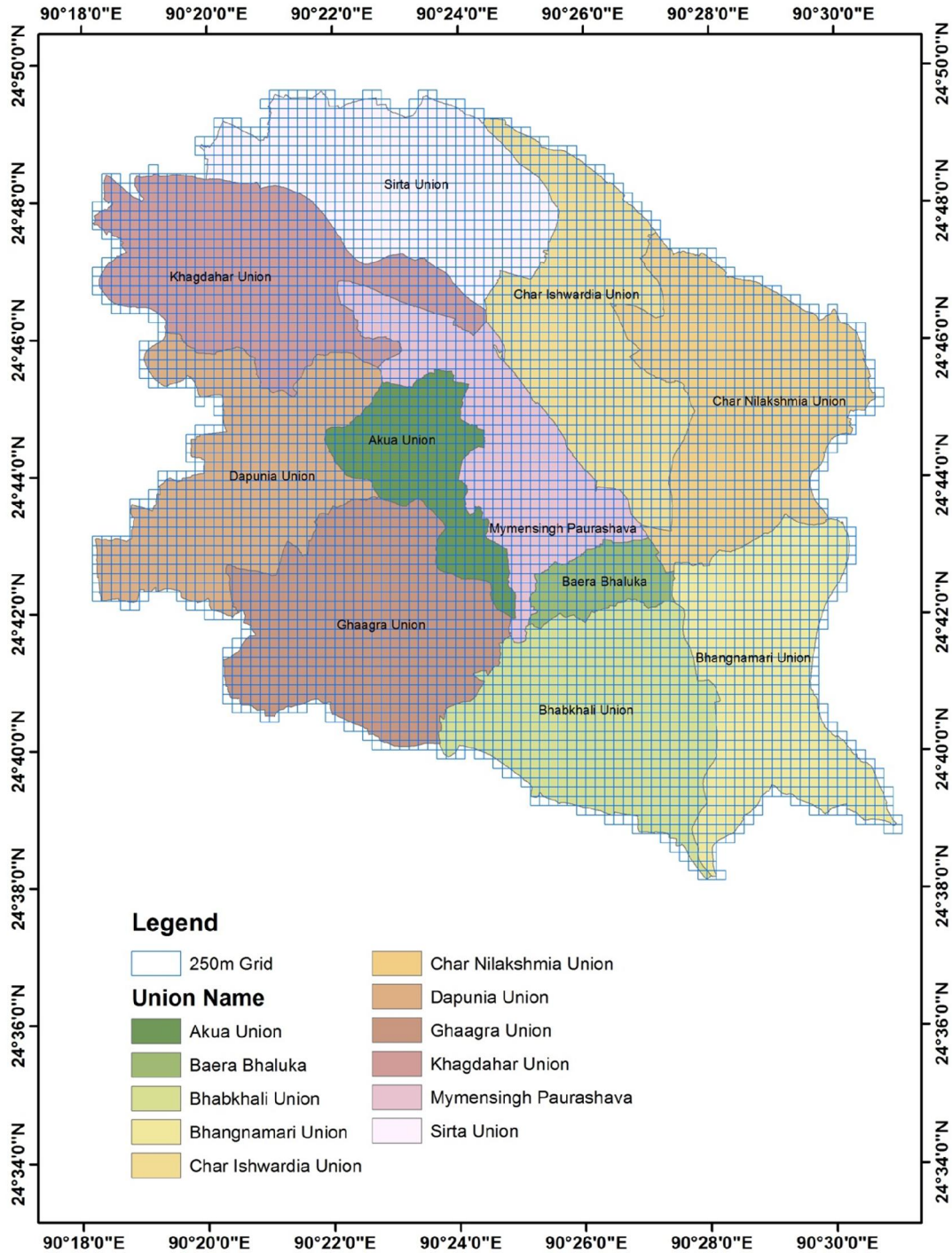


Figure 3- 1: 250 m Grid in MSDP Area with Union Boundary

3.2.2. GEOLOGICAL CLASSIFICATION

The geological layer is classified into 10 types based on soil sample observation from seventy numbers of boring and results of the laboratory test as shown in Table 3- 1.

Table 3- 1: Tabulation of Geological Classification

Age	Formation	Layer	
Holocene	Alluvium	Clayey Soil (H-c)	Layer 1: Soft CLAY / SILTY CLAY
		Sandy Soil (H-S)	Layer 2: Very loose to loose SAND
		Sandy Soil (H-S)	Layer 3: medium dense to very dense SAND
		Clayey Soil (H-c)	Layer 4: Medium stiff CLAY / CLAY WITH SILT
		Sandy Soil (H-S)	Layer 5: Medium dense SAND / SILTY SAND
		Clayey Soil (H-c)	Layer 6: Soft to medium stiff ORGANIC CLAY
Pleistocene	Modhupur Clay	Modhupur Clay (MC)	Layer 7: Medium stiff to stiff CLAYEY SILT
			Layer 8: Medium dense SAND
			Layer 9: Stiff to very stiff SILT / CLAYEY SILT / SANDY SILT
Plio-Pleistocene	DupiTila	DupiTila (DT)	Layer 10: Dense to very dense SAND

The 10 (ten) subsurface soil layers have identified by excavate 70 numbers of boring with SPT at every 1.5m interval. By using those boring data, subsurface lithological 3D model have prepared as shown in Figure 3- 2

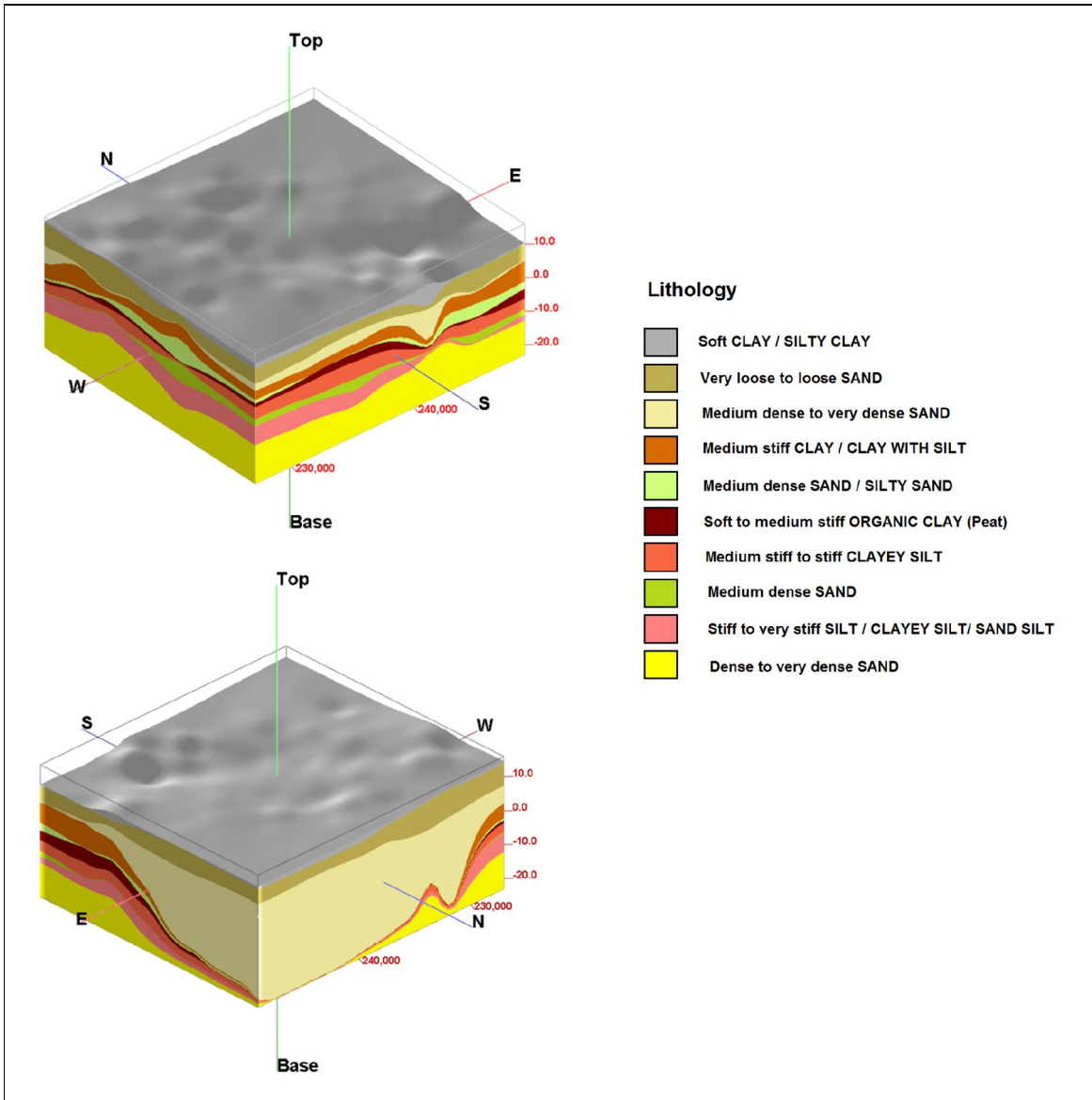


Figure 3- 2: Subsurface lithological 3D model

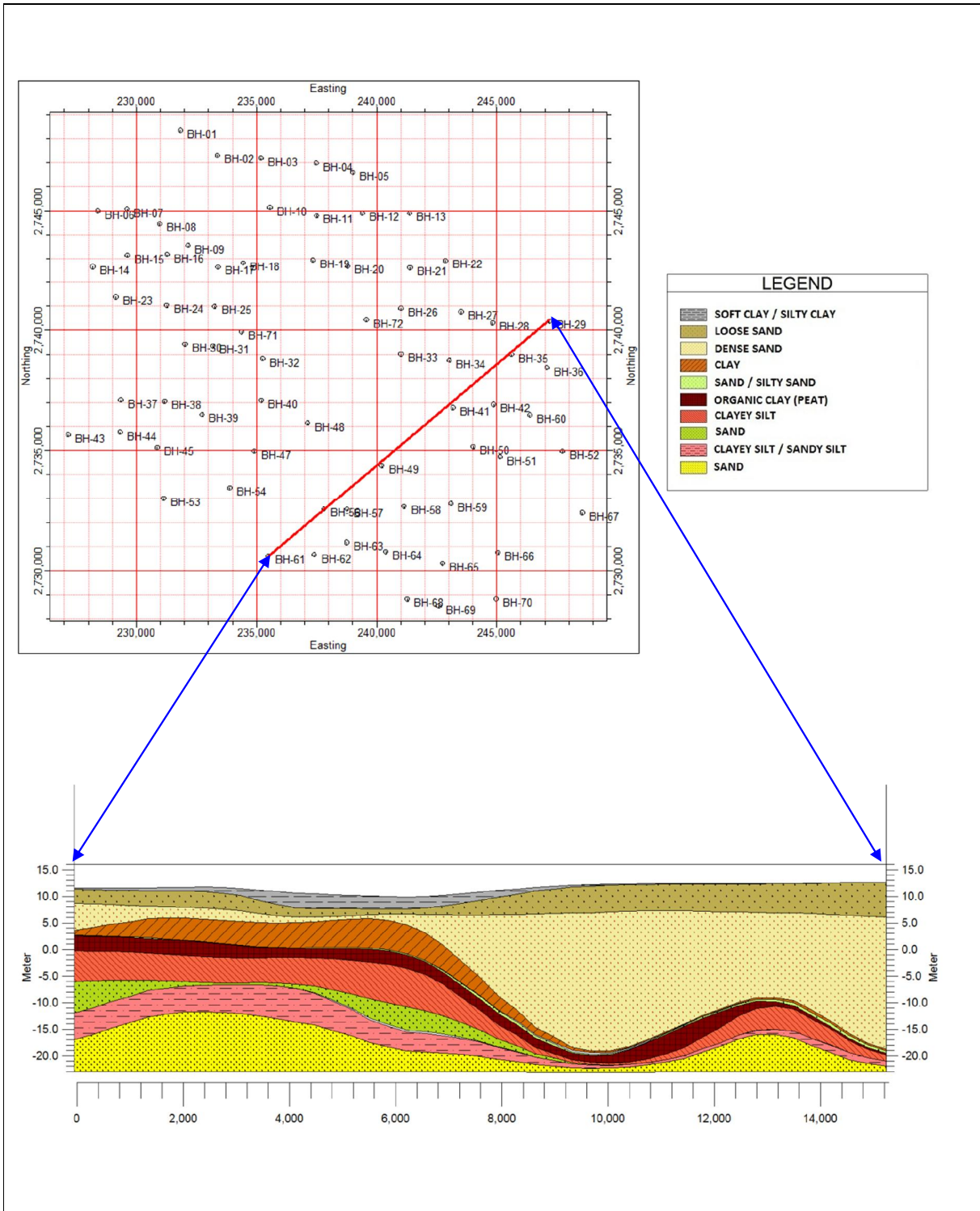


Figure 3- 3: Subsurface cross section along the SW-NS direction of the project area

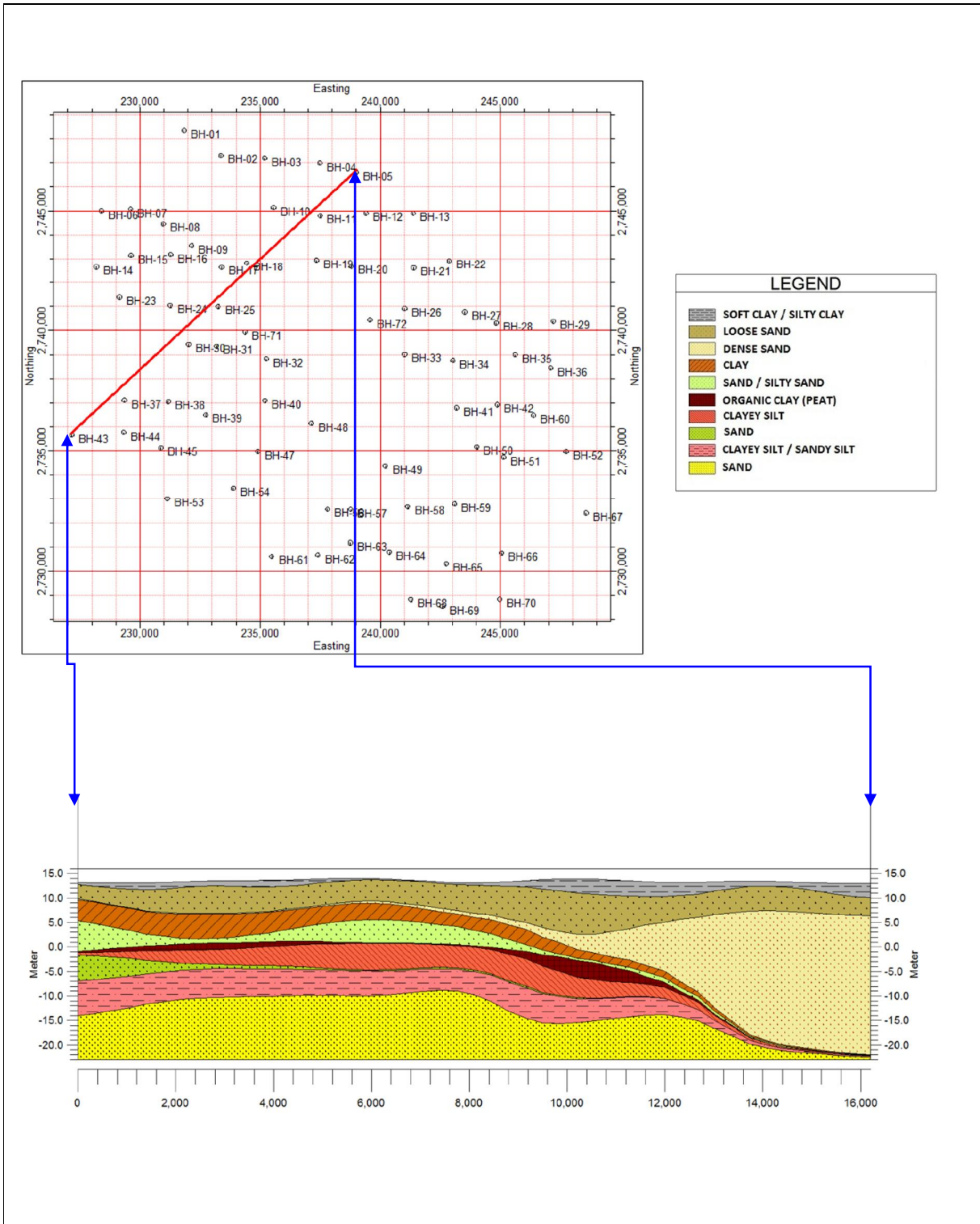


Figure 3- 4: Subsurface cross section along the SW-NS direction of the project area

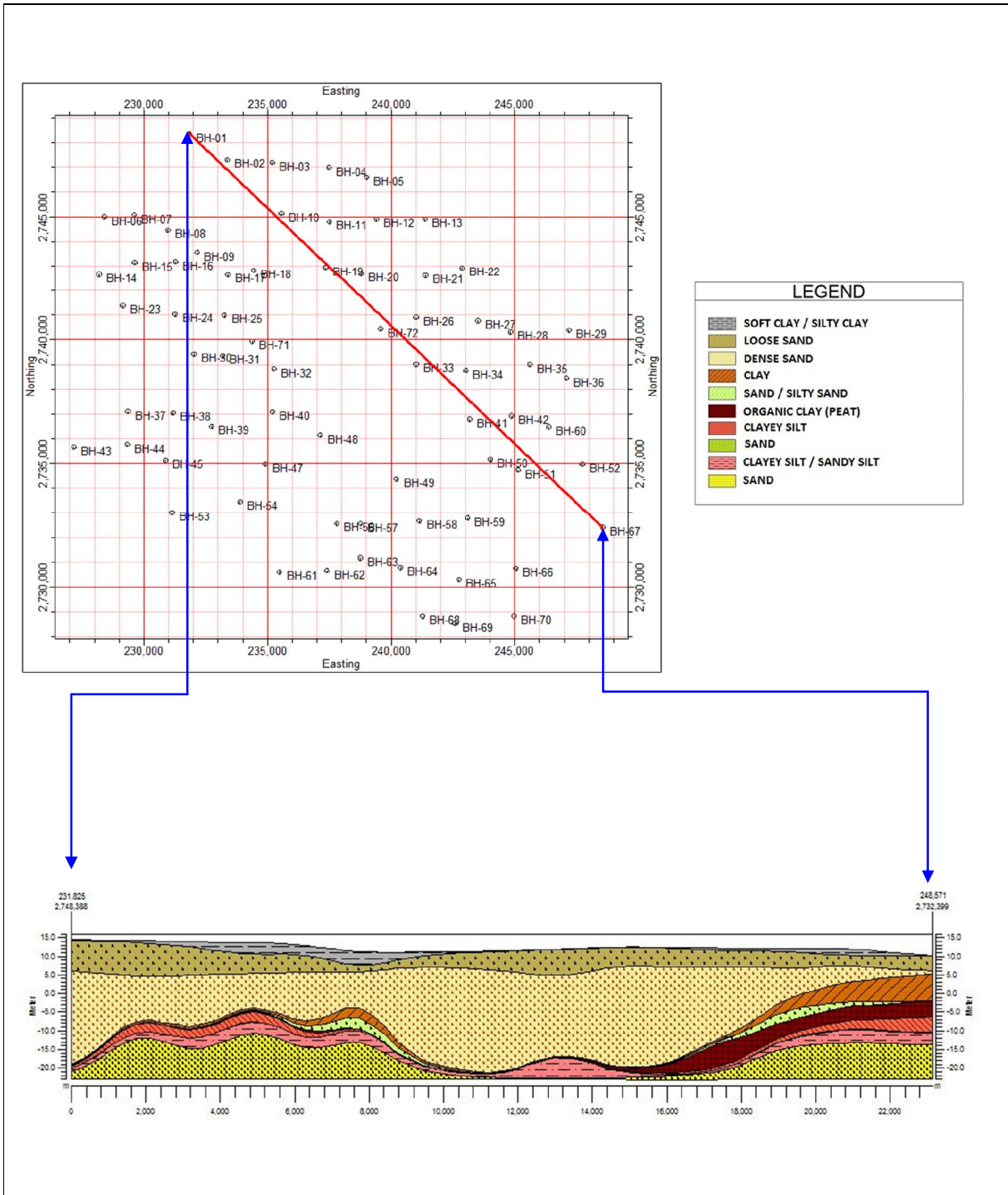


Figure 3- 5: Subsurface cross section along the NW-SE direction of the project area

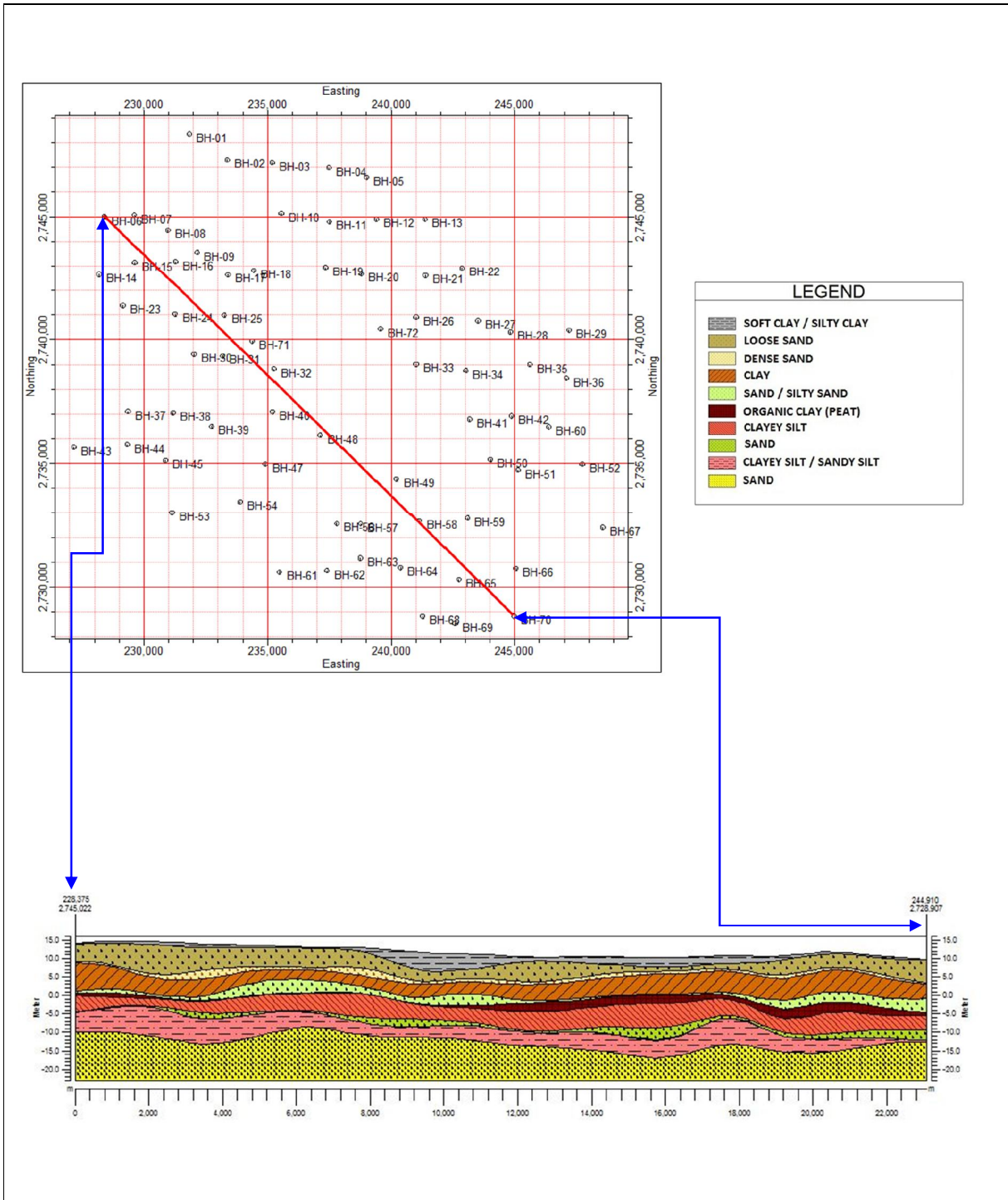


Figure 3- 6: Subsurface cross section along the NW-SE direction of the project area

The project area situated in the central part of Bangladesh comprises of an older flood plain having relatively flat terrain condition with few depressions. The central, north eastern and south western parts of the project area are higher than the surrounded landmass. The area encompasses Brahmaputra River flood plain sediments dominantly comprising of silty clay, organic clay, clay-silt, clayey silt, silty sand of recent alluvium whereas the low lying areas within the project area includes gullies and depressions dominantly comprising of clayey sediments. Considering the surface lithology, the project area comprises of alluvial clay deposits being associate with the flood plain deposits. Flood plain sediments cover the project area which is underlain by Pleistocene Modhupur clay formation followed by the Dupi Tila Formation.

Table 3- 2: Tabulation of Geological Classification (Formations)

Geological Classification	
Recent	Fill (F)
Holocene	Clayey Soil (H-C)
	Sandy Soil (H-S)
Pleistocene	Modhupur Clay (MC)
Pliocene	Dupi Tila (DT)

Alluvial deposits

Alluvial deposits of the Holocene age are dominantly characterized by clayey soil and sandy soil. Thickness of this lithology unit is in its maximum in the eastern side of the Brahmaputra River. This unit is dominated by grey, soft and moderately sticky clayey silt. Few of the boreholes also encountered organic clay (peat) and clay within this unit. Almost all of the boreholes of that sight show this deposit unto the depth they covered. On the other hand, on the western portion of the river the thickness much less and show a more or less linear pattern at their limit. A gradual general decreasing trend in thickness from east to west is observed but the N-E corner is less thick. Thickness of this deposit varies from 7.50m to 30 m.

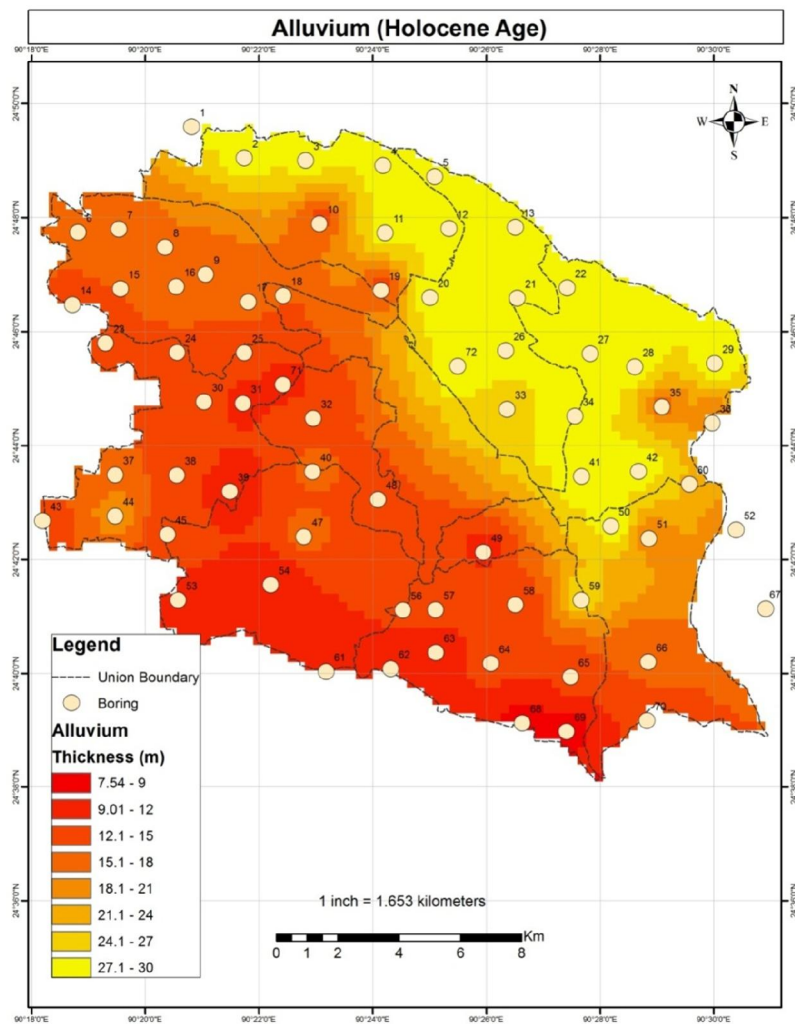


Figure 3- 8: Thickness distribution map of the Holocene soil in the project area.

Modhupur Clay deposit

47 boreholes in the project area confirms the presence of Pleistocene Modhupur Clay Formation. Modhupur Formation is dominantly composed of yellowish brown, stiff and moderately sticky silty clay mixed with fine sand. Some places it is reddish brown to greyish brown in colour. This particular unit also consists of grey, stiff and moderately sticky silt with clay lithology. Thickness varies from 0m to 21m within the project area. SE and SW part attains the maximum thickness (approximately 12m-21m). Boreholes on the NE and northern part don't show any evidence of this formation. A general decreasing trend of thickness of this formation is observed from SW to NE. Though this formation is relatively continuous at the western portion of the Brahmaputra River, but it is discretely found in the eastern portion of the river.

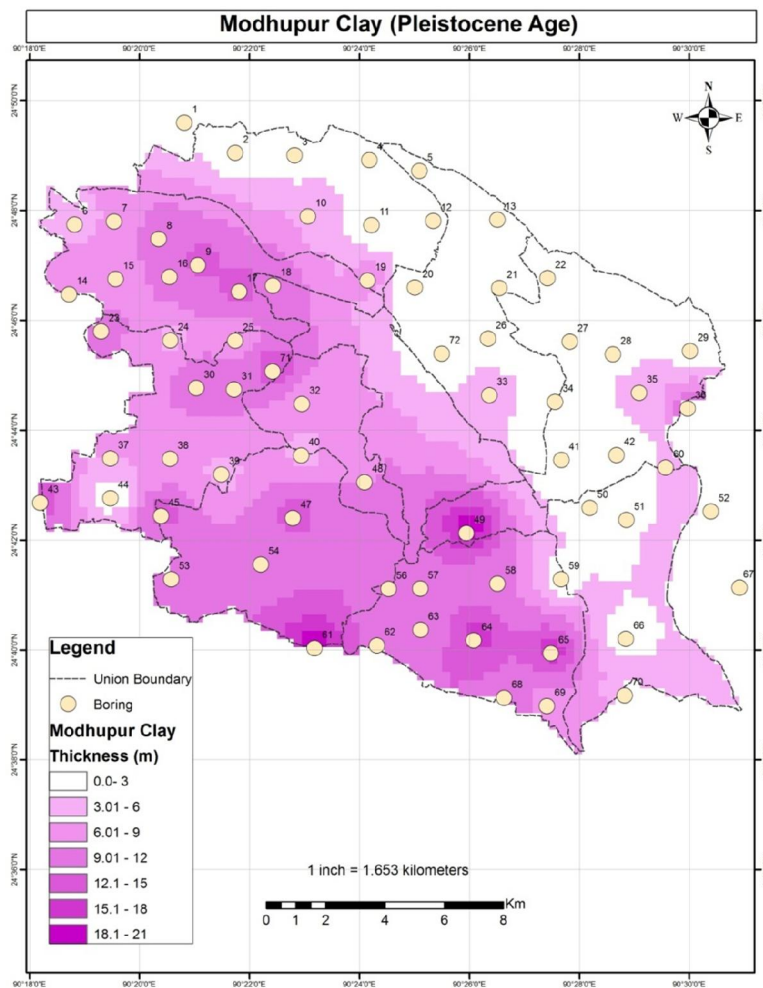


Figure 3- 9: Thickness distribution map of the Modhupur Clay Formation in the project area.

DupiTila Formation

The dominant lithological unit of DupiTila formation is yellowish brown medium dense to dense fine to very fine sand with trace silt and yellowish brown dense to very dense fine to medium sand with trace silt. 39 boreholes show the evidence of this formation present in this area, from the depth approximately of 18.5 meter from the ground surface. The thickness distribution map shows that in the northern corner, middle and NE corner the formation was not found. That means in the eastern portion of the Brahmaputra River this formation is not continuous within the depth covered by the boreholes. In the other areas thickness of this formation is about is 1.5 meter to 15 meter. Maximum thickness was encountered in the southern most corner and in the middle of the western part of the Brahmaputra River. In the western portion of the Brahmaputra river thickness of the formation attains thicker in the middle part whereas a pinching out trend is observed all around. All the geological and geotechnical properties suggest this unit is suitable for foundation layer for any civil structures.

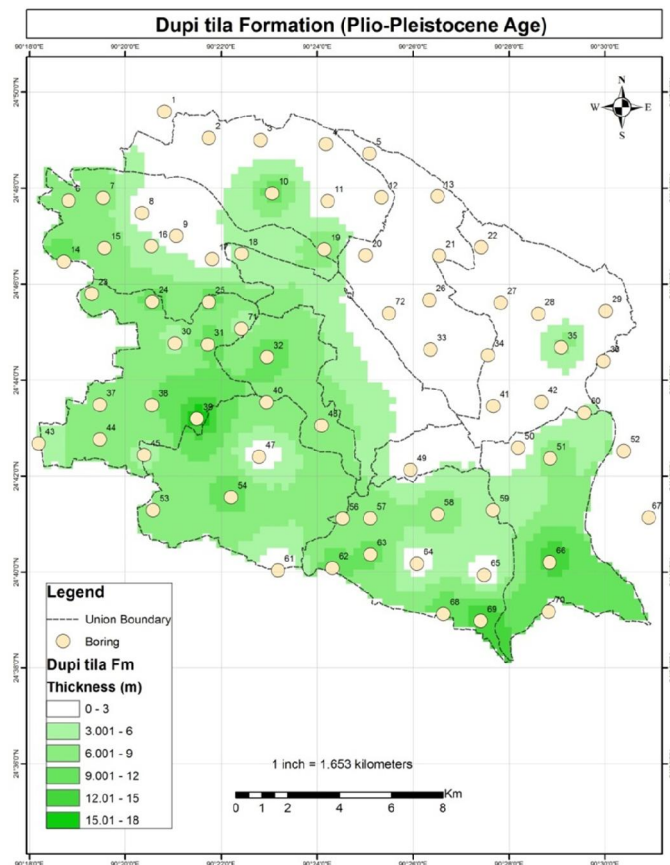
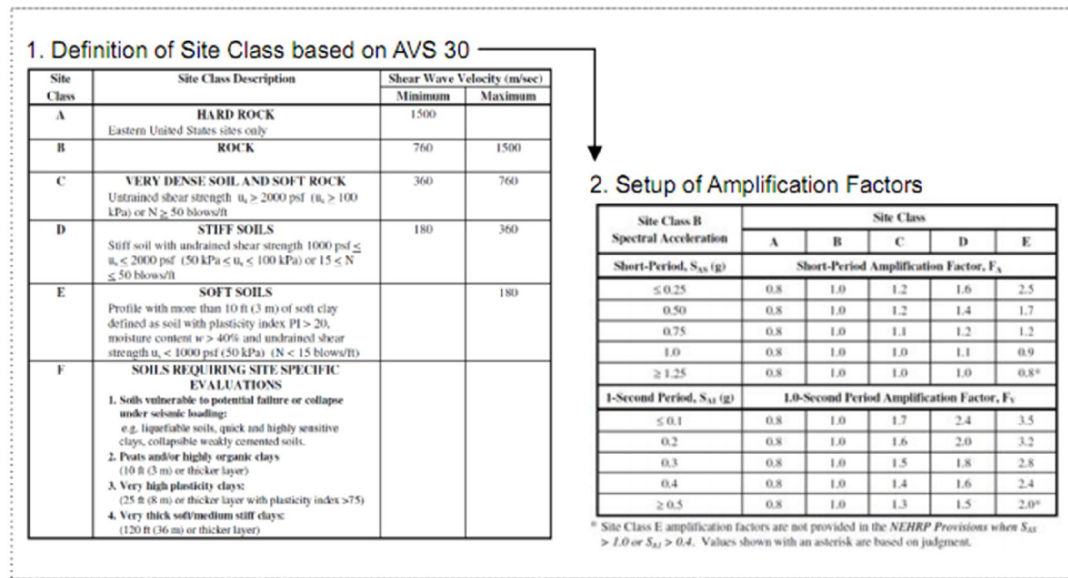


Figure 3- 10: Thickness distribution map of the Dupitila Formation in the project area

3.3. AVS 30 MAP AS AN ENGINEERING GEOLOGICAL MAP

AVS 30 Map is utilized for the amplification analysis such as a method provided by NEHRP (stands for National Earthquake Hazard Reduction Program, USA). NEHRP Provisions describes; at first to define the site class based on AVS 30, and secondly to set the amplification factors by the selected site class, as shown in Figure 3- 11.



[extract from HAZUS-MH MR2 Technical Manual]

Figure 3- 11: Sample of Utilization of AVS 30 for the Amplification Analysis

Figure 3- 12 shows AVS 30 Map of MSDP area based on all the geophysical and geotechnical test results.

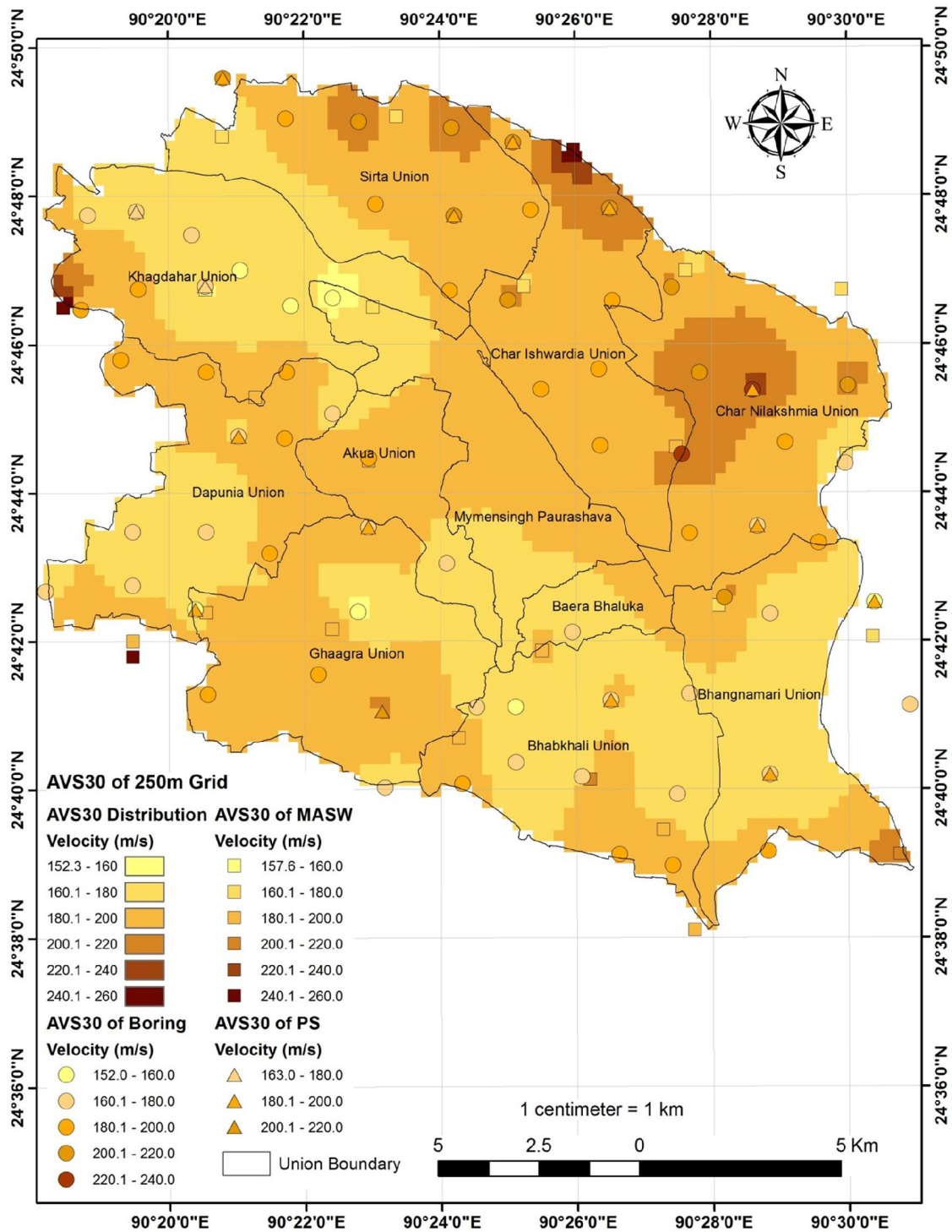


Figure 3- 12: AVS 30 Map in MSDP area.

Appendix

Appendix I: Borehole Geotechnical Logs

Appendix II: Laboratory Test Result and Graph

- a. Grain size analysis determination
- b. Atterberg limits determination
- c. Specific gravity
- d. Unconfined compression strength determination
- e. Direct shear test
- f. Tri-axial test (Undrained Unconsolidation)
- g. Consolidation test

Appendix III: PS Logging Test Result and Velocity Profiles

Appendix IV: Multi-channel Analysis of Surface Wave (MASW) 1D and 2D Models

Appendix V: Array Microtremor Survey Results

Appendix VI: Single Microtremor Survey Results

Appendix VII: Relation between N values and Vs at each Boring

Appendix I: Borehole Geotechnical Logs

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area

Client: Urban Development Directorate (UDD)

Bore Hole No :BH-Sirta 01

Existing Ground Level : 14.5

Location: Haliamari, Sirta, Mymensingh

Date :18-07-2014







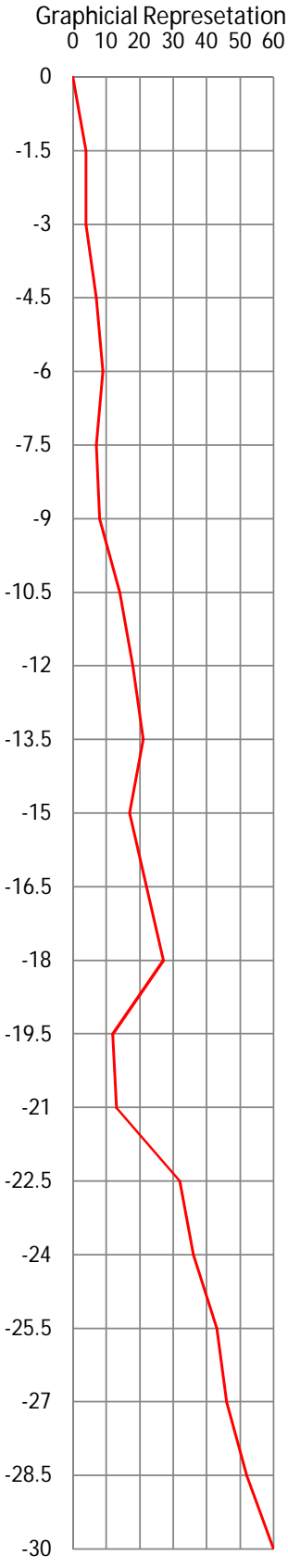



Co-ordinate : Lat- 24° 49'35.571"N Long- 90°20'48.624"

Legend







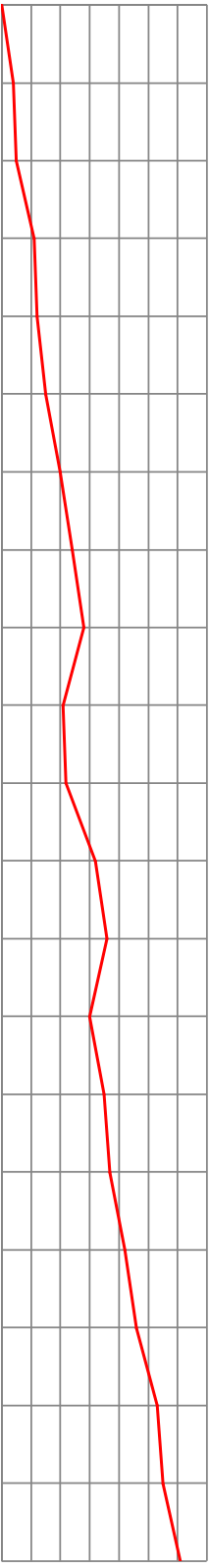




Sand	Clay	Silt	N-Value	Organic

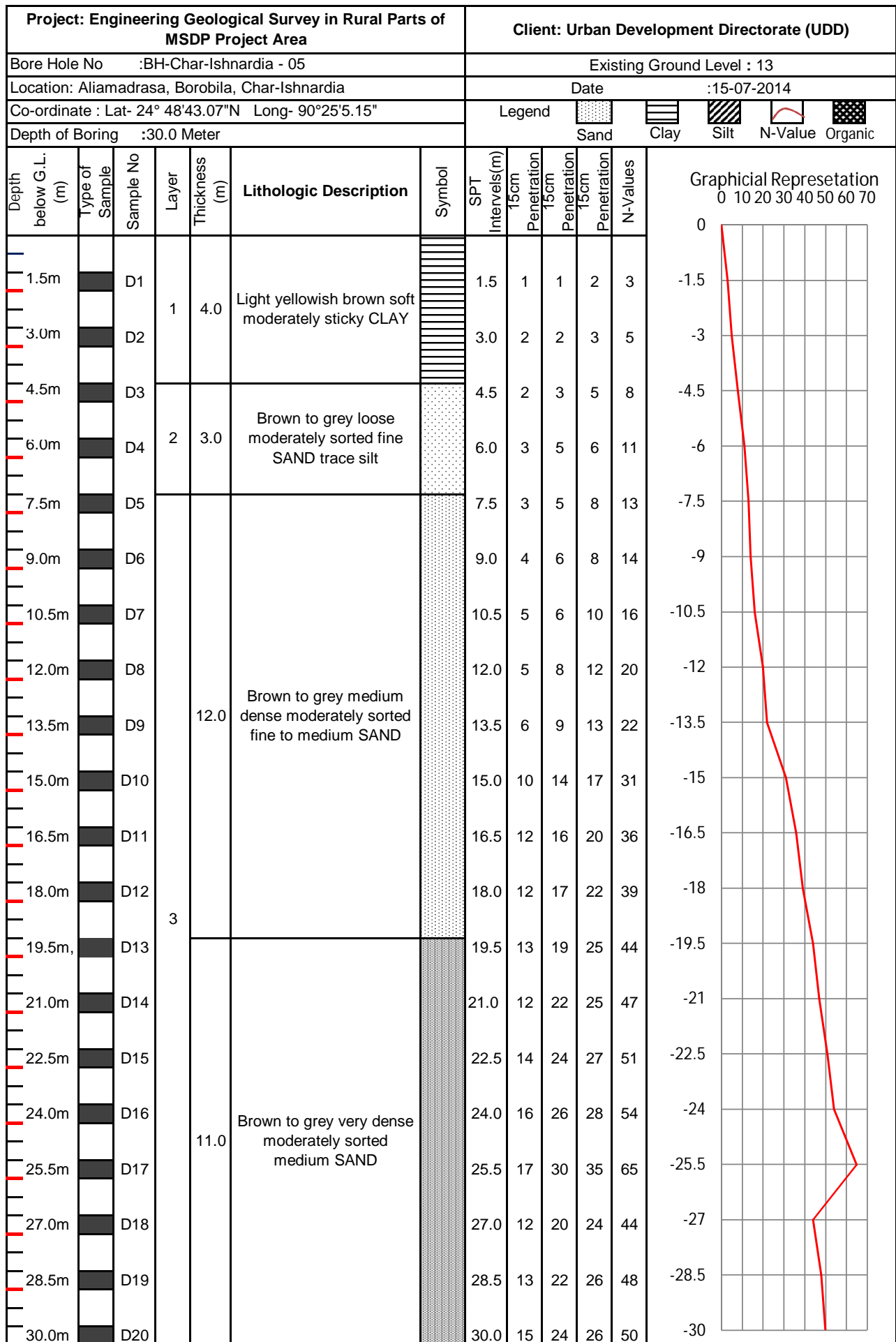
Depth of Boring :30.0 Meter







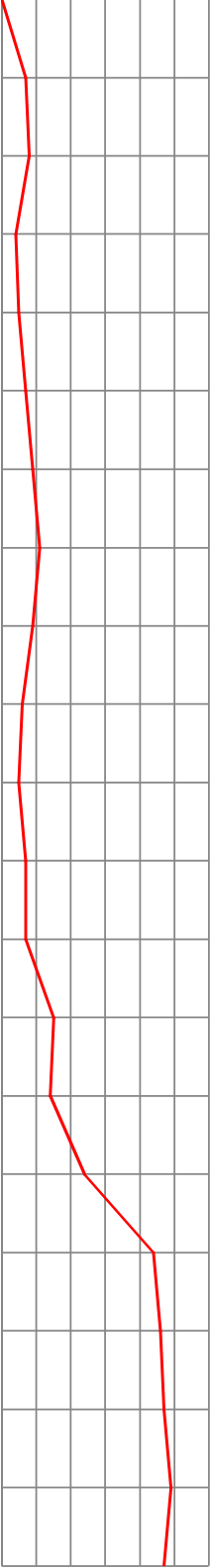




Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT					N-Values	Graphical Representation
							Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	Penetration 15cm		
1.5m		D1	2	8.5	Brown to grey loose moderately sorted very fine to fine SAND with silt		1.5	2	3	4	7		
3.0m		D2					3.0	2	2	3	5		
4.5m		D3					4.5	2	3	3	5		
6.0m		D4					6.0	1	2	3	5		
7.5m		D5					7.5	2	2	3	5		
9.0m		D6					3	5.5	Brown to grey medium dense moderately sorted fine to medium SAND trace silt		9.0		5	7	10	17
10.5m		D7	10.5	5	8	12					20		
12.0m		D8	12.0	5	8	12					20		
13.5m		D9	13.5	6	9	13					22		
15.0m		D10	3	6.5	Brown to grey dense moderately sorted fine to medium SAND trace silt		15.0	7	10	14	24		
16.5m		D11					16.5	8	12	16	28		
18.0m		D12					18.0	8	12	17	29		
19.5m		D13					19.5	10	13	19	32		
21.0m		D14	3	9.5	Light grey to brown dense moderately sorted fine to medium SAND trace silt		21.0	12	15	20	35		
22.5m		D15					22.5	13	16	23	39		
24.0m		D16					24.0	14	18	25	43		
25.5m		D17					25.5	14	19	26	45		
27.0m		D18					27.0	11	16	20	36		
28.5m		D19					28.5	12	18	22	40		
30.0m		D20	30.0	13	19	24	43						










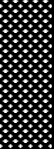


Project: Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Shirta 02						Existing Ground Level : 14.25							
Location:Nayapara, Sirta, Mymensingh						Date : 18-07-2014							
Co-ordination : Lat- 24° 49'2.66"N Long- 90°21'44.09"						Legend  Sand  Clay  Silt  N-Value  Organic							
Depth of Boring :30.0 Meter													
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT					N-Values	Graphical Representation
							Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	Penetration 15cm		
1.5m		D1	2	10.0	Yellowish brown to grey loose moderately sorted fine to medium SAND trace silt		1.5	1	2	2	4		
3.0m		D2					3.0	2	2	2	4		
4.5m		D3					4.5	2	3	4	7		
6.0m		D4					6.0	2	4	5	9		
7.5m		D5					7.5	2	3	4	7		
9.0m		D6					9.0	3	4	4	8		
10.5m		D7					10.5	3	6	8	14		
12.0m		D8	3	4.5	Grey medium dense moderately sorted medium SAND		12.0	3	8	10	18		
13.5m		D9					13.5	3	9	12	21		
15.0m		D10					15.0	5	7	10	17		
16.5m		D11	7	4.5	Light bluish grey very stiff moderately sticky SANDY SILT		16.5	6	8	14	22		
18.0m		D12					18.0	7	11	16	27		
19.5m		D13					19.5	5	6	6	12		
21.0m		D14					21.0	5	6	7	13		
22.5m		D15	10	8.0	Grey dense to very dense moderately sorted medium SAND		22.5	9	12	20	32		
24.0m		D16					24.0	10	14	22	36		
25.5m		D17					25.5	11	15	25	43		
27.0m		D18					27.0	12	20	26	46		
28.5m		D19					28.5	12	22	30	52		
30.0m		D20					30.0	14	25	35	60		







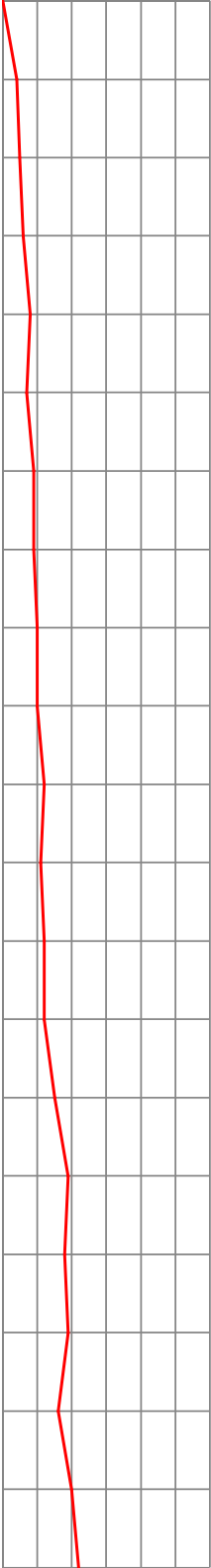





Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Metro Properties Ltd.								
Bore Hole No :BH-Shirta 03							Existing Ground Level : 13								
Location:Golakatamor, Sirta, Mymensingh							Date : 17-07-2014								
Co-ordination : Lat- 24° 49'00.00"N Long- 90°22'48.8"							Legend								
Depth of Boring :30.0 Meter															
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation								
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values				
1.5m		D1	2	8.5	Light brown to grey loose to very loose moderately sorted fine to medium SAND little silt		1.5	1	1	1	2				
3.0m		D2					3.0	2	3	5	8				
4.5m		D3					4.5	3	5	5	10				
6.0m		D4					6.0	3	5	7	12				
7.5m		D5					7.5	3	6	8	14				
9.0m		D6					3	15.0	Light grey dense to medium dense moderately sorted medium SAND		9.0	7	10	13	23
10.5m		D7	10.5	8	12	15					27				
12.0m		D8	12.0	8	13	17					30				
13.5m		D9	13.5	10	14	18					32				
15.0m		D10	15.0	10	14	16					30				
16.5m		D11	16.5	11	15	19					34				
18.0m		D12	18.0	11	17	21					38				
19.5m		D13	19.5	12	17	22					39				
21.0m		D14	21.0	8	12	14					26				
22.5m		D15	22.5	8	12	17					29				
24.0m		D16	3	6.5	Light grey dense to very dense moderately sorted medium SAND						24.0	9	14	18	32
25.5m		D17									25.5	10	16	20	36
27.0m		D18					27.0	12	17	22	39				
28.5m		D19					28.5	13	19	25	44				
30.0m		D20					30.0	15	21	27	48				











Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Urban Development Directorate (UDD)					
Bore Hole No :BH-Sirta 04							Existing Ground Level : 13.25					
Location: New Charkharichar bazar, Mymensingh							Date :17-07-2014					
Co-ordinate : Lat- 27° 48'54.98"N Long- 90°24'10.59"							Legend  Sand  Clay  Silt  N-Value  Organic					
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)				N-Values	Graphical Representation
							15cm	15cm	15cm	15cm		
1.5m		D1	2	4.0	Brown to grey loose moderately sorted fine to medium SAND		1.5	2	2	2	4	
3.0m		D2					3.0	2	3	4	5	
4.5m		D3					4.5	3	5	6	11	
6.0m		D4	3	5.5	Grey medium dense moderately sorted medium SAND little silt		6.0	3	5	7	12	
7.5m		D5					7.5	3	6	9	15	
9.0m		D6					9.0	4	8	12	20	
10.5m		D7					10.5	5	9	15	24	
12.0m		D8					12.0	6	10	18	28	
13.5m		D9	3	3.0	Light bluish grey very stiff moderately sticky SANDY SILT		13.5	4	8	13	21	
15.0m		D10					15.0	5	9	13	22	
16.5m		D11	3	10.5	Light grey dense moderately sorted medium SAND		16.5	10	12	20	32	
18.0m		D12					18.0	11	14	22	36	
19.5m		D13					19.5	12	16	22	30	
21.0m		D14					21.0	7	15	20	35	
22.5m		D15					22.5	7	15	22	37	
24.0m		D16					24.0	12	16	26	42	
25.5m		D17					25.5	13	18	28	46	
27.0m		D18					27.0	14	23	30	53	
28.5m		D19	3	3.5	Light grey very dense moderately sorted medium SAND		28.5	14	23	32	55	
30.0m		D20					30.0	15	25	36	61	








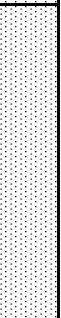


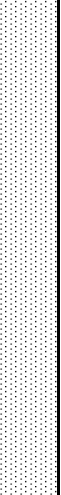


Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Khagdahar - 06						Existing Ground Level : 13.5						
Location: Khagdahar, Mymensingh						Date :01-07-2014						
Co-ordinate : Lat- 24° 47'44.500"N Long- 90°18'48.845"						Legend     						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)				N-Values	Graphical Representation
							15cm	15cm	15cm	15cm		
1.5m		D1	2	4.0	Brown to grey loose moderately sorted very fine to fine SAND little silt		1.5	2	3	4	7	 <p>Graphical Representation 0 10 20 30 40 50 60</p>
3.0m		D2					3.0	2	4	4	8	
4.5m		D3	4	4.5	Grey medium stiff to soft moderately sticky SILTY CLAY with very fine sand		4.5	2	2	2	4	
6.0m		D4					6.0	2	2	3	5	
7.5m		D5					7.5	3	3	4	7	
9.0m		D6					9.0	3	4	5	9	
10.5m		D7	7	5.5	Brown to grey medium stiff moderately sticky CLAY trace silt		10.5	3	5	6	11	
12.0m		D8					12.0	3	4	5	9	
13.5m		D9					13.5	2	3	3	6	
15.0m		D10	9	5.0	Bluish grey very stiff moderately sticky SILT little clay trace sand		15.0	2	2	3	5	
16.5m		D11					16.5	3	3	4	7	
18.0m		D12					18.0	3	3	4	7	
19.5m		D13	10	6.5	Light yellowish brown dense moderately sorted medium to fine SAND		19.5	4	7	8	15	
21.0m		D14					21.0	5	6	8	14	
22.5m		D15					22.5	8	10	14	24	
24.0m		D16					24.0	14	20	24	44	
25.5m		D17					25.5	15	21	25	46	
27.0m		D18					27.0	15	21	26	47	
28.5m		D19					28.5	16	23	26	49	
30.0m		D20					30.0	15	22	25	47	

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)							
Bore Hole No : Khagdahar - 07						Existing Ground Level : 16							
Location: Khagdahar, Kollayanpur, Mymensingh						Date : 01-07-2014							
Co-ordinate : Lat- 24° 47'47.686"N Long- 90°19'31.802"						Legend  Sand  Clay  Silt  N-Value  Organic							
Depth of Boring : 30.0 Meter													
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation						
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values		
1.5m		D1	2	4.0	Brown to grey loose moderately sorted fine to medium SAND little silt		1.5	3	3	5	8		
3.0m		D2					3.0	2	3	3	6		
4.5m		D3	4	4.5	Grey medium stiff moderately sticky CLAYEY SILT trace sand		4.5	2	2	3	5		
6.0m		D4							6.0	2	2	3	5
7.5m		D5							7.5	2	3	3	6
9.0m		D6				2.0	Bluish grey stiff moderately sticky SANDY SILT		9.0	3	5	6	11
10.5m		D7					10.5	3	4	5	9		
12.0m		D8	5	4.0	Grey medium dense moderately sorted fine SAND little silt		12.0	6	8	12	20		
13.5m		D9							13.5	5	7	9	16
15.0m		D10	6	3.0	Dark grey medium stiff moderately sticky ORGANIC CLAY (PEAT)		15.0	2	3	3	6		
16.5m		D11							16.5	2	2	3	5
18.0m		D12	9	6.0	Light bluish grey to brown stiff moderately sticky SILTY CLAY		18.0	3	4	6	10		
19.5m		D13							19.5	3	5	6	11
21.0m		D14							21.0	4	4	6	10
22.5m		D15							22.5	4	5	5	10
24.0m		D16	10	6.5	Yellowish brown dense moderately sorted fine SAND little silt		24.0	9	14	16	30		
25.5m		D17							25.5	13	21	26	47
27.0m		D18							27.0	14	21	27	48
28.5m		D19							28.5	17	24	31	55
30.0m		D20							30.0	19	27	32	59

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)							
Bore Hole No : Khagdahar - 08						Existing Ground Level : 16							
Location: BouBazar, Khagdahar, Mymensingh						Date : 01-07-2014							
Co-ordinate : Lat- 24° 47'28.686"N Long- 90°20'20.691"						Legend  Sand  Clay  Silt  N-Value  Organic							
Depth of Boring : 30.0 Meter													
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT					N-Values	Graphical Representation
							Intervals(m)	15cm Penetration	15cm Penetration	15cm Penetration	15cm Penetration		
1.5m		D1					1.5	1	2	2	4	1.5	 <p>Graphical Representation 0 10 20 30 40 50 60</p>
3.0m		D2	2	5.5	Bluish grey medium stiff moderately sticky SANDY SILT little clay		3.0	1	2	3	5	-3	
4.5m		D3					4.5	2	2	4	6	-4.5	
6.0m		D4					6.0	2	3	5	8	-6	
7.5m		D5					7.5	3	3	4	7	-7.5	
9.0m		D6					9.0	3	4	5	9	-9	
10.5m		D7					10.5	4	4	5	9	-10.5	
12.0m		D8	7				12.0	2	4	6	10	-12	
13.5m		D9					13.5	4	4	6	10	-13.5	
15.0m		D10					15.0	4	5	7	12	-15	
16.5m		D11					16.5	5	5	6	11	-16.5	
18.0m		D12					18.0	6	6	6	12	-18	
19.5m		D13	9				19.5	4	5	7	12	-19.5	
21.0m		D14					21.0	6	7	8	15	-21	
22.5m		D15					22.5	7	9	10	19	-22.5	
24.0m		D16					24.0	7	8	10	18	-24	
25.5m		D17					25.5	8	9	10	19	-25.5	
27.0m		D18					27.0	7	7	9	16	-27	
28.5m		D19					28.5	8	9	11	20	-28.5	
30.0m		D20					30.0	8	10	12	22	-30	

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No : Khagdahor 09						Existing Ground Level : 14.25						
Location: Khagdahor Govt. Praimary School, Mymensingh						Date :23-07-2014						
Co-ordinate : Lat- 24° 47'00.000"N Long- 90°21'03.318"						Legend     						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	Graphical Representation 0 10 20 30 40 50 60
1.5m		D1	1	5.5	Brown to grey soft to medium stiff moderately sticky SANDY SILT little clay		1.5	1	1	2	3	
3.0m		D2					3.0	2	2	2	4	
4.5m		D3					4.5	3	4	5	9	
6.0m		D4					2	3.0	Light brown loose moderately sorted fine SAND little silt		6.0	2		3	4	7
7.5m		D5	7.5	3	4	5					9	
9.0m		D6	9.0	1	1	2					3	
10.5m		D7	4	9.0	Grey soft to medium stiff moderately sticky SILTY CLAY		10.5	1	2	2	4	
12.0m		D8					12.0	2	3	3	6	
13.5m		D9					13.5	2	3	4	7	
15.0m		D10					15.0	2	3	5	8	
16.5m		D11					16.5	2	3	5	8	
18.0m		D12					9	9.0	Light yellowish brown stiff moderately sticky CLAYEY SILT		18.0	3		3	7	10
19.5m		D13	19.5	3	5	7					12	
21.0m		D14	21.0	4	5	8					13	
22.5m		D15	22.5	4	6	6					12	
24.0m		D16	24.0	4	6	7					13	
25.5m		D17	3.5	3.5	Bluish grey very stiff moderately sticky CLAYEY SILT		25.5	3	6	6	12	
27.0m		D18					27.0	6	8	10	18	
28.5m		D19					28.5	7	9	12	21	
30.0m		D20					30.0	7	10	13	23	

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Urban Development Directorate (UDD)					
Bore Hole No : Sirta 10							Existing Ground Level : 14					
Location: Konapara mor, Chourastar Bazar, Sirta, Mymensingh							Date :16-07-2014					
Co-ordinate : Lat- 24° 47'53.440"N Long- 90°23'03.398"							Legend  Sand  Clay  Silt  N-Value  Organic					
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration			N-Values	Graphical Representation
								15cm	15cm	15cm		
1.5m		D1	1	4.0	Grey to brown medium stiff to soft clayey SILT with Sand		1.5	2	3	4	7	-1.5
3.0m		D2					3.0	1	1	1	2	-3
4.5m		D3					4.5	2	2	5	7	-4.5
6.0m		D4	2	4.0	Brown to grey loose moderately sorted very fine to fine SAND with silt		6.0	3	3	6	9	-6
7.5m		D5					7.5	3	3	5	8	-7.5
9.0m		D6					9.0	5	8	10	18	-9
10.5m		D7					10.5	5	10	11	21	-10.5
12.0m		D8	3	6.0	Brown to grey medium dense moderately sorted fine to medium SAND trace silt		12.0	5	8	12	20	-12
13.5m		D9					13.5	6	10	13	23	-13.5
15.0m		D10					15.0	3	5	8	13	-15
16.5m		D11	7	3.0	Reddish brown stiff moderately sticky CLAYEY SILT		16.5	5	3	7	12	-16.5
18.0m		D12					18.0	3	3	4	7	-18
19.5m		D13	9	3.0	Yellowish brown medium stiff moderately sticky CLAYEY SILT		19.5	3	3	5	8	-19.5
21.0m		D14					21.0	5	8	11	19	-21
22.5m		D15					22.5	6	12	15	27	-22.5
24.0m		D16					24.0	7	11	13	24	-24
25.5m		D17	10	30.0	Yellowish to reddish brown medium dense moderately sorted fine SAND with silt little clay		25.5	7	12	15	27	-25.5
27.0m		D18					27.0	8	13	18	31	-27
28.5m		D19					28.5	7	12	14	26	-28.5
30.0m		D20					30.0	8	13	15	28	-30

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area

Client: Urban Development Directorate (UDD)

Bore Hole No :BH-Sirta 11

Existing Ground Level : 14

Location: Joybangla, Sirta, Mymensingh

Date :16-07-2014

Co-ordinate : Lat- 24° 47'43.889"N Long- 90°24'12.832"

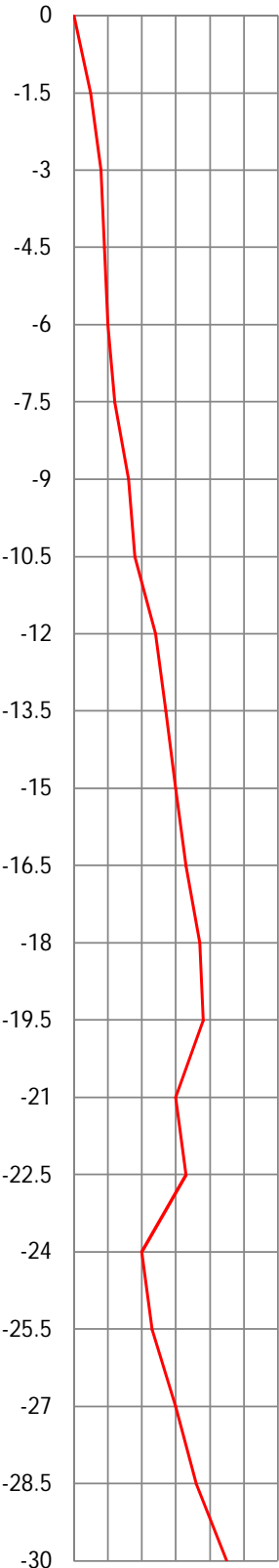
Legend







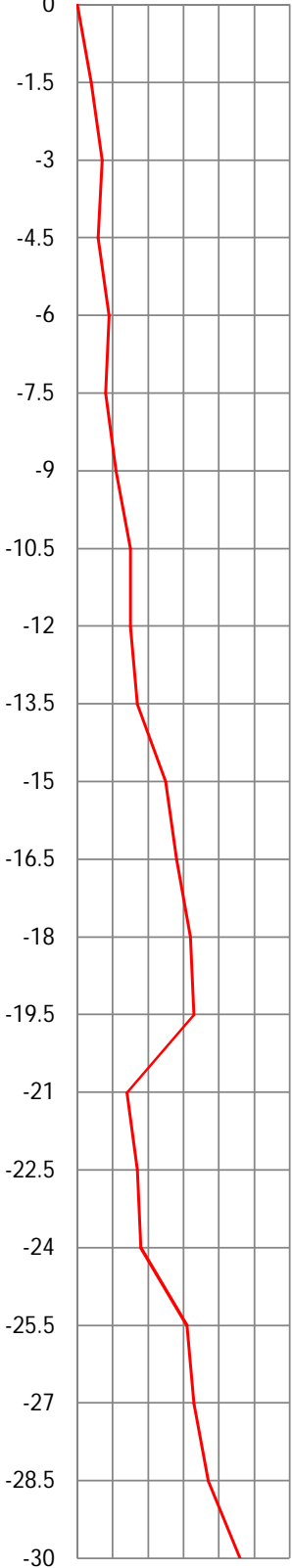



Sand	Clay	Silt	N-Value	Organic







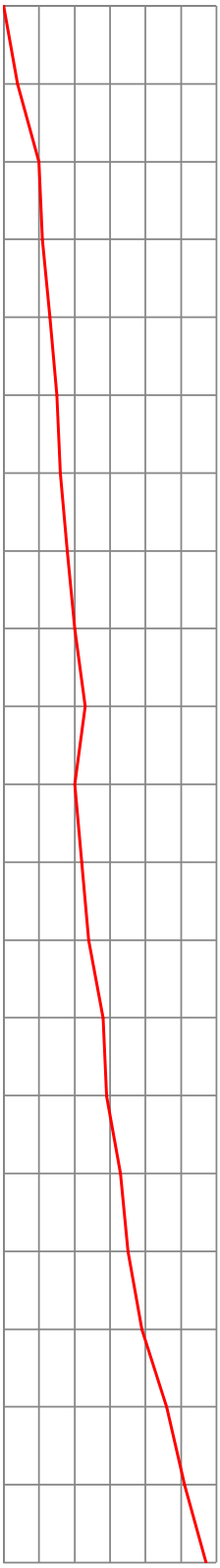
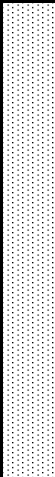
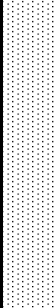
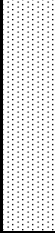


Depth of Boring :30.0 Meter







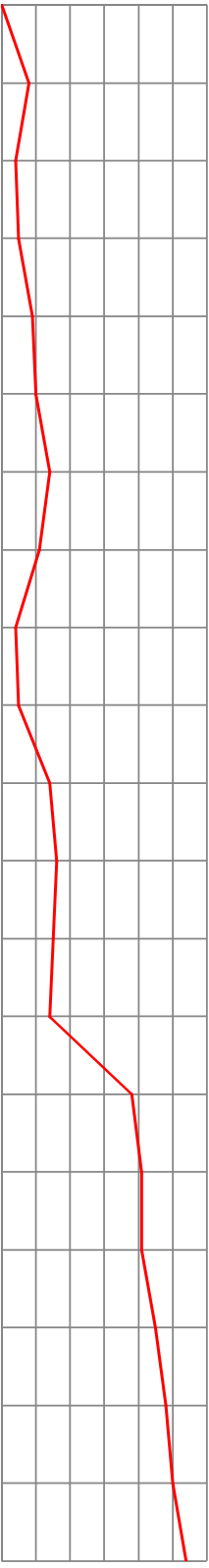

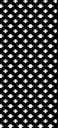



Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT					N-Values	Graphical Representation
							Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	Penetration 15cm		
1.5m		D1			Brown to grey loose moderately sorted very fine to fine SAND with silt		1.5	2	2	3	5	0	
3.0m		D2	2	5.5			3.0	2	3	5	8	-1.5	
4.5m		D3					4.5	2	3	6	9	-3	
6.0m		D4					6.0	3	4	6	10	-4.5	
7.5m		D5					7.5	3	5	7	12	-6	
9.0m		D6			Grey medium dense moderately sorted fine to medium SAND trace silt		9.0	6	7	9	16	-7.5	
10.5m		D7					10.5	6	8	10	18	-9	
12.0m		D8					12.0	7	10	14	24	-10.5	
13.5m		D9					13.5	8	12	15	27	-12	
15.0m		D10					15.0	8	13	17	30	-13.5	
16.5m		D11					16.5	10	14	19	33	-15	
18.0m		D12	3	30.0			18.0	11	16	21	37	-16.5	
19.5m		D13					19.5	10	16	22	38	-18	
21.0m		D14					21.0	10	13	17	30	-19.5	
22.5m		D15					22.5	11	14	17	33	-21	
24.0m		D16					24.0	6	8	12	20	-22.5	
25.5m		D17					25.5	7	10	13	23	-24	
27.0m		D18					27.0	10	13	17	30	-25.5	
28.5m		D19					28.5	12	16	20	36	-27	
30.0m		D20					30.0	14	19	26	45	-28.5	







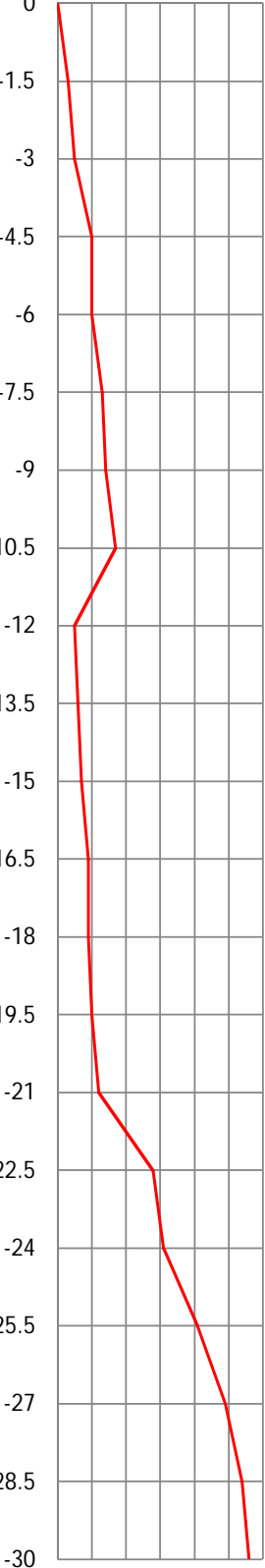

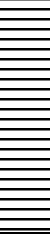


Graphical Representation
0 10 20 30 40 50 60








































Project: Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Shirta 12						Existing Ground Level : 13							
Location: Sirta, Mymensingh						Date : 17-07-2014							
Co-ordination : Lat- 24° 47'48.40"N Long- 90°25'20.38"						Legend  Sand  Clay  Silt  N-Value  Organic							
Depth of Boring :30.0 Meter													
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT					N-Values	Graphical Representation
							Intervals(m)	15cm Penetration	15cm Penetration	15cm Penetration	Penetration		
1.5m		D1	2	8.5	Yellowish brown to grey loose moderately sorted very fine to fine SAND little silt		1.5	1	2	2	4		
3.0m		D2					3.0	2	3	4	7		
4.5m		D3					4.5	2	3	3	6		
6.0m		D4					6.0	3	4	5	9		
7.5m		D5					7.5	3	3	5	8		
9.0m		D6					9.0	5	5	6	11		
10.5m		D7	3	12.0	Yellowish brown to brown medium dense moderately sorted medium SAND little silt		10.5	5	7	8	15		
12.0m		D8					12.0	6	6	9	15		
13.5m		D9					13.5	6	7	10	17		
15.0m		D10					15.0	8	10	15	25		
16.5m		D11					16.5	8	12	16	28		
18.0m		D12					18.0	10	14	18	32		
19.5m		D13	6.0	6.0	Light bluish grey medium dense moderately sorted very fine SILTY SAND		19.5	12	15	18	33		
21.0m		D14					21.0	4	6	8	14		
22.5m		D15					22.5	5	8	9	17		
24.0m		D16	3.5	3.5	Light grey dense moderately sorted medium SAND		24.0	5	8	10	18		
25.5m		D17					25.5	11	13	18	31		
27.0m		D18					27.0	12	14	19	33		
28.5m		D19					28.5	14	16	21	37		
30.0m		D20					30.0	15	20	26	46		






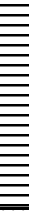
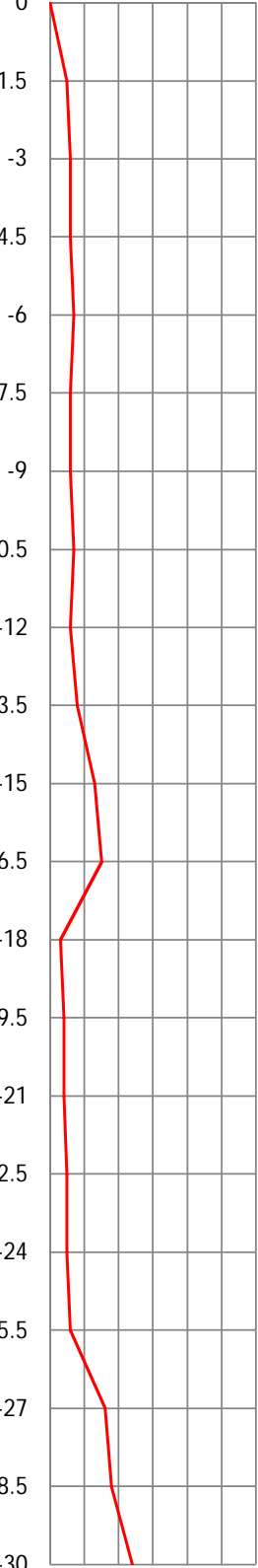





Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Metro Properties Ltd.						
Bore Hole No :BH-Chor-Ishwardia 13						Existing Ground Level : 12.5						
Location:Chorborbila, Chor-Ishwardia, Mymensingh						Date : 14-07-2014						
Co-ordination : Lat- 24° 47'49.588"N Long- 90°26'30.347"						Legend     						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT					Graphical Representation
							Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	
1.5m		D1	1	2.5	Grey soft moderately sticky CLAY with Silt		1.5	2	2	2	4	 <p>Graphical Representation 0 10 20 30 40 50 60</p>
3.0m		D2	3	9.0	Brownish grey medium dense moderately sorted fine to medium SAND		3.0	3	5	5	10	
4.5m		D3					4.5	3	5	6	11	
6.0m		D4					6.0	3	5	8	13	
7.5m		D5					7.5	4	6	9	15	
9.0m		D6					9.0	4	6	10	16	
10.5m		D7					10.5	5	7	11	18	
12.0m		D8					12.0	5	8	12	20	
13.5m		D9					13.5	7	10	13	23	
15.0m		D10	3	6.0	Brownish grey to grey medium dense moderately sorted fine to medium SAND		15.0	5	8	12	20	
16.5m		D11					16.5	6	9	13	22	
18.0m		D12					18.0	7	10	14	24	
19.5m		D13					19.5	8	12	16	28	
21.0m		D14	3	4.5	Brownish grey to grey medium dense moderately sorted very fine to fine SAND		21.0	8	13	16	29	
22.5m		D15					22.5	9	15	18	33	
24.0m		D16					24.0	11	16	19	35	
25.5m		D17	3	4.5	Brownish grey to grey dense moderately sorted very fine to fine SAND		25.5	12	18	21	39	
27.0m		D18					27.0	14	20	26	46	
28.5m		D19	3	3.5	Brownish grey to grey very dense moderately sorted very fine to fine SAND		28.5	16	23	28	51	
30.0m		D20					30.0	18	26	31	57	

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Khagdahar 14						Existing Ground Level : 16						
Location: Khagdahar bazar, Mymensingh						Date :03-07-2014						
Co-ordinate : Lat- 24° 46'28.19"N Long- 90°18'42.71"						Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)				N-Values	Graphical Representation
							15cm	15cm	15cm	15cm		
1.5m		D1		5.5	Brown to grey loose moderately sorted medium to fine SAND trace silt		1.5	3	4	4	8	
3.0m		D2					3.0	2	2	2	4	
4.5m		D3					4.5	2	2	3	5	
6.0m		D4	2	6.0	Light grey loose moderately sorted medium to fine SAND trace silt		6.0	3	4	5	9	
7.5m		D5					7.5	3	4	6	10	
9.0m		D6					9.0	4	6	8	14	
10.5m		D7					10.5	3	4	7	11	
12.0m		D8		3.0	Grey medium stiff moderately sticky ORGANIC CLAY (PEAT)		12.0	2	2	2	4	
13.5m		D9	6				13.5	2	2	3	5	
15.0m		D10		6.0	Reddish brown, yellowish brown stiff moderately sticky SILT with clay		15.0	5	6	8	14	
16.5m		D11					16.5	5	7	9	16	
18.0m		D12	9				18.0	6	7	8	15	
19.5m		D13		9.5	Yellowish brown dense to very dense moderately sorted medium to fine SAND, moderately oxidized		19.5	5	7	7	14	
21.0m		D14					21.0	11	16	22	38	
22.5m		D15					22.5	11	18	23	41	
24.0m		D16					24.0	9	18	23	41	
25.5m		D17		9.5	Yellowish brown dense to very dense moderately sorted medium to fine SAND, moderately oxidized		25.5	11	19	26	45	
27.0m		D18					27.0	13	21	27	48	
28.5m		D19					28.5	15	23	27	50	
30.0m		D20					30.0	18	26	28	54	

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)								
Bore Hole No :BH-khagdagor - 15						Existing Ground Level : 14.5								
Location: Begunbari Bazar, Khagdagor, Mymensingh						Date :04-07-2014								
Co-ordinate : Lat- 24° 46'44.93"N Long- 90°19'33.6-"						Legend     								
Depth of Boring :30.0 Meter														
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation							
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values			
1.5m		D1	2	4.0	Brown to grey very loose to loose moderately sorted fine SAND trace silt		1.5	1	1	2	3	 <p>Graphical Representation 0 10 20 30 40 50 60</p>		
3.0m		D2					3.0	1	2	3	5			
4.5m		D3					4.5	3	4	6	10			
6.0m		D4	3	7.0	Brown to grey medium dense moderately sorted fine to very fine SAND little silt		6.0	4	4	6	10			
7.5m		D5							7.5	4	6		7	13
9.0m		D6							9.0	4	6		8	14
10.5m		D7			10.5	5	7	10	17					
12.0m		D8	7	4.5	Reddish brown, yellowish brown medium stiff moderately sticky CLAY with silt		12.0	2	2	3	5			
13.5m		D9							13.5	2	3		3	6
15.0m		D10							15.0	3	3		4	7
16.5m		D11	9	6.0	Reddish brown to yellowish brown stiff moderately sticky SILT with clay		16.5	3	4	5	9			
18.0m		D12							18.0	4	4		5	9
19.5m		D13							19.5	4	4		6	10
21.0m		D14			21.0	5	5	7	12					
22.5m		D15	10	8.0	Yellowish brown dense to very dense moderately sorted medium to fine SAND trace silt		22.5	6	11	17	28			
24.0m		D16							24.0	6	13		18	31
25.5m		D17							25.5	14	18		23	41
27.0m		D18							27.0	10	22		27	49
28.5m		D19							28.5	15	24		30	54
30.0m		D20			30.0	16	25	31	56					

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Khagdahar - 16						Existing Ground Level : 13						
Location: Rahamatpur, Khagdahar, Mymensingh						Date :04-07-2014						
Co-ordinate : Lat- 24° 46'47.137"N Long- 90°20'32.501"						Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation					
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	
1.5m		D1			Brown to grey loose moderately sorted very fine to fine SAND with silt		1.5	1	1	2	3	-1.5
3.0m		D2	2	5.5			3.0	2	2	2	4	-3
4.5m		D3					4.5	3	4	5	9	-4.5
6.0m		D4					6.0	3	5	7	12	-6
7.5m		D5	3	6.0	Grey to bluish grey medium dense moderately sorted fine SAND little silt		7.5	3	6	8	14	-7.5
9.0m		D6					9.0	4	6	9	15	-9
10.5m		D7					10.5	4	7	10	17	-10.5
12.0m		D8					12.0	3	4	5	9	-12
13.5m		D9	4	6.0	Grey stiff moderately sticky SANDY SILT		13.5	3	4	4	8	-13.5
15.0m		D10					15.0	3	3	4	7	-15
16.5m		D11					16.5	3	3	3	6	-16.5
18.0m		D12					18.0	4	5	6	11	-18
19.5m		D13	7	3.0	Grey, yellowish brwn stiff moderately sticky CLAYEY SILT		19.5	5	6	6	12	-19.5
21.0m		D14			Yellowish brown to reddish brown dense moderately sorted fine SAND little silt and clay, moderately oxidized		21.0	6	10	18	28	-21
22.5m		D15	8	4.5			22.5	11	19	24	43	-22.5
24.0m		D16			Light bluish grey stiff moderately sticky CLAYEY SILT		24.0	8	11	25	36	-24
25.5m		D17	9	3.0			25.5	4	5	5	10	-25.5
27.0m		D18			Light grey very dense moderately sorted medium to fine SAND trace silt		27.0	5	5	6	11	-27
28.5m		D19	10	2.0			28.5	13	18	37	55	-28.5
30.0m		D20					30.0	15	21	39	60	-30

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Khagdahar - 17						Existing Ground Level : 13.75						
Location: Behind BGB Camp, Khagdahar, Mymensingh						Date :23-07-2014						
Co-ordinate : Lat- 24° 46'31.19"N Long- 90°21'48.27"						Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	Graphical Representation 0 10 20 30 40 50 60
1.5m		D1			Brown to grey loose moderately sorted fine to medium SAND little silt		1.5	3	4	5	9		-1.5
3.0m		D2					3.0	2	2	5	7	-3
4.5m		D3	2	8.5			4.5	1	2	3	5	-4.5
6.0m		D4					6.0	3	3	4	7	-6
7.5m		D5					7.5	3	4	5	9	-7.5
9.0m		D6			Yellowish brown, grey medium stiff moderately sticky CLAY with silt		9.0	1	2	2	4	-9
10.5m		D7					10.5	1	2	2	4	-10.5
12.0m		D8	4	6.0			12.0	2	2	3	5	-12
13.5m		D9					13.5	2	3	3	6	-13.5
15.0m		D10			Light grey to yellowish brown medium stiff moderately sticky SILTY CLAY trace sand		15.0	2	4	5	9	-15
16.5m		D11	7	4.5			16.5	2	3	5	8	-16.5
18.0m		D12					18.0	3	3	3	6	-18
19.5m		D13			Yellowish brown light grey stiff Silty CLAY organic content		19.5	4	5	5	10	-19.5
21.0m		D14					21.0	4	4	4	8	-21
22.5m		D15					22.5	4	5	6	11	-22.5
24.0m		D16	9				24.0	5	5	6	11	-24
25.5m		D17			Bluish grey very stiff moderately sticky CLAYEY SILT		25.5	6	7	7	14	-25.5
27.0m		D18					27.0	6	8	9	17	-27
28.5m		D19					28.5	7	7	9	16	-28.5
30.0m		D20					30.0	9	10	12	22	-30

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Khagdahar - 18						Existing Ground Level : 14.5							
Location:Dholadiya, Saleha Market, Mymensingh						Date :24-07-2014							
Co-ordinate : Lat- 24° 46'37.517N Long- 90°22'25.386"						Legend     							
Depth of Boring :30.0 Meter													
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation						
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values		
1.5m		D1	1	4.0	Brownish grey medium stiff Silty CLAY with Sand		1.5	1	2	5	5	 <p>Graphical Representation 0 10 20 30 40 50 60</p>	
3.0m		D2				3.0	2	3	3	6			
4.5m		D3				4.5	3	3	3	6			
6.0m		D4	2	13.5	Grey to brownish grey loose to medium dense moderately sorted very fine to fine SAND with silt		6.0	2	2	5	7		
7.5m		D5						7.5	3	3	3		6
9.0m		D6						9.0	2	3	3		6
10.5m		D7						10.5	2	3	4		7
12.0m		D8						12.0	3	3	3		6
13.5m		D9						13.5	3	4	4		8
15.0m		D10	3	3.0	Grey to brownish grey medium dense moderately sorted very fine to fine SAND with silt		15.0	3	5	8	13		
16.5m		D11						16.5	4	6	9		15
18.0m		D12	6	5.0	Dark grey medium soft moderately sticky ORGANIC CLAY (PEAT)		18.0	1	1	2	3		
19.5m		D13						19.5	1	2	2		4
21.0m		D14						21.0	2	2	2		4
22.5m		D15						22.5	2	2	3		5
24.0m		D16	9	5.0	Bluish grey medium stiff to stiff moderately sticky SILT little sand		24.0	2	2	3	5		
25.5m		D17						25.5	2	3	3		6
27.0m		D18						27.0	4	6	10		16
28.5m		D19	10	1.5	Yellowish brown, bluish grey medium dense moderately sorted very fine to fine SAND		28.5	5	6	12	18		
30.0m		D20						30.0	7	10	14		24

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area

Client: Urban Development Directorate (UDD)

Bore Hole No :BH-Sirta 19

Existing Ground Level : 10.5

Location: Gobindapur, Sirta, Mymensingh

Date :18-07-2014











Co-ordinate : Lat- 24° 46'43.30"N Long- 90°24'8.45"







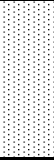




Legend








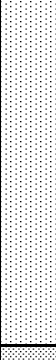

Sand	Clay	Silt	N-Value	Organic












Depth of Boring :30.0 Meter







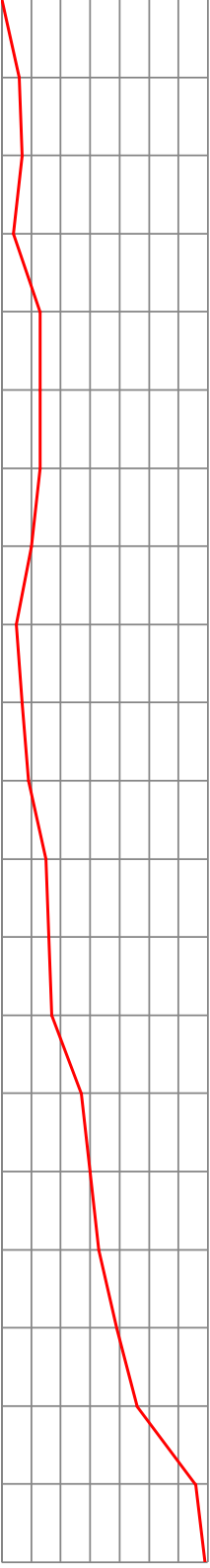


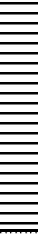


Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration			N-Values	Graphical Representation
								15cm	15cm	15cm		
1.5m		D1	2	2.5	Light grey to brown loose moderately sorted fine to medium SAND with silt		1.5	2	2	3	5	
3.0m		D2	4	3.0	Light brownish grey soft moderately sticky CLAY little silt trace sand		3.0	1	1	2	3	
4.5m		D3					4.5	1	2	2	4	
6.0m		D4	7	4.5	Light bluish grey medium stiff moderately sticky CLAYEY SILT		6.0	3	3	4	7	
7.5m		D5					7.5	3	3	3	6	
9.0m		D6					9.0	4	4	4	8	
10.5m		D7	8	4.5	Grey to brownish grey medium dense moderately sorted medium SAND little silt		10.5	6	8	10	18	
12.0m		D8					12.0	6	8	10	18	
13.5m		D9					13.5	7	9	12	21	
15.0m		D10	9	4.5	Grey stiff moderately sticky CLAY with silt		15.0	5	5	6	11	
16.5m		D11					16.5	4	4	5	9	
18.0m		D12					18.0	4	5	7	12	
19.5m		D13	10	3.0	Grey medium dense moderately sorted fine to medium SAND little silt		19.5	8	8	9	17	
21.0m		D14					21.0	8	9	10	19	
22.5m		D15	10	8.0	Reddish brown, yellowish brown dense moderately sorted medium SAND little silt		22.5	11	12	15	27	
24.0m		D16					24.0	10	15	20	35	
25.5m		D17					25.5	10	17	25	42	
27.0m		D18					27.0	12	18	25	44	
28.5m		D19					28.5	13	20	29	49	
30.0m		D20				30.0	14	22	29	51		







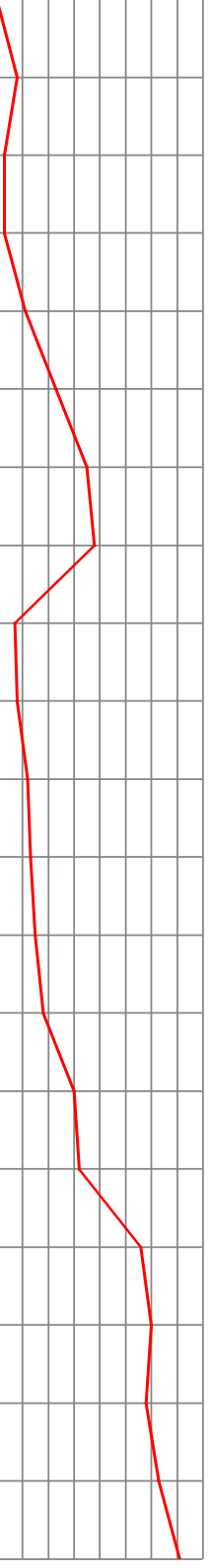

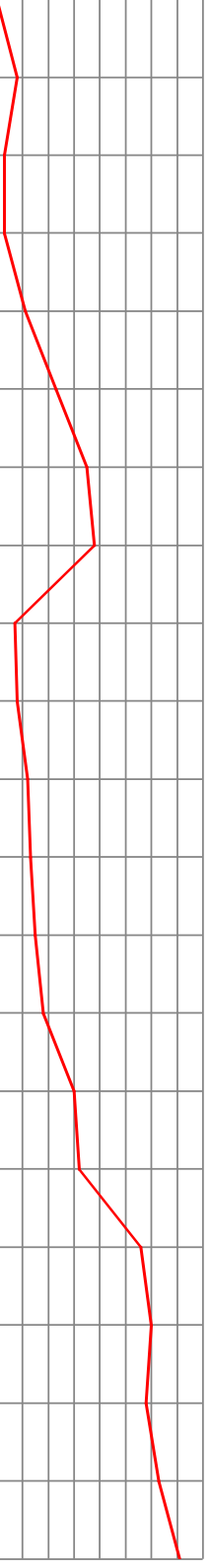


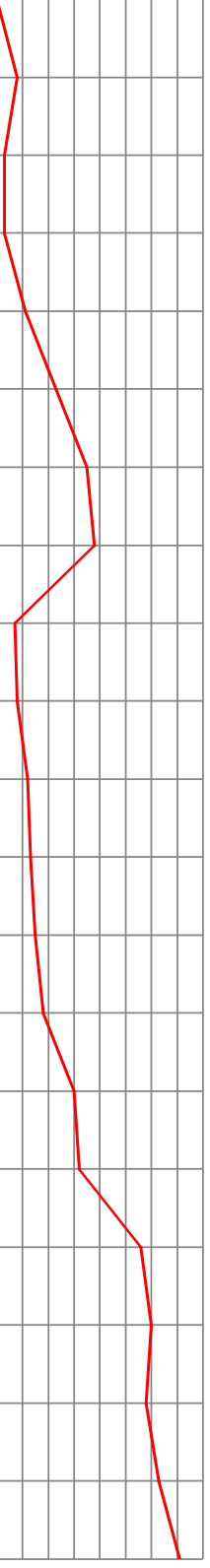
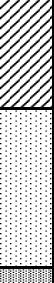
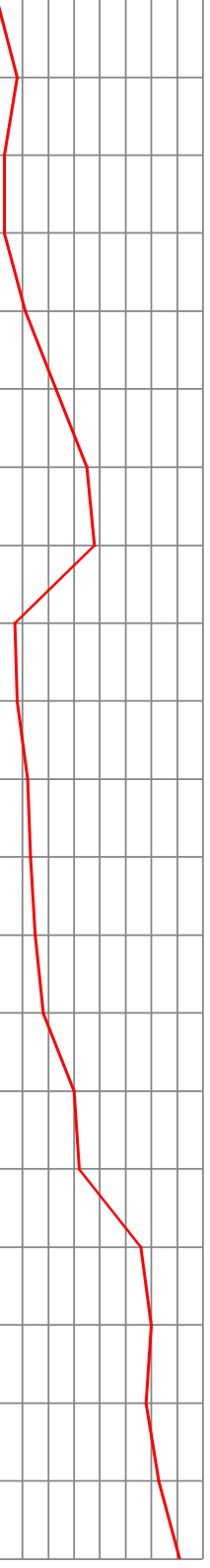

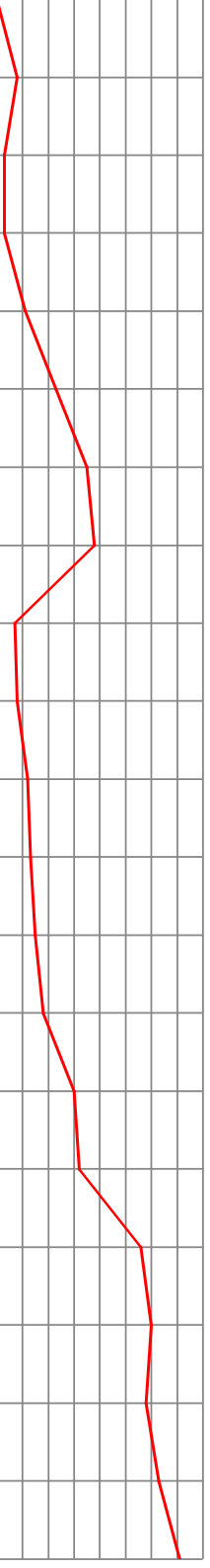

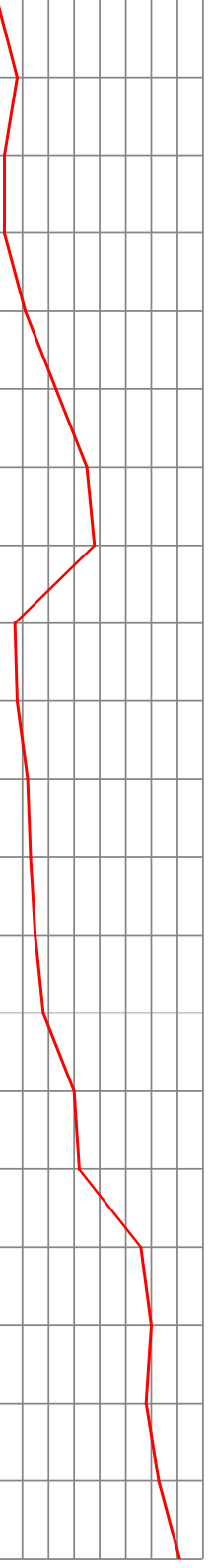
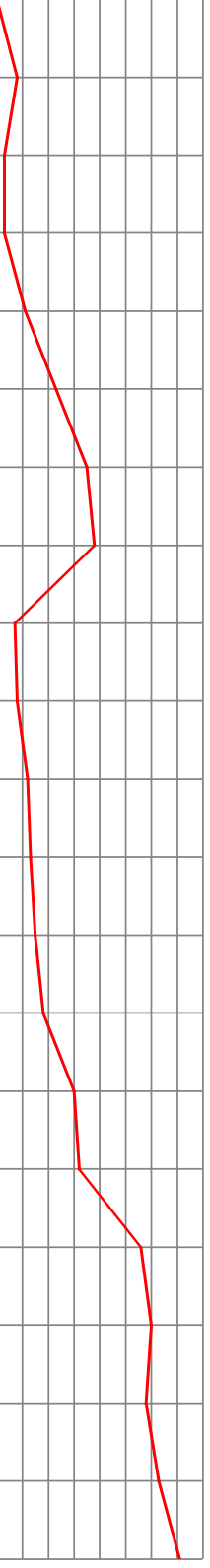
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area					Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Sirta 20					Existing Ground Level : 14							
Location: Konapara mor, Chourastar Bazar, Sirta, Mymensingh					Date :16-07-2014							
Co-ordinate : Lat- 24° 47'53.440"N Long- 90°23'03.398"					Legend  Sand  Clay  Silt  N-Value  Organic							
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation					
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	
1.5m		D1	2	2.5	Brown loose moderately sorted very fine to fine SAND with silt trace clay		1.5	2	3	3	6	-1.5
3.0m		D2	7.5		Light brown medium dense moderately sorted fine SAND with silt trace clay		3.0	3	5	6	11	-3
4.5m		D3					4.5	4	4	8	12	-4.5
6.0m		D4					6.0	3	5	6	11	-6
7.5m		D5					7.5	4	5	6	11	-7.5
9.0m		D6					9.0	5	6	7	13	-9
10.5m		D7	6.0		Light brown medium dense moderately sorted fine SAND with silt trace clay		10.5	6	11	14	25	-10.5
12.0m		D8					12.0	7	12	18	30	-12
13.5m		D9					13.5	6	8	10	18	-13.5
15.0m		D10					15.0	7	8	11	19	-15
16.5m		D11					16.5	8	11	13	24	-16.5
18.0m		D12	9.0		Light grey to light brown medium dense moderately sorted fine to medium SAND with silt trace clay		18.0	9	11	15	26	-18
19.5m		D13					19.5	8	10	13	23	-19.5
21.0m		D14					21.0	8	8	10	18	-21
22.5m		D15					22.5	10	12	13	25	-22.5
24.0m		D16					24.0	8	11	16	27	-24
25.5m		D17	5.0		Light brown dense moderately sorted fine to medium SAND little silt		25.5	8	12	18	30	-25.5
27.0m		D18					27.0	10	16	20	36	-27
28.5m		D19					28.5	12	17	22	39	-28.5
30.0m		D20					30.0	12	16	24	40	-30









Project: Engineering Geological Survey in Rural Parts of MSDP Project Area					Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Chor-Ishwardia 21					Existing Ground Level : 13.25							
Location: Chor-Ishwardia, Mymensingh					Date :15-07-2014							
Co-ordinate : Lat- 24° 46'35.11"N Long- 90°26'32.46"					Legend     							
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT	Graphical Representation				
							Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	
1.5m		D1	1	2.5	Brownish grey soft moderately sticky CLAY with silt		1.5	1	1	2	3	-1.5
3.0m		D2	3	3.0	Yellowish brown medium dense moderately sorted fine to medium SAND trace silt		3.0	3	5	6	11	-3
4.5m		D3					4.5	3	5	8	13	-4.5
6.0m		D4					6.0	3	4	5	9	-6
7.5m		D5					7.5	3	5	6	11	-7.5
9.0m		D6	3	6.0	Light brownish grey medium dense moderately sorted fine SAND trace silt		9.0	3	6	6	12	-9
10.5m		D7					10.5	4	5	6	11	-10.5
12.0m		D8					12.0	5	10	14	24	-12
13.5m		D9					13.5	8	12	16	28	-13.5
15.0m		D10	3	4.5	Grey medium dense moderately sorted fine to medium SAND trace silt		15.0	9	11	12	23	-15
16.5m		D11					16.5	4	5	5	10	-16.5
18.0m		D12					18.0	3	4	6	10	-18
19.5m		D13					19.5	3	6	7	13	-19.5
21.0m		D14	3	7.5	Light bluish grey medium stiff moderately sticky SANDY SILT trace clay		21.0	4	5	6	11	-21
22.5m		D15					22.5	4	4	7	11	-22.5
24.0m		D16					24.0	12	14	20	34	-24
25.5m		D17					25.5	10	11	23	34	-25.5
27.0m		D18	3	6.5	Brownish grey dense moderately sorted medium SAND		27.0	13	15	18	33	-27
28.5m		D19					28.5	15	18	20	38	-28.5
30.0m		D20					30.0	15	19	25	44	-30











Project: Project: Engineering Geological Survey in Rural Parts of MSDP Project Area					Client: Urban Development Directorate (UDD)								
Bore Hole No :BH-Chor-Nilakhshmia 22					Existing Ground Level : 12.25								
Location: Shabazpur Brac School, Chor-Nilakhshmia, Mymensingh					Date : 12-07-2014								
Co-ordination : Lat- 24° 46'45.888"N Long- 90°27'52.091"					Legend     								
Depth of Boring :30.0 Meter													
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	Graphical Representation 0 10 20 30 40 50 60	
1.5m		D1	2	7.0	Reddish brown,bluish grey loose fine to very fine SAND little silt		1.5	3	4	5	9		0
3.0m		D2					3.0	2	3	3	6		-1.5
4.5m		D3					4.5	1	1	2	3		-3
6.0m		D4					6.0	2	2	3	5		-4.5
7.5m		D5					7.5	3	4	5	9		-6
9.0m		D6	3	6.0	Grey medium dense moderately sorted fine to medium SAND		9.0	5	6	6	12		-7.5
10.5m		D7					10.5	5	7	9	16		-9
12.0m		D8					12.0	6	8	12	20		-10.5
13.5m		D9					13.5	6	8	13	21		-12
15.0m		D10					15.0	7	12	15	27		-13.5
16.5m		D11	3	7.5	Grey medium dense moderately sorted very fine to fine SAND		16.5	8	13	17	30		-15
18.0m		D12					18.0	10	15	18	33		-16.5
19.5m		D13					19.5	10	13	15	28		-18
21.0m		D14					21.0	11	16	20	36		-19.5
22.5m		D15					22.5	9	14	19	33		-21
24.0m		D16	3	9.5	Grey dense moderately sorted fine to medium SAND		24.0	10	15	22	37		-22.5
25.5m		D17					25.5	11	17	24	41		-24
27.0m		D18					27.0	13	17	25	42		-25.5
28.5m		D19					28.5	13	19	27	46		-27
30.0m		D20					30.0	15	23	29	52	-28.5	






Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Metro Properties Ltd.					
Bore Hole No :BH-Dapunia-23						Existing Ground Level : 14.5					
Location:Harti Govt. Primary School, Dapunia, Mymensingh						Date : 02-07-2014					
Co-ordination : Lat- 24° 45'47.756"N Long- 90°19'17.712"						Legend  Sand  Clay  Silt  N-Value  Organic					
Depth of Boring :30.0 Meter											
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation				
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values
1.5m		D1	2	2.5	Brownish grey loose moderately sorted fine SAND little silt		1.5	2	2	3	5
3.0m		D2	4	4.0	Grey very soft highly sticky CLAY little silt		3.0	1	1	1	2
4.5m		D3	5	9.0	Light grey medium dense moderately sorted fine SAND with silt		4.5	3	5	7	12
6.0m		D4					6.0	4	6	8	14
7.5m		D5					7.5	4	6	10	16
9.0m		D6					9.0	3	5	7	12
10.5m		D7					10.5	2	3	5	8
12.0m		D8				12.0	2	3	4	7	
13.5m		D9	7	7.5	Yellowish brown, light bluish grey stiff moderately sticky CLAYEY SILT, moderately oxidized		13.5	3	4	6	10
15.0m		D10					15.0	5	6	7	13
16.5m		D11					16.5	3	3	3	6
18.0m		D12					18.0	2	3	5	8
19.5m		D13				19.5	3	4	7	11	
21.0m		D14	9	3.0	Light bluish grey stiff moderately sticky SANDY SILT trace clay		21.0	4	5	7	12
22.5m		D15					22.5	5	6	9	15
24.0m		D16	10	6.5	Grey dense moderately sorted fine SAND little silt		24.0	8	14	22	36
25.5m		D17					25.5	10	15	20	35
27.0m		D18					27.0	13	13	23	36
28.5m		D19					28.5	15	17	22	39
30.0m		D20					30.0	15	19	26	45







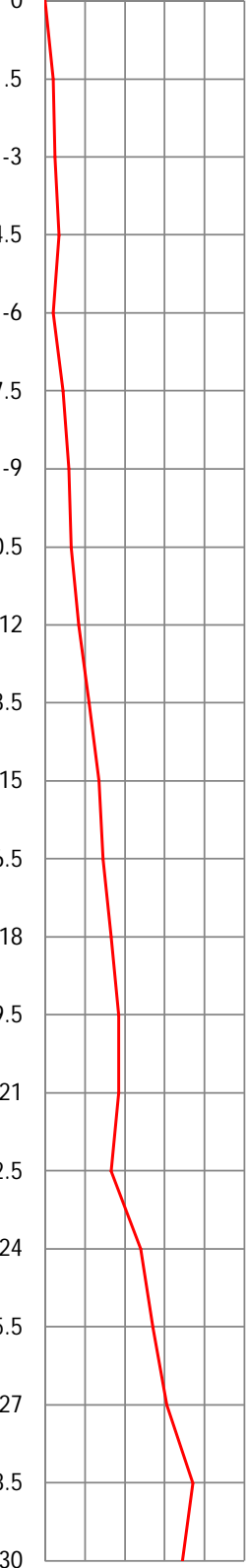



Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Urban Development Directorate (UDD)					
Bore Hole No :BH-Dapunia- 24							Existing Ground Level : 13.75					
Location: Azmatpur,Purbopara. Dapunia Mymensingh							Date :02-07-2014					
Co-ordinate : Lat- 24° 45'37.75"N Long- 90°20'33.50"							Legend  Sand  Clay  Silt  N-Value  Organic					
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration			N-Values	Graphical Representation
								15cm	15cm	15cm		
1.5m		D1	2	4.0	Brown to grey loose moderately sorted fine SAND trace silt		1.5	2	3	3	6	
3.0m		D2					3.0	2	3	4	7	
4.5m		D3	4	1.5	Brownish grey moderately sticky CLAY little silt		4.5	1	2	2	4	
6.0m		D4					6.0	5	6	7	13	
7.5m		D5			Grey medium dense moderately sorted fine SAND trace silt		7.5	5	6	7	13	
9.0m		D6	5	6.0			9.0	4	6	7	13	
10.5m		D7					10.5	3	4	6	10	
12.0m		D8					12.0	2	2	3	5	
13.5m		D9	7	4.5	Grey stiff moderately sticky CLAY with silt		13.5	2	3	4	7	
15.0m		D10					15.0	3	4	5	9	
16.5m		D11			Yellowish brown medium dense moderately sorted very fine SILTY SAND		16.5	5	7	8	15	
18.0m		D12	9	4.5			18.0	5	7	9	16	
19.5m		D13					19.5	6	8	9	17	
21.0m		D14			Yellowish brown very dense moderately sorted fine to medium SAND trace silt		21.0	10	12	15	27	
22.5m		D15					22.5	11	14	16	30	
24.0m		D16					24.0	12	15	18	33	
25.5m		D17	10	9.5			25.5	15	17	22	39	
27.0m		D18					27.0	16	21	25	46	
28.5m		D19					28.5	15	32	34	66	
30.0m		D20			30.0	18	32	37	69			

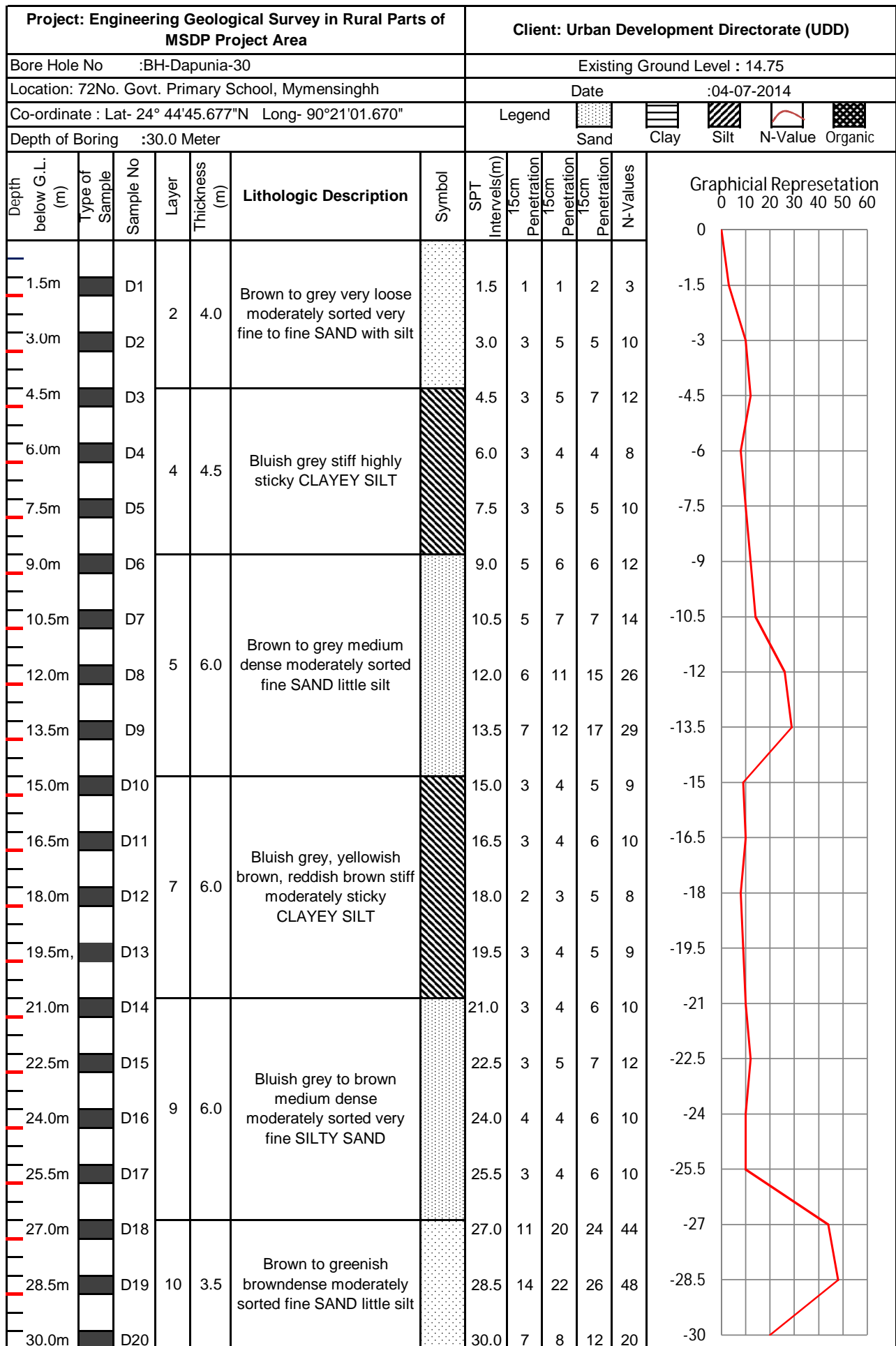
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Urban Development Directorate (UDD)					
Bore Hole No :BH-khagdagor - 25							Existing Ground Level : 12.25					
Location: Badekolpa,Mymensingh							Date :03-07-2014					
Co-ordinate : Lat- 24° 45'37.511"N Long- 90°21'44.269"							Legend  Sand  Clay  Silt  N-Value  Organic					
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)				N-Values	Graphical Representation 0 1020304050607080
							15cm	Penetration	15cm	Penetration		
1.5m		D1			Brown loose moderately sorted very fine to fine SAND with silt		1.5	3	3	5	8	
3.0m		D2	2	5.5			3.0	1	1	2	3	
4.5m		D3					4.5	1	1	2	3	
6.0m		D4	4	1.5	Grey stiff moderately sticky CLAYEY SILT		6.0	3	5	6	11	
7.5m		D5			Light grey dense to medium dense moderately sorted medium to fine SAND trace silt		7.5	7	10	13	23	
9.0m		D6	5	4.5			9.0	12	15	20	35	
10.5m		D7			Light bluish grey medium stiff moderately sticky SILT with clay		10.5	12	16	22	38	
12.0m		D8					12.0	3	3	4	7	
13.5m		D9	7	3.0			13.5	3	4	4	8	
15.0m		D10			Bluish grey, greenish brown stiff moderately sticky SILT with clay		15.0	3	5	7	12	
16.5m		D11					16.5	3	5	8	13	
18.0m		D12	9	6.0			18.0	5	7	8	15	
19.5m		D13			Yellowish brown medium dense moderately sorted fine SAND with silt, moderately oxidized		19.5	6	8	10	18	
21.0m		D14					21.0	10	14	16	30	
22.5m		D15		3.0			22.5	11	15	17	32	
24.0m		D16			Light yellowish brown very dense moderately sorted medium SAND		24.0	12	26	30	56	
25.5m		D17	10				25.5	14	28	32	60	
27.0m		D18		6.5			27.0	16	27	31	58	
28.5m		D19					28.5	15	30	33	63	
30.0m		D20					30.0	17	33	38	71	

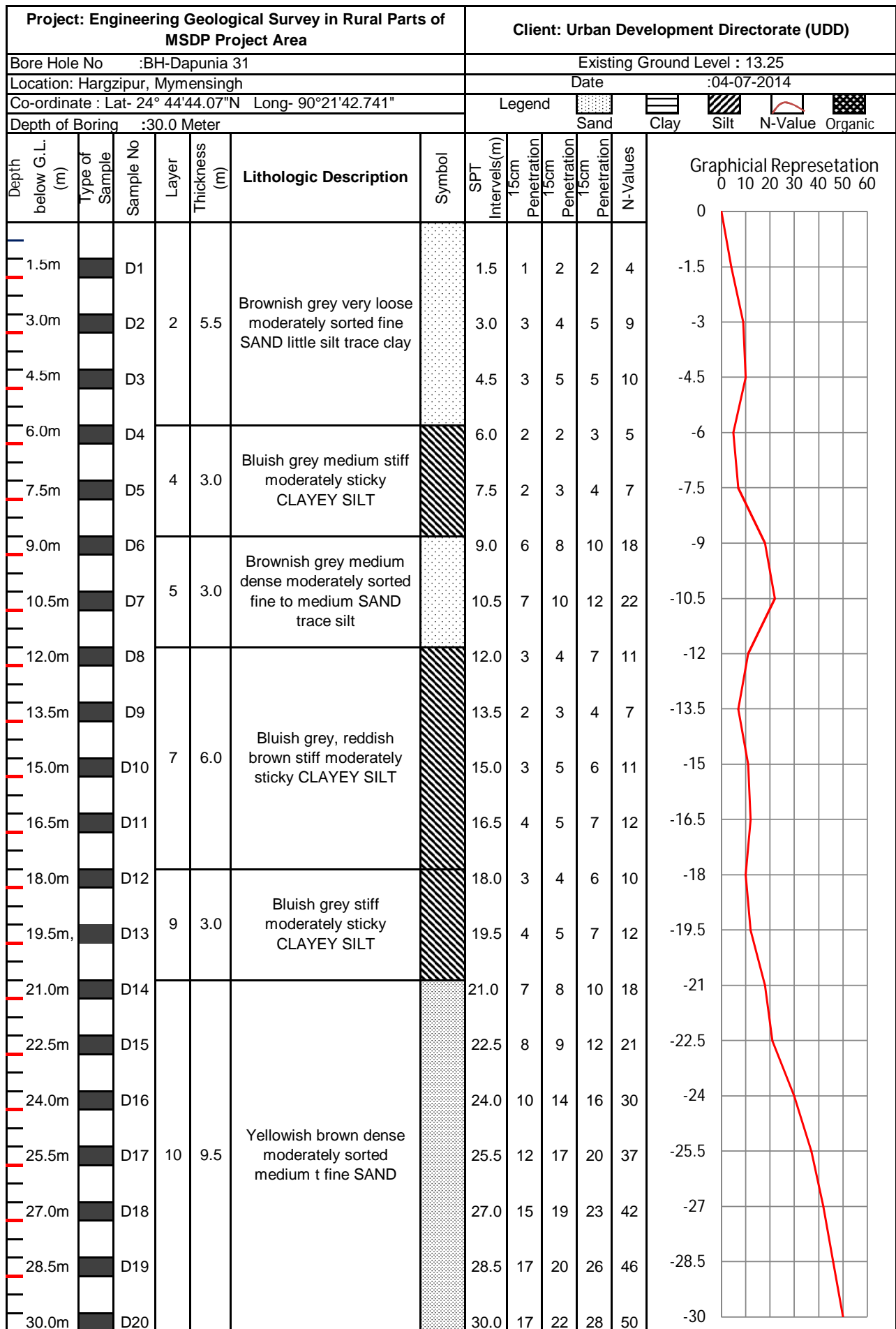
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area					Client: Urban Development Directorate (UDD)							
Bore Hole No :BH- Char-Ishwardia - 26					Existing Ground Level : 11.75							
Location: Chinamor. Char-Ishwardia, Mymensingh					Date :14-07-2014							
Co-ordinate : Lat- 24° 45'39.606"N Long- 90°26'20.301"					Legend  Sand  Clay  Silt  N-Value  Organic							
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	Graphical Representation 0 10 20 30 40 50 60
1.5m		D1	2	7.0	Reddish brown loose moderately sorted medium SAND with silt		1.5	2	3	5	8	
3.0m		D2					3.0	3	5	5	10	
4.5m		D3					4.5	3	5	8	13	
6.0m		D4					6.0	3	4	5	9	
7.5m		D5					7.5	3	5	6	11	
9.0m		D6	3	16.5	Brown to grey medium dense moderately sorted fine to medium SAND		9.0	5	6	8	14	
10.5m		D7					10.5	5	8	10	18	
12.0m		D8					12.0	5	8	12	20	
13.5m		D9					13.5	6	9	12	21	
15.0m		D10					15.0	6	10	14	24	
16.5m		D11					16.5	7	11	15	27	
18.0m		D12					18.0	6	10	14	24	
19.5m		D13					19.5	6	11	15	26	
21.0m		D14					21.0	8	12	17	29	
22.5m		D15					22.5	10	14	19	33	
24.0m		D16		6.5	Dark grey medium stiff highly sticky ORGANIC CLAY (PEAT)		24.0	3	3	4	7	
25.5m		D17					25.5	2	3	3	6	
27.0m		D18					27.0	3	4	4	8	
28.5m		D19					28.5	3	4	6	10	
30.0m		D20					30.0	3	4	6	10	













Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Nilakhsma - 27						Existing Ground Level : 12.75						
Location: Shombaganj Railgate, Mymensingh						Date :19-07-2014						
Co-ordinate : Lat- 24° 45'36.51"N Long- 90°27'49.29"						Legend     						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	Graphical Representation 0 10 20 30 40 50 60
1.5m		D1	2	4.0	Grey loose moderately sorted fine SAND little silt		1.5	2	3	5	8	
3.0m		D2					3.0	2	4	4	8	
4.5m		D3					4.5	4	4	6	10	
6.0m		D4	4.5	Brownish grey medium dense moderately sorted medium SAND trace silt		6.0	4	5	5	10		
7.5m		D5				7.5	5	5	6	11		
9.0m		D6				9.0	6	12	12	24		
10.5m		D7				10.5	11	13	18	31		
12.0m		D8				12.0	6	9	10	19		
13.5m		D9	7.5	Brownish grey medium dense moderately sorted fine to medium SAND trace silt		13.5	6	9	15	24		
15.0m		D10				15.0	10	12	17	29		
16.5m		D11				16.5	12	15	20	35		
18.0m		D12				18.0	13	18	22	40		
19.5m		D13				19.5	14	14	18	32		
21.0m		D14	10.5	Brownish grey dense moderately sorted fine to medium SAND trace silt		21.0	7	10	15	25		
22.5m		D15				22.5	8	12	16	28		
24.0m		D16				24.0	12	14	20	34		
25.5m		D17				25.5	13	15	22	27		
27.0m		D18				27.0	15	20	26	46		
28.5m		D19	3.5	Brownish grey medium very dense moderately sorted fine to medium SAND trace silt		28.5	15	22	29	51		
30.0m		D20				30.0	14	21	30	51		






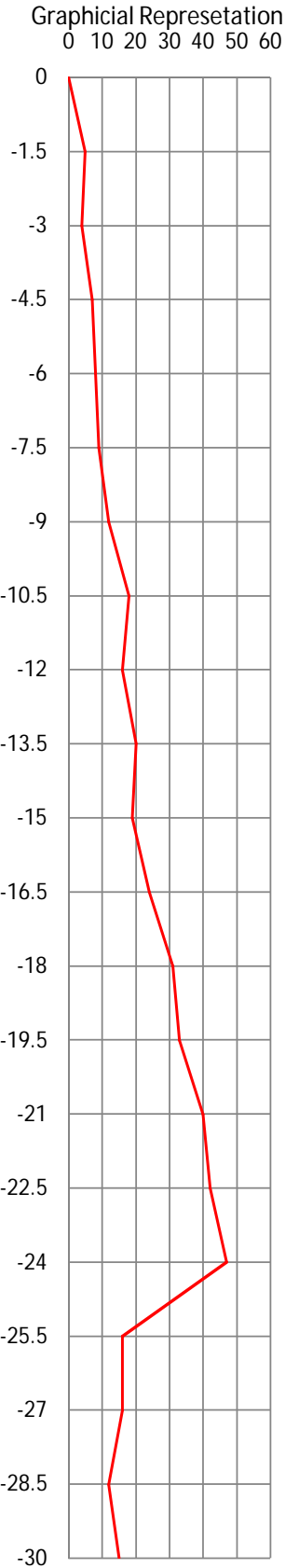
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Nilakhsimia - 28						Existing Ground Level : 13						
Location:7No. Choranolaxmia,Raghabpur, Mymensingh						Date :19-07-2014						
Co-ordinate : Lat- 24° 45'22.508N Long- 90°28'36.284"						Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation					
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	
1.5m		D1					1.5	3	5	5	10	
3.0m		D2	2	5.5	Light brown loose moderately sorted fine SAND little silt		3.0	3	4	7	11	
4.5m		D3					4.5	3	5	8	13	
6.0m		D4					6.0	5	8	12	20	
7.5m		D5		4.5	Light brown medium dense moderately sorted medium SAND trace silt		7.5	6	10	12	22	
9.0m		D6					9.0	10	15	17	32	
10.5m		D7					10.5	5	8	11	19	
12.0m		D8					12.0	7	10	14	24	
13.5m		D9		7.5	Light grey to brown dense moderately sorted fine SAND little silt		13.5	8	12	16	28	
15.0m		D10					15.0	10	14	16	30	
16.5m		D11					16.5	11	16	19	35	
18.0m		D12	3				18.0	5	8	12	20	
19.5m		D13					19.5	6	9	14	23	
21.0m		D14		7.5	Light grey to brown dense moderately sorted fine t medium SAND little silt		21.0	8	10	15	25	
22.5m		D15					22.5	10	13	17	30	
24.0m		D16					24.0	12	16	19	35	
25.5m		D17					25.5	8	14	16	30	
27.0m		D18		3.5	Light grey to brown dense moderately sorted medium SAND little silt		27.0	12	17	20	37	
28.5m		D19					28.5	14	20	25	45	
30.0m		D20					30.0	16	24	27	51	






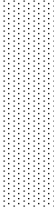
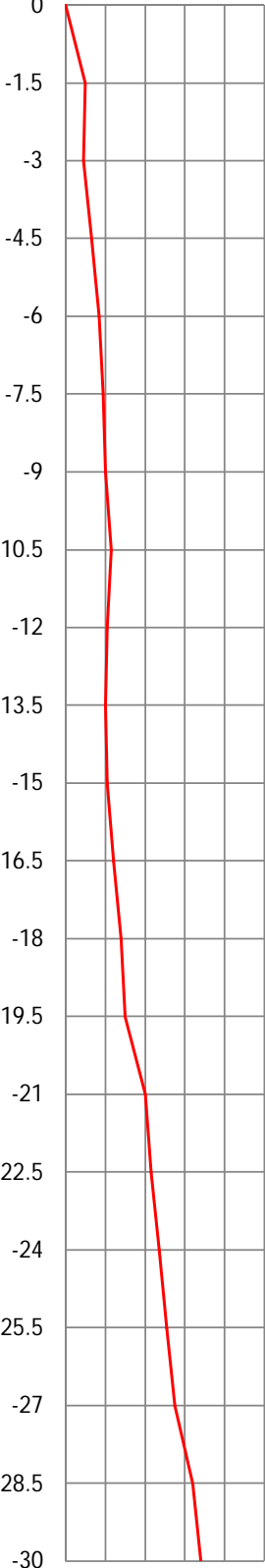


Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Chor-Nilakshmia 29						Existing Ground Level : 12.75						
Location: Bijonagar, Chor-Nilakshmia, Mymensingh						Date :22-07-2014						
Co-ordinate : Lat- 24° 45'26.11"N Long- 90°30'0.65"						Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals (m)				N-Values	Graphical Representation
							15cm	Penetration	15cm	Penetration		
1.5m		D1	1	7.0	Brownish grey loose moderately sorted fine to medium SAND little silt		1.5	1	2	2	4	
3.0m		D2					3.0	2	2	3	5	
4.5m		D3					4.5	2	3	4	7	
6.0m		D4					6.0	2	2	2	4	
7.5m		D5					7.5	4	4	5	9	
9.0m		D6	3	6.0	Light grey medium dense moderately sorted very fine to fine SAND		9.0	5	5	7	12	
10.5m		D7					10.5	6	6	7	13	
12.0m		D8					12.0	7	8	9	17	
13.5m		D9					13.5	8	10	12	22	
15.0m		D10	3	10.0	Light yellowish brown medium dense to dense moderately sorted fine to medium SAND		15.0	9	12	15	27	
16.5m		D11					16.5	9	13	16	29	
18.0m		D12					18.0	11	14	19	33	
19.5m		D13					19.5	12	5	22	37	
21.0m		D14					21.0	12	15	22	37	
22.5m		D15	3	7.0	Light yellowish brown very dense moderately sorted medium SAND		22.5	13	16	17	33	
24.0m		D16					24.0	13	22	26	48	
25.5m		D17					25.5	14	26	28	54	
27.0m		D18	3	7.0	Light yellowish brown very dense moderately sorted medium SAND		27.0	15	29	32	61	
28.5m		D19					28.5	15	35	39	74	
30.0m		D20					30.0	15	34	35	69	

















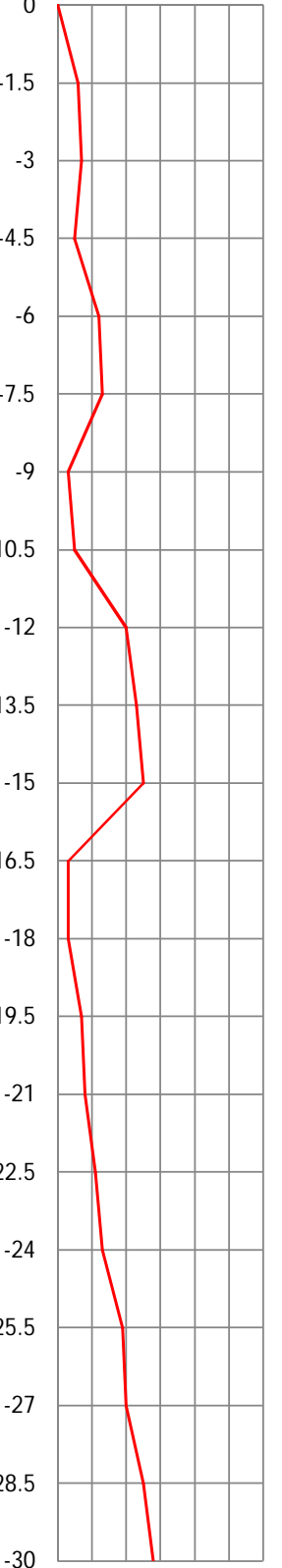




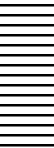











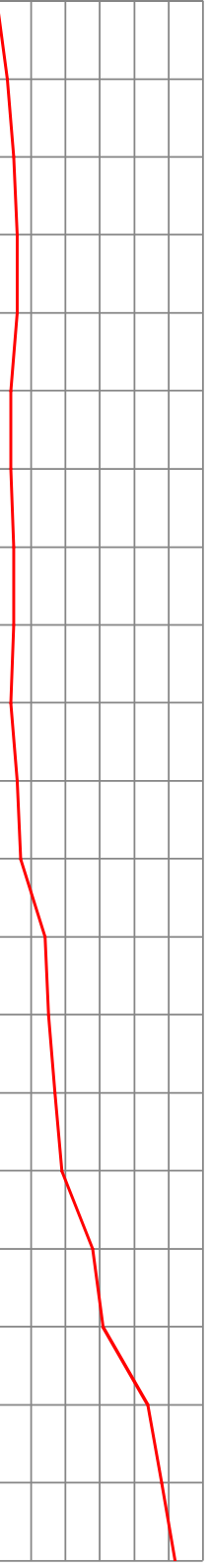

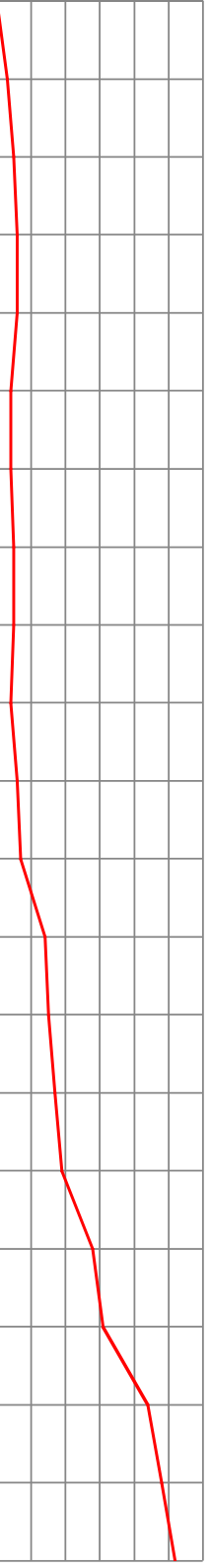


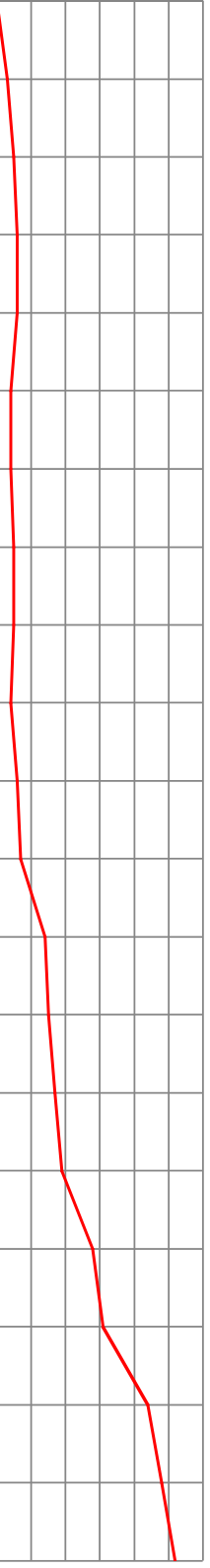

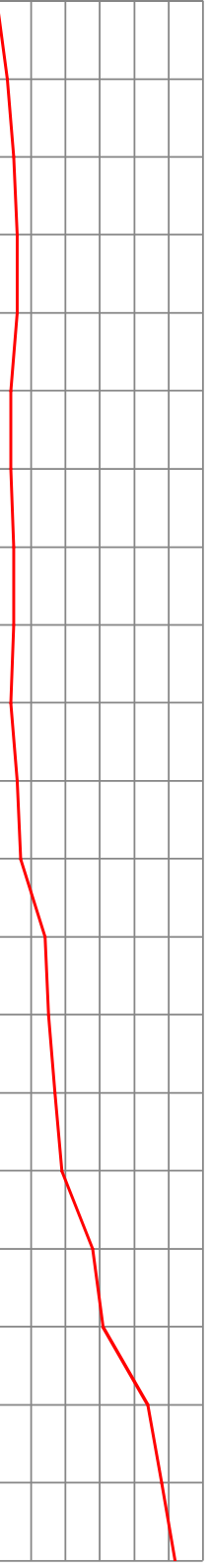

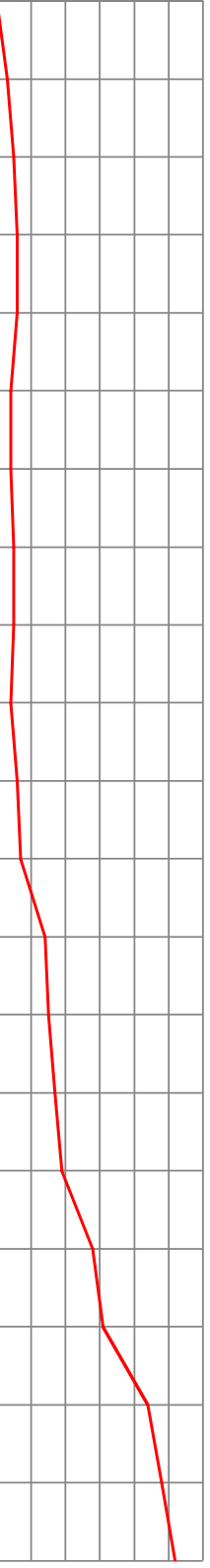
Project: Project: Engineering Geological Survey in Rural Parts of MSDP Project Area					Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Akua 32					Existing Ground Level : 11							
Location: Haji Jalaluddin High School, Akua Mymensingh					Date : 05-07-2014							
Co-ordination : Lat- 24° 44'28.236"N Long- 90°22'56.971"					Legend     							
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	Graphical Representation 0 10 20 30 40 50 60
1.5m		D1	1	7.0	Brownish grey medium stiff moderately sticky SANDY SILT little clay		1.5	2	2	3	5	
3.0m		D2					3.0	2	2	2	4	
4.5m		D3					4.5	2	2	2	4	
6.0m		D4					6.0	1	1	1	3	
7.5m		D5	2	3.0	Grey medium dense moderately sorted very fine SAND little silt		7.5	3	5	7	12	
9.0m		D6					9.0	5	6	8	14	
10.5m		D7	4	3.0	Grey medium stiff moderately sticky SANDY SILT little clay		10.5	3	3	4	7	
12.0m		D8					12.0	2	3	4	7	
13.5m		D9	7	3.0	Bluish grey stiff moderately sticky CLAYEY SILT		13.5	3	4	4	8	
15.0m		D10					15.0	3	4	5	9	
16.5m		D11	8	4.5	Yellowish brown medium dense moderately sorted very fine SAND little silt		16.5	4	5	6	11	
18.0m		D12					18.0	5	8	11	19	
19.5m		D13					19.5	5	8	12	20	
21.0m		D14	9	1.5	Yellowish brown stiff SILT with clay moderately oxidized		21.0	5	9	13	22	
22.5m		D15	10	8.0	Yellowish brown dense moderately sorted very fine to fine SAND little silt		22.5	9	13	21	34	
24.0m		D16					24.0	7	14	21	35	
25.5m		D17					25.5	10	19	26	45	
27.0m		D18					27.0	12	20	27	47	
28.5m		D19					28.5	13	21	32	53	
30.0m		D20					30.0	17	25	34	59	

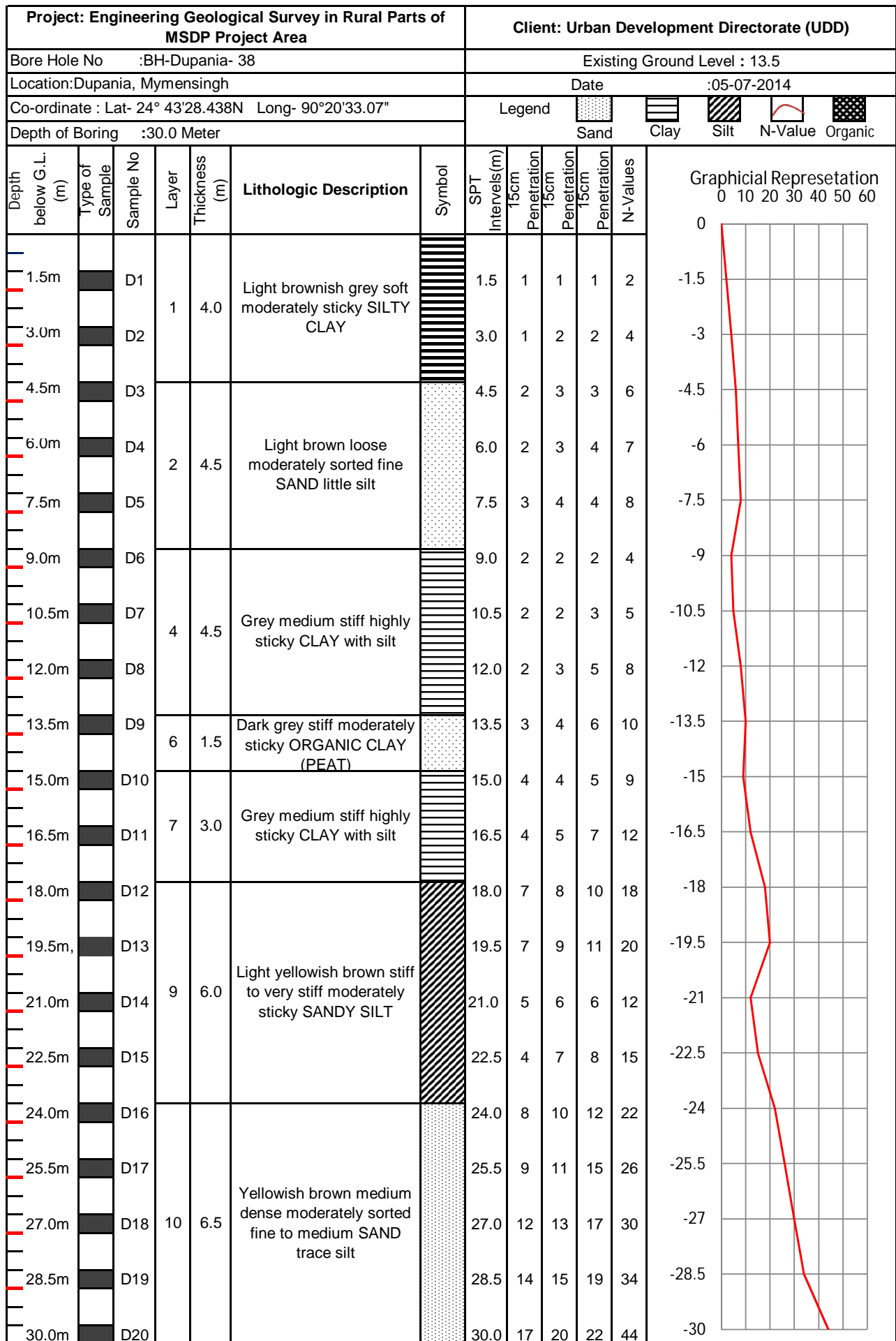
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Metro Properties Ltd.						
Bore Hole No :BH-Chor-Ishwardia-33						Existing Ground Level : 11.75						
Location:Chor-Ishwardia, Mymensingh						Date : 14-07-2014						
Co-ordination : Lat- 24° 44'37.99"N Long- 90°26'21.45"						Legend     						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation					
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	
1.5m		D1					1.5	2	2	3	5	
3.0m		D2				3.0	2	2	2	4		
4.5m		D3	2	8.5	Dark brown loose moderately sorted medium SAND		4.5	2	3	4	7	
6.0m		D4				6.0	2	3	5	8		
7.5m		D5				7.5	4	4	5	9		
9.0m		D6				9.0	5	5	7	12		
10.5m		D7				10.5	7	8	10	18		
12.0m		D8				12.0	7	8	8	16		
13.5m		D9				13.5	8	9	11	20		
15.0m		D10				15.0	6	9	10	19		
16.5m		D11	3	21.5	Dark brown to grey medium dense to dense moderately sorted medium to fine SAND		16.5	7	10	14	24	
18.0m		D12				18.0	9	13	18	31		
19.5m		D13				19.5	11	15	18	33		
21.0m		D14				21.0	10	16	24	40		
22.5m		D15				22.5	15	18	24	42		
24.0m		D16				24.0	17	20	27	47		
25.5m		D17				25.5	7	8	8	16		
27.0m		D18	9	5.0	Light bluish grey very stiff silty CLAY		27.0	6	7	9	16	
28.5m		D19				28.5	5	6	6	12		
30.0m		D20				30.0	6	7	8	15		














Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Dapunia- 34						Existing Ground Level : 13.75						
Location: Azmatpur,Purbopara. Dapunia Mymensingh						Date :02-07-2014						
Co-ordinate : Lat- 24° 45'37.75"N Long- 90°20'33.50"						Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)				N-Values	Graphical Representation
							15cm	15cm	15cm	15cm		
1.5m		D1	2	4.0	Light brown medium dense moderately sorted fine SAND little silt (Filling soil)		1.5	3	5	5	10	
3.0m		D2					3.0	3	4	5	9	
4.5m		D3					4.5	5	6	7	13	
6.0m		D4	3	16.5	Light brown medium dense moderately sorted medium SAND trace silt		6.0	5	7	10	17	
7.5m		D5					7.5	5	8	11	19	
9.0m		D6					9.0	5	8	12	20	
10.5m		D7					10.5	7	10	13	23	
12.0m		D8					12.0	6	9	12	21	
13.5m		D9					13.5	6	8	12	20	
15.0m		D10					15.0	6	8	13	21	
16.5m		D11					16.5	7	10	14	24	
18.0m		D12					18.0	8	12	16	28	
19.5m		D13					19.5	8	13	17	30	
21.0m		D14	9.5		Light brown dense moderately sorted medium SAND trace silt		21.0	10	18	22	40	
22.5m		D15					22.5	11	19	24	43	
24.0m		D16					24.0	12	21	26	47	
25.5m		D17					25.5	12	23	28	51	
27.0m		D18					27.0	14	25	30	55	
28.5m		D19					28.5	16	30	34	64	
30.0m		D20					30.0	18	32	37	68	







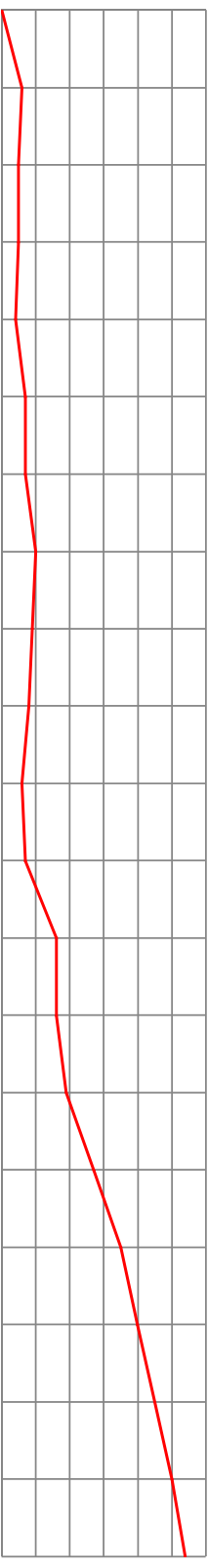





Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Nilakkhia - 35						Existing Ground Level : 12.25						
Location: Nilakkhia,Jadobpur,Mymensingh						Date :22-07-2014						
Co-ordinate : Lat- 24° 44'40.42"N Long- 90°29'05.12"						Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	15cm Penetration	15cm Penetration	15cm Penetration	N-Values	Graphical Representation 0 10 20 30 40 50 60
1.5m		D1			Light brown loose moderately sorted fine to medium SAND trace silt		1.5	1	2	3	5	
3.0m		D2	2	5.5		3.0	2	2	2	4		
4.5m		D3				4.5	2	3	3	6		
6.0m		D4				6.0	4	6	8	14		
7.5m		D5				7.5	5	7	9	16		
9.0m		D6			Light grey to brown medium dense moderately sorted medium SAND trace silt		9.0	5	8	10	18	
10.5m		D7				10.5	7	9	12	21		
12.0m		D8	3	12.0		12.0	8	12	15	27		
13.5m		D9				13.5	8	13	15	28		
15.0m		D10				15.0	10	14	16	30		
16.5m		D11				16.5	12	15	18	33		
18.0m		D12				18.0	2	3	4	7		
19.5m		D13			Brown, reddish brown stiff highly sticky CLAYEY SILT, oxidized		19.5	2	3	5	8	
21.0m		D14	7	6.0		21.0	3	5	5	10		
22.5m		D15				22.5	3	5	6	11		
24.0m		D16			Yellowish brown to reddish brown medium dense moderately sorted fine to medium SAND little silt		24.0	6	10	14	24	
25.5m		D17				25.5	7	11	16	27		
27.0m		D18	10	6.5		27.0	8	12	17	29		
28.5m		D19				28.5	10	14	19	33		
30.0m		D20				30.0	11	15	20	35		

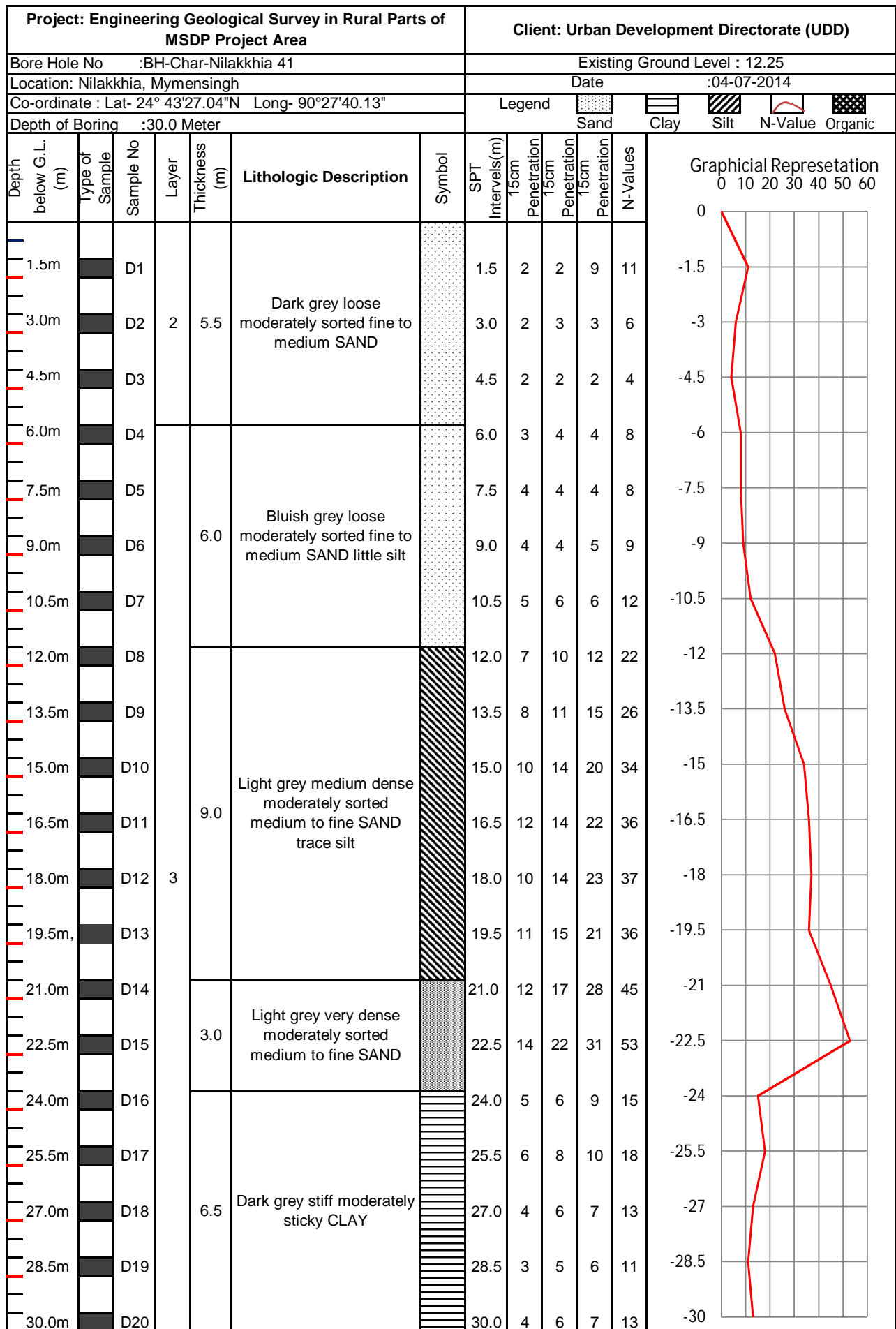
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Urban Development Directorate (UDD)						
Bore Hole No :BH- Char-Nilakkhia, - 36							Existing Ground Level : 12.25						
Location: Baishakhi Hachary, Char-Nilakkhia,, Mymensingh							Date :13-07-2014						
Co-ordinate : Lat- 24° 44'23.238"N Long- 90°29'57.995"							Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter													
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	Graphical Representation 0 10 20 30 40 50 60 	
1.5m		D1			Grey loose moderately sorted very fine to fine SAND little silt		1.5	2	3	3	6		-1.5
3.0m		D2	2	5.5		3.0	2	3	4	7	-3		
4.5m		D3				4.5	2	2	3	5	-4.5		
6.0m		D4	3	3.0	Grey medium dense moderately sorted fine to medium SAND trace silt		6.0	3	5	7	12		-6
7.5m		D5					7.5	4	7	6	13		-7.5
9.0m		D6	4	3.0	Grey soft moderately sticky SILT trace clay		9.0	1	1	2	3		-9
10.5m		D7					10.5	2	2	3	5		-10.5
12.0m		D8	5	4.5	Light brownish grey medium dense moderately sorted very fine to fine SAND little silt		12.0	5	8	12	20		-12
13.5m		D9					13.5	6	10	13	23		-13.5
15.0m		D10					15.0	7	11	14	25		-15
16.5m		D11	7	3.0	Light yellowish brown, bluish grey soft moderately sticky CLAY with silt		16.5	1	1	2	3		-16.5
18.0m		D12					18.0	1	1	2	3		-18
19.5m		D13	7	3.0	Reddish brown, bluish grey medium stiff moderately sticky CLAYEY SILT		19.5	3	3	4	7		-19.5
21.0m		D14					21.0	3	4	4	8		-21
22.5m		D15					22.5	3	5	6	11		-22.5
24.0m		D16	9	5.0	Yellowish brown stiff moderately sticky SILTY CLAY		24.0	4	6	7	13		-24
25.5m		D17					25.5	7	7	12	19		-25.5
27.0m		D18	9	5.0	Yellowish brown, reddish brown, bluish grey stiff moderately sticky SILT with clay		27.0	7	8	12	20		-27
28.5m		D19					28.5	7	10	15	25		-28.5
30.0m		D20					30.0	8	12	16	28	-30	






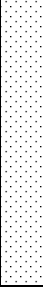
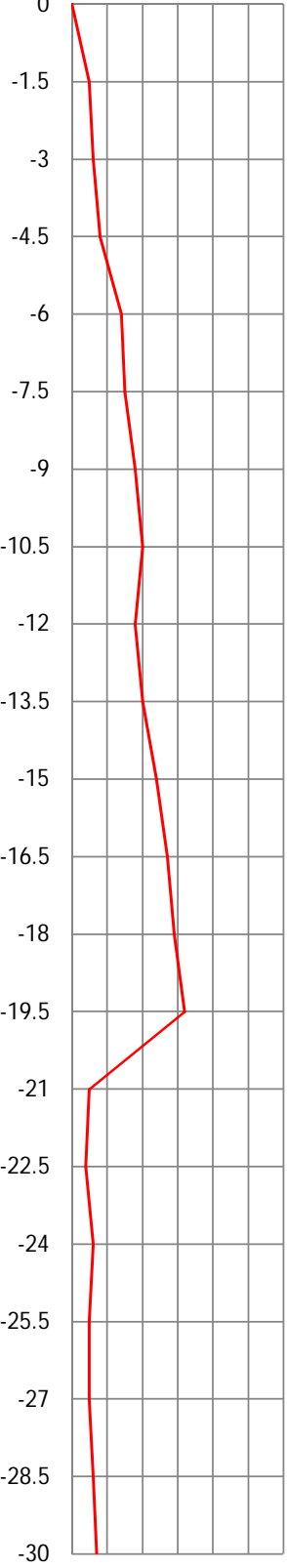



Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Urban Development Directorate (UDD)					
Bore Hole No :BH-Dupania - 37							Existing Ground Level : 13.75					
Location: Gostagram, Dupania, Mymensingh							Date :05-07-2014					
Co-ordinate : Lat- 24° 43'28.717"N Long- 90°19'27.957"							Legend     					
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration			N-Values	Graphical Representation
								15cm	15cm	15cm		
1.5m		D1			Light brown loose moderately sorted fine SAND with silt		1.5	1	1	2	3	
3.0m		D2	2	7.0			3.0	2	2	3	5	
4.5m		D3					4.5	2	3	3	6	
6.0m		D4					6.0	1	3	3	6	
7.5m		D5					7.5	2	2	2	4	
9.0m		D6			Grey medium stiff moderately sticky CLAY with silt		9.0	1	2	2	4	
10.5m		D7	4	6.0			10.5	1	2	3	5	
12.0m		D8					12.0	1	2	3	5	
13.5m		D9	6	1.5			Dark grey soft moderately sticky ORGANIC CLAY (PEAT)		13.5	1	2		2	4
15.0m		D10			Grey medium stiff highly sticky CLAY with silt		15.0	2	3	3	6	
16.5m		D11	7	3.0			16.5	2	3	4	7	
18.0m		D12			Reddish brown, bluish grey stiff moderately sticky SILTY CLAY		18.0	4	6	8	14	
19.5m		D13					19.5	4	6	9	15	
21.0m		D14	9	6.0			21.0	5	7	10	17	
22.5m		D15					22.5	5	8	11	19	
24.0m		D16			Yellowish brown dense moderately sorted medium SAND trace silt		24.0	8	12	16	28	
25.5m		D17					25.5	10	14	17	31	
27.0m		D18	10	6.5			27.0	12	19	25	44	
28.5m		D19					28.5	15	21	27	48	
30.0m		D20					30.0	16	23	29	52	









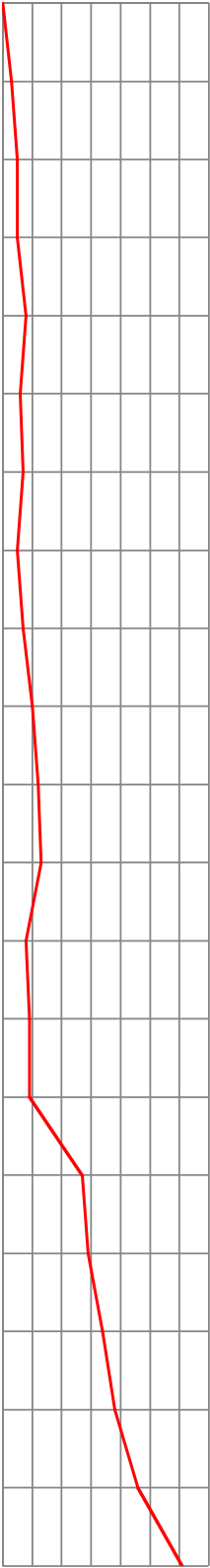






Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Dapunia 39						Existing Ground Level : 13.75						
Location: D.K.G.S., United College. Dapunia, Mymensingh						Date :06-07-2014						
Co-ordinate : Lat- 24° 43'11.242"N Long- 90°21'28.943"						Legend     						
Depth of Boring :30.0 Meter						Sand Clay Silt N-Value Organic						
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Graphical Representation				
								15cm Penetration	15cm Penetration	15cm Penetration	N-Values	
1.5m		D1	1	2.5	Brown loose moderately sorted fine SAND little silt (filling)		1.5	1	1	1	2	-1.5
3.0m		D2		1.5	Grey soft moderately sticky CLAYEY SILT		3.0	1	2	2	4	-3
4.5m		D3					4.5	2	3	4	7	-4.5
6.0m		D4	2	4.5	Brown loose moderately sorted very fine to fine micaceous SAND		6.0	4	4	6	10	-6
7.5m		D5					7.5	4	6	10	16	-7.5
9.0m		D6	6	1.5	Dark grey soft moderately sticky ORGANIC CLAY (PEAT)		9.0	1	1	2	3	-9
10.5m		D7					10.5	2	3	5	8	-10.5
12.0m		D8	7	4.5	Yellowish brown, bluish grey medium stiff moderately sticky CLAYEY SILT		12.0	3	5	7	12	-12
13.5m		D9					13.5	4	6	7	13	-13.5
15.0m		D10					15.0	7	12	15	27	-15
16.5m		D11					16.5	8	13	16	29	-16.5
18.0m		D12	8	6.0	Yellowish brown medium dense moderately sorted medium SAND trace silt moderately oxidized		18.0	7	10	10	20	-18
19.5m		D13					19.5	7	10	11	21	-19.5
21.0m		D14					21.0	4	6	9	15	-21
22.5m		D15					22.5	5	7	10	17	-22.5
24.0m		D16	9	6.0	Bluish grey medium dense moderately sorted fine to very fine SAND		24.0	7	12	21	33	-24
25.5m		D17					25.5	7	10	18	28	-25.5
27.0m		D18					27.0	10	15	35	50	-27
28.5m		D19	10	3.5	Grey dense moderately sorted fine SAND little clay		28.5	12	40	45	85	-28.5
30.0m		D20					30.0	12	40	45	85	-30







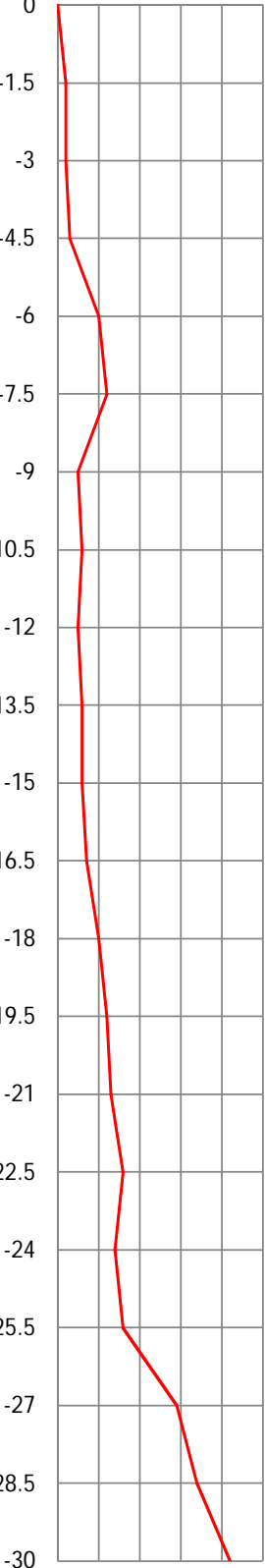
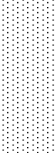




Project: Engineering Geological Survey in Rural Parts of MSDP Project Area					Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Ghagra 40					Existing Ground Level : 11							
Location: Moddho Brara, Ghagra, Mymensingh					Date :07-07-2014							
Co-ordinate : Lat- 24° 43'32.006"N Long- 90°22'56.175"					Legend     							
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT				N-Values	Graphical Representation
							Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm		
1.5m		D1			Brownish grey medium stiff moderately sticky SANDY SILT trace clay		1.5	2	3	3	6	 <p>Graphical Representation 0 10 20 30 40 50 60</p>
3.0m		D2	1	5.5			3.0	2	2	3	5	
4.5m		D3					4.5	2	2	3	5	
6.0m		D4	4	1.5	Grey soft highly sticky CLAY trace silt		6.0	1	2	2	4	
7.5m		D5			Light grey loose moderately sorted very fine to fine SAND		7.5	1	3	4	7	
9.0m		D6					9.0	2	3	4	7	
10.5m		D7	5	7.5			10.5	4	5	5	10	
12.0m		D8					12.0	4	4	5	9	
13.5m		D9					13.5	4	4	4	8	
15.0m		D10			Bluish grey medium stiff moderately CLAYEY SILT		15.0	2	3	3	6	
16.5m		D11	7	3.0			16.5	2	3	4	7	
18.0m		D12			Yellowish brown medium dense moderately sorted medium SAND trace silt		18.0	7	8	8	16	
19.5m		D13	9	4.5			19.5	7	8	8	16	
21.0m		D14					21.0	8	9	10	19	
22.5m		D15			Light yellowish brown medium dense to dense moderately sorted medium SAND trace silt		22.5	11	12	15	27	
24.0m		D16					24.0	13	15	20	35	
25.5m		D17	10	8.0			25.5	14	18	22	40	
27.0m		D18					27.0	15	21	24	45	
28.5m		D19					28.5	15	23	27	50	
30.0m		D20				30.0	16	24	30	54		






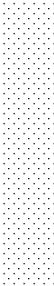
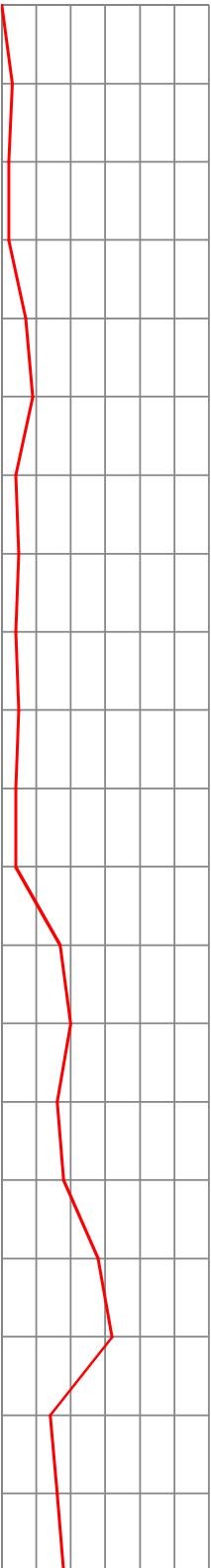
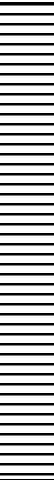
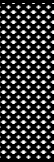
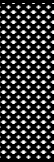









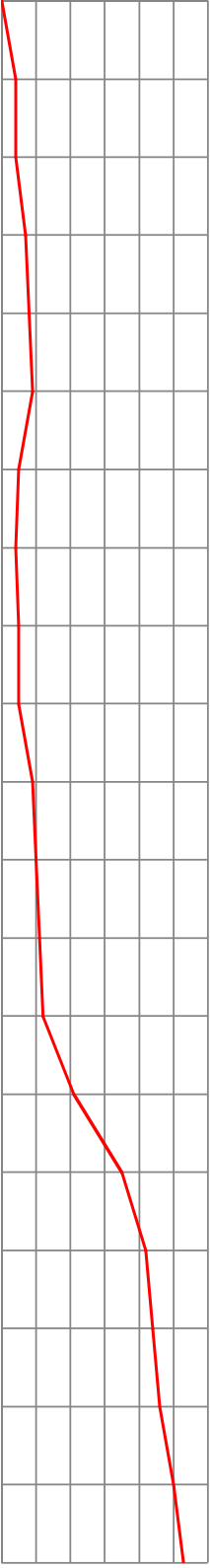





Project: Project: Engineering Geological Survey in Rural Parts of MSDP Project Area					Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Char-Nilakkhia- 42					Existing Ground Level : 12.25							
Location: Jugir,Agli,Char-Nilakkhia, Mymensingh					Date : 13-07-2014							
Co-ordination : Lat- 24° 43'32.480"N Long- 90°28'40.184"					Legend     							
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation					
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	
1.5m		D1	2	5.5	Brownish grey loose moderately sorted fine SAND		1.5	2	2	3	5	
3.0m	D2	3.0					2	3	3	6		
4.5m	D3	4.5					2	3	5	8		
6.0m	D4	6.0					4	6	8	14		
7.5m	D5	D5-D8	3	6.0	Bluish grey medium dense moderately sorted fine to medium SAND		7.5	4	7	8	15	
9.0m	D6						9.0	5	8	10	18	
10.5m	D7						10.5	5	8	12	20	
12.0m	D8						12.0	6	8	10	18	
13.5m	D9	D9-D12	3	9.0	Grey medium dense moderately sorted medium SAND		13.5	6	8	12	20	
15.0m	D10						15.0	7	10	14	24	
16.5m	D11						16.5	8	11	16	27	
18.0m	D12						18.0	10	13	16	29	
19.5m	D13	D13-D16	3	9.5	Dark grey medium stiff highly sticky ORGANIC CLAY (PEAT)		19.5	11	14	18	32	
21.0m	D14						21.0	2	2	3	5	
22.5m	D15						22.5	2	2	2	4	
24.0m	D16						24.0	2	3	3	6	
25.5m	D17	D17-D20	6	9.5	Dark grey medium stiff highly sticky ORGANIC CLAY (PEAT)		25.5	2	2	3	5	
27.0m	D18						27.0	2	2	3	5	
28.5m	D19						28.5	2	3	3	6	
30.0m	D20						30.0	2	3	4	7	









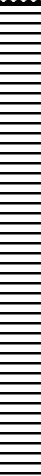

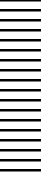
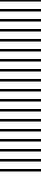
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area					Client: Metro Properties Ltd.							
Bore Hole No :BH-Dapunia-43					Existing Ground Level : 13.25							
Location: Nama-katla-shon, Mymensingh					Date : 06-07-2014							
Co-ordination : Lat- 24° 42'40.58"N Long- 90°18'11.16"					Legend							
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(15cm)	Penetration			N-Values	Graphical Representation
								15cm	15cm	15cm		
1.5m		D1	2	2.5	Brown very loose moderately sorted fine SAND		1.5	1	1	2	3	<p>Graphical Representation 0 10 20 30 40 50 60 70</p>
3.0m		D2	4	6.0	Brown to grey soft to medium stiff moderately sticky SILT with clay		3.0	1	1	2	3	
4.5m		D3					4.5	1	2	2	4	
6.0m		D4					6.0	2	3	3	6	
7.5m		D5					7.5	2	3	4	7	
9.0m		D6	5	6.0	Grey medium dense moderately sorted fine to very fine SAND with silt		9.0	4	4	6	10	
10.5m		D7					10.5	4	5	7	12	
12.0m		D8					12.0	4	6	8	14	
13.5m		D9					13.5	5	7	9	16	
15.0m		D10					15.0	10	19	25	44	
16.5m		D11	8	6.0	Light grey dense moderately sorted medium SAND with silt		16.5	12	21	26	47	
18.0m		D12					18.0	12	24	28	52	
19.5m		D13					19.5	13	26	31	57	
21.0m		D14	9	7.0	Brown, reddish brown, bluish grey medium stiff to stiff moderately sticky CLAYEY SILT		21.0	4	4	6	10	
22.5m		D15					22.5	4	5	6	11	
24.0m		D16					24.0	2	3	3	6	
25.5m		D17					25.5	2	3	4	7	
27.0m		D18	10	2.5	Yellowish brown very dense moderately sorted fine SAND		27.0	3	4	5	9	
28.5m		D19					28.5	15	26	30	56	
30.0m		D20					30.0	18	30	36	66	

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Dapunia- 44						Existing Ground Level : 11.5						
Location: Dapunia Mymensingh						Date :02-07-2014						
Co-ordinate : Lat- 24° 42'45.26"N Long- 90°19'27.93"						Legend     						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)				N-Values	Graphical Representation
							15cm	15cm	15cm	15cm		
1.5m		D1	1	4.0	Light brown soft moderately sticky CLAYEY SILT		1.5	1	1	2	3	 <p>Graphical Representation 0 10 20 30 40 50 60 70</p>
3.0m		D2					3.0	1	2	3	5	
4.5m		D3	2	3.0	Brownish grey loose moderately sorted very fine to fine SAND		4.5	2	2	3	5	
6.0m		D4					6.0	3	4	4	8	
7.5m		D5	4	4.0	Grey medium stiff moderately sticky SILTY CLAY		7.5	2	3	3	6	
9.0m		D6					9.0	2	3	4	7	
10.5m		D7	6	1.0	Dark grey soft highly sticky ORGANIC CLAY (PEAT)		10.5	2	2	3	5	
12.0m		D8					12.0	3	3	4	7	
13.5m		D9	8	5.0	Light yellowish grey medium dense moderately sorted fine SAND with silt		13.5	4	5	5	10	
15.0m		D10					15.0	4	5	7	12	
16.5m		D11	9	4.5	Light bluish grey medium stiff moderately sticky SANDY SILT		16.5	4	6	7	13	
18.0m		D12					18.0	3	4	4	8	
19.5m		D13					19.5	3	3	6	9	
21.0m		D14	10	8.0	Yellowish brown medium dense moderately sorted medium SAND		21.0	4	4	5	9	
22.5m		D15					22.5	10	12	15	27	
24.0m		D16					24.0	11	12	17	29	
25.5m		D17					25.5	13	15	19	34	
27.0m		D18					27.0	16	18	20	38	
28.5m		D19					28.5	17	22	24	46	
30.0m		D20					30.0	23	29	32	61	

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Ghagra - 45						Existing Ground Level : 13.25						
Location: Suhila west para,Ghagra,Mymensingh						Date :07-07-2014						
Co-ordinate : Lat- 24° 42'25.896"N Long- 90°20'23.328"						Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)				N-Values	Graphical Representation
							15cm	15cm	15cm	15cm		
1.5m		D1			Brown soft moderately sticky CLAYEY SILT with sand		1.5	1	1	1	2	
3.0m		D2	1	5.5		3.0	1	1	1	2		
4.5m		D3				4.5	1	1	2	3		
6.0m		D4			Grey medium dense moderately sorted very fine to fine SAND trace silt		6.0	3	5	5	10	
7.5m		D5	2	3.0		7.5	3	5	7	12		
9.0m		D6			Dark grey medium stiff highly sticky ORGANIC CLAY (PEAT)		9.0	2	2	3	5	
10.5m		D7	6	4.5		10.5	2	3	3	6		
12.0m		D8				12.0	2	2	3	5		
13.5m		D9			Reddish brown, grey, Yellowish brown medium stiff moderately sticky CLAYEY SILT		13.5	2	3	3	6	
15.0m		D10	7	4.5		15.0	2	3	3	6		
16.5m		D11				16.5	3	3	4	7		
18.0m		D12			Reddish brown, grey, Yellowish brown stiff moderately sticky SILTY CLAY		18.0	3	4	6	10	
19.5m		D13				19.5	3	5	7	12		
21.0m		D14				21.0	4	5	8	13		
22.5m		D15	9	9.0		22.5	4	6	10	16		
24.0m		D16				24.0	3	5	9	14		
25.5m		D17				25.5	4	6	10	16		
27.0m		D18			Brown to grey medium dense moderately sorted medium SAND little silt		27.0	8	12	17	29	
28.5m		D19	10	3.5		28.5	10	14	20	34		
30.0m		D20				30.0	14	17	25	42		







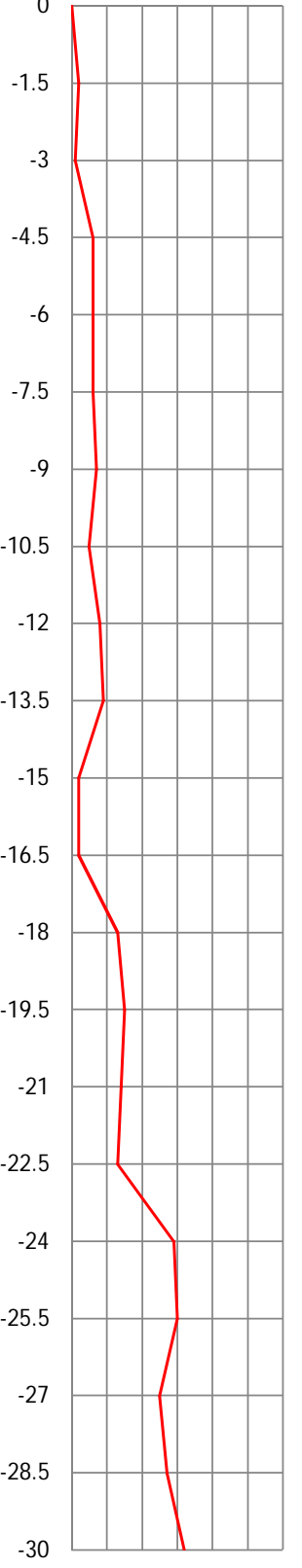





Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH- Ghagra - 47						Existing Ground Level : 11.75						
Location: Char-Ghagra, Mymensingh						Date :08-07-2014						
Co-ordinate : Lat- 24° 42'23.541"N Long- 90°22'47.139"						Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)				N-Values	Graphical Representation
							15cm	15cm	15cm	15cm		
1.5m		D1			Brownish grey loose moderately sorted very fine to fine SAND little silt		1.5	1	1	2	3	 <p>Graphical Representation 0 10 20 30 40 50 60</p>
3.0m		D2	2	5.5		3.0	1	1	1	2		
4.5m		D3				4.5	1	1	1	2		
6.0m		D4	4	9.0	Grey medium stiff moderately to highly sticky CLAY with silt		6.0	2	3	4	7	
7.5m		D5				7.5	2	3	6	9		
9.0m		D6				9.0	1	1	3	4		
10.5m		D7				10.5	1	2	3	5		
12.0m		D8					12.0	2	2	2	4	
13.5m		D9				13.5	2	2	3	5		
15.0m		D10	6	3.0	Dark grey medium stiff highly sticky ORGANIC CLAY (PEAT)		15.0	1	2	2	4	
16.5m		D11				16.5	1	2	2	4		
18.0m		D12	9	12.5	Reddish brown, bluish grey, yellowish brown very stiff moderately sticky SANDY SILT		18.0	4	7	10	17	
19.5m		D13				19.5	5	8	12	20		
21.0m		D14				21.0	6	8	8	16		
22.5m		D15				22.5	6	8	10	18		
24.0m		D16				24.0	8	12	16	28		
25.5m		D17				25.5	10	14	18	32		
27.0m		D18				27.0	5	6	8	14		
28.5m		D19	28.5	6	8	8	16					
30.0m		D20	30.0	7	9	9	18					











Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Akua- 48						Existing Ground Level : 10						
Location: Gostagram, Vati Borra, Akua, Mymensingh						Date :05-07-2014						
Co-ordinate : Lat- 24° 43'2.80"N Long- 90°24'5.40"						Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)				N-Values	Graphical Representation
							15cm	Penetration	15cm	Penetration		
1.5m		D1			Grey to brown loose moderately sorted fine to medium SAND trace silt		1.5	1	1	3	4	
3.0m		D2	2	7.0		3.0	1	2	2	4		
4.5m		D3				4.5	2	3	4	7		
6.0m		D4				6.0	2	3	5	8		
7.5m		D5				7.5	3	3	6	9		
9.0m		D6	4	4.5	Grey medium stiff to stiff moderately sticky CLAY with silt		9.0	2	2	3	5	
10.5m		D7				10.5	2	2	2	4		
12.0m		D8				12.0	2	2	3	5		
13.5m		D9	6	3.0	Dark grey soft moderately sticky ORGANIC CLAY (PEAT)		13.5	2	2	3	5	
15.0m		D10				15.0	3	4	5	9		
16.5m		D11			Yellowish brwn, bluish grey stiff moderately sticky SILT with clay		16.5	3	4	6	10	
18.0m		D12	7	6.0		18.0	3	5	6	11		
19.5m		D13				19.5	4	6	6	12		
21.0m		D14				21.0	8	10	11	21		
22.5m		D15	9	3.0	Reddish brown, bluish grey medium dense moderately sorted SILTY SAND		22.5	11	15	20	35	
24.0m		D16				24.0	12	19	23	42		
25.5m		D17			Yellowish brown dense moderately sorted medium SAND trace silt		25.5	13	20	24	44	
27.0m		D18	10	6.5		27.0	16	21	25	46		
28.5m		D19				28.5	15	23	27	50		
30.0m		D20				30.0	16	24	29	53		







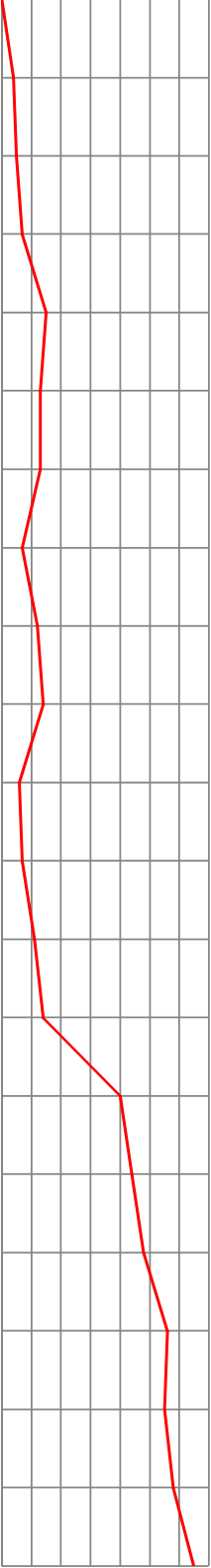
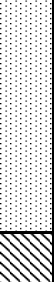




Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Urban Development Directorate (UDD)					
Bore Hole No :BH-Baera- 49							Existing Ground Level : 9.5					
Location:chalabondi,kicharibill, Mymensingh							Date :05-07-2014					
Co-ordinate : Lat- 24° 42'07.02N Long- 90°25'56.4"							Legend     					
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	Graphical Representation 0 10 20 30 40 50 60
1.5m		D1	1	2.5	Brown soft moderately sticky SANDY SILT		1.5	2	2	2	4		-1.5
3.0m		D2	4	6.5	Grey stiff to medium stiff moderately sticky SILT with clay		3.0	2	3	6	9	-3
4.5m		D3					4.5	3	3	7	10	-4.5
6.0m		D4					6.0	2	3	4	7	-6
7.5m		D5					7.5	3	3	5	8	-7.5
9.0m		D6	6	3.0	Dark grey stiff moderately sticky ORGANIC CLAY (PEAT)		9.0	1	1	2	3	-9
10.5m		D7					10.5	2	2	2	4	-10.5
12.0m		D8	7	9.0	Light yellowish brown, bluish grey stiff to medium stiff moderately sticky CLAY with silt little sand		12.0	4	5	7	12	-12
13.5m		D9					13.5	4	5	6	11	-13.5
15.0m		D10					15.0	2	2	3	5	-15
16.5m		D11					16.5	2	3	3	6	-16.5
18.0m		D12					18.0	4	5	7	12	-18
19.5m		D13	8	6.5	Grey medium dense moderately sorted fine SAND with silt		19.5	4	7	9	16	-19.5
21.0m		D14					21.0	8	10	12	22	-21
22.5m		D15					22.5	10	10	16	26	-22.5
24.0m		D16	9	3.5	Grey stiff to medium stiff moderately sticky CLAY trace silt		24.0	12	21	24	45	-24
25.5m		D17					25.5	13	22	25	47	-25.5
27.0m		D18	9	3.5	Grey stiff to medium stiff moderately sticky CLAY trace silt		27.0	4	4	5	9	-27
28.5m		D19					28.5	3	5	5	10	-28.5
30.0m		D20					30.0	3	3	4	7	-30







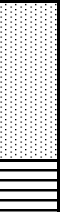


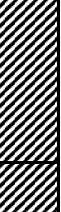
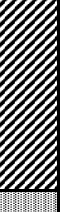
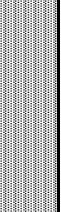
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Urban Development Directorate (UDD)					
Bore Hole No :BH-Bhangnamari-50							Existing Ground Level : 12.25					
Location: Vangamasari, Anantagonj bazar, Mymensingh							Date :14-07-2014					
Co-ordinate : Lat- 24° 42'34.960"N Long- 90°28'10.933"							Legend					
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration			N-Values	Graphical Representation
								15cm	15cm	15cm		
1.5m		D1	1	2.5	Brown very soft moderately sticky SANDY SILT little clay		1.5	1	0	1	1	<p>Graphical Representation 0 10 20 30 40 50 60</p>
3.0m		D2	3	6.0	Light brown to greymedium dense moderately sorted fine to medium SAND trace silt		3.0	3	5	6	11	
4.5m		D3					4.5	4	5	7	12	
6.0m		D4					6.0	5	6	8	14	
7.5m		D5					7.5	6	7	10	17	
9.0m		D6					9.0	10	12	14	26	
10.5m		D7	3	12.0	Light brown to greymedium dense moderately sorted fine to medium SAND trace silt		10.5	10	10	12	22	
12.0m		D8					12.0	7	9	12	21	
13.5m		D9					13.5	8	11	13	24	
15.0m		D10					15.0	7	12	14	26	
16.5m		D11					16.5	8	11	16	27	
18.0m		D12					18.0	7	12	22	34	
19.5m		D13					19.5	9	13	19	32	
21.0m		D14					21.0	12	20	25	45	
22.5m		D15					22.5	10	17	20	37	
24.0m		D16					3	9.5	Light brown to grey dense moderately sorted fine to medium SAND trace silt		24.0		7	10	18	28
25.5m		D17	25.5	7	12	18					30	
27.0m		D18	27.0	8	14	16					30	
28.5m		D19	28.5	9	18	22					40	
30.0m		D20	30.0	10	19	26					45	







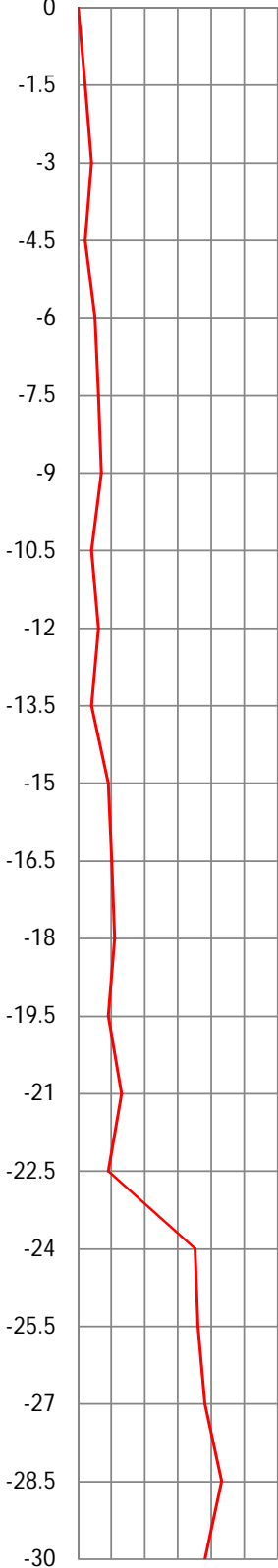
















Project: Engineering Geological Survey in Rural Parts of MSDP Project Area					Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Bhangnamari 51					Existing Ground Level : 11.5							
Location: Bhangnamari, Mymensingh					Date :04-07-2014							
Co-ordinate : Lat- 24° 42'21.80"N Long- 90°28'51.07"					Legend							
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT	Graphical Representation				
							Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	
1.5m		D1			Brown to grey loose moderately sorted very fine to fine SAND with silt		1.5	1	2	2	4	
3.0m		D2	2	5.5			3.0	1	1	1	2	
4.5m		D3					4.5	1	1	2	3	
6.0m		D4			Light bluish grey medium stiff moderately sticky CLAY with silt		6.0	2	2	4	6	
7.5m		D5	4	4.5			7.5	2	2	4	6	
9.0m		D6					9.0	2	2	3	5	
10.5m		D7			Light yellowish brown medium dense moderately sorted very fine to fine SILTY SAND		10.5	3	5	6	11	
12.0m		D8					12.0	4	6	7	13	
13.5m		D9	5	6.0			13.5	4	6	7	13	
15.0m		D10			Dark grey medium stiff moderately sticky ORGANIC CLAY (PEAT)		15.0	4	5	7	12	
16.5m		D11					16.5	2	2	2	4	
18.0m		D12	6	3.0			18.0	2	2	3	5	
19.5m		D13			Brownish grey very soft moderately sticky SANDY SILT		19.5	5	7	10	17	
21.0m		D14	9	3.0			21.0	5	8	10	18	
22.5m		D15			Yellowish brown medium dense moderately sorted medium SAND little silt		22.5	6	9	14	23	
24.0m		D16		3.0			24.0	7	10	15	25	
25.5m		D17					25.5	8	15	20	35	
27.0m		D18			Grey dense moderately sorted medium to coarse SAND		27.0	8	14	22	36	
28.5m		D19		5.0			28.5	7	15	25	40	
30.0m		D20					30.0	10	17	27	44	

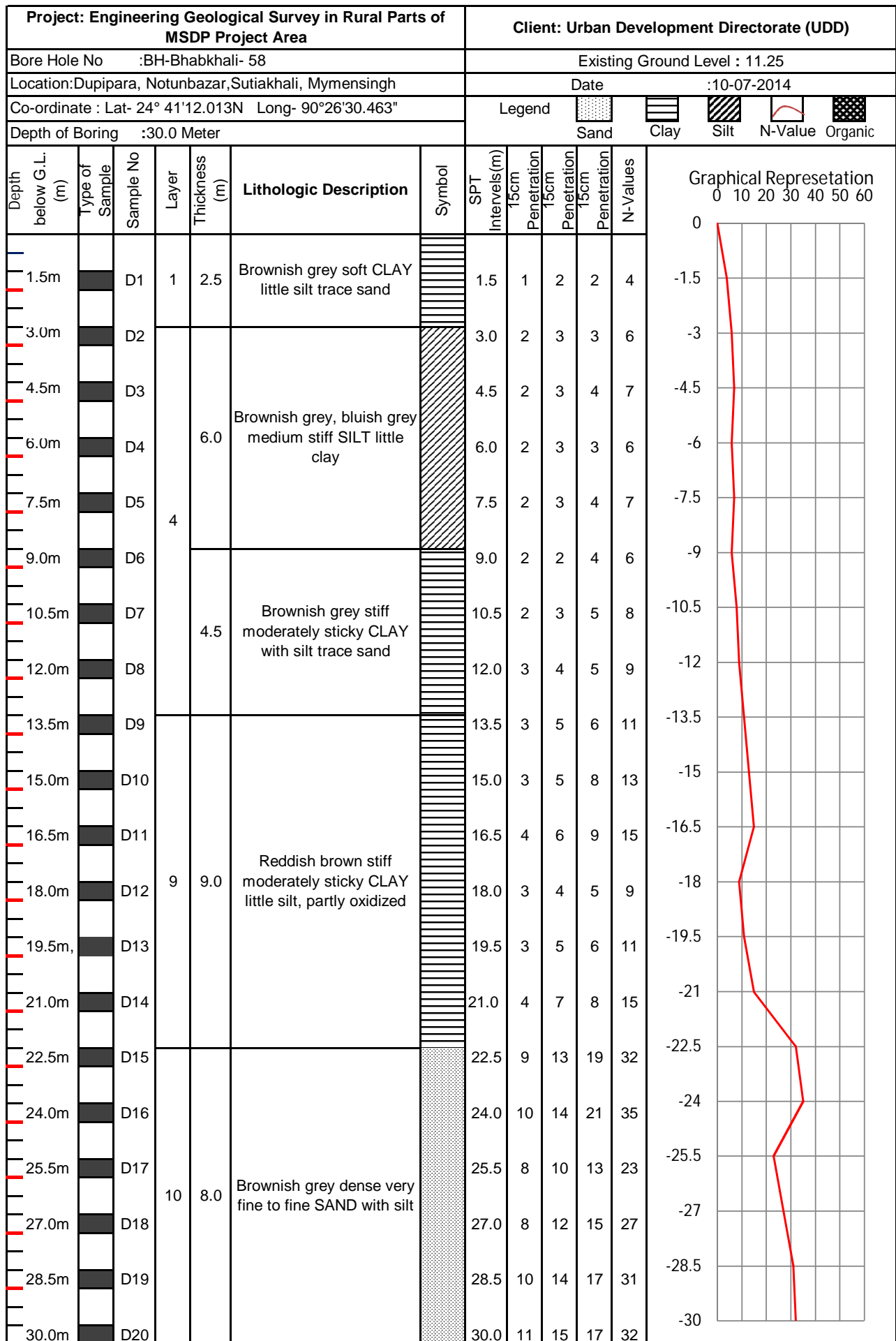
Project: Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Bhangnamari 52						Existing Ground Level : 13.5						
Location:Douhakhola, kajir Panati, Mymensingh						Date : 15-07-2014						
Co-ordination : Lat- 24° 42'31.02"N Long- 90°30'23.25"						Legend     						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation					
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	
1.5m		D1	1	4.0	Light brown very loose moderately sorted very fine SILTY SAND trace clay		1.5	1	1	1	2	 <p>Graphical Representation 0 10 20 30 40 50 60</p>
3.0m		D2				3.0	1	0	1	1		
4.5m		D3			Light brown to grey medium stiff moderately sticky SILTY CLAY		4.5	2	2	4	6	
6.0m		D4				6.0	2	3	3	6		
7.5m		D5	4	7.5			7.5	2	3	3	6	
9.0m		D6				9.0	2	3	4	7		
10.5m		D7				10.5	2	2	3	5		
12.0m		D8			Dark grey stiff moderately sticky ORGANIC CLAY (PEAT)		12.0	3	4	4	8	
13.5m		D9	6	3.0			13.5	3	4	5	9	
15.0m		D10			Light brownish grey soft moderately sticky CLAY little silt		15.0	1	1	1	2	
16.5m		D11	7	3.0			16.5	1	1	1	2	
18.0m		D12			Reddish brown, yellowish brown, bluish grey stiff moderately sticky Clayey SILT little Sand, highly oxidized, iron concretion present		18.0	5	6	7	13	
19.5m		D13				19.5	5	6	9	15		
21.0m		D14	9	6.0			21.0	5	6	8	14	
22.5m		D15				22.5	4	6	7	13		
24.0m		D16			Yellowish brown medium dense moderately sorted very fine SILTY SAND trace clay		24.0	7	13	16	29	
25.5m		D17				25.5	8	14	16	30		
27.0m		D18	10	6.5			27.0	8	10	15	25	
28.5m		D19				28.5	8	11	17	27		
30.0m		D20				30.0	9	13	19	32		








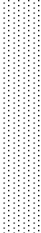


Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Metro Properties Ltd.					
Bore Hole No :BH-Ghagra-53						Existing Ground Level : 13					
Location:Ghagra, Mymensingh						Date : 08-07-2014					
Co-ordination : Lat- 24° 41'16.93"N Long- 90°20'34.23"						Legend     					
Depth of Boring :30.0 Meter											
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation				
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values
1.5m		D1	2	7.0	Brownish grey loose moderately sorted very fine SILTY SAND		1.5	2	3	3	6
3.0m		D2					3.0	2	2	3	5
4.5m		D3					4.5	2	3	3	5
6.0m		D4					6.0	3	3	5	8
7.5m		D5	3	4.5	Light brownish grey medium dense moderately sorted medium SAND little silt		7.5	4	6	8	14
9.0m		D6					9.0	4	5	9	14
10.5m		D7					10.5	5	6	7	13
12.0m		D8	7	6.0	Bluish grey, yellowish brown medium stiff moderately sticky Clayey SILT		12.0	2	3	3	6
13.5m		D9					13.5	4	6	8	14
15.0m		D10					15.0	2	2	2	4
16.5m		D11					16.5	2	3	4	7
18.0m		D12	9	4.5	Yellowish brown medium dense very fine SILTY SAND		18.0	4	4	7	11
19.5m		D13					19.5	4	5	6	11
21.0m		D14					21.0	5	5	6	11
22.5m		D15	10	8.0	Brownish grey dense to very dense moderately sorted fine to medium SAND		22.5	10	12	14	26
24.0m		D16					24.0	15	21	23	44
25.5m		D17					25.5	17	25	26	51
27.0m		D18					27.0	15	21	20	41
28.5m		D19					28.5	18	26	32	58
30.0m		D20				30.0	19	29	39	68	







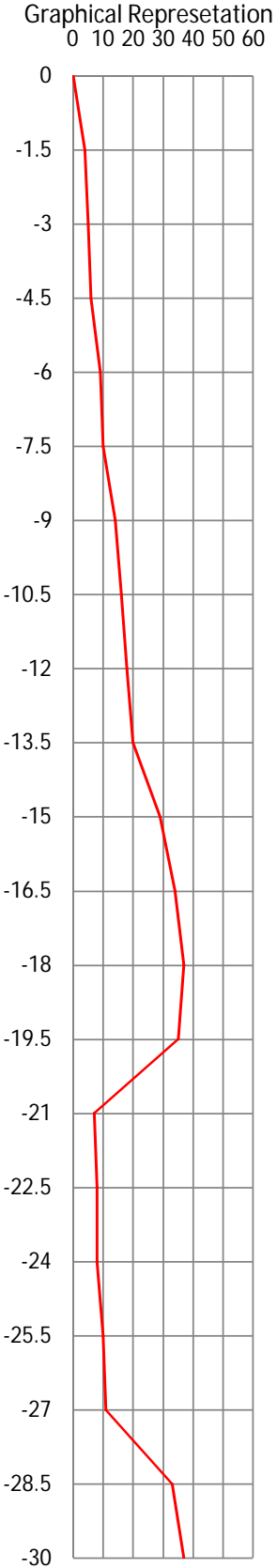

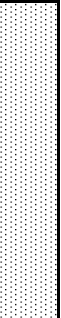

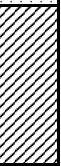
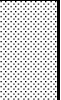
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Ghagra- 54						Existing Ground Level : 13						
Location: Azmatpur,Purbopara. Dapunia Mymensingh						Date :07-07-2014						
Co-ordinate : Lat- 24° 41'33.045"N Long- 90°22'11.955"						Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)				N-Values	Graphical Representation
							15cm	15cm	15cm	15cm		
1.5m		D1			Brown very loose moderately sorted very fine SAND with silt		1.5	2	2	2	4	
3.0m		D2	2	5.5			3.0	2	2	3	5	
4.5m		D3					4.5	2	3	4	7	
6.0m		D4			Brown medium dense moderately sorted fine to medium SAND		6.0	5	7	8	15	
7.5m		D5	3	4.5			7.5	4	5	8	13	
9.0m		D6					9.0	5	6	7	13	
10.5m		D7	4	1.5	Light bluish grey, yellowish brown stiff moderately sticky CLAYEY SILT		10.5	2	3	4	7	
12.0m		D8					12.0	4	5	7	12	
13.5m		D9			Yellowish brown medium stiff moderately sticky SANDY SILT		13.5	5	6	8	14	
15.0m		D10	7	6.0			15.0	2	3	3	6	
16.5m		D11					16.5	3	3	4	7	
18.0m		D12			Bluish grey stiff moderately sticky SILTY CLAY		18.0	3	4	7	11	
19.5m		D13	9	3.0			19.5	3	5	9	14	
21.0m		D14			Grey, greenish brown, yellowish brown dense moderately sorted fine to medium SAND, trace silt		21.0	11	17	23	40	
22.5m		D15					22.5	11	17	27	44	
24.0m		D16					24.0	11	20	28	48	
25.5m		D17	10	9.5			25.5	11	24	32	56	
27.0m		D18					27.0	13	23	32	55	
28.5m		D19					28.5	15	25	33	58	
30.0m		D20			30.0	18	27	38	65			

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Ghagra - 56						Existing Ground Level : 12.25						
Location: Churknai, Jamtoli, Mymensingh						Date :09-07-2014						
Co-ordinate : Lat- 24° 41'06.346"N Long- 90°24'31.546"						Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals (m)				N-Values	Graphical Representation
							15cm	Penetration	15cm	Penetration		
1.5m		D1	2	4.0	Brownish grey loose moderately sorted fine to medium SAND with silt		1.5	2	3	4	7	-1.5
3.0m		D2					3.0	3	4	5	9	-3
4.5m		D3	3	3.0	Grey medium dense moderately sorted medium SAND trace silt		4.5	3	5	5	10	-4.5
6.0m		D4					6.0	3	5	5	10	-6
7.5m		D5	4	4.5	Grey stiff moderately sticky CLAY little silt		7.5	3	3	4	7	-7.5
9.0m		D6					9.0	2	2	3	5	-9
10.5m		D7					10.5	2	2	2	4	-10.5
12.0m		D8	6	3.0	Dark grey to grey medium stiff moderately sticky ORGANIC CLAY (PEAT)		12.0	2	2	3	5	-12
13.5m		D9					13.5	1	1	2	3	-13.5
15.0m		D10	7	4.5	Yellowish brown medium stiff moderately sticky SANDY SILT with clay		15.0	2	3	3	6	-15
16.5m		D11					16.5	2	3	4	7	-16.5
18.0m		D12					18.0	3	5	5	10	-18
19.5m		D13	9	4.5	Light brownish grey very stiff moderately sticky SANDY SILT		19.5	6	10	10	20	-19.5
21.0m		D14					21.0	6	10	11	21	-21
22.5m		D15					22.5	7	10	13	23	-22.5
24.0m		D16	10	6.5	Yellowish brown very dense to dense moderately sorted medium to fine SAND		24.0	10	16	20	36	-24
25.5m		D17					25.5	14	20	26	46	-25.5
27.0m		D18					27.0	16	25	30	55	-27
28.5m		D19					28.5	17	26	33	59	-28.5
30.0m		D20					30.0	20	30	37	67	-30







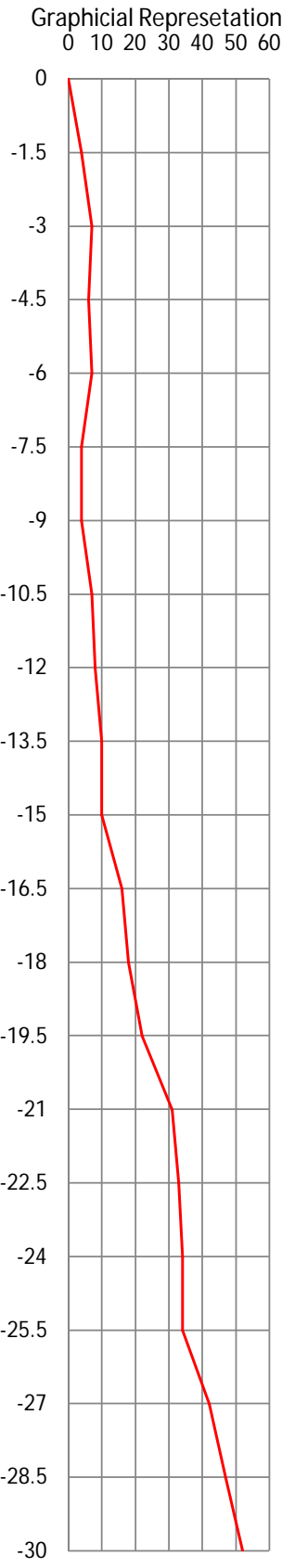





Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Bhabkhali - 57						Existing Ground Level : 9.5						
Location: Namapara, Bhabkhali						Date :11-07-2014						
Co-ordinate : Lat- 24° 41'06.73"N Long- 90°25'06.07"						Legend  Sand  Clay  Silt  N-Value  Organic						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)				N-Values	Graphical Representation
							15cm	Penetration	15cm	Penetration		
1.5m		D1			Yellowish brown soft moderately sticky CLAY with silt		1.5	1	1	1	2	 <p>Graphical Representation 0 10 20 30 40 50 60</p>
3.0m		D2	1	5.5			3.0	1	2	2	4	
4.5m		D3					4.5	1	1	1	2	
6.0m		D4			Light bluish grey medium stiff moderately sticky CLAYEY SILT		6.0	2	2	3	5	
7.5m		D5	4	4.5			7.5	3	3	3	6	
9.0m		D6					9.0	3	3	4	7	
10.5m		D7			Grey soft moderately sticky SILTY CLAY		10.5	2	2	2	4	
12.0m		D8	7	4.5			12.0	2	2	4	6	
13.5m		D9					13.5	2	2	2	4	
15.0m		D10			Reddish brown medium stiff moderately sticky SILTY CLAY, moderately oxidized		15.0	3	4	5	9	
16.5m		D11					16.5	3	5	5	10	
18.0m		D12					18.0	4	5	6	11	
19.5m		D13	9	9.0		19.5	4	4	5	9		
21.0m		D14				21.0	4	6	7	13		
22.5m		D15				22.5	3	4	5	9		
24.0m		D16			Brownish grey dense moderately sorted fine to medium SAND		24.0	10	15	20	35	
25.5m		D17					25.5	10	16	20	36	
27.0m		D18	10	6.5			27.0	11	16	22	38	
28.5m		D19				28.5	12	19	24	43		
30.0m		D20				30.0	12	17	21	38		



Project: Engineering Geological Survey in Rural Parts of MSDP Project Area					Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Bhangnamari 59					Existing Ground Level : 7							
Location:Bhangnamari					Date :06-07-2014							
Co-ordinate : Lat- 24° 41'17.00"N Long- 90°27'39.65"					Legend  Sand  Clay  Silt  N-Value  Organic							
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	Graphical Representation 0 10 20 30 40 50 60
1.5m		D1			Brownish grey loose moderately sorted very fine to fine SAND little silt		1.5	1	2	2	4	
3.0m		D2				3.0	2	2	4	6		
4.5m		D3	2	10.0		4.5	2	2	5	7		
6.0m		D4				6.0	3	3	4	7		
7.5m		D5				7.5	3	4	5	9		
9.0m		D6				9.0	3	4	6	10		
10.5m		D7				10.5	4	5	7	12		
12.0m		D8			Reddish brown, light bluish grey dense moderately sorted fine SILTY SAND		12.0	4	5	7	12	
13.5m		D9	4	7.5		13.5	5	6	8	14		
15.0m		D10				15.0	5	7	10	17		
16.5m		D11				16.5	5	8	11	19		
18.0m		D12			Grey medium dense moderately sorted medium SAND little silt		18.0	6	9	11	20	
19.5m		D13	5	4.5		19.5	7	12	17	29		
21.0m		D14				21.0	8	12	18	30		
22.5m		D15			Dark grey medium stiff moderately sticky ORGANIC CLAY (PEAT)		22.5	3	3	4	7	
24.0m		D16				24.0	3	3	5	8		
25.5m		D17	6	6.0		25.5	4	4	7	11		
27.0m		D18				27.0	5	6	7	13		
28.5m		D19			Grey dense moderately sorted medium SAND little silt		28.5	8	12	20	32	
30.0m		D20	10	2.0		30.0	9	13	23	36		








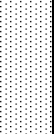
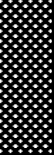



Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Bhangnamari-60						Existing Ground Level : 12.25						
Location: Bhangnamari,Barmari, Mymensingh						Date :21-07-2014						
Co-ordinate : Lat- 24° 43'18.988"N Long- 90°29'34.045"						Legend     						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation					
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	
1.5m		D1			Light brownish grey very loose moderately sorted medium SAND little silt		1.5	2	2	2	4	
3.0m		D2	2	5.5			3.0	2	2	3	5	
4.5m		D3					4.5	2	3	3	6	
6.0m		D4	3	8.5	Light brownish grey loose moderately sorted medium SAND little silt		6.0	3	4	5	9	
7.5m		D5					7.5	3	4	6	10	
9.0m		D6					9.0	4	7	7	14	
10.5m		D7			Light brownish grey medium dense moderately sorted medium SAND little silt		10.5	4	7	9	16	
12.0m		D8	6	6.0			12.0	5	8	10	18	
13.5m		D9					13.5	5	8	12	20	
15.0m		D10			Dark grey medium stiff moderately sticky ORGANIC CLAY (PEAT)		15.0	8	12	17	29	
16.5m		D11	6	4.5			16.5	10	14	20	34	
18.0m		D12					18.0	11	15	22	37	
19.5m		D13			Light bluish grey to greenish grey stiff moderately sticky SILT with clay little sand		19.5	10	14	21	35	
21.0m		D14	7	3.0			21.0	2	3	4	7	
22.5m		D15					22.5	2	3	5	8	
24.0m		D16			Reddish brown dense moderately sorted medium SAND little silt, highly oxidized		24.0	3	3	5	8	
25.5m		D17	7	3.0			25.5	3	4	6	10	
27.0m		D18					27.0	3	4	7	11	
28.5m		D19	10	2.0	28.5	10	15	18	33			
30.0m		D20			30.0	12	17	20	37			

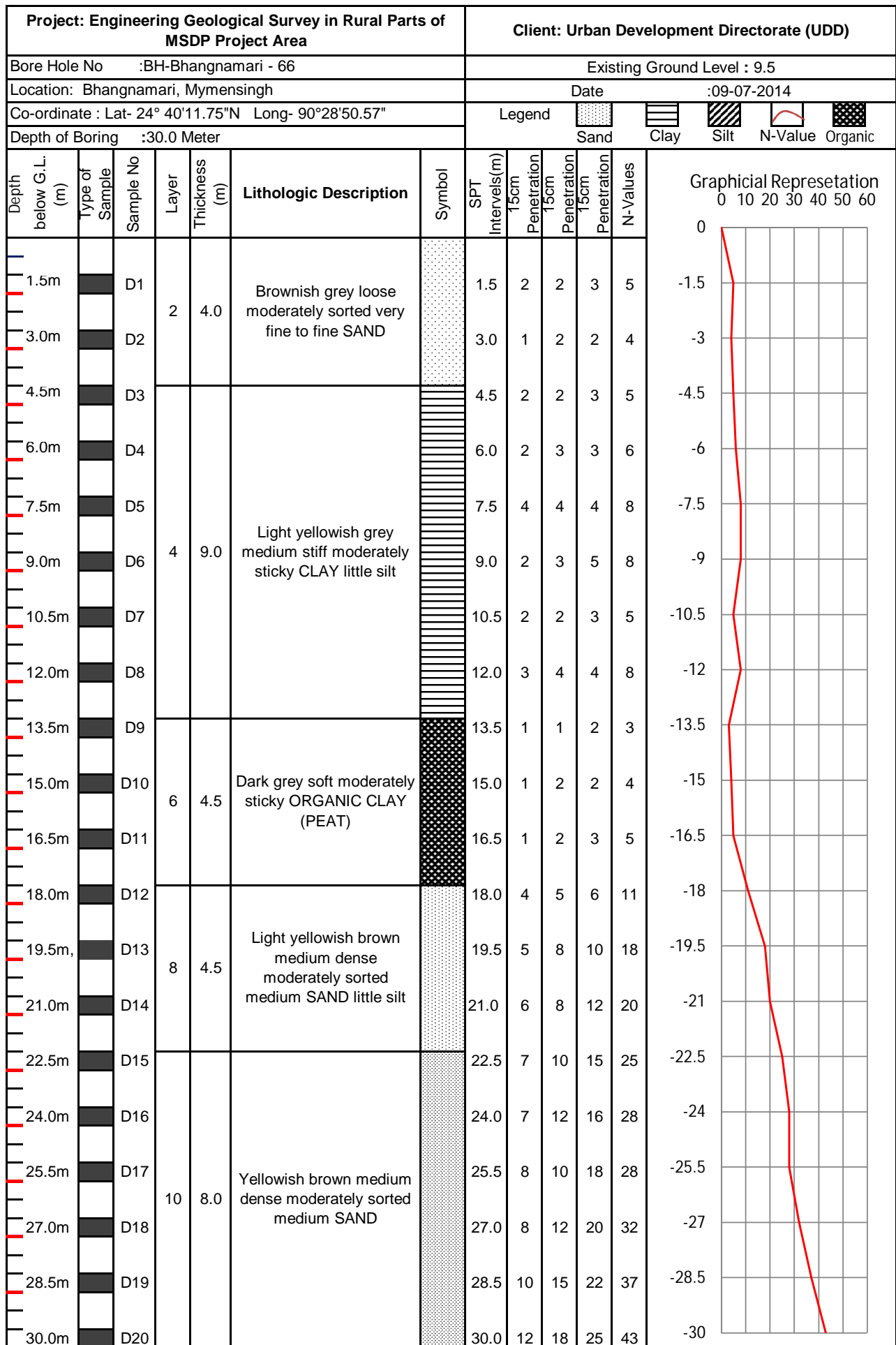
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area					Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Ghagrai 61					Existing Ground Level : 11.5							
Location: Ghagra Mohila Alia Madrasa,Abukhali Mymensingh					Date :08-07-2014							
Co-ordinate : Lat- 24° 40'1.41"N Long- 90°23'10.66"					Legend							
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT	Penetration	Penetration	Penetration	N-Values	Graphical Representation
							Intervals(m)	15cm	15cm	15cm		
1.5m		D1	2	2.5	Brown very loose moderately sorted very fine to fine micaceous SAND with silt		1.5	1	1	2	3	
3.0m		D2	3	6.0	Light brown medium dense to loose moderately sorted medium SAND trace clay		3.0	3	3	5	8	
4.5m		D3					4.5	3	4	6	10	
6.0m		D4					6.0	4	5	7	12	
7.5m		D5					7.5	4	5	8	13	
9.0m		D6	6	3.0	Dark grey soft moderately sickly ORGANIC CLAY with silt (PEAT)		9.0	2	2	2	4	
10.5m		D7					10.5	1	2	2	4	
12.0m		D8	7	6.0	Light bluish grey medium stiff to stiff moderately sticky CLAYEY SILT		12.0	3	4	6	10	
13.5m		D9					13.5	3	5	6	11	
15.0m		D10					15.0	5	6	7	13	
16.5m		D11					16.5	5	6	9	15	
18.0m		D12	8	7.5	Light grey medium dense moderately sorted very fine to fine SAND little silt		18.0	8	12	15	27	
19.5m		D13					19.5	8	14	16	30	
21.0m		D14					21.0	7	11	13	24	
22.5m		D15					22.5	7	12	15	27	
24.0m		D16	9	5.0	Grey stiff moderately sticky SILT with clay little sand		24.0	7	12	16	28	
25.5m		D17					25.5	5	7	7	14	
27.0m		D18					27.0	3	4	4	8	
28.5m		D19					28.5	3	4	5	9	
30.0m		D20					30.0	4	6	7	13	







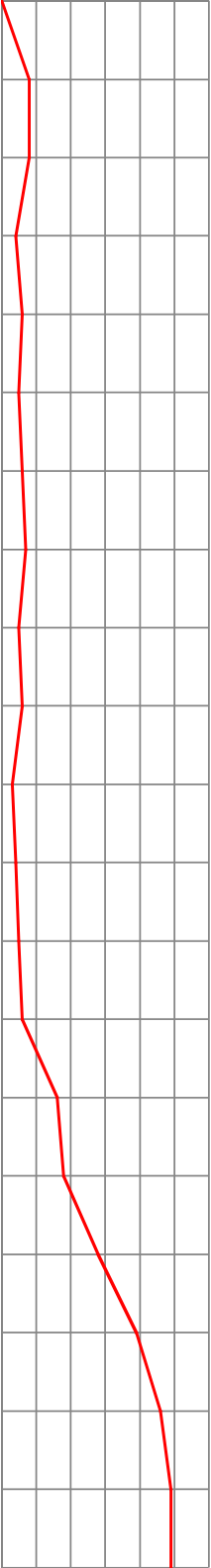
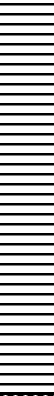

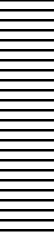


Project: Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Urban Development Directorate (UDD)					
Bore Hole No :BH-Bhabkhali 62							Existing Ground Level : 11.25					
Location:Behind CBMC, Bhabkhali, Mymensingh							Date : 09-07-2014					
Co-ordination : Lat- 24° 40'04.49"N Long- 90°24'18.88"							Legend     					
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation					
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	
1.5m		D1	2	2.5	Yellowish brown loose moderately sorted very fine to fine SAND		1.5	2	2	2	4	
3.0m		D2	4	4.5	Brownish grey loose moderately sorted medium SAND trace silt		3.0	2	3	4	7	
4.5m		D3					4.5	2	3	3	6	
6.0m		D4					6.0	3	3	4	7	
7.5m		D5	6	3.0	Dark grey soft moderately sicky ORGANIC CLAY (PEAT)		7.5	2	2	2	4	
9.0m		D6					9.0	1	2	2	4	
10.5m		D7	7	6.0	Light bluish grey medium stiff moderately sicky medium stiff CLAYEY SILT		10.5	3	3	4	7	
12.0m		D8					12.0	4	4	4	8	
13.5m		D9					13.5	4	5	5	10	
15.0m		D10					15.0	5	5	5	10	
16.5m		D11	9	4.5	Yellowish brown stiff moderately sicky SANDY SILT		16.5	5	7	9	16	
18.0m		D12					18.0	6	8	10	18	
19.5m		D13					19.5	7	9	13	22	
21.0m		D14	10	9.5	Yellowish brown, reddish brown dense moderately sorted medium SAND		21.0	7	12	18	31	
22.5m		D15					22.5	8	13	20	33	
24.0m		D16					24.0	10	14	20	34	
25.5m		D17					25.5	10	13	21	34	
27.0m		D18					27.0	12	14	28	42	
28.5m		D19					28.5	13	17	30	47	
30.0m		D20	30.0	14	20	32	52					







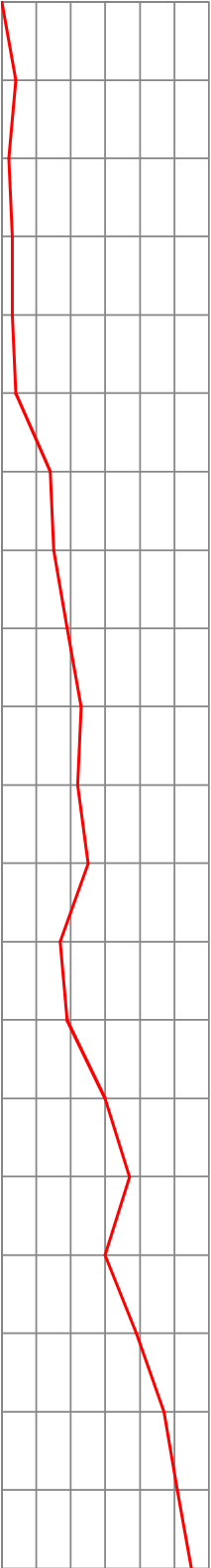


Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Metro Properties Ltd.				
Bore Hole No :BH-Bhabkhali-63							Existing Ground Level : 12.75				
Location:Bhabkhali Umar par (Churkhai), Mymensingh							Date : 09-07-2014				
Co-ordination : Lat- 24° 40'21.751"N Long- 90°25'06.390"							Legend				
Depth of Boring :30.0 Meter											
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	Graphical Representation				
							SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values
1.5m		D1	2	2.5	Brownish grey loose moderately sorted fine SAND trace silt		1.5	3	4	4	8
3.0m		D2	4	4.5	Brownish grey very loose moderately sorted very fine to fine SAND trace silt		3.0	2	2	2	4
4.5m		D3					4.5	2	2	4	6
6.0m		D4					6.0	2	2	4	6
7.5m		D5	6	4.5	Dark grey medium stiff moderately sticky ORGANIC CLAY (PEAT)		7.5	2	2	3	5
9.0m		D6					9.0	2	2	3	5
10.5m		D7					10.5	2	3	3	6
12.0m		D8	7	6.0	Reddish brown, light bluish grey, yellowish brown medium stiff moderately sticky SILT with clay		12.0	3	4	5	9
13.5m		D9					13.5	4	5	6	11
15.0m		D10					15.0	2	3	4	7
16.5m		D11	9	3.0	Yellowish brown medium stiff moderately sticky SILTY CLAY		16.5	3	3	5	8
18.0m		D12					18.0	3	4	5	9
19.5m		D13					19.5	5	6	8	14
21.0m		D14	10	9.5	Yellowish brown, reddish brown medium dense moderately sorted medium SAND little silt, moderately oxidized		21.0	6	8	12	20
22.5m		D15					22.5	7	10	15	25
24.0m		D16					24.0	9	14	19	33
25.5m		D17					25.5	7	14	22	36
27.0m		D18					27.0	8	16	23	39
28.5m		D19					28.5	10	19	25	44
30.0m		D20	30.0	14	23	32	55				







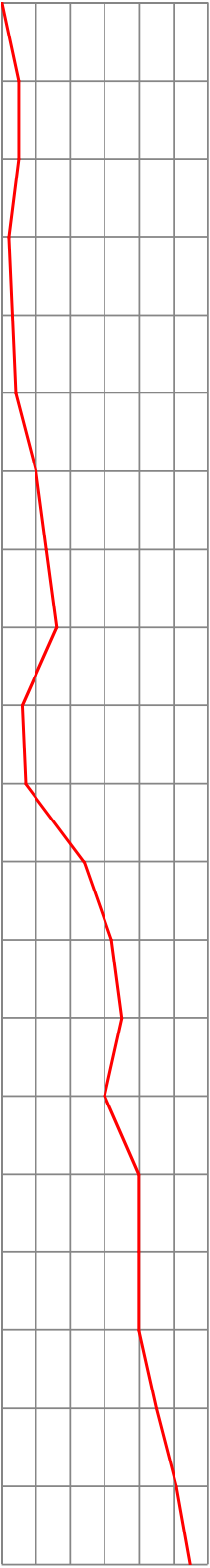

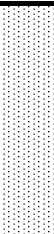





Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Urban Development Directorate (UDD)					
Bore Hole No :BH-Bhabkhali- 64							Existing Ground Level : 10.25					
Location: Bhabkhali, Mymensingh							Date :10-07-2014					
Co-ordinate : Lat- 24° 40'10.06"N Long- 90°26'04.53"							Legend					
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT	Penetration	Penetration	Penetration	N-Values	Graphical Representation
							Intervals(m)	15cm	15cm	15cm		
1.5m		D1			Brownish grey,reddish brown very loose moderately sorted very fine to fine SAND with silt		1.5	1	1	1	2	
3.0m		D2					3.0	1	1	2	3	
4.5m		D3	2	8.5			4.5	2	2	2	4	
6.0m		D4					6.0	2	2	3	5	
7.5m		D5					7.5	2	3	4	7	
9.0m		D6				Light brownish grey, bluish grey medium stiff to soft moderately sticky CLAY		9.0	1	1	2		3
10.5m		D7					10.5	3	4	4	8	
12.0m		D8	4	6.0			12.0	3	4	5	9	
13.5m		D9					13.5	4	4	4	8	
15.0m		D10			Light grey medium dense moderately sorted vey fine SILTY SAND		15.0	5	8	12	20	
16.5m		D11	5	4.5			16.5	6	9	12	21	
18.0m		D12					18.0	6	10	14	24	
19.5m,		D13			Dark grey stiff moderately sicky ORGANIC CLAY (PEAT)		19.5	5	5	6	11	
21.0m		D14	6	3.0			21.0	6	6	7	13	
22.5m		D15			Brownish grey dense moderately sorted medium SAND		22.5	10	15	20	35	
24.0m		D16		3.0			24.0	10	16	22	38	
25.5m		D17			Light yellowish brown stiff moderately sticky CLAYEY SILT		25.5	5	5	5	10	
27.0m		D18					27.0	5	5	6	11	
28.5m		D19					28.5	4	5	7	12	
30.0m		D20				30.0	5	6	6	12		







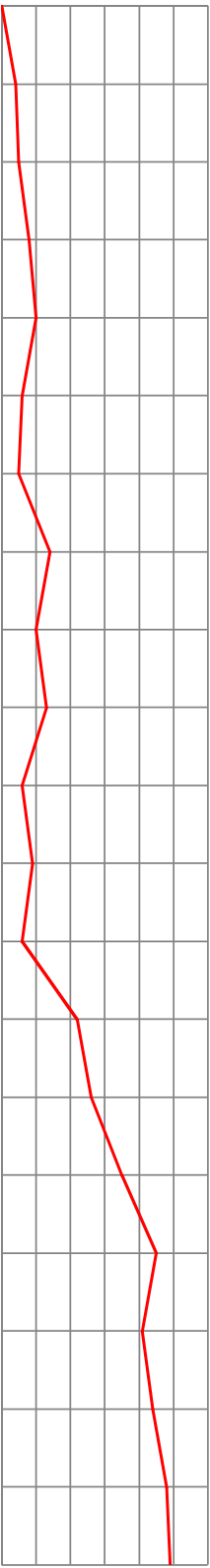



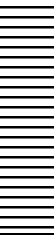


Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)						
Bore Hole No :BH-Bhabkhali - 65						Existing Ground Level : 12.25						
Location: Bhabkhali Bazar,Mymensingh						Date :10-07-2014						
Co-ordinate : Lat- 24° 39'56.008"N Long- 90°27'28.718"						Legend     						
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)				N-Values	Graphical Representation
							15cm	Penetration	15cm	Penetration		
1.5m		D1	2	2.5	Reddish brownish grey very loose moderately sorted fine SILTY SAND		1.5	1	1	2	3	-1.5
3.0m		D2	4	6.0	Brownish grey,bluish grey medium stiff to soft moderately sticky CLAY with silt		3.0	1	1	2	3	-3
4.5m		D3					4.5	2	2	3	5	-4.5
6.0m		D4					6.0	2	3	4	7	-6
7.5m		D5					7.5	2	2	4	6	-7.5
9.0m		D6	5	3.0	Grey medium dense moderately sorted medium SAND		9.0	5	6	9	15	-9
10.5m		D7					10.5	5	6	8	14	-10.5
12.0m		D8	6	3.0	Dark grey stiff moderately sticky ORGANIC CLAY (PEAT)		12.0	1	1	2	3	-12
13.5m		D9					13.5	1	1	2	3	-13.5
15.0m		D10	7	9.0	Reddish brown yellowish brown stiff moderately sticky CLAYEY SILT, iron concretion present		15.0	3	4	6	10	-15
16.5m		D11					16.5	3	5	7	12	-16.5
18.0m		D12					18.0	4	7	11	18	-18
19.5m		D13					19.5	5	8	12	20	-19.5
21.0m		D14					21.0	6	6	7	13	-21
22.5m		D15					22.5	6	7	7	14	-22.5
24.0m		D16	8	1.5	Bluish grey dense moderately sorted very fine SILTY SAND		24.0	8	17	21	38	-24
25.5m		D17	9	5.0	Bluish grey stiff moderately sticky CLAYEY SILT		25.5	5	6	9	15	-25.5
27.0m		D18					27.0	4	6	6	12	-27
28.5m		D19					28.5	4	5	6	11	-28.5
30.0m		D20					30.0	4	6	7	13	-30







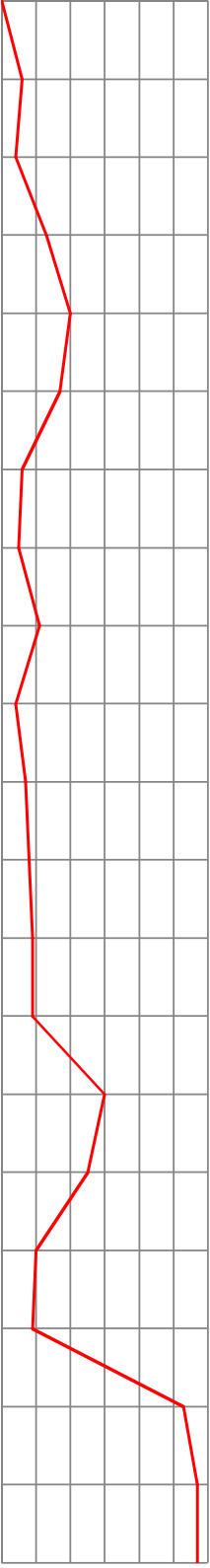
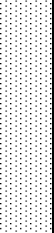


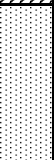











Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Bangnamari - 67							Existing Ground Level : 10							
Location: Ramnagon Eyoub Alir Bari, Mymensingh							Date :20-07-2014							
Co-ordinate : Lat- 24° 41'07.631"N Long- 90°30'54.492"							Legend  Sand  Clay  Silt  N-Value  Organic							
Depth of Boring :30.0 Meter														
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	Graphical Representation 0 10 20 30 40 50 60		
1.5m		D1	2	4.0	Brown loose moderately sorted fine SAND little silt		1.5	3	4	4	8			
3.0m		D2					3.0	3	5	5	8			
4.5m		D3					4.5	2	2	2	4			
6.0m		D4	4	7.5	Grey medium stiff highly sticky CLAY with silt		6.0	2	3	3	6			
7.5m		D5							7.5	2	2	3		5
9.0m		D6							9.0	2	3	3		6
10.5m		D7							10.5	2	3	4		7
12.0m		D8	6	4.5	Dark grey soft moderately sticky ORGANIC CLAY (PEAT)		12.0	2	2	3	5			
13.5m		D9							13.5	2	3	3		6
15.0m		D10							15.0	1	1	2		3
16.5m		D11	7	4.5	Brown medium stiff moderately sticky CLAY with silt		16.5	1	2	2	4			
18.0m		D12							18.0	2	2	3		5
19.5m		D13							19.5	2	3	3		6
21.0m		D14	9	3.0	Yellowish brown stiff moderately sticky SANDY SILT		21.0	4	8	8	16			
22.5m		D15							22.5	5	8	10		18
24.0m		D16	10	6.5	Yellowish brown medium dense moderately sorted medium SAND, moderately oxidized		24.0	8	12	16	28			
25.5m		D17							25.5	10	17	22		39
27.0m		D18							27.0	13	21	25		46
28.5m		D19							28.5	15	22	27		49
30.0m		D20							30.0	14	21	28		49

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area					Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Bhabkhali- 68					Existing Ground Level : 12.25							
Location:Sarkarbari, Narayanpur, Bhabkhali, Mymensingh					Date :11-07-2014							
Co-ordinate : Lat- 24° 39'07.270N Long- 90°26'37.604"					Legend  Sand  Clay  Silt  N-Value  Organic							
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT	Penetration	Penetration	Penetration	N-Values	Graphical Representation
							Intervals(m)	15cm	15cm	15cm		
1.5m		D1			Light brownish grey loose moderately sorted very fine SILTY SAND		1.5	1	2	2	4	
3.0m		D2					3.0	1	1	1	2	
4.5m		D3	1	8.5			4.5	1	1	2	3	
6.0m		D4					6.0	1	1	2	3	
7.5m		D5					7.5	1	2	2	4	
9.0m		D6					9.0	5	7	7	14	
10.5m		D7			Yellowish brown medium dense moderately sorted fine SAND		10.5	5	7	8	15	
12.0m		D8					12.0	7	7	12	19	
13.5m		D9					13.5	8	9	14	23	
15.0m		D10	3	12.0			15.0	8	11	11	22	
16.5m		D11					16.5	8	12	13	25	
18.0m		D12					18.0	5	6	11	17	
19.5m		D13			Brownish grey dense to very dense moderately sorted fine to medium SAND		19.5	6	7	12	19	
21.0m		D14					21.0	11	13	17	30	
22.5m		D15					22.5	12	15	22	37	
24.0m		D16					24.0	11	14	16	30	
25.5m		D17	10	9.5			25.5	11	17	22	39	
27.0m		D18					27.0	13	21	26	47	
28.5m		D19					28.5	14	20	31	51	
30.0m		D20					30.0	15	23	32	55	

Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Bhabkhali 69						Existing Ground Level : 9.5							
Location:Bhabkhali Chor, Mymensingh						Date :11-07-2014							
Co-ordinate : Lat- 24° 38'58.39"N Long- 90°27'24.47"						Legend  Sand  Clay  Silt  N-Value  Organic							
Depth of Boring :30.0 Meter													
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT					N-Values	Graphical Representation
							Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	Penetration 15cm		
1.5m		D1	2	4.0	Brown to grey loose moderately sorted very fine to fine SAND with silt		1.5	1	2	3	5	-1.5	
3.0m		D2					3.0	2	2	3	5	-3	
4.5m		D3					4.5	1	1	1	2	-4.5	
6.0m		D4	4	4.5	Brown ish grey moderately sticky soft Clay		6.0	1	1	2	3	-6	
7.5m		D5					7.5	1	2	2	4	-7.5	
9.0m		D6					9.0	3	4	6	10	-9	
10.5m		D7	5	4.5	Light grey to brown medium dense moderately sorted fine to medium SAND trace silt		10.5	4	5	8	13	-10.5	
12.0m		D8					12.0	5	7	9	16	-12	
13.5m		D9	7	3.0	Yellowish brown medium dense to dense medium grain SAND little silt		13.5	3	3	3	6	-13.5	
15.0m		D10					15.0	2	3	4	7	-15	
16.5m		D11					16.5	8	10	14	24	-16.5	
18.0m		D12					18.0	11	14	18	32	-18	
19.5m		D13					19.5	10	15	20	35	-19.5	
21.0m		D14					21.0	10	16	20	30	-21	
22.5m		D15	10	14.0	Yellowish brown dense to very dense medium to coarse grain SAND little silt		22.5	10	15	25	40	-22.5	
24.0m		D16					24.0	9	16	24	40	-24	
25.5m		D17					25.5	12	18	22	40	-25.5	
27.0m		D18					27.0	12	20	25	45	-27	
28.5m		D19					28.5	13	24	27	51	-28.5	
30.0m		D20					30.0	14	25	30	55	-30	

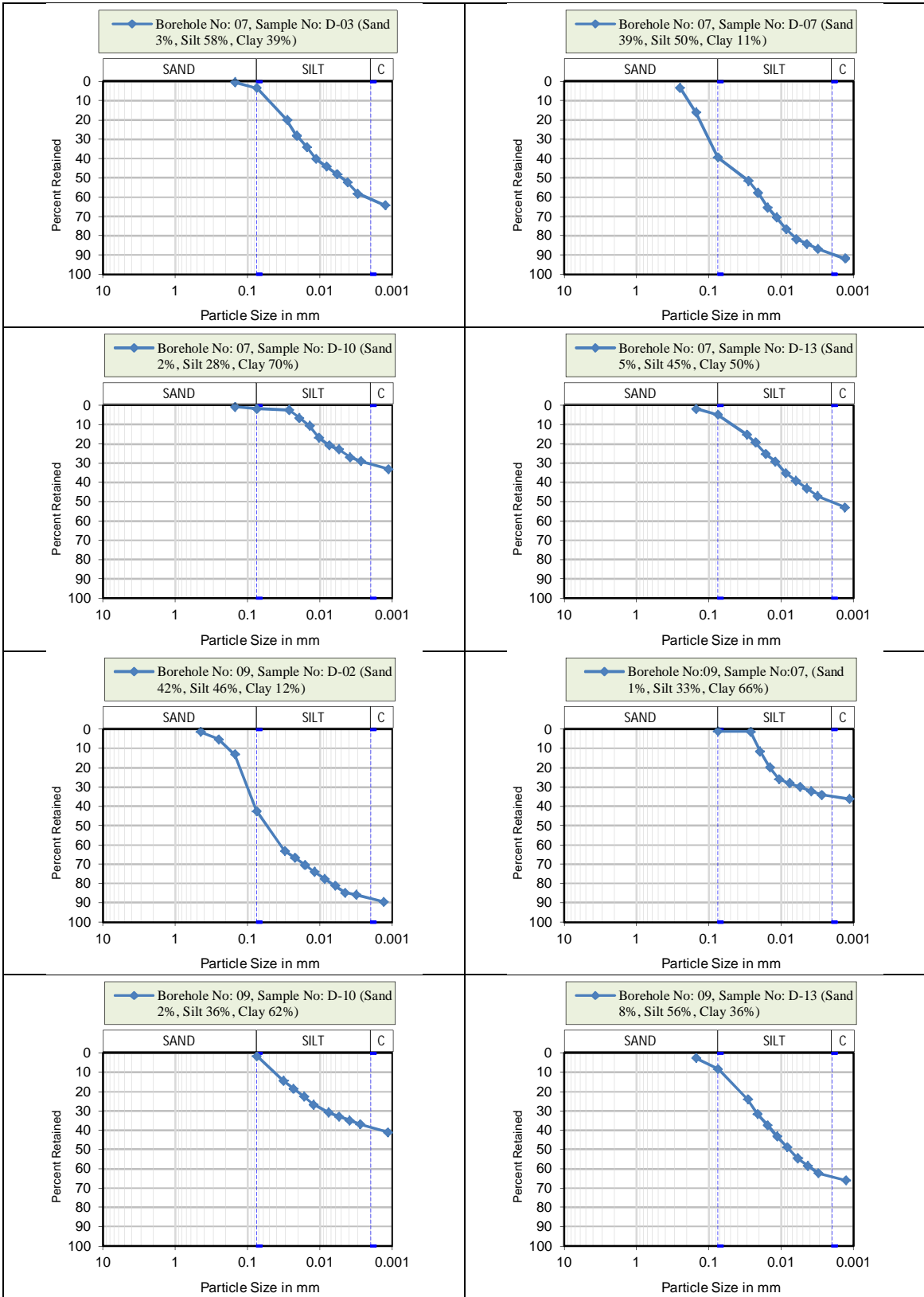
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area							Client: Urban Development Directorate (UDD)					
Bore Hole No :BH-Bhangnamari 70							Existing Ground Level : 9.5					
Location: Bhangnamari, Mymensingh							Date :21-07-2014					
Co-ordinate : Lat- 24° 39'9.74"N Long- 90°28'49.22"							Legend     					
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT	Penetration	Penetration	Penetration	N-Values	Graphical Representation
							Intervals(m)	15cm	15cm	15cm		
1.5m		D1	2	7.0	Brown to grey loose moderately sorted very fine to fine SAND with silt		1.5	2	2	2	4	 <p>Graphical Representation 0 10 20 30 40 50 60</p>
3.0m		D2					3.0	2	2	3	5	
4.5m		D3					4.5	3	4	4	8	
6.0m		D4	4	3.0	Yellowish brown loose fine to medium SAND little		6.0	3	5	5	10	
7.5m		D5					7.5	3	3	3	6	
9.0m		D6	5	4.5	Sluish grey medium stiff Clayey SILT trace fine sand iron concretion		9.0	2	2	3	5	
10.5m		D7					10.5	4	6	8	14	
12.0m		D8	7	4.5	Grey medium dense silty very fine to fine SAND		12.0	4	4	6	10	
13.5m		D9					13.5	5	6	7	13	
15.0m		D10					15.0	2	3	3	6	
16.5m		D11	8	3.0	Brownish grey medium stiff CLAY with silt		16.5	2	4	5	9	
18.0m		D12					18.0	2	2	4	6	
19.5m		D13	10	8.0	Yellowish brown medium dense fine to medium SAND little silt		19.5	8	10	12	22	
21.0m		D14					21.0	8	12	14	26	
22.5m		D15					22.5	10	15	20	35	
24.0m		D16	10	8.0	Yellowish brown dense to very dense medium SAND trace silt		24.0	12	20	25	45	
25.5m		D17					25.5	10	15	26	41	
27.0m		D18					27.0	12	16	28	44	
28.5m		D19					28.5	13	18	30	48	
30.0m		D20					30.0	14	19	30	49	

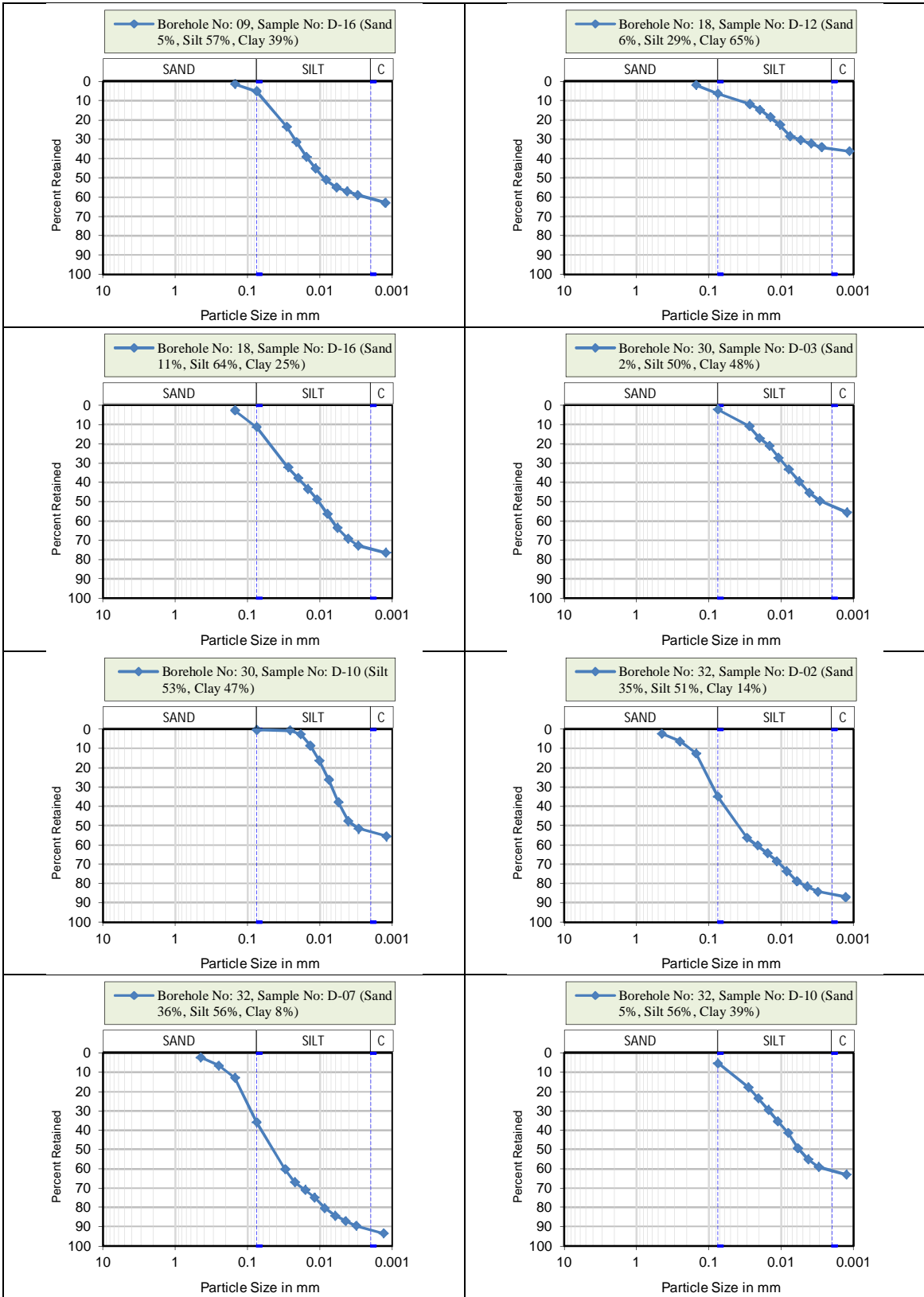
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area						Client: Urban Development Directorate (UDD)							
Bore Hole No :BH- 71						Existing Ground Level :							
Location: 45No. Gandoapa Govt. Primary School						Date :26-08-2014							
Co-ordinate : Lat- 24° 45'03.831"N Long- 90°22'24.919"						Legend     							
Depth of Boring :30.0 Meter													
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)					N-Values	Graphical Representation
							15cm	Penetration	15cm	Penetration	15cm			Penetration
1.5m		D1	2	4.0	Yellowish brown to grey loose moderately sorted very fine to fine SAND with silt		1.5	1	2	4	6	-1.5	 <p>Graphical Representation 0 10 20 30 40 50 60</p>
3.0m		D2					3.0	1	2	2	4	-3	
4.5m		D3					4.5	4	6	7	13	-4.5	
6.0m		D4	3	4.5	Brownish grey medium dense medium to coarse SAND little Clay		6.0	6	8	12	20	-6	
7.5m		D5					7.5	6	7	10	17	-7.5	
9.0m		D6	4	3.0	Light bluish grey medium stiff moderately sticky CLAY with Silt		9.0	2	3	3	6	-9	
10.5m		D7					10.5	2	2	3	5	-10.5	
12.0m		D8					12.0	4	5	6	11	-12	
13.5m		D9					13.5	1	2	2	4	-13.5	
15.0m		D10	7	9.0	Light bluish grey medium stiff to stiff Clayey SILT trace fine sand and organic matter		15.0	3	3	4	7	-15	
16.5m		D11					16.5	3	4	4	8	-16.5	
18.0m		D12					18.0	4	4	5	9	-18	
19.5m		D13					19.5	3	4	5	9	-19.5	
21.0m		D14					21.0	11	14	16	30	-21	
22.5m		D15	8	3.0	Light yellowish brown dense fine SAND little Silt		22.5	10	12	13	25	-22.5	
24.0m		D16					24.0	4	5	5	10	-24	
25.5m		D17	9	3.0	Bluish grey stiff SILT little Clay		25.5	4	4	5	9	-25.5	
27.0m		D18					27.0	16	23	30	53	-27	
28.5m		D19		3.5	Grey to light brown very dense medium to coarse SAND trace silt		28.5	17	26	31	57	-28.5	
30.0m		D20					30.0	15	25	32	57	-30	

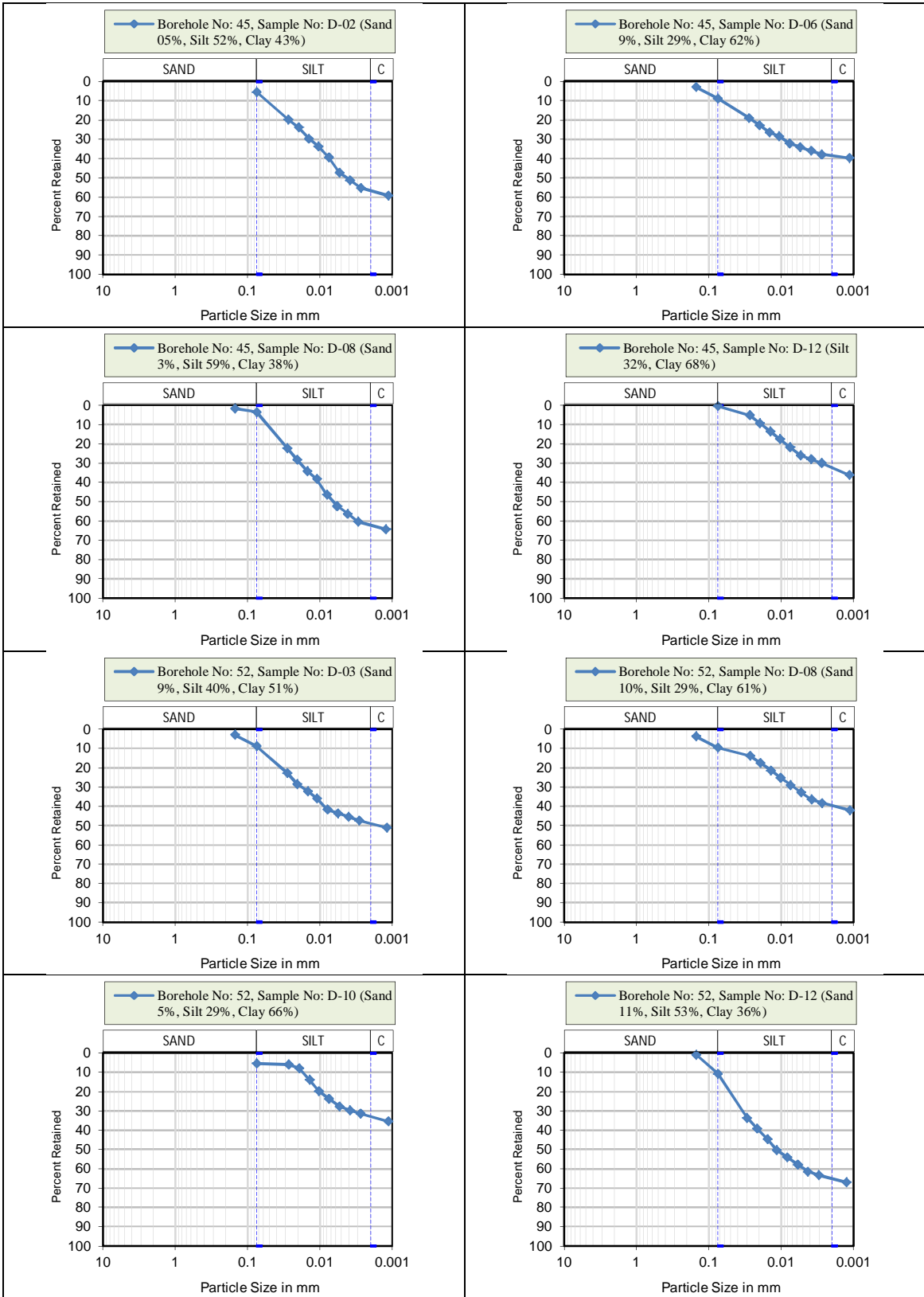
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area					Client: Urban Development Directorate (UDD)							
Bore Hole No :BH-Chor-Ishwardia 72					Existing Ground Level :							
Location: Beside Jute Mill, Chor-Ishwardia					Date :27-07-2014							
Co-ordinate : Lat- 24° 45'23.44"N Long- 90°25'29.352"					Legend  Sand  Clay  Silt  N-Value  Organic							
Depth of Boring :30.0 Meter												
Depth below G.L. (m)	Type of Sample	Sample No	Layer	Thickness (m)	Lithologic Description	Symbol	SPT Intervals(m)	Penetration 15cm	Penetration 15cm	Penetration 15cm	N-Values	Graphical Representation 0 10 20 30 40 50 60
1.5m		D1	2	4.0	Brown to grey loose moderately sorted very fine to fine SAND with silt		1.5	1	3	4	7		-1.5
3.0m		D2					3.0	1	4	6	10	-3
4.5m		D3					4.5	2	4	8	12	-4.5
6.0m		D4	3	26.0	Brown to grey medium dense to dense moderately sorted very fine to fine SAND tracesilt		6.0	3	5	6	11	-6
7.5m		D5					7.5	4	5	8	13	-7.5
9.0m		D6					9.0	5	7	8	15	-9
10.5m		D7					10.5	5	8	8	16	-10.5
12.0m		D8					12.0	7	8	10	18	-12
13.5m		D9					13.5	6	7	10	17	-13.5
15.0m		D10					15.0	4	7	10	17	-15
16.5m		D11					16.5	5	8	11	19	-16.5
18.0m		D12					18.0	5	8	11	19	-18
19.5m		D13					19.5	4	7	9	16	-19.5
21.0m		D14					21.0	5	8	9	17	-21
22.5m		D15					22.5	4	8	12	20	-22.5
24.0m		D16					24.0	6	7	9	16	-24
25.5m		D17					25.5	7	8	10	18	-25.5
27.0m		D18					27.0	8	10	12	22	-27
28.5m		D19					28.5	8	11	13	24	-28.5
30.0m		D20					30.0	7	13	17	30	-30

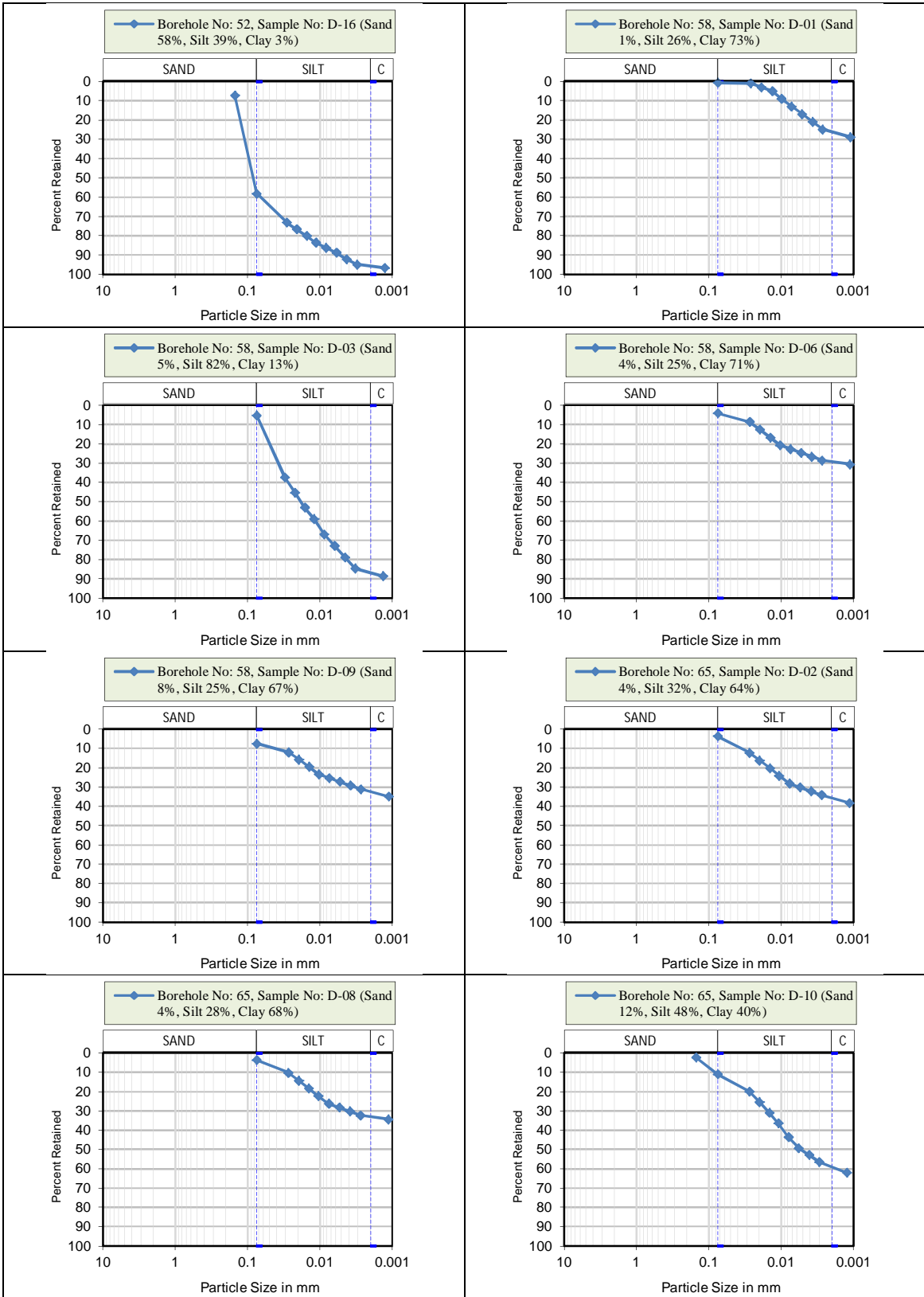
Appendix II: Laboratory Test Result and Graph

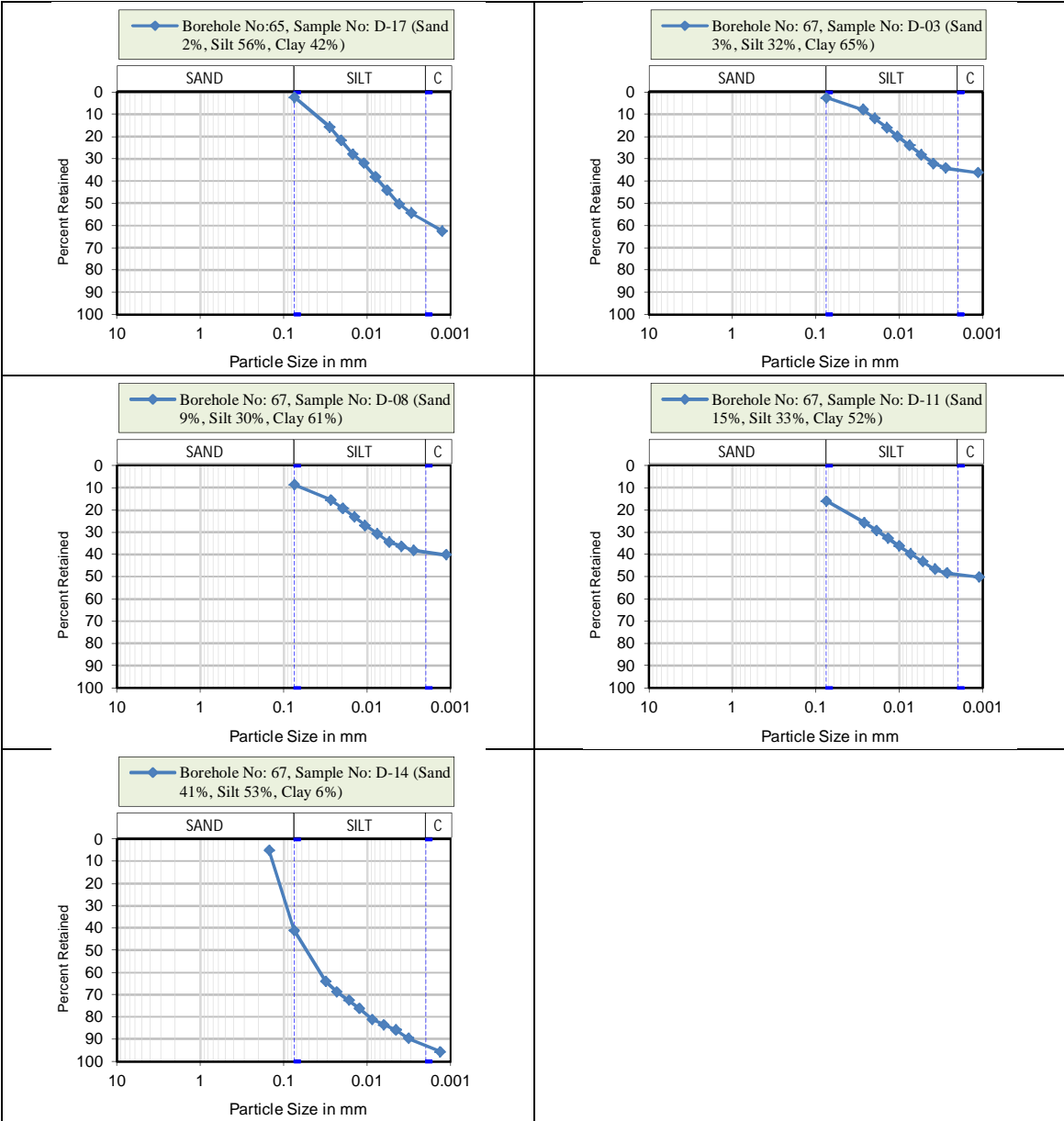
a. Grain size analysis determination

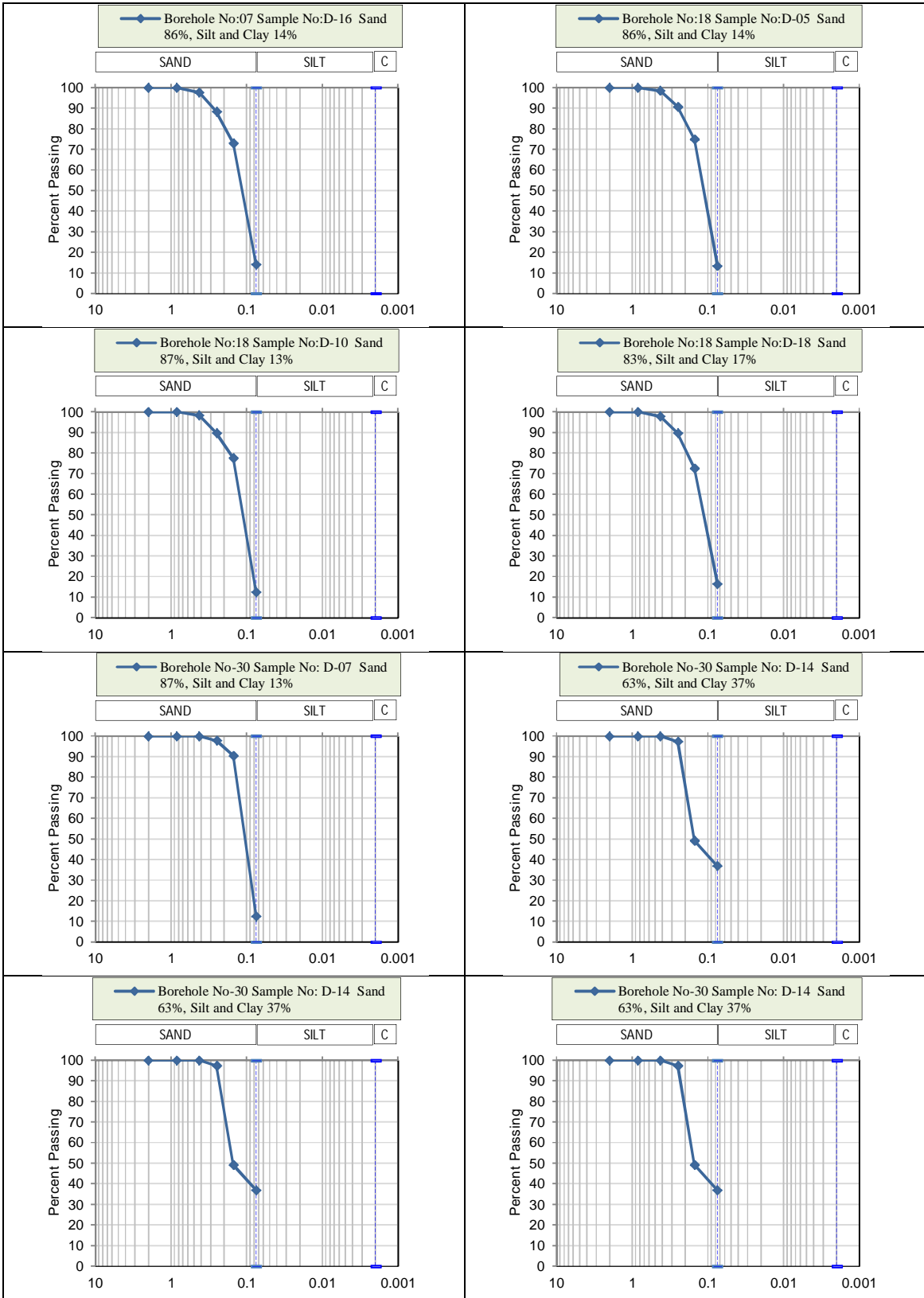


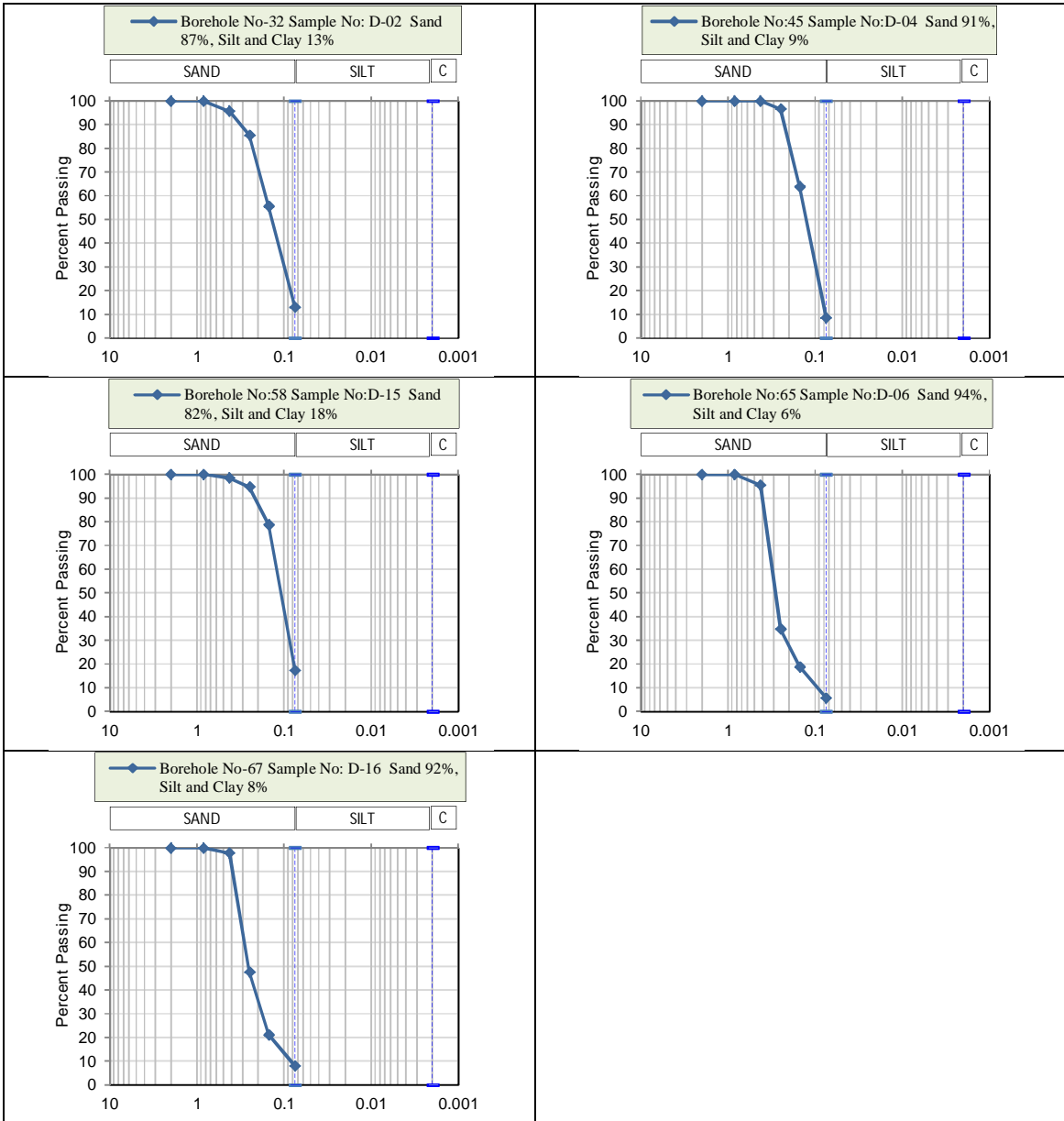






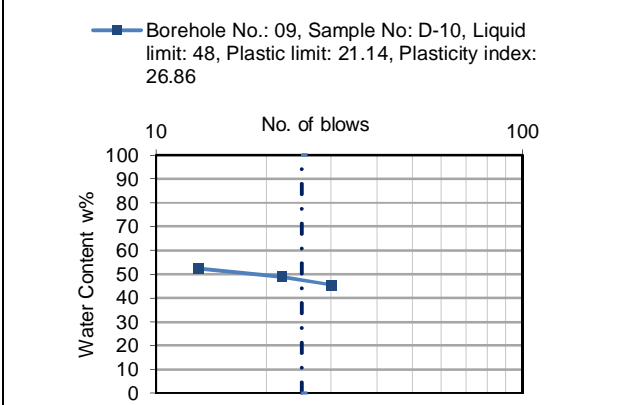
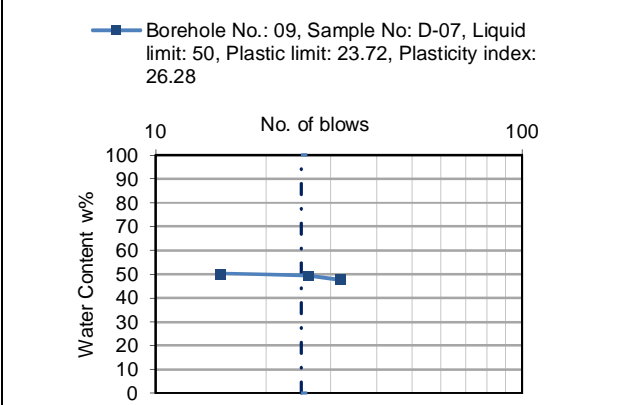
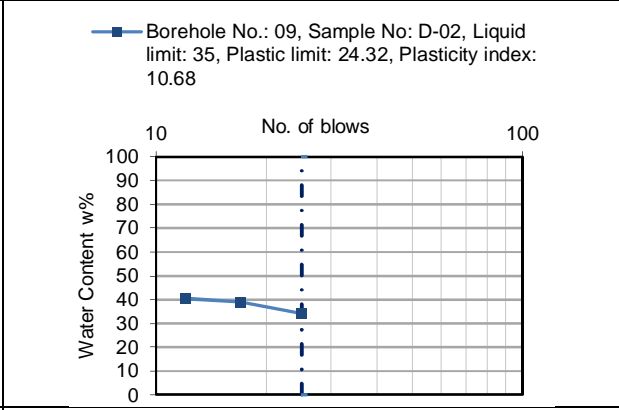
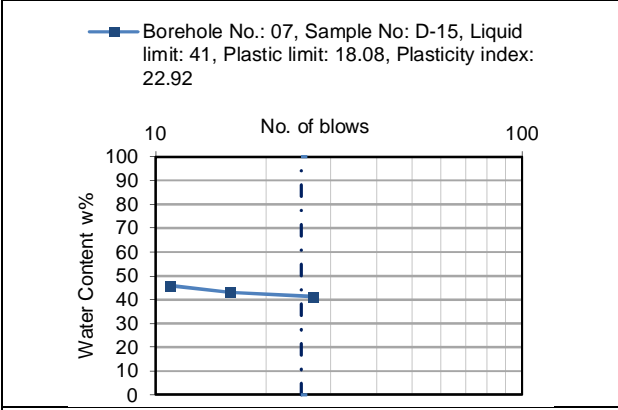
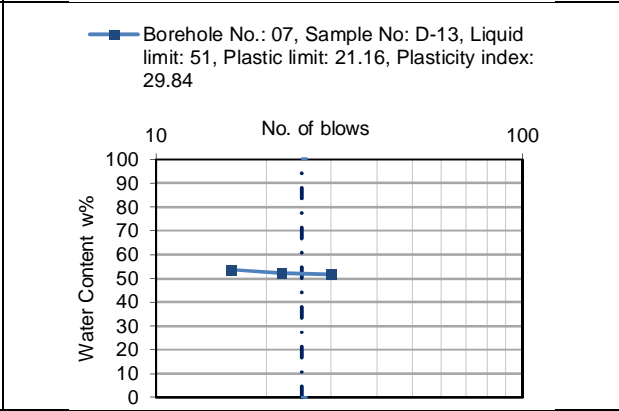
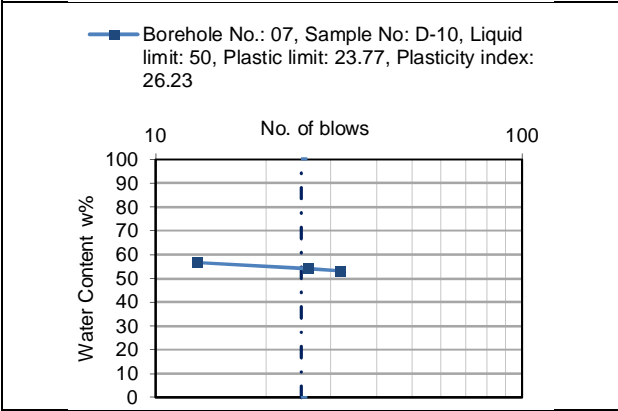
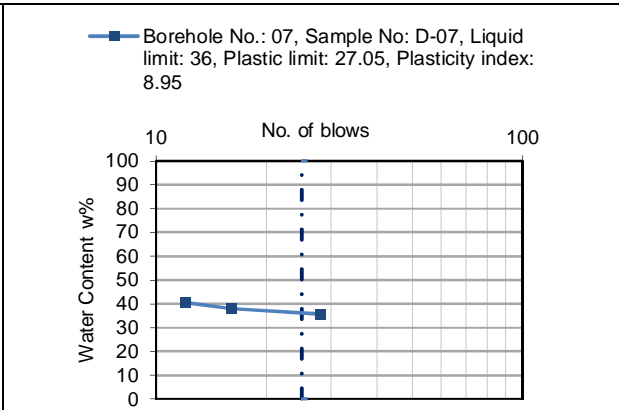
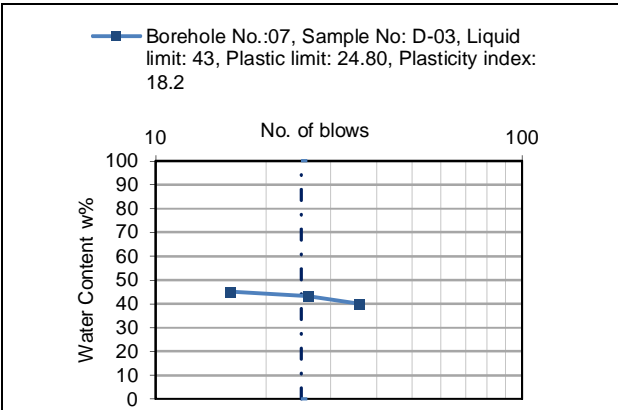


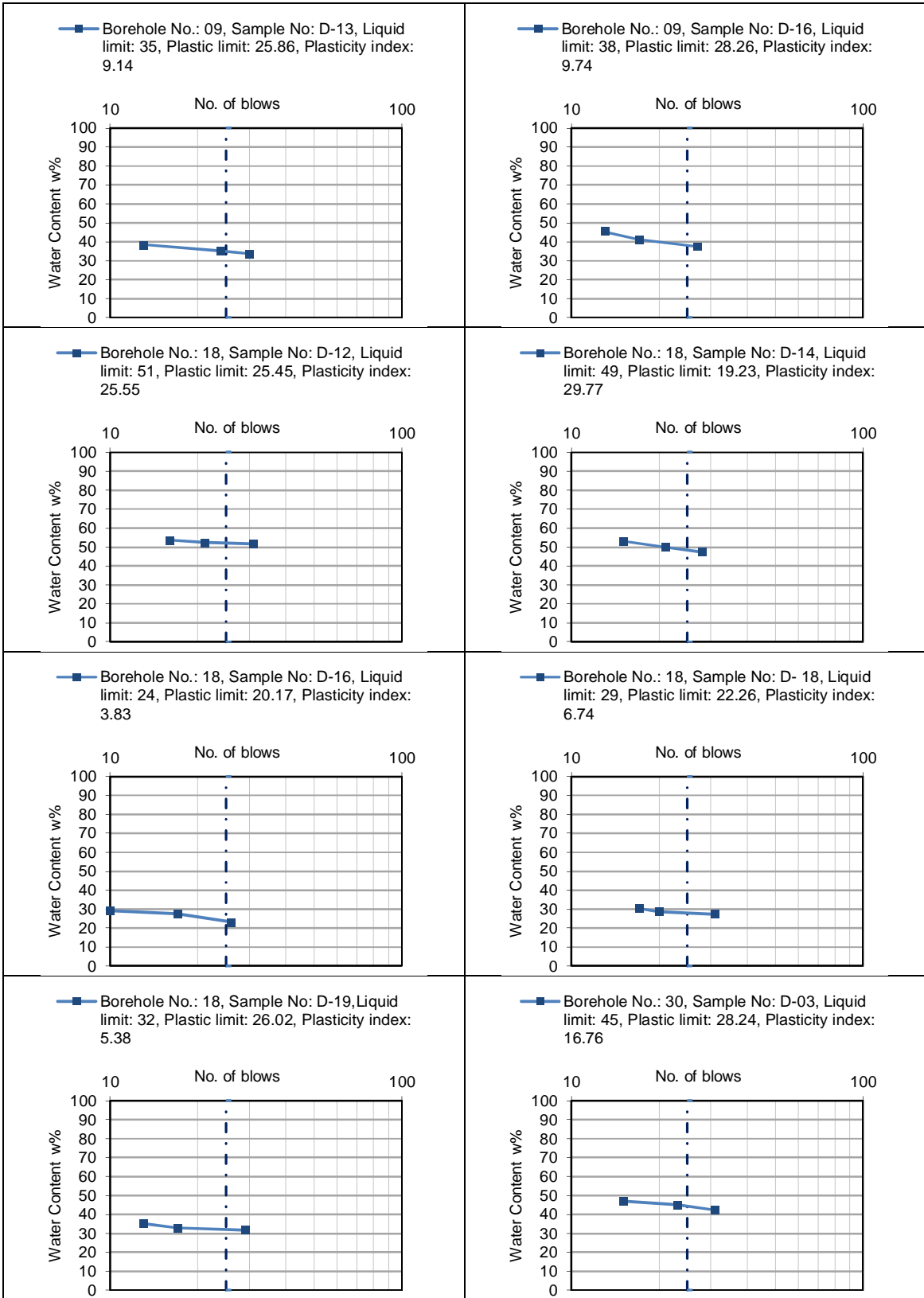


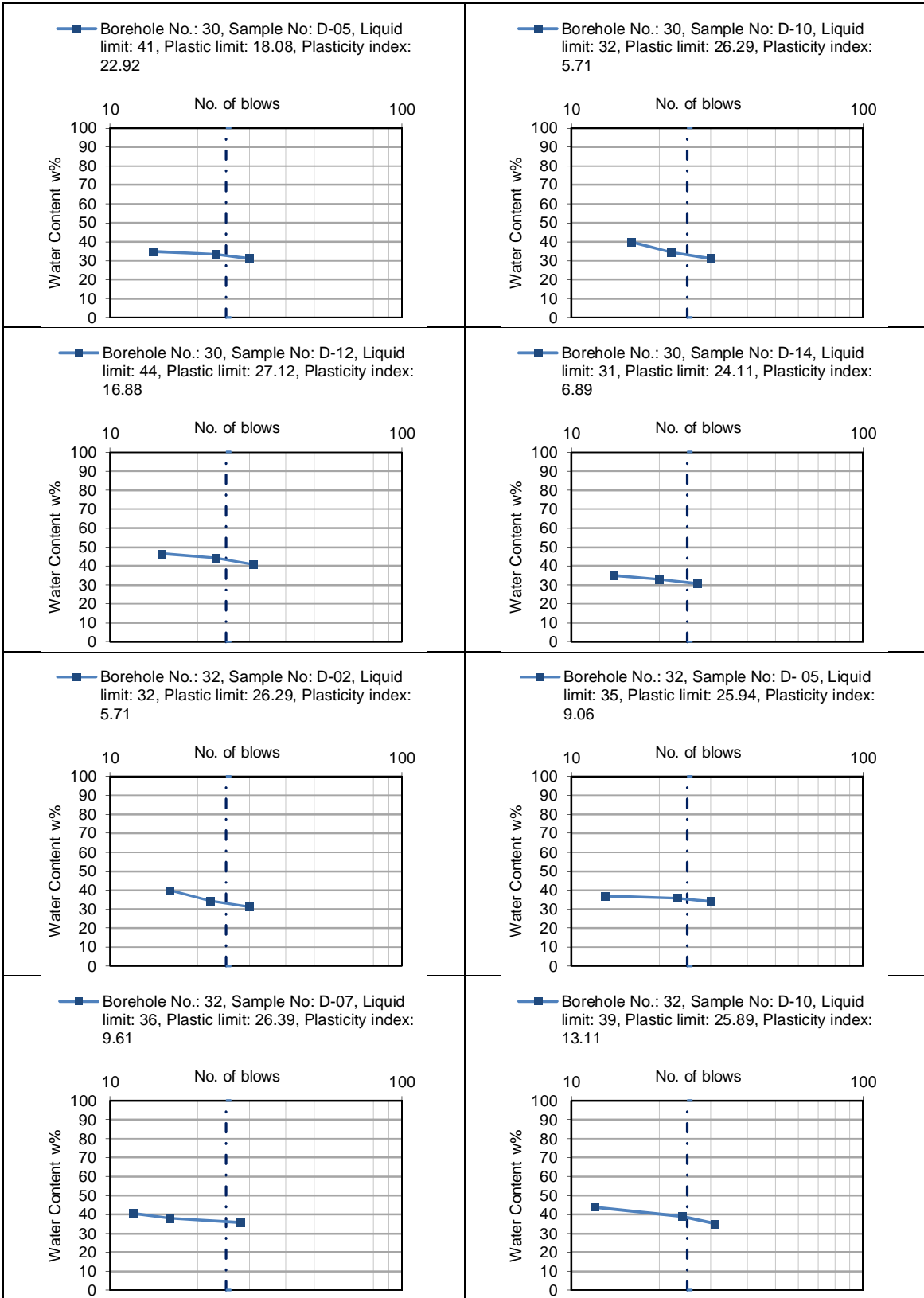


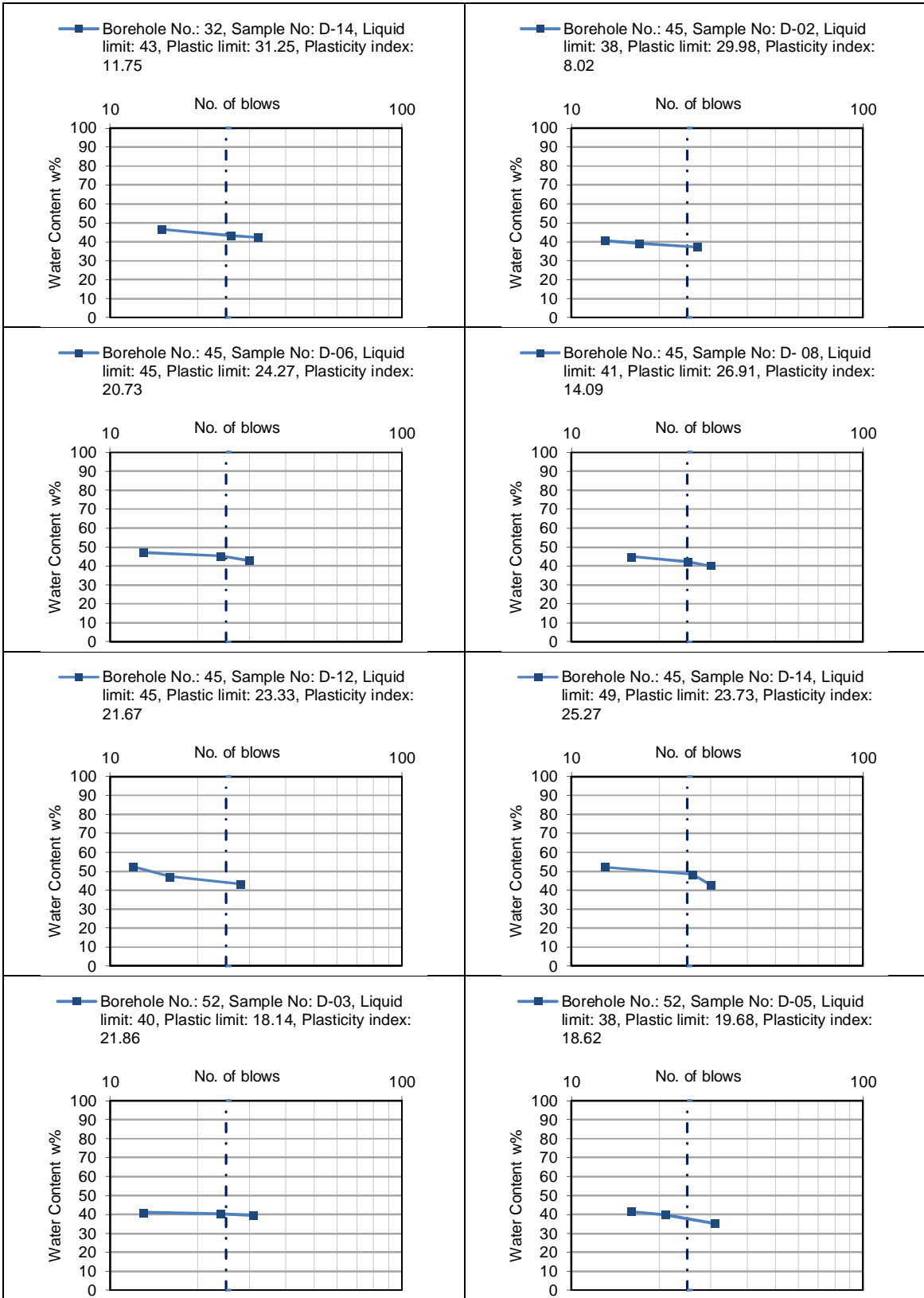
Appendix II: Laboratory Test Result and Graph

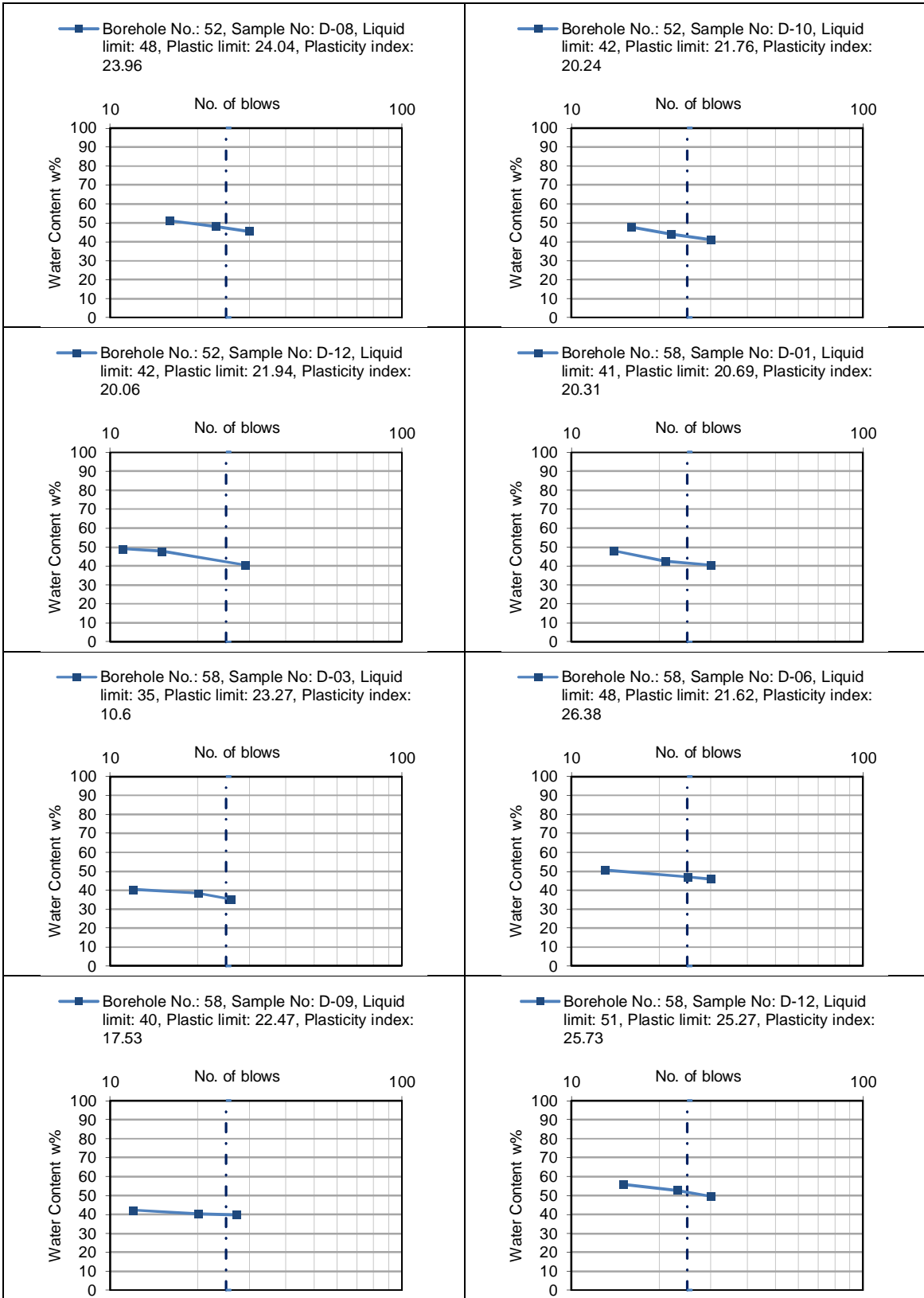
b. Atterberg limits determination

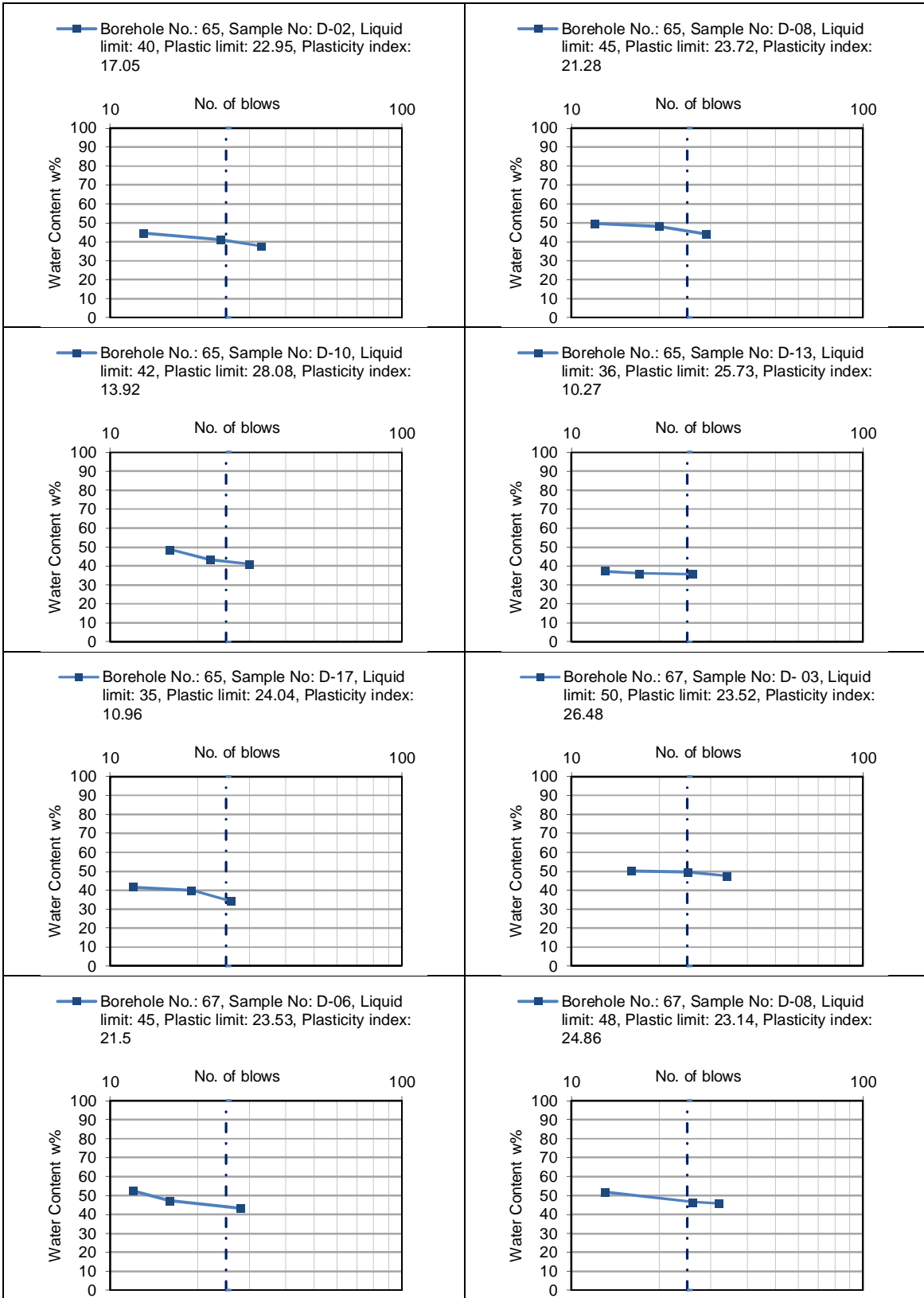




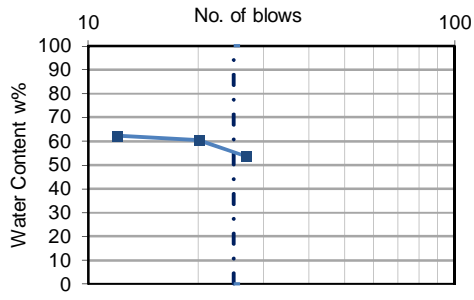




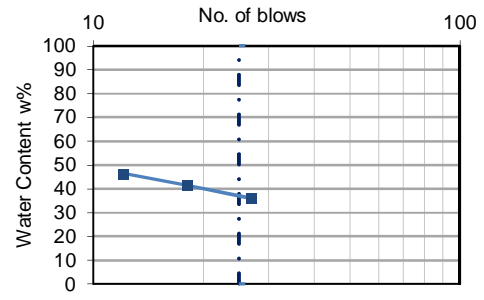




■ Borehole No.: 67, Sample No: D-11, Liquid limit: 55, Plastic limit: 23.08, Plasticity index: 31.92



■ Borehole No.: 67, Sample No: D-14, Liquid limit: 38, Plastic limit: 24.59, Plasticity index: 13.41



Appendix II: Laboratory Test Result and Graph

c. Specific gravity

SPECIFIC GRAVITY DETERMINATION DATA SHEET**Project Name: Engineering Geological Survey in Rural Parts of MSDP Project Area****Location: MSDP area, Mymensingh**

Sample No	Sample Name	Specific Gravity
BH No: 07; Sample No:D-03	Grey CLAYEY SILT trace sand	2.50
BH No: 07; Sample No:D-07	Bluish grey SANDY SILT little clay	2.52
BH No: 07; Sample No:D-10	Dark grey ORGANIC CLAY (PEAT) with silt trace sand	1.80
BH No: 07; Sample No:D-13	Light bluish grey to brown SILTY CLAY trace sand	2.54
BH No: 07; Sample No:D-16	Yellowish brown fine SAND little silt trace clay	2.60
BH No: 09; Sample No:D-02	Brown to grey SANDY SILT little clay	2.56
BH No: 09; Sample No:D-04	Light brown fine SAND little silt	2.50
BH No: 09; Sample No:D-10	Grey SILTY CLAY trace sand	2.54
BH No: 09; Sample No:D-13	Light yellowish brown CLAYEY SILT trace sand	2.51
BH No: 09; Sample No:D-16	Light yellowish brown CLAYEY SILT trace sand	2.56
BH No: 18; Sample No:D-05	Grey to brownish grey very fine to fine SAND with silt	2.60
BH No: 18; Sample No:D-10	Grey to brownish grey very fine to fine SAND with silt	2.60
BH No: 18; Sample No:D-12	Dark grey ORGANIC CLAY (PEAT) with silt trace clay	1.98
BH No: 18; Sample No:D-16	Bluish grey SILT with clay little sand	2.53
BH No: 18; Sample No:D-20	Yellowish brown, bluish grey very fine to fine SAND	2.60
BH No: 30; Sample No:D-03	Bluish grey CLAYEY SILT trace sand	2.55
BH No: 30; Sample No:D-06	Brown to grey fine SAND little silt	2.60
BH No: 30; Sample No:D-10	Bluish grey CLAYEY SILT	2.53
BH No: 30; Sample No:D-14	Bluish grey to brown very fine SILTY SAND trace clay	2.60
BH No: 30; Sample No:D-18	Brown to greenish brown fine SAND little silt	2.60
BH No: 32; Sample No:D-02	Brownish grey SANDY SILT little clay	2.54
BH No: 32; Sample No:D-05	Grey very fine SAND little silt	2.61
BH No: 32; Sample No:D-07	Grey SANDY SILT little clay	2.55
BH No: 32; Sample No:D-10	Bluish grey CLAYEY SILT trace sand	2.54
BH No: 32; Sample No:D-15	Yellowish brown very fine to fine SAND little silt	2.63
BH No: 45; Sample No:D-02	Brown CLAYEY SILT trace sand	2.54
BH No: 45; Sample No:D-04	Grey very fine to fine SAND trace silt	2.62
BH No: 45; Sample No:D-06	Dark grey ORGANIC CLAY (PEAT) with silt trace sand	2.53
BH No: 45; Sample No:D-08	Grey CLAYEY SILT trace sand	2.55
BH No: 45; Sample No:D-12	Reddish brown to Yellowish brown SILTY CLAY	2.55
BH No: 52; Sample No:D-03	Grey SILTY CLAY trace sand	2.62
BH No: 52; Sample No:D-08	Dark grey ORGANIC CLAY with silt trace sand (PEAT)	1.96
BH No: 52; Sample No:D-10	Light brownish grey CLAY with silt trace sand	2.56
BH No: 52; Sample No:D-12	Reddish brown Clayey SILT little Sand	2.53
BH No: 52; Sample No:D-16	Yellowish brown very fine SILTY SAND trace clay	2.62
BH No: 58; Sample No:D-01	Brownish grey CLAY with silt trace sand	2.54
BH No: 58; Sample No:D-03	Brownish grey SILT little clay trace sand	2.55
BH No: 58; Sample No:D-06	Brownish grey CLAY with silt trace sand	2.56
BH No: 58; Sample No:D-09	Reddish brown CLAY with silt trace sand	2.53
BH No: 58; Sample No:D-15	Brownish grey very fine to fine SAND with silt	2.61
BH No: 65; Sample No:D-02	Brownish grey CLAY with silt trace sand	2.55

SPECIFIC GRAVITY DETERMINATION DATA SHEET**Project Name: Engineering Geological Survey in Rural Parts of MSDP Project Area****Location: MSDP area, Mymensingh**

Sample No	Sample Name	Specific Gravity
BH No: 65; Sample No:D-06	Grey medium SAND trace silt	2.6
BH No: 65; Sample No:D-08	Dark grey ORGANIC CLAY with silt trace sand (PEAT)	1.95
BH No: 65; Sample No:D-10	Reddish to yellowish brown CLAYEY SILT little sand	2.55
BH No: 65; Sample No:D-17	Bluish grey CLAYEY SILT trace sand	2.52
BH No: 67; Sample No:D-03	Grey CLAY with silt trace sand	2.51
BH No: 67; Sample No:D-08	Dark grey ORGANIC CLAY with silt trace sand (PEAT)	1.98
BH No: 67; Sample No:D-11	Brown CLAY with silt little sand	2.57
BH No: 67; Sample No:D-14	Yellowish brown SANDY SILT trace clay	2.55
BH No: 67; Sample No:D-16	Yellowish brown medium to fine SAND trace silt	2.61

Appendix II: Laboratory Test Result and Graph

- d. Unconfined compression strength Determination

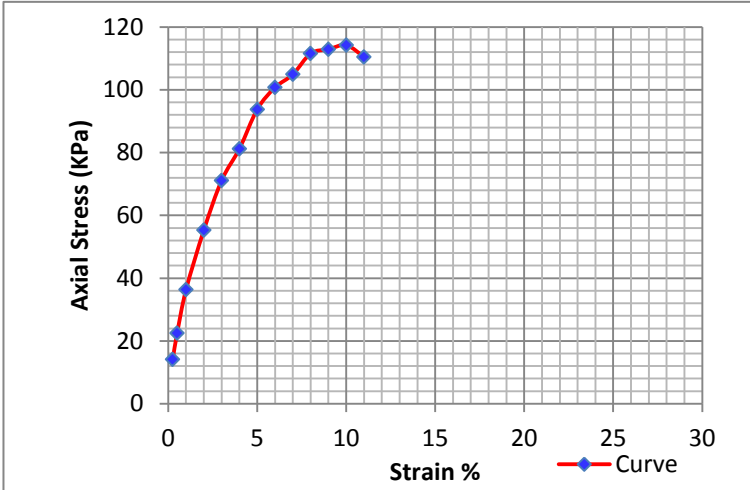


Engineering Lab, Department Disaster Science & Management,
Faculty of Earth and Environmental Science

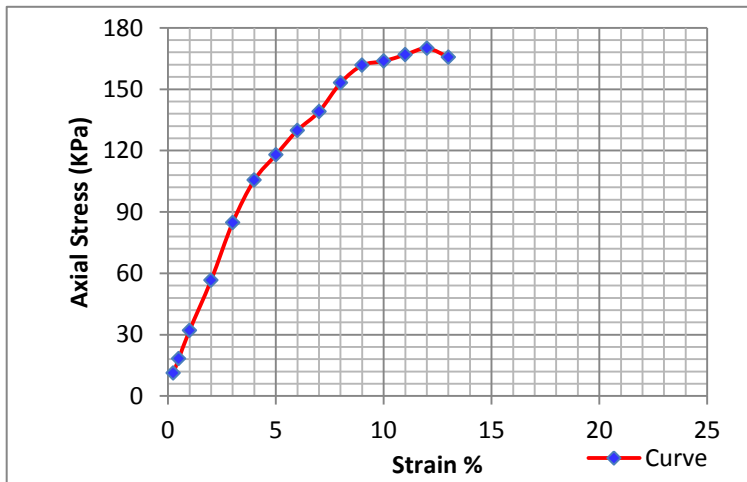
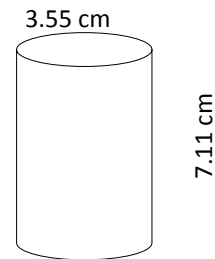
University of Dhaka

Project: Engineering Geological Survey in Rural Parts of
MSDP Project Area
Location: MSDP area, Mymensingh

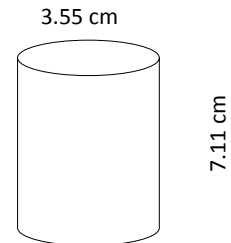
UNCONFINED COMPRESSION STRENGTH TEST



Bore hole No.	BH-07
Sample No.	UD-1
Depth (ft)	12 to 13.5
Description of soil	Caly
qu (Kpa)	114.21
% Strain	10.0
γ_{wet} (gm/cc)	1.98
γ_{Dry} (gm/cc)	1.50
% Moisture	32.13

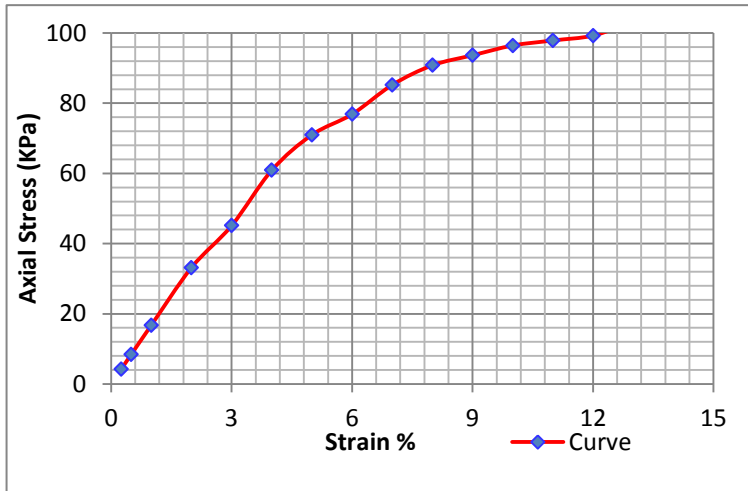


Bore hole No.	BH-09
Sample No.	UD-1
Depth (ft)	8 to 9.5
Description of soil	Caly
qu (Kpa)	169.99
% Strain	12.0
γ_{wet} (gm/cc)	1.98
γ_{Dry} (gm/cc)	1.54
% Moisture	28.12

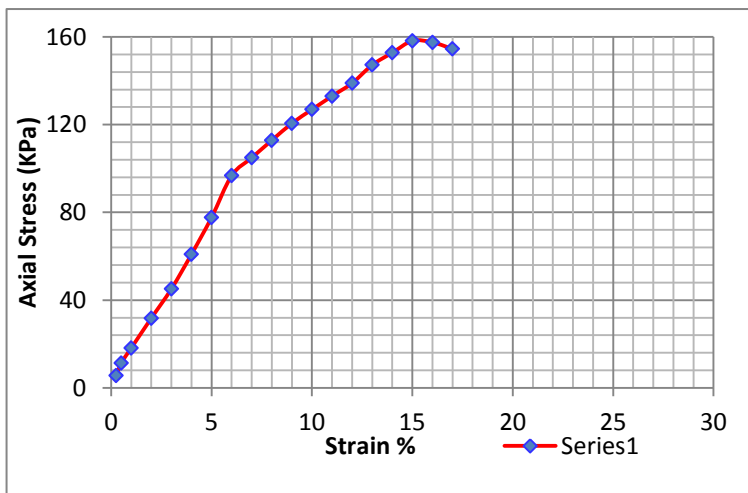
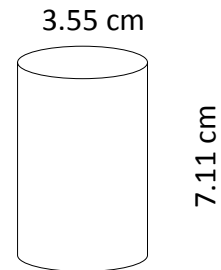




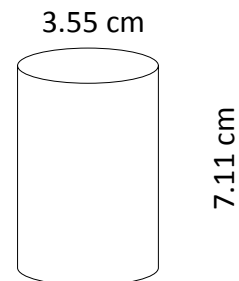
UNCONFINED COMPRESSION STRENGTH TEST



Bore hole No.	BH-18
Sample No.	UD-2
Depth (ft)	12 to 13.5
Description of soil	Soft Caly
qu (Kpa)	105.46
% Strain	15.0
γ_{wet} (gm/cc)	1.89
γ_{Dry} (gm/cc)	1.41
% Moisture	34.65

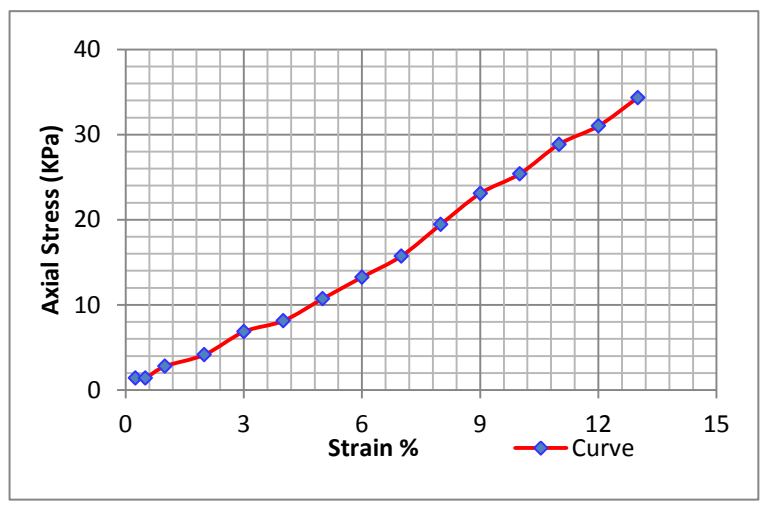


Bore hole No.	BH-30
Sample No.	UD-2
Depth (ft)	17 to 18.5
Description of soil	Clay
qu (Kpa)	157.52
% Strain	16.0
γ_{wet} (gm/cc)	1.97
γ_{Dry} (gm/cc)	1.48
% Moisture	32.81

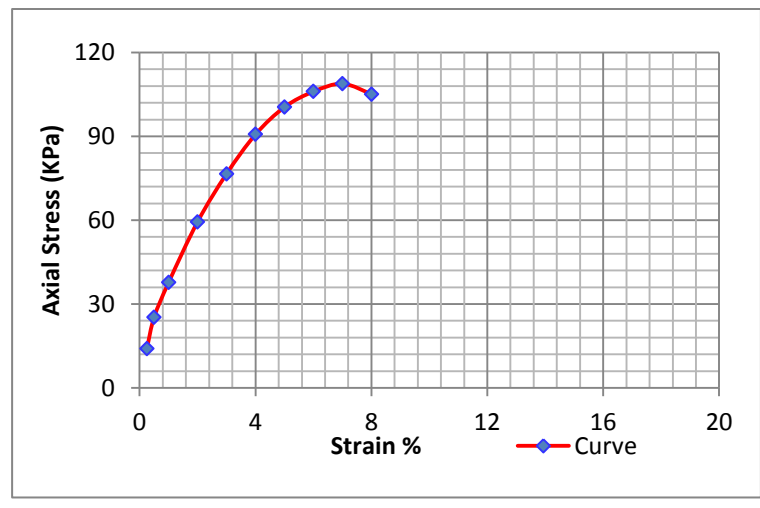
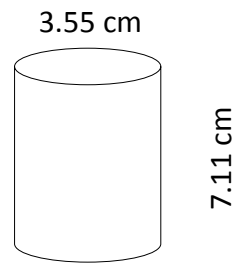




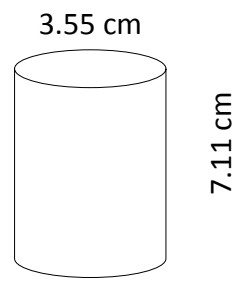
UNCONFINED COMPRESSION STRENGTH TEST



Bore hole No.	BH-32
Sample No.	UD-1
Depth (ft)	7 to 8.5
Description of soil	Very Soft Clay
qu (Kpa)	43.30
% Strain	17.0
γ_{wet} (gm/cc)	1.96
γ_{Dry} (gm/cc)	1.35
% Moisture	45.44



Bore hole No.	BH-52
Sample No.	UD-2
Depth (m)	17 to 18.5
Description of soil	Caly
qu (Kpa)	108.84
% Strain	7.0
γ_{wet} (gm/cc)	1.94
γ_{Dry} (gm/cc)	1.45
% Moisture	34.24



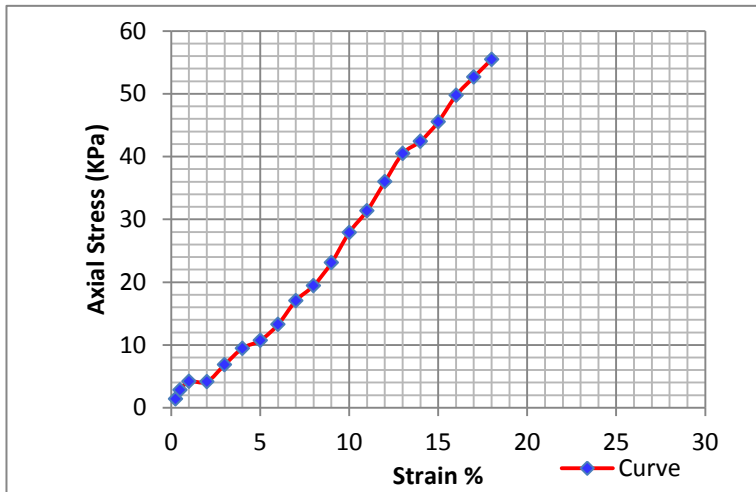


Engineering Lab, Department Disaster Science & Management,
Faculty of Earth and Environmental Science

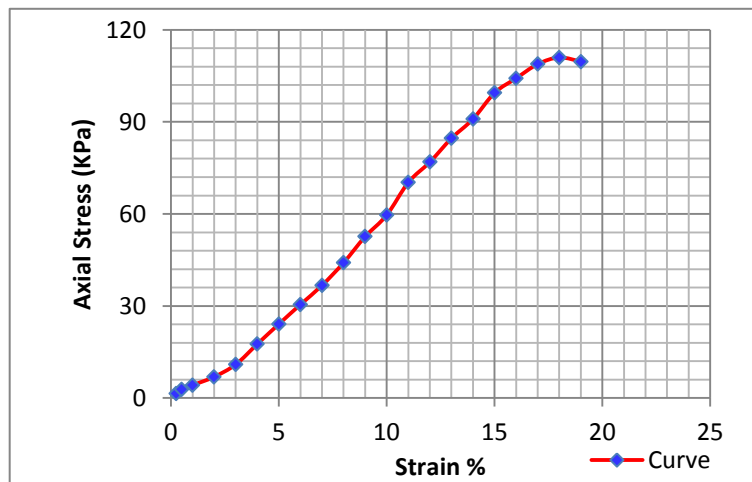
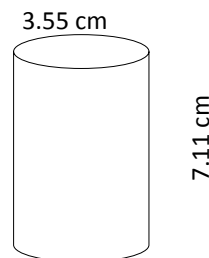
University of Dhaka

Project: Engineering Geological Survey in Rural Parts of
MSDP Project Area
Location: MSDP area, Mymensingh

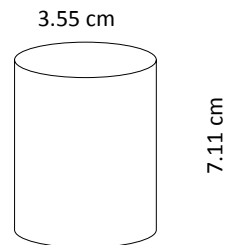
UNCONFINED COMPRESSION STRENGTH TEST



Bore hole No.	BH-65
Sample No.	UD-2
Depth (ft)	17 to 18.5
Description of soil	Soft Caly
qu (Kpa)	59.39
% Strain	19.0
γ_{wet} (gm/cc)	1.91
γ_{Dry} (gm/cc)	1.49
% Moisture	28.43

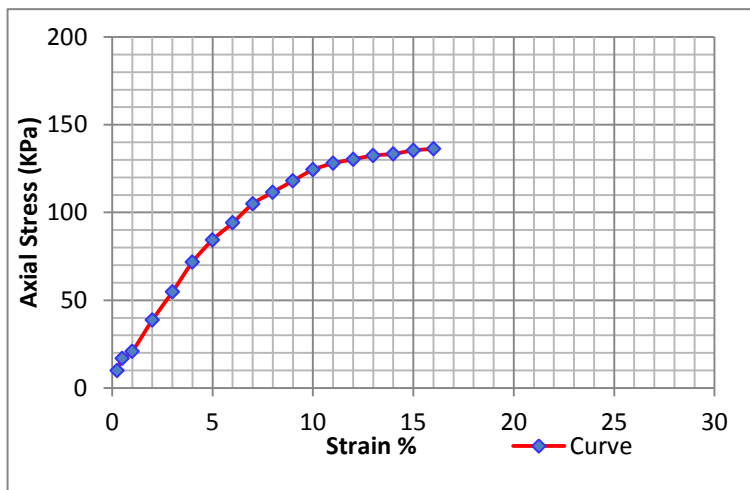


Bore hole No.	BH-67
Sample No.	UD-2
Depth (ft)	8 to 9.5
Description of soil	Caly Some Silt
qu (Kpa)	110.99
% Strain	18.0
γ_{wet} (gm/cc)	2.13
γ_{Dry} (gm/cc)	1.60
% Moisture	33.03

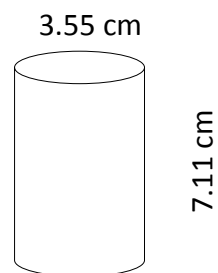




UNCONFINED COMPRESSION STRENGTH TEST



Bore hole No.	BH-58
Sample No.	UD-1
Depth (ft)	12 to 13.5
Description of soil	Caly Some Silt
qu (Kpa)	136.20
% Strain	16.0
γ_{wet} (gm/cc)	1.98
γ_{Dry} (gm/cc)	1.56
% Moisture	27.12

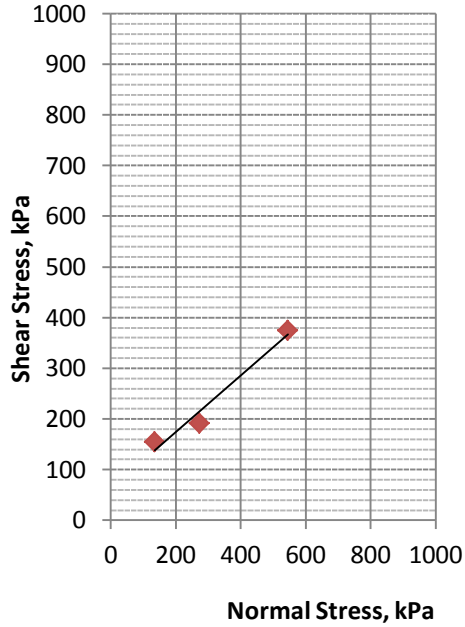


Appendix II: Laboratory Test Result and Graph

e. Direct shear test

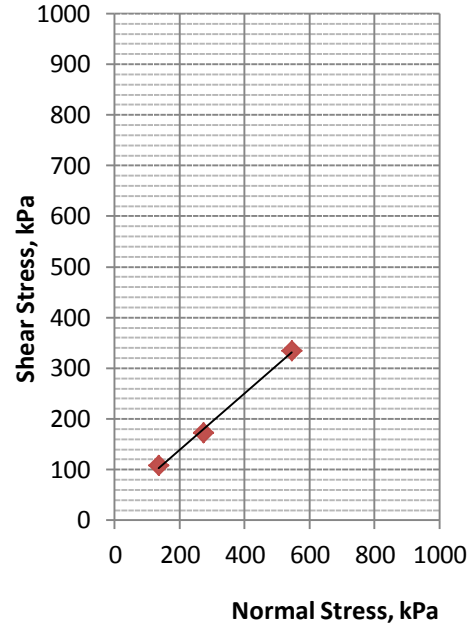
◆ Borehole No.: 07; Sample No.: 08,
Friction Angle: 29.210, Cohesion: 62.5
kPa

$$y = 0.5592x + 62.5$$
$$R^2 = 0.97$$



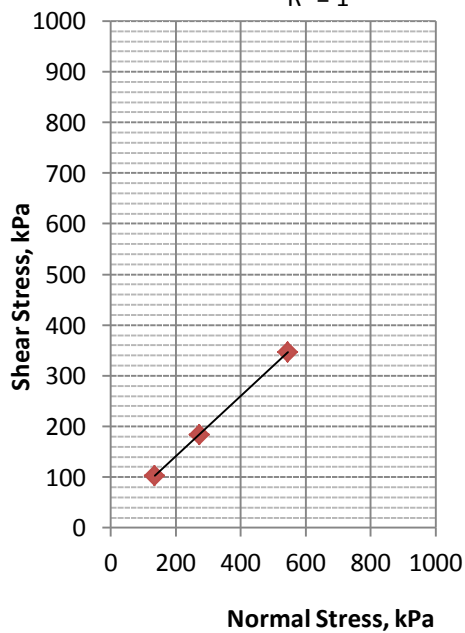
◆ Borehole No.: 09; Sample No.: 04,
Friction Angle: 29.160, Cohesion:
27.08 kPa

$$y = 0.5588x + 27.083$$
$$R^2 = 0.9966$$



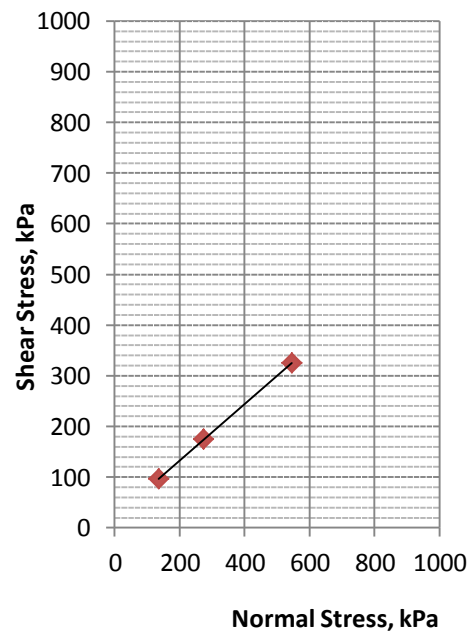
◆ Borehole No.: 18; Sample No.: 06,
Friction Angle: 30.840, Cohesion:
20.83 kPa

$$y = 0.5976x + 20.833$$
$$R^2 = 1$$



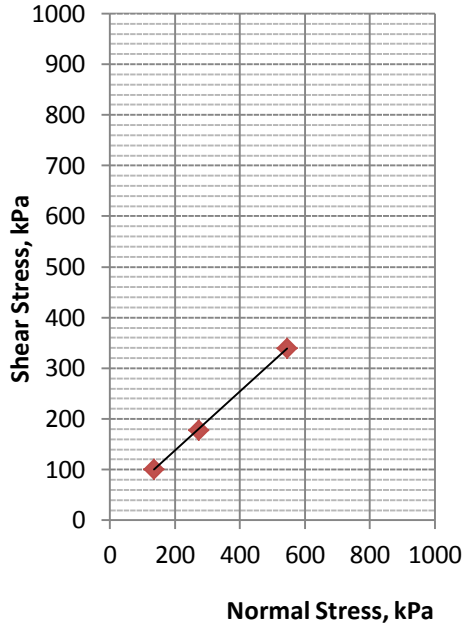
◆ Borehole No.: 30; Sample No.: 06,
Friction Angle: 29.210, Cohesion:
20.83 kPa

$$y = 0.5592x + 20.833$$
$$R^2 = 0.9998$$



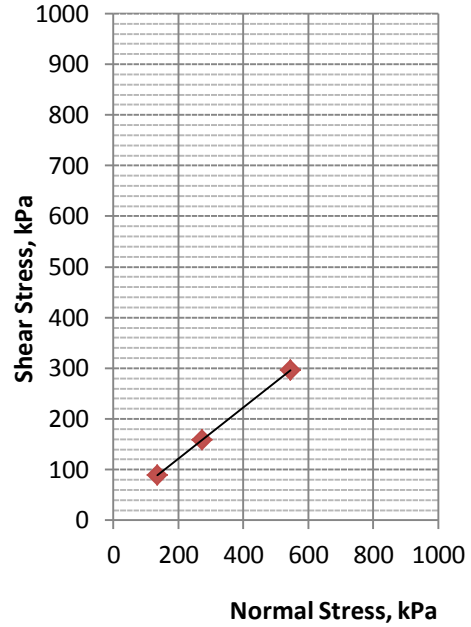
◆ Borehole No.: 32; Sample No.: 06,
Friction Angle: 30.280, Cohesion: 20
kPa

$$y = 0.5845x + 20$$
$$R^2 = 0.9998$$



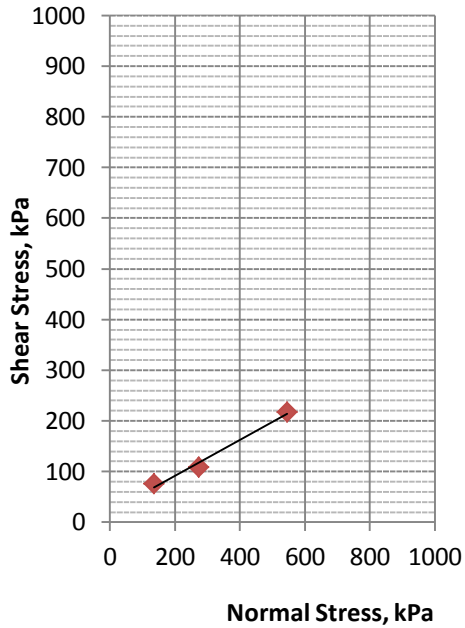
◆ Borehole No.: 45; Sample No.: 05,
Friction Angle: 26.890, Cohesion:
19.58 kPa

$$y = 0.5072x + 19.583$$
$$R^2 = 1$$



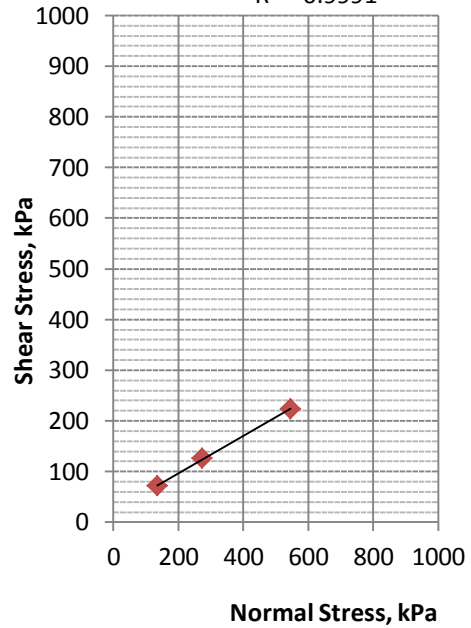
◆ Borehole No.: 58; Sample No.: 06,
Friction Angle: 19.440, Cohesion:
20.83 kPa

$$y = 0.3539x + 20.833$$
$$R^2 = 0.9887$$



◆ Borehole No.: 65; Sample No.: 07,
Friction Angle: 20.300, Cohesion:
22.08 kPa

$$y = 0.3709x + 22.083$$
$$R^2 = 0.9991$$



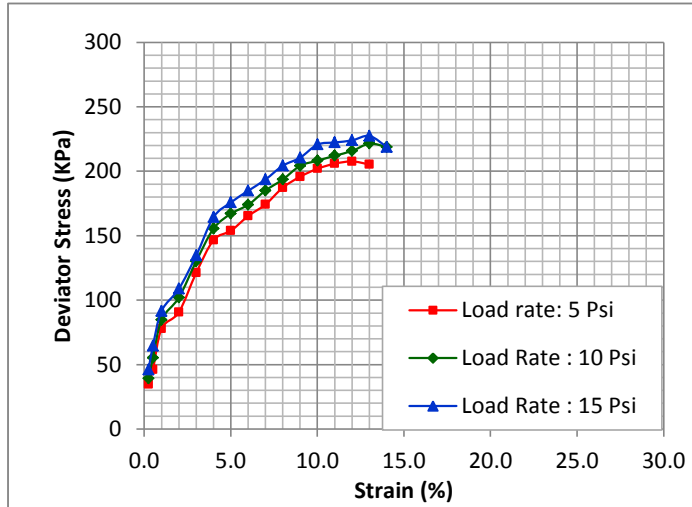
Appendix II: Laboratory Test Result and Graph

f. Tri-axial test (Undrained Unconsolidation)

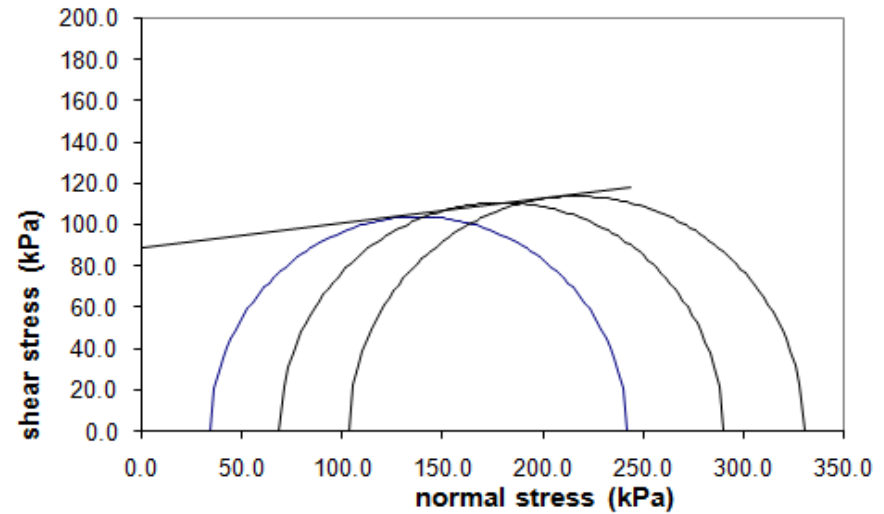


Triaxial Compression Test
 (Unconsolidated Undrained)

STRESS-STRAIN DIAGRAM



MOHRS STRESS DIAGRAM



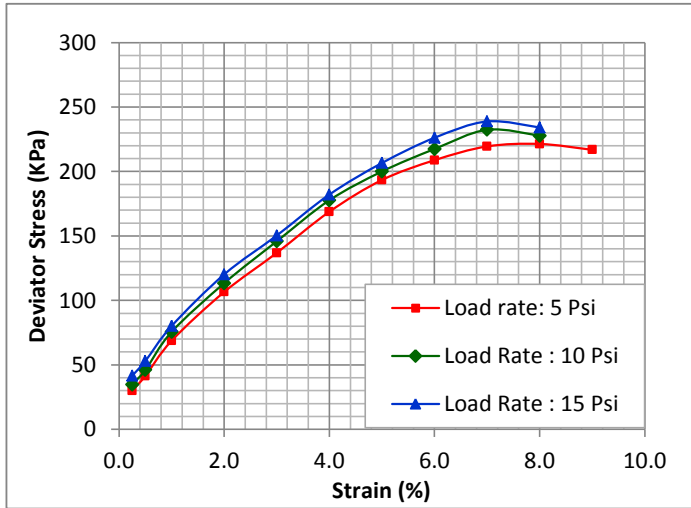
Symbol	Moisture Content (%)	Dry density (g/cc)
—■—	31.85	1.46
—◆—	32.04	1.46
—▲—	32.07	1.46

Borehole No.	BH-07
Sample No.	UD-2
Depth (m)	2.44 to 2.99
Cohesion (kPa)	89
Angle of Friction (Degree)	6.9

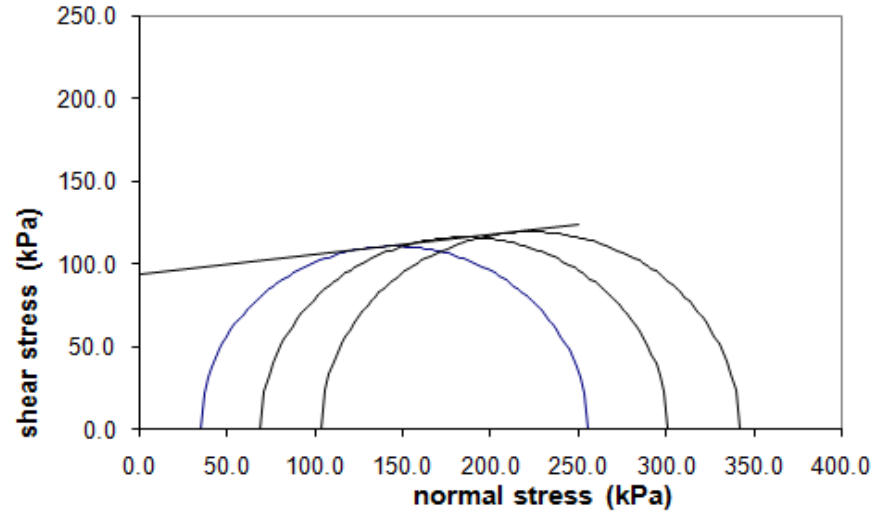


Triaxial Compression Test
 (Unconsolidated Undrained)

STRESS-STRAIN DIAGRAM



MOHRS STRESS DIAGRAM



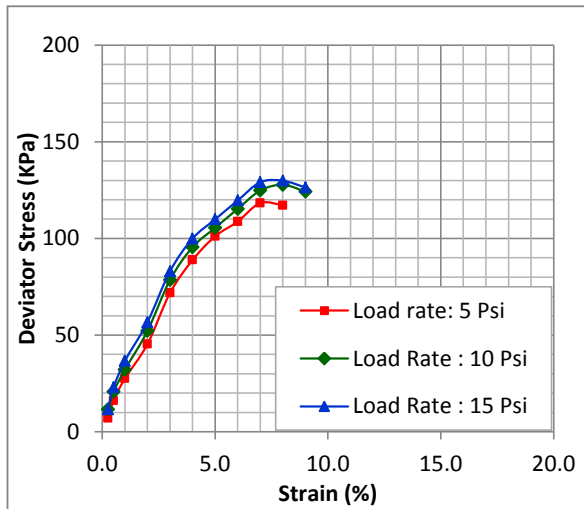
Symbol	Moisture Content (%)	Dry density (g/cc)
■	32.04	1.46
◆	31.59	1.46
▲	31.56	1.46

Borehole No.	BH-09
Sample No.	UD-2
Depth (m)	3.96 to 4.41
Cohesion (KPa)	94
Angle of Friction (degree)	6.9

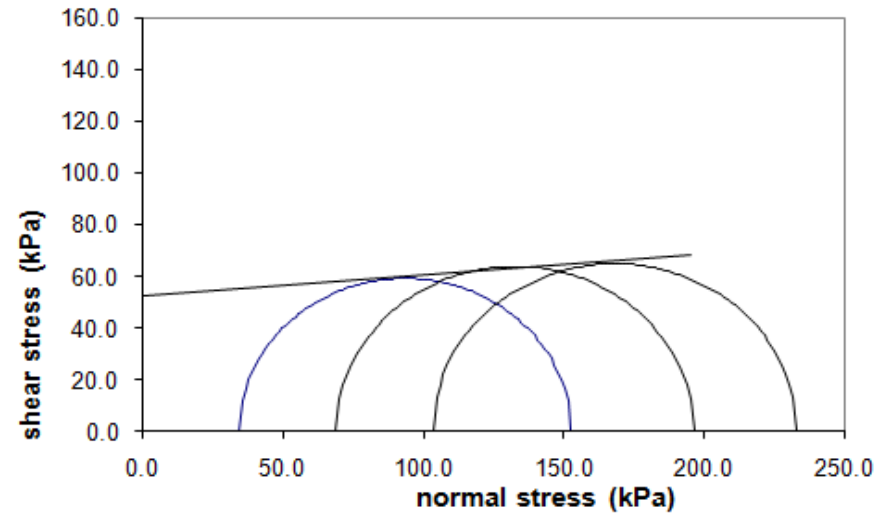


Triaxial Compression Test
 (Unconsolidated Undrained)

STRESS-STRAIN DIAGRAM



MOHR'S STRESS DIAGRAM



Symbol	Moisture Content (%)	Dry density (g/cc)
—■—	24.98	1.57
—◆—	25.04	1.57
—▲—	25.17	1.57

Borehole No.	BH-18
Sample No.	UD-01
Depth (m)	2.44 to 2.99
Cohesion (kPa)	52
Angle of Friction (degree)	4.6



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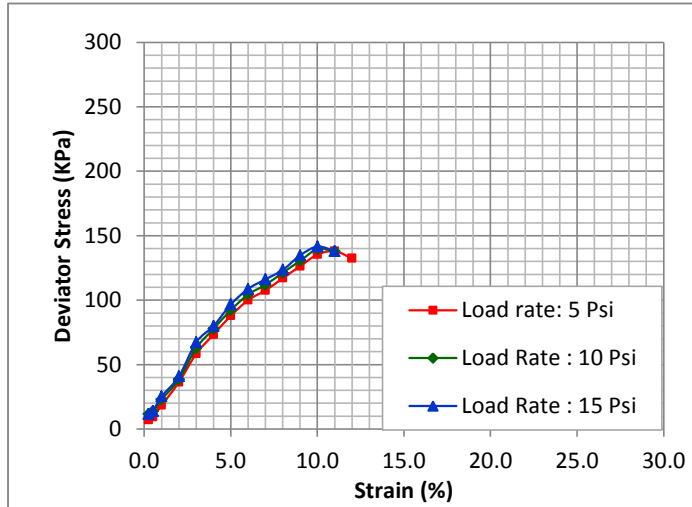
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area

Location: 72No. Govt. Primary School, Mymensingh

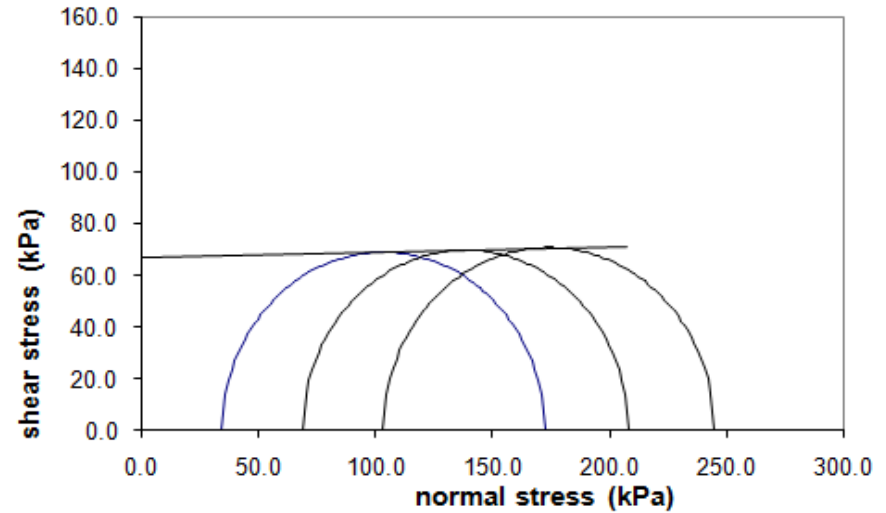
Client: Urban Development Directorate (UDD)

Triaxial Compression Test
 (Unconsolidated Undrained)

STRESS-STRAIN DIAGRAM



MOHRS STRESS DIAGRAM



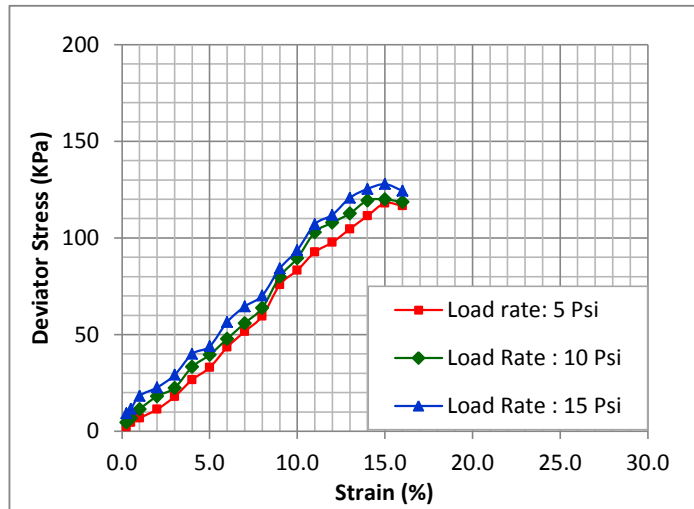
Symbol	Moisture Content (%)	Dry density (g/cc)
—■—	61.11	1.02
—◆—	61.19	1.02
—▲—	61.10	1.02

Borehole No.	BH-30
Sample No.	UD-1
Depth (m)	2.44 to 2.99
Cohesion (KPa)	67
Angle of Friction (Degree)	1.1

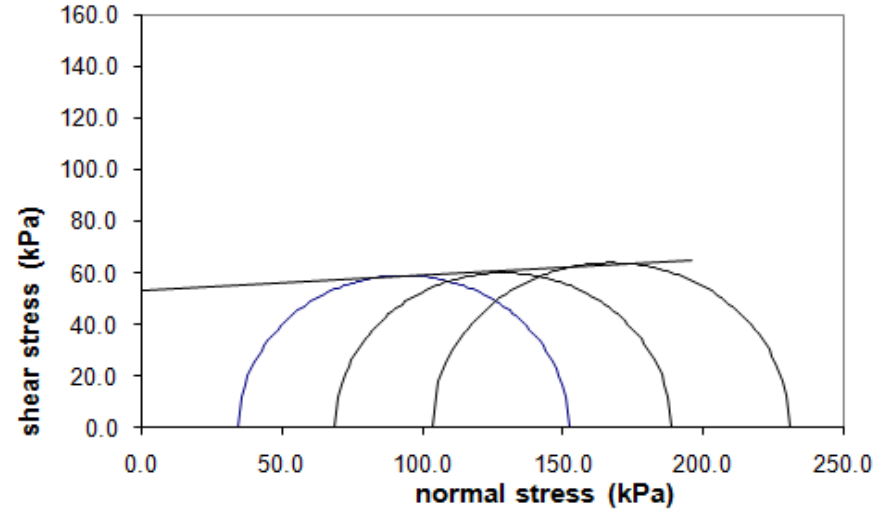


Triaxial Compression Test
 (Unconsolidated Undrained)

STRESS-STRAIN DIAGRAM



MOHRS STRESS DIAGRAM



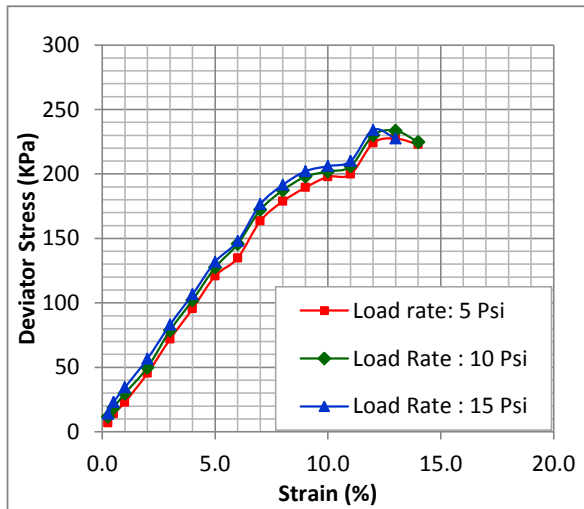
Symbol	Moisture Content (%)	Dry density (g/cc)
—■—	29.63	1.53
—◆—	29.63	1.53
—▲—	29.39	1.53

Borehole No.	BH-32
Sample No.	UD-2
Depth (m)	3.96 to 4.41
Cohesion (KPa)	53
Angle of Friction (degree)	3.4

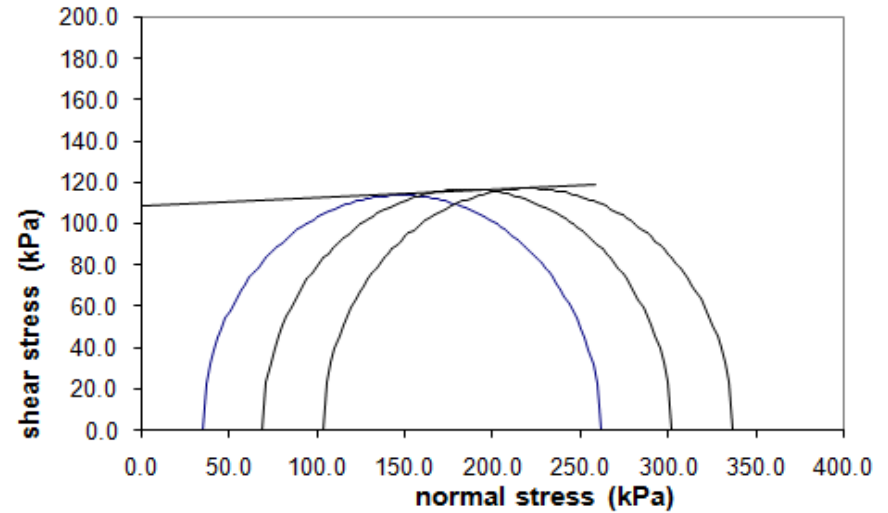


Triaxial Compression Test
 (Unconsolidated Undrained)

STRESS-STRAIN DIAGRAM



MOHRS STRESS DIAGRAM



Symbol	Moisture Content (%)	Dry density (g/cc)
—■—	54.00	1.41
—◆—	54.15	1.42
—▲—	54.18	1.42

Borehole No.	BH-52
Sample No.	UD-01
Depth (m)	2.44 to 2.99
Cohesion (kPa)	109
Angle of Friction (degree)	2.3



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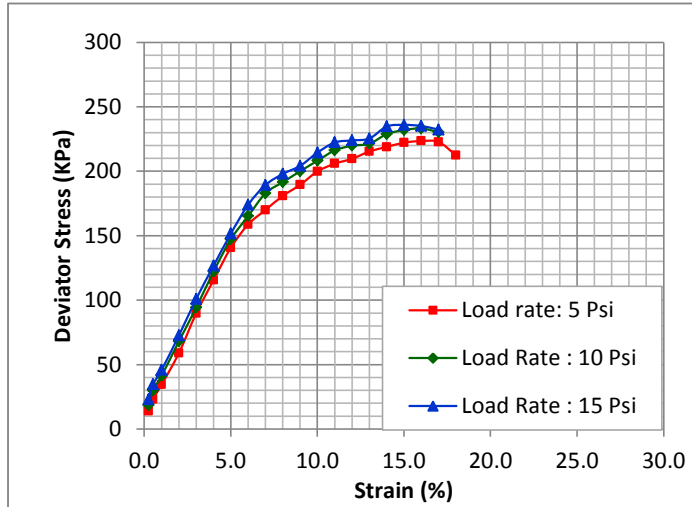
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area

Location: Dupipara, Notunbazar, Sutiakhali, Mymensingh

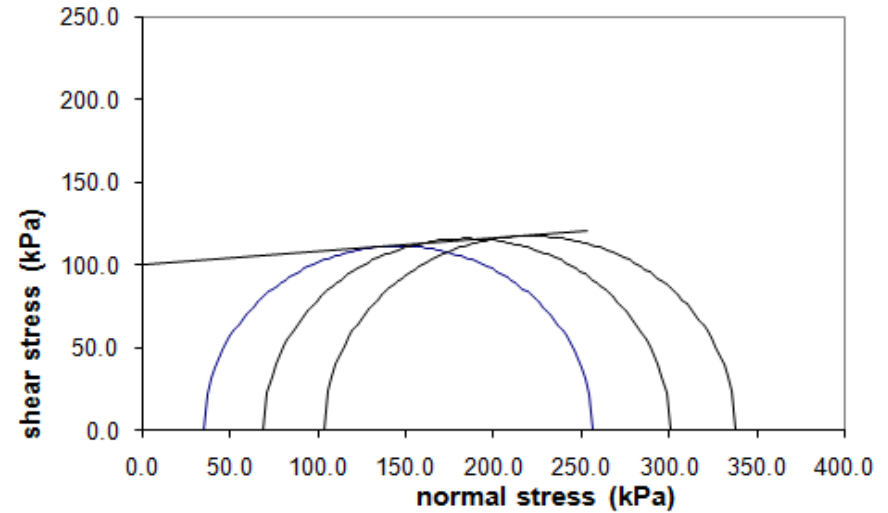
Client: Urban Development Directorate (UDD)

Triaxial Compression Test
 (Unconsolidated Undrained)

STRESS-STRAIN DIAGRAM



MOHRS STRESS DIAGRAM



Symbol	Moisture Content (%)	Dry density (g/cc)
—■—	27.20	1.56
—◆—	27.20	1.56
—▲—	27.24	1.56

Borehole No.	BH-58
Sample No.	UD-2
Depth (m)	2.44 to 2.99
Cohesion (kPa)	101
Angle of Friction (Degree)	4.6



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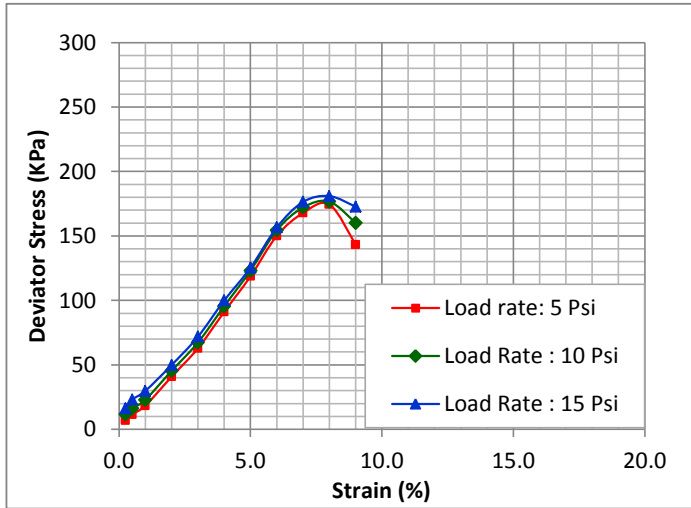
Project: Engineering Geological Survey in Rural Parts of MSDP Project Area

Location: Bhabkhali Bazar, Mymensingh

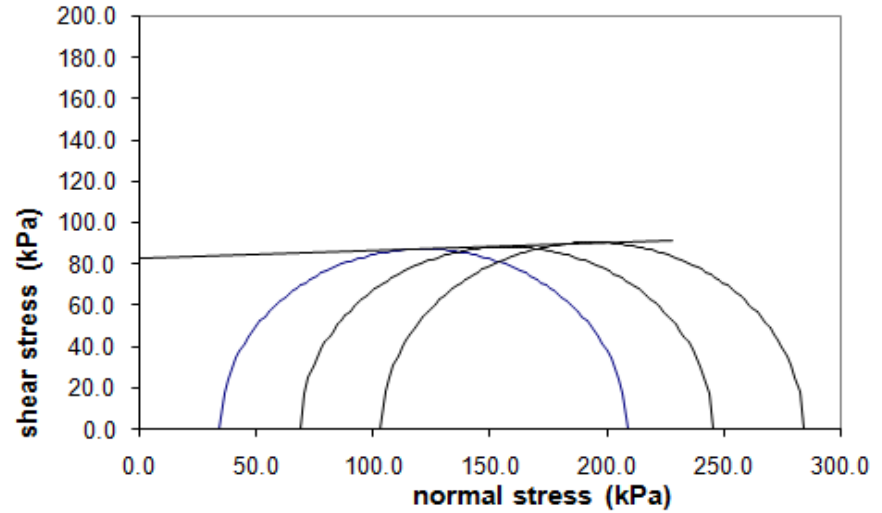
Client: Urban Development Directorate (UDD)

Triaxial Compression Test
 (Unconsolidated Undrained)

STRESS-STRAIN DIAGRAM



MOHR'S STRESS DIAGRAM



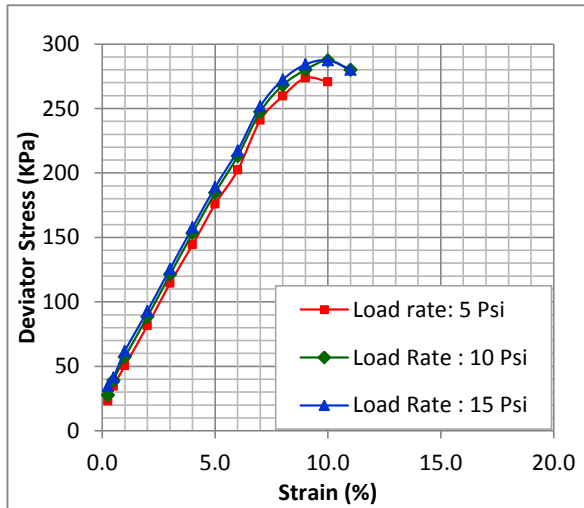
Symbol	Moisture Content (%)	Dry density (g/cc)
—■—	31.25	1.58
—◆—	30.99	1.59
—▲—	31.15	1.59

Borehole No.	BH-65
Sample No.	UD-1
Depth (m)	3.96 to 4.41
Cohesion (KPa)	82
Angle of Friction (degree)	2.3

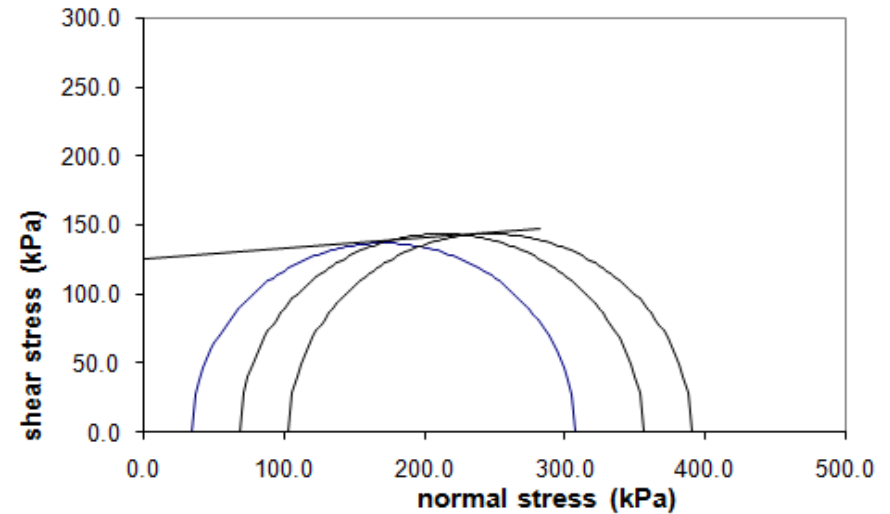


Triaxial Compression Test
 (Unconsolidated Undrained)

STRESS-STRAIN DIAGRAM



MOHRS STRESS DIAGRAM

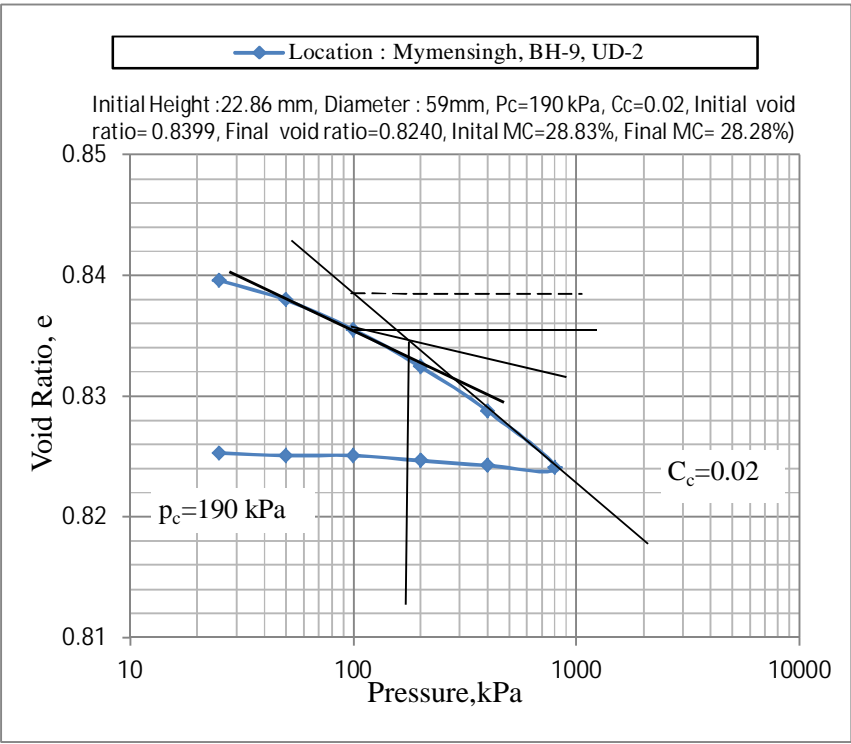
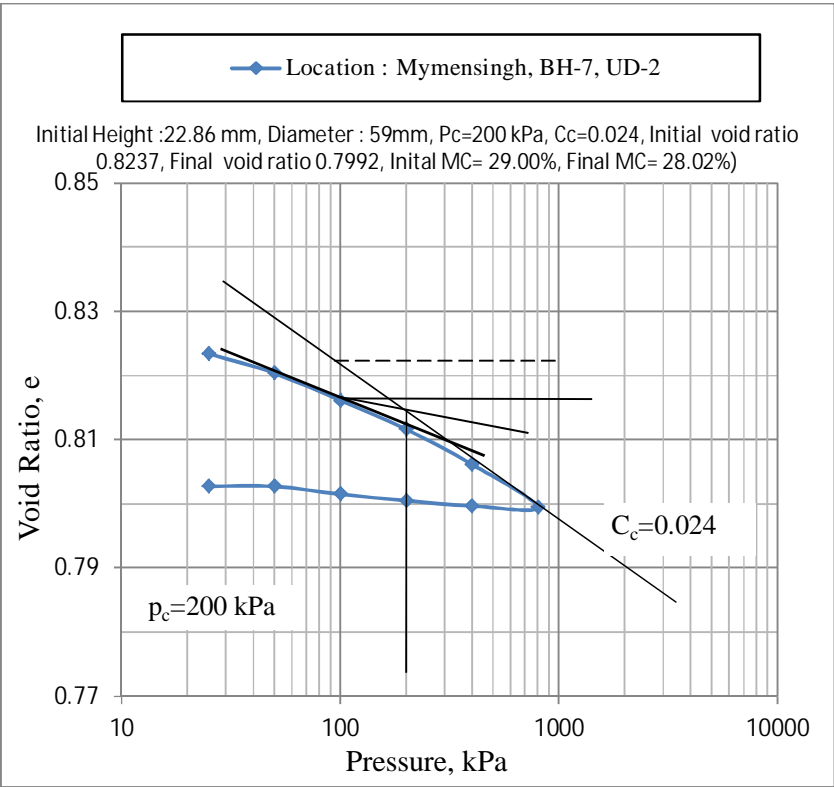


Symbol	Moisture Content (%)	Dry density (g/cc)
—■—	30.33	1.54
—◆—	30.28	1.54
—▲—	30.28	1.54

Borehole No.	BH-67
Sample No.	UD-01
Depth (m)	2.44 to 2.99
Cohesion (KPa)	125
Angle of Friction (degree)	4.6

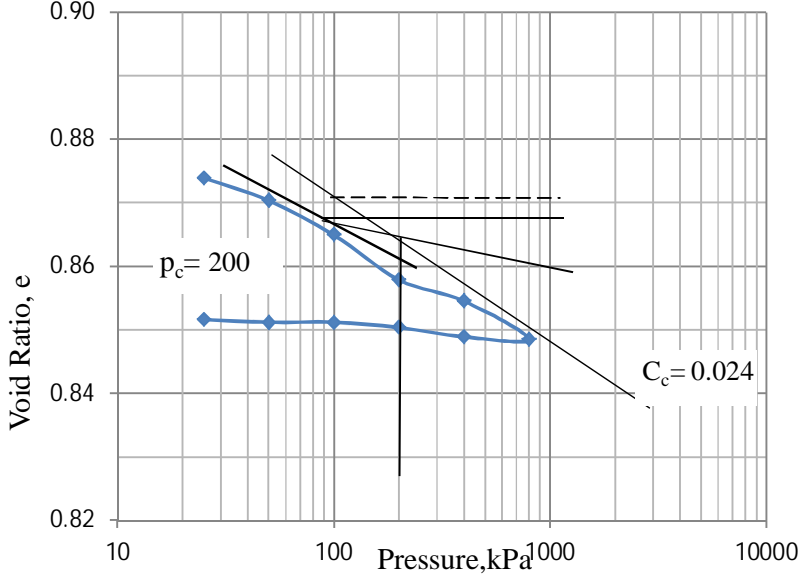
Appendix II: Laboratory Test Result and Graph

g. Consolidation Test



Location : Mymensingh, BH-18, UD-1

Initial Height : 22.86 mm, Diameter : 59mm, $P_c=200\text{kPa}$, $C_c=0.024$, Initial void ratio = 0.8745, Final void ratio = 0.8484, Initial MC = 31.12%, Final MC = 30.20%

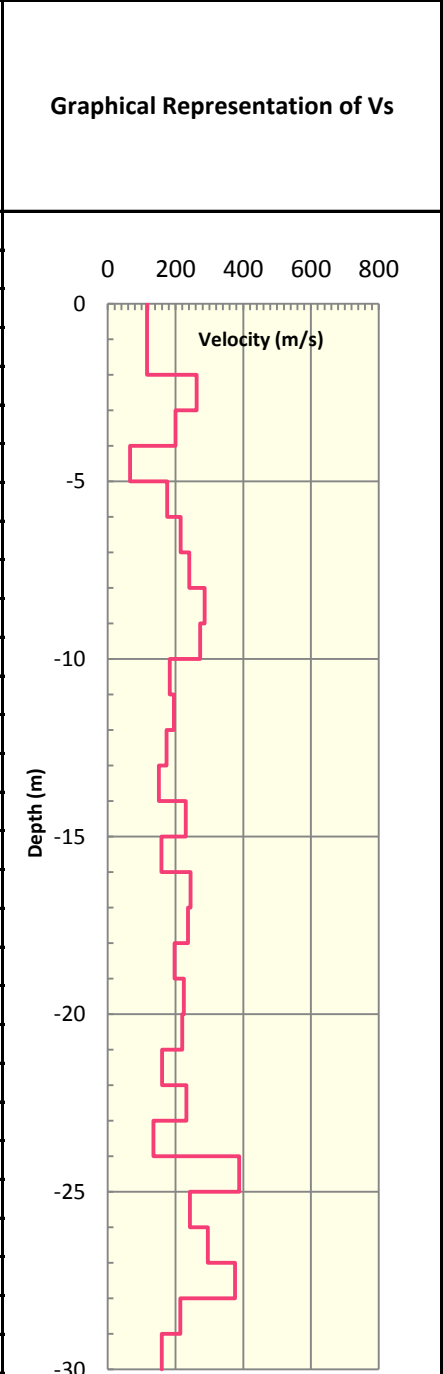


Appendix III: PS Logging Test Result and Velocity Profiles

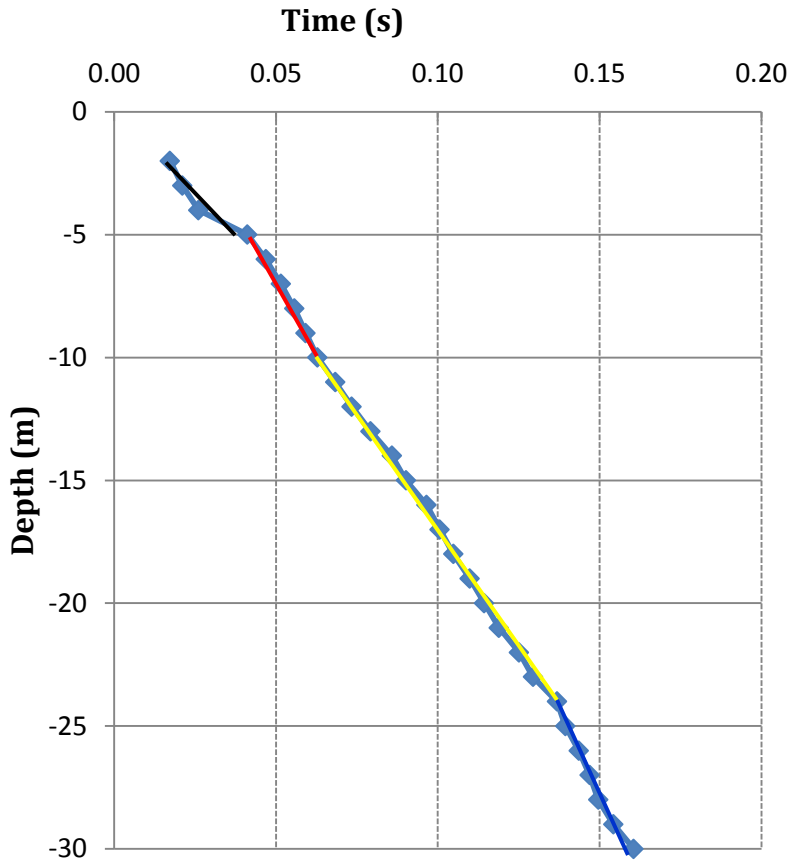
SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

Tested Date(dd/mm/yyyy) : 23/07/2014 Location : Holiamari, Poranganj PS Id : Sirta-01 Coordinate : Latitude- 24°49'35.57"N Longitude- 90°20'48.62"E Operator : The Olson Instruments Downhole Seismic system	Source : 7kg Sledge Hammer Downhole Receiver : Tri-axial Geophone Recording Equipment : Freedom Data PC Borehole Information : Grouted Cased Borehole Casing Diameter : 75mm PVC Casing
--	---

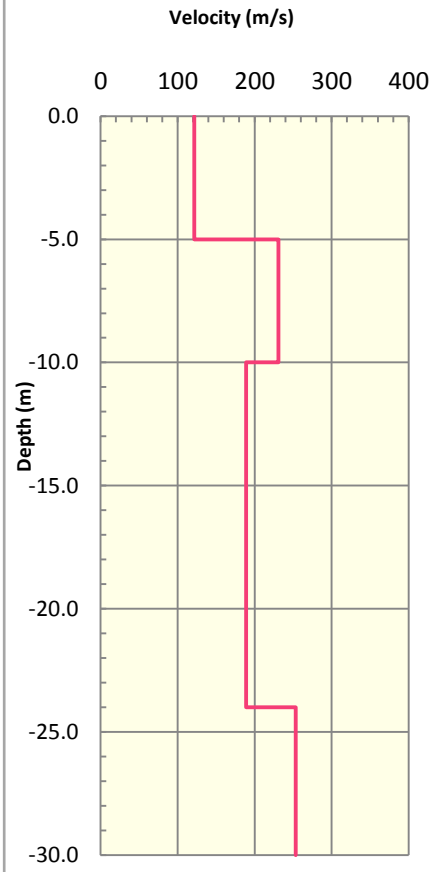
time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotnal Wave, tc=D*/R (s)	Shear Wave Velocity Vs, Vs=D/tc (m/s)	Shear Modulus,G (Mpa)
0.019289	2	1	2.236068	0.0173	116	27.4
0.022201	3	1	3.162278	0.0211	263	140.6
0.026873	4	1	4.123106	0.0261	200	81.3
0.041996	5	1	5.09902	0.0412	66	8.9
0.047541	6	1	6.082763	0.0469	175	62.5
0.052056	7	1	7.071068	0.0515	216	94.8
0.056122	8	1	8.062258	0.0557	241	118.1
0.059550	9	1	9.055385	0.0592	286	166.8
0.063160	10	1	10.04988	0.0628	273	152.2
0.068606	11	1	11.04536	0.0683	183	68.0
0.073691	12	1	12.04159	0.0734	196	78.0
0.079428	13	1	13.0384	0.0792	174	61.5
0.086055	14	1	14.03567	0.0858	151	46.2
0.090383	15	1	15.0333	0.0902	230	108.0
0.096698	16	1	16.03122	0.0965	158	50.9
0.100781	17	1	17.02939	0.1006	244	121.5
0.104998	18	1	18.02776	0.1048	236	114.0
0.110063	19	1	19.0263	0.1099	197	79.2
0.114503	20	1	20.02498	0.1144	225	103.0
0.119033	21	1	21.0238	0.1189	220	99.0
0.125281	22	1	22.02272	0.1252	160	52.2
0.129589	23	1	23.02173	0.1295	232	109.5
0.136992	24	1	24.02082	0.1369	135	37.2
0.139563	25	1	25.01999	0.1395	388	306.8
0.143682	26	1	26.01922	0.1436	242	119.9
0.147060	27	1	27.01851	0.1470	296	178.2
0.149716	28	1	28.01785	0.1496	376	287.9
0.154371	29	1	29.01724	0.1543	215	94.0
0.160641	30	1	30.01666	0.1606	159	51.8



PS Id : Sirta-01



Time Distance Curve

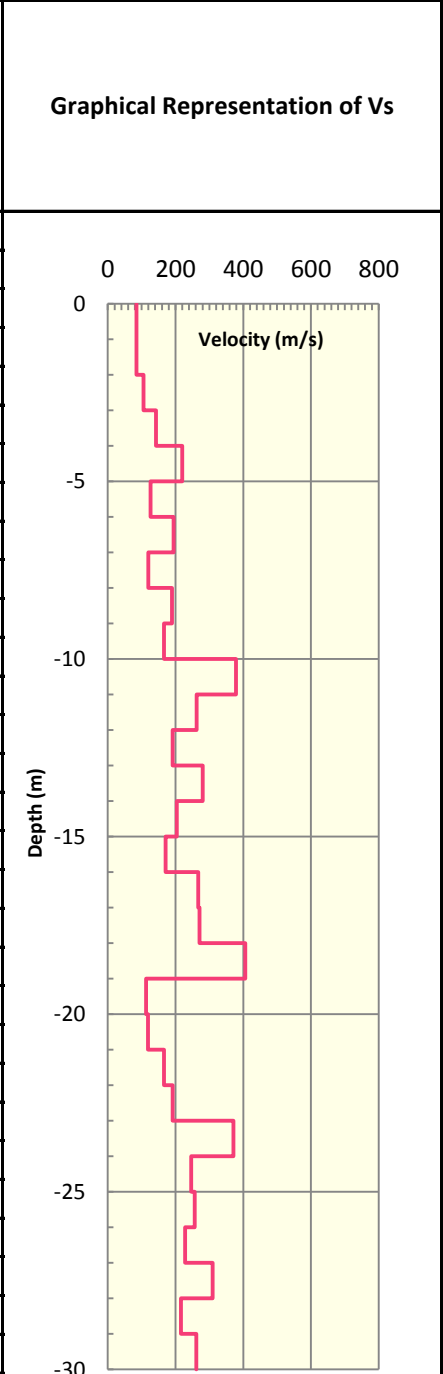


Layer Velocity

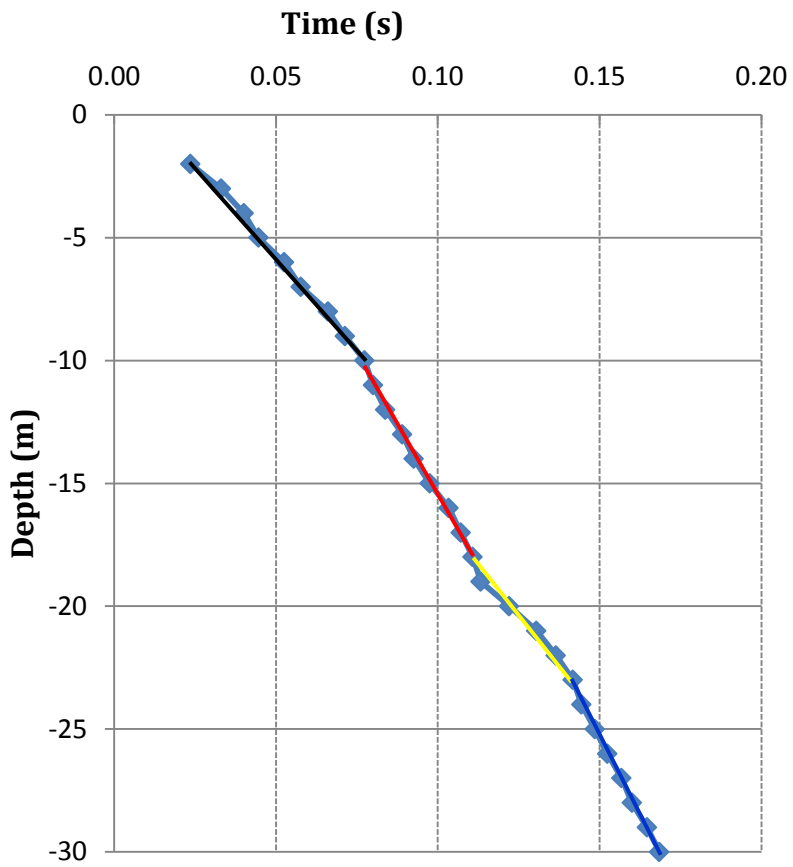
SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

Tested Date(dd/mm/yyyy) : 14/07/2014 Location : Kallanpur Primary School, Khagdahar PS Id : Khagdahar-02 Coordinate : Latitude- 24°47'47.69"N Longitude- 90°19'31.80"E Operator : The Olson Instruments Downhole Seismic system	Source : 7kg Sledge Hammer Downhole Receiver : Tri-axial Geophone Recording Equipment : Freedom Data PC Borehole Information : Grouted Cased Borehole Casing Diameter : 75mm PVC Casing
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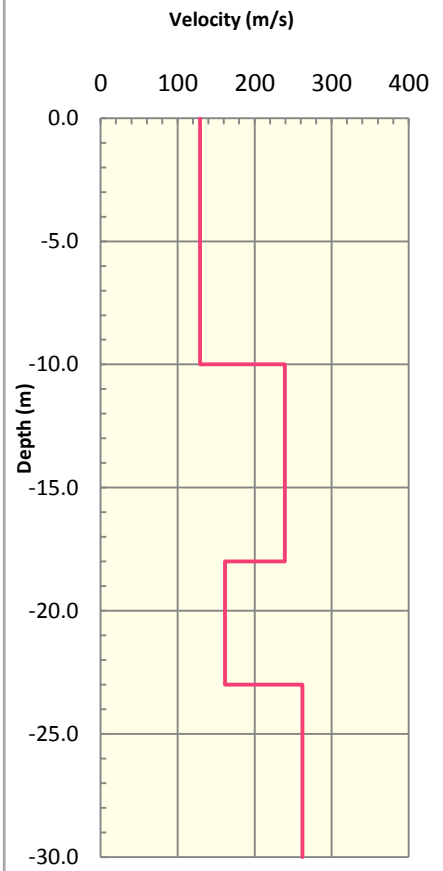
time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotonal Wave, tc=D*/R (s)	Shear Wave Velocity Vs, Vs=D/tc (m/s)	Shear Modulus,G (Mpa)
0.026340	2	1	2.236068	0.0236	85	14.7
0.034818	3	1	3.162278	0.0330	106	22.7
0.041304	4	1	4.123106	0.0401	142	41.2
0.045502	5	1	5.09902	0.0446	220	98.6
0.053289	6	1	6.082763	0.0526	126	32.3
0.058290	7	1	7.071068	0.0577	195	77.2
0.066601	8	1	8.062258	0.0661	119	29.0
0.071790	9	1	9.055385	0.0714	190	73.6
0.077762	10	1	10.04988	0.0774	166	56.2
0.080348	11	1	11.04536	0.0800	379	292.2
0.084114	12	1	12.04159	0.0838	263	140.8
0.089303	13	1	13.0384	0.0890	192	74.9
0.092848	14	1	14.03567	0.0926	280	159.8
0.097735	15	1	15.0333	0.0975	204	84.7
0.103573	16	1	16.03122	0.1034	171	59.5
0.107304	17	1	17.02939	0.1071	267	145.2
0.110979	18	1	18.02776	0.1108	271	149.8
0.113429	19	1	19.0263	0.1133	406	335.9
0.122235	20	1	20.02498	0.1221	114	26.3
0.130662	21	1	21.0238	0.1305	119	28.7
0.136684	22	1	22.02272	0.1365	166	56.1
0.141897	23	1	23.02173	0.1418	192	74.8
0.144582	24	1	24.02082	0.1445	371	281.1
0.148638	25	1	25.01999	0.1485	246	123.6
0.152528	26	1	26.01922	0.1524	257	134.4
0.156897	27	1	27.01851	0.1568	229	106.6
0.160125	28	1	28.01785	0.1600	309	195.1
0.164745	29	1	29.01724	0.1646	216	95.4
0.168562	30	1	30.01666	0.1685	262	139.7



PS Id : Khagdahar-02



Time Distance Curve

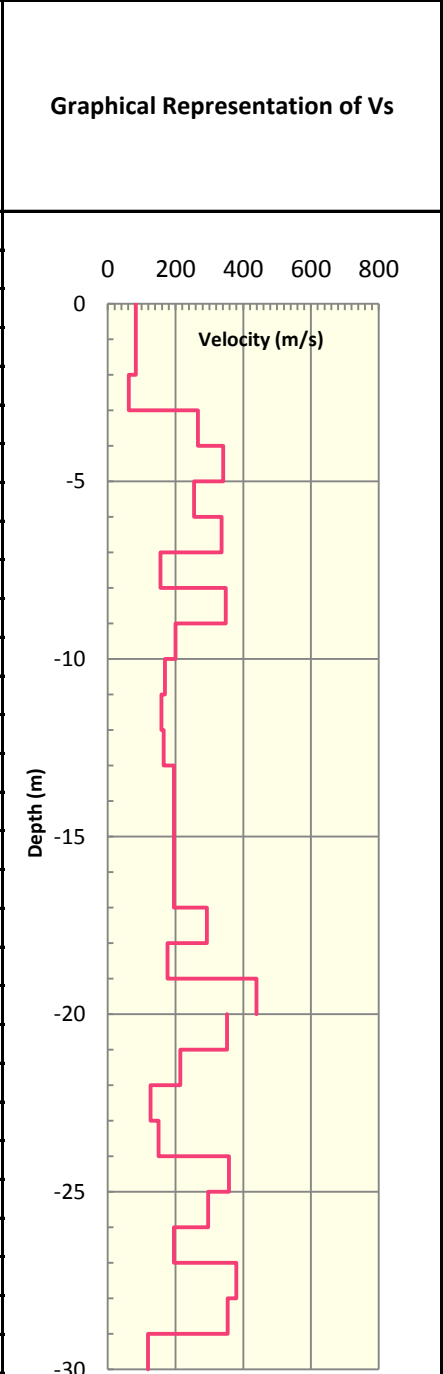


Layer Velocity

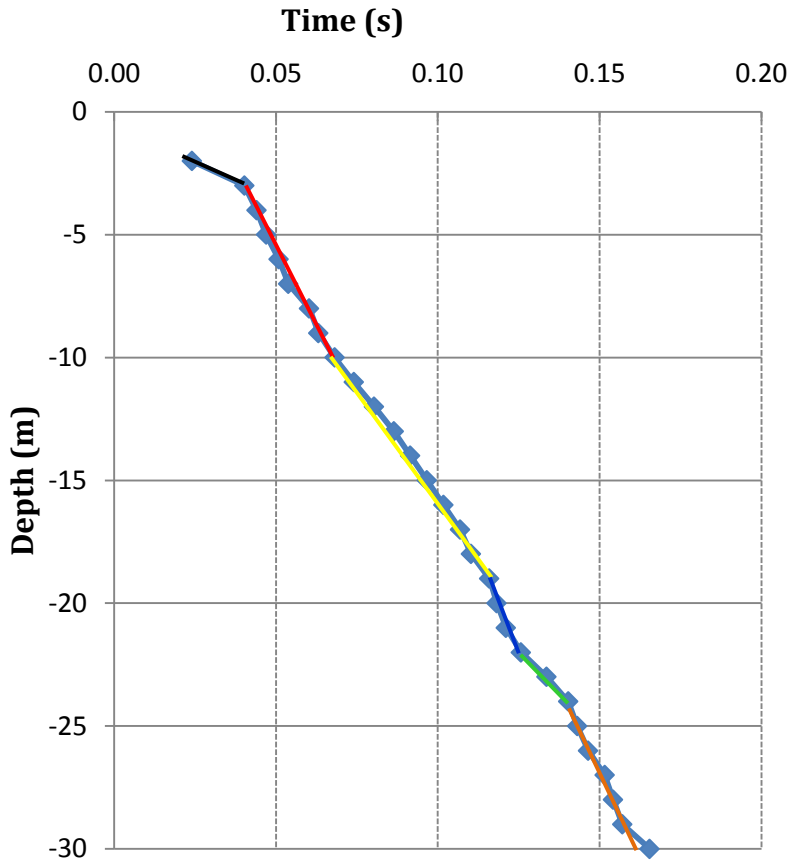
SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

Tested Date(dd/mm/yyyy) : 23/07/2014 Location : Char Vabanipur, West side from Joybangla Bazar PS Id : Sirta-03 Coordinate : Latitude- 24°47'43.89"N Longitude- 90°24'12.83"E Operator : The Olson Instruments Downhole Seismic system	Source : 7kg Sledge Hammer Downhole Receiver : Tri-axial Geophone Recording Equipment : Freedom Data PC Borehole Information : Grouted Cased Borehole Casing Diameter : 75mm PVC Casing
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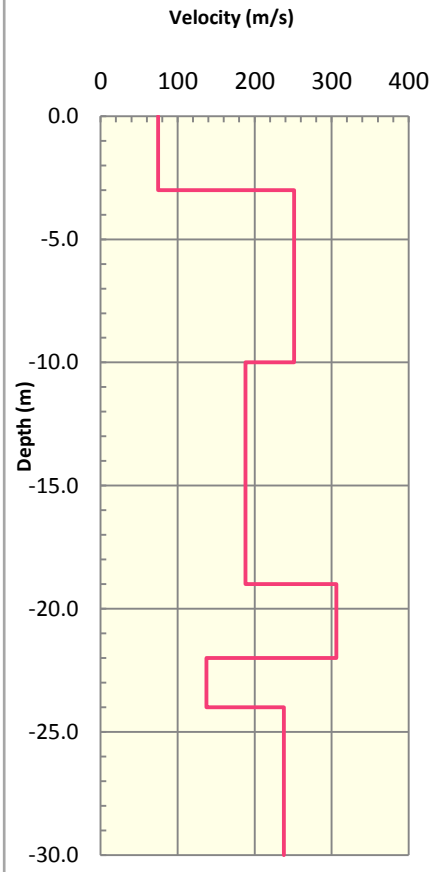
time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotonal Wave, $t_c = D^*/R$ (s)	Shear Wave Velocity $V_s, V_s = D/t_c$ (m/s)	Shear Modulus, G (Mpa)
0.026943	2	1	2.236068	0.0241	83	14.0
0.042444	3	1	3.162278	0.0403	62	7.8
0.045374	4	1	4.123106	0.0440	266	144.8
0.047885	5	1	5.09902	0.0470	341	236.6
0.051579	6	1	6.082763	0.0509	255	132.6
0.054395	7	1	7.071068	0.0538	337	231.0
0.060729	8	1	8.062258	0.0603	156	49.6
0.063516	9	1	9.055385	0.0631	349	248.0
0.068472	10	1	10.04988	0.0681	200	81.4
0.074360	11	1	11.04536	0.0741	169	58.1
0.080639	12	1	12.04159	0.0804	159	51.3
0.086680	13	1	13.0384	0.0864	165	55.5
0.091777	14	1	14.03567	0.0915	195	77.8
0.096873	15	1	15.0333	0.0967	196	78.0
0.101970	16	1	16.03122	0.1018	196	78.0
0.107066	17	1	17.02939	0.1069	196	78.1
0.110464	18	1	18.02776	0.1103	293	175.1
0.116126	19	1	19.0263	0.1160	176	63.4
0.118391	20	1	20.02498	0.1182	439	393.1
0.121222	21	1	21.0238	0.1211	352	252.6
0.125888	22	1	22.02272	0.1258	214	93.4
0.133777	23	1	23.02173	0.1337	127	32.7
0.140447	24	1	24.02082	0.1403	150	45.8
0.143232	25	1	25.01999	0.1431	358	261.6
0.146603	26	1	26.01922	0.1465	296	178.8
0.151719	27	1	27.01851	0.1516	195	77.8
0.154345	28	1	28.01785	0.1542	380	294.5
0.157161	29	1	29.01724	0.1571	354	256.3
0.165608	30	1	30.01666	0.1655	118	28.6



AVS 30 181 m/s



Time Distance Curve

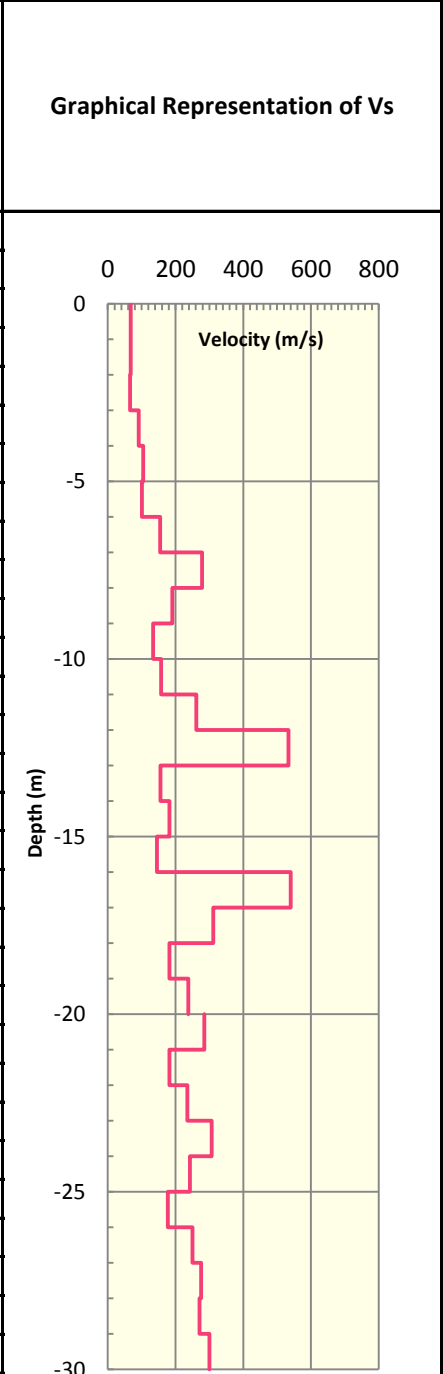


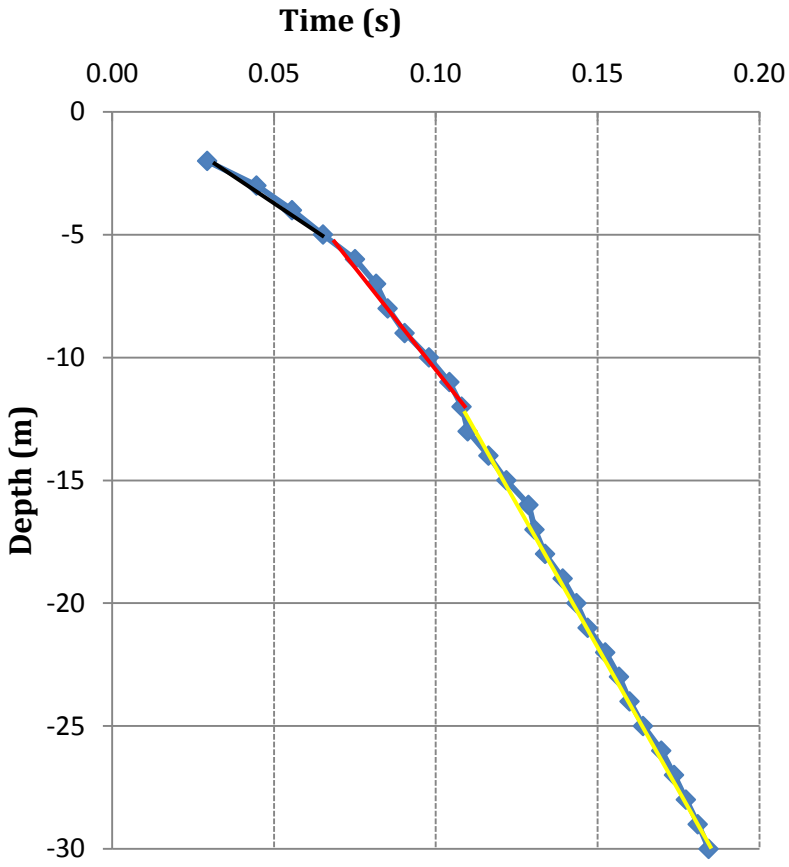
Layer Velocity

SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

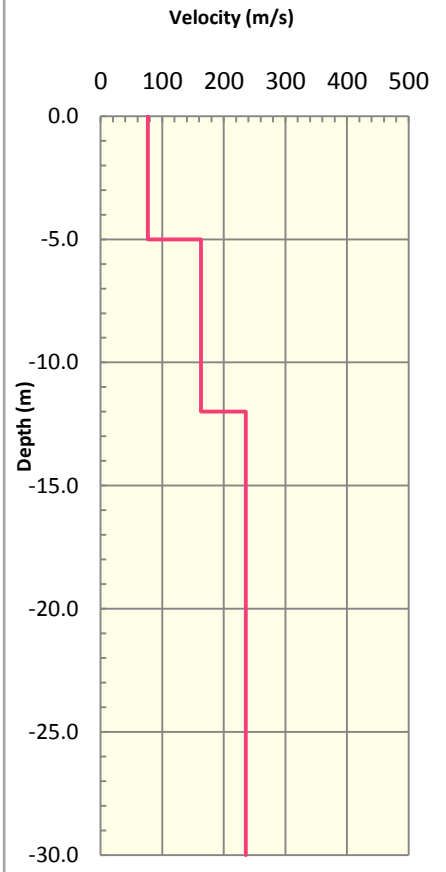
Tested Date(dd/mm/yyyy) : 16/07/2014 Location : Behind Engineering College, Khagdahar PS Id : Khagdahar-04 Coordinate : Latitude- 24°46'45.41"N Longitude- 90°20'34.59"E Operator : The Olson Instruments Downhole Seismic system	Source : 7kg Sledge Hammer Downhole Receiver : Tri-axial Geophone Recording Equipment : Freedom Data PC Borehole Information : Grouted Cased Borehole Casing Diameter : 75mm PVC Casing
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time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotonal Wave, $t_c = D^*/R$ (s)	Shear Wave Velocity $V_s, V_s = D/t_c$ (m/s)	Shear Modulus, G (Mpa)
0.032815	2	1	2.236068	0.0294	68	9.5
0.047042	3	1	3.162278	0.0446	65	8.7
0.057311	4	1	4.123106	0.0556	91	16.9
0.066439	5	1	5.09902	0.0651	105	22.4
0.076137	6	1	6.082763	0.0751	100	20.6
0.082413	7	1	7.071068	0.0816	154	48.5
0.085836	8	1	8.062258	0.0852	279	158.4
0.090970	9	1	9.055385	0.0904	191	74.3
0.098387	10	1	10.04988	0.0979	134	36.4
0.104662	11	1	11.04536	0.1042	158	50.8
0.108427	12	1	12.04159	0.1081	262	139.7
0.110252	13	1	13.0384	0.1099	533	580.2
0.116642	14	1	14.03567	0.1163	156	49.5
0.122119	15	1	15.0333	0.1218	182	67.3
0.128965	16	1	16.03122	0.1287	146	43.3
0.130790	17	1	17.02939	0.1306	540	595.6
0.133985	18	1	18.02776	0.1338	311	197.4
0.139462	19	1	19.0263	0.1393	182	67.7
0.143652	20	1	20.02498	0.1435	238	115.4
0.147145	21	1	21.0238	0.1470	285	165.9
0.152625	22	1	22.02272	0.1525	182	67.7
0.156870	23	1	23.02173	0.1567	235	112.7
0.160124	24	1	24.02082	0.1600	306	191.5
0.164235	25	1	25.01999	0.1641	243	120.2
0.169854	26	1	26.01922	0.1697	178	64.5
0.173842	27	1	27.01851	0.1737	250	127.8
0.177458	28	1	28.01785	0.1773	276	155.5
0.181140	29	1	29.01724	0.1810	271	150.0
0.184469	30	1	30.01666	0.1844	300	183.5





Time Distance Curve



Layer Velocity

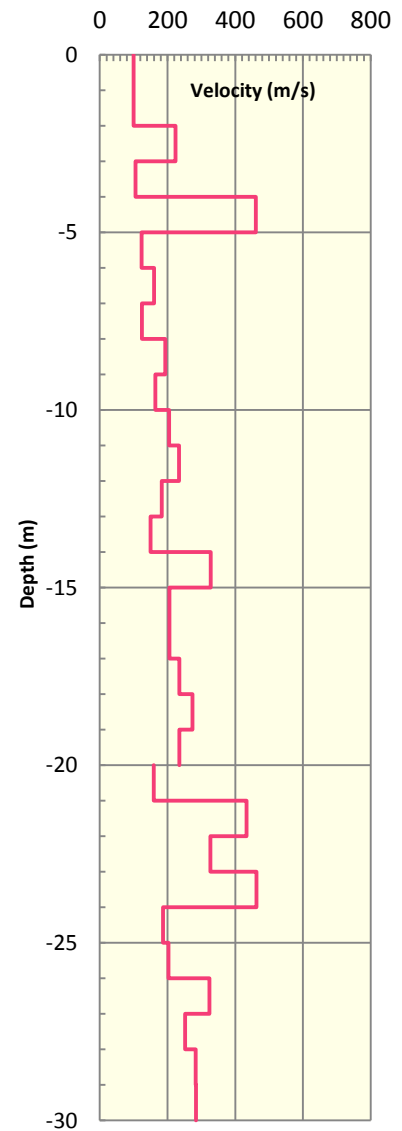
SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

Tested Date(dd/mm/yyyy) : 21/07/2014
 Location : Beside Akashi agro mill, Char Borbila, Char Ishwardia
 PS Id : Char-Ishwardia-05
 Coordinate : Latitude- 24°47'49.59"N Longitude- 90°26'30.35"E
 Operator : The Olson Instruments Downhole Seismic system

Source : 7kg Sledge Hammer
 Downhole Receiver : Tri-axial Geophone
 Recording Equipment : Freedom Data PC
 Borehole Information : Grouted Cased Borehole
 Casing Diameter : 75mm PVC Casing

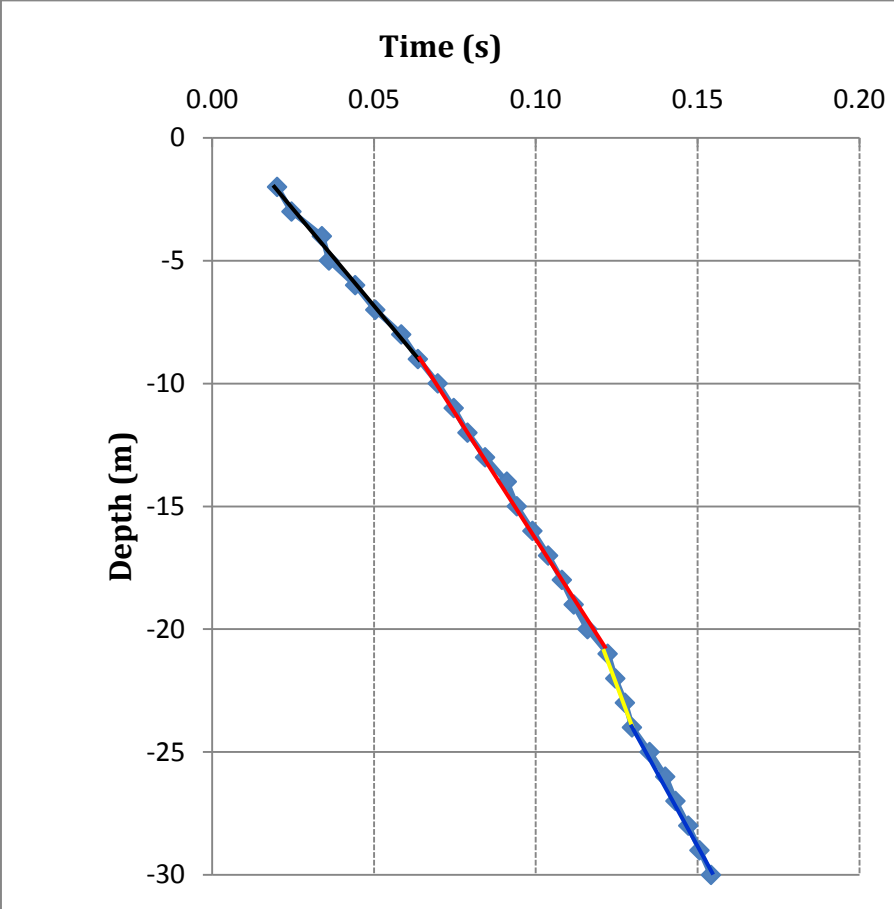
time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotonal Wave, $t_c = D^*/R$ (s)	Shear Wave Velocity $V_s, V_s = D/t_c$ (m/s)	Shear Modulus, G (Mpa)
0.022420	2	1	2.236068	0.0201	100	20.3
0.025844	3	1	3.162278	0.0245	224	102.3
0.035034	4	1	4.123106	0.0340	106	22.7
0.036872	5	1	5.09902	0.0362	461	433.9
0.044836	6	1	6.082763	0.0442	124	31.3
0.050963	7	1	7.071068	0.0505	161	52.6
0.058928	8	1	8.062258	0.0585	125	31.7
0.064042	9	1	9.055385	0.0637	193	76.1
0.070101	10	1	10.04988	0.0698	164	54.8
0.074949	11	1	11.04536	0.0746	205	85.4
0.079190	12	1	12.04159	0.0789	234	111.6
0.084643	13	1	13.0384	0.0844	183	68.0
0.091308	14	1	14.03567	0.0911	150	45.7
0.094338	15	1	15.0333	0.0941	328	218.8
0.099185	16	1	16.03122	0.0990	206	86.2
0.104032	17	1	17.02939	0.1039	206	86.3
0.108273	18	1	18.02776	0.1081	235	112.7
0.111909	19	1	19.0263	0.1118	274	153.2
0.116150	20	1	20.02498	0.1160	235	112.9
0.122411	21	1	21.0238	0.1223	160	51.9
0.124710	22	1	22.02272	0.1246	433	382.6
0.127761	23	1	23.02173	0.1276	327	217.9
0.129916	24	1	24.02082	0.1298	462	435.9
0.135271	25	1	25.01999	0.1352	187	71.0
0.140200	26	1	26.01922	0.1401	203	83.8
0.143278	27	1	27.01851	0.1432	324	214.5
0.147240	28	1	28.01785	0.1471	252	129.6
0.150761	29	1	29.01724	0.1507	284	164.1
0.154281	30	1	30.01666	0.1542	284	164.2

Graphical Representation of Vs

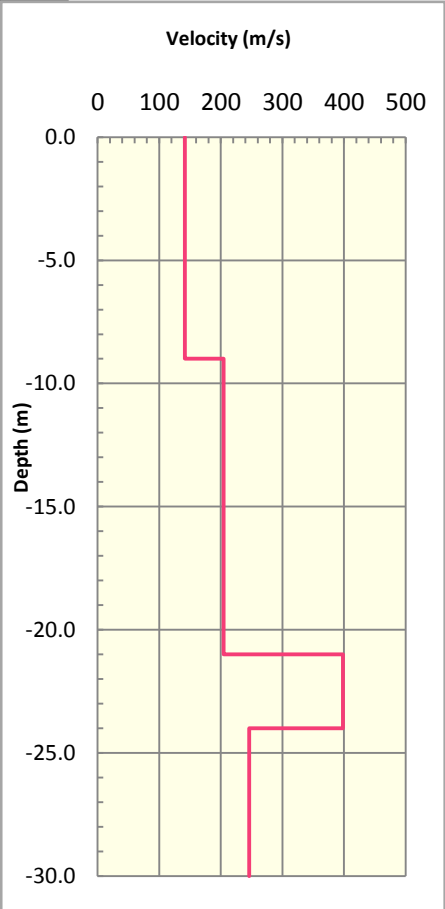


AVS 30

195 m/s



Time Distance Curve

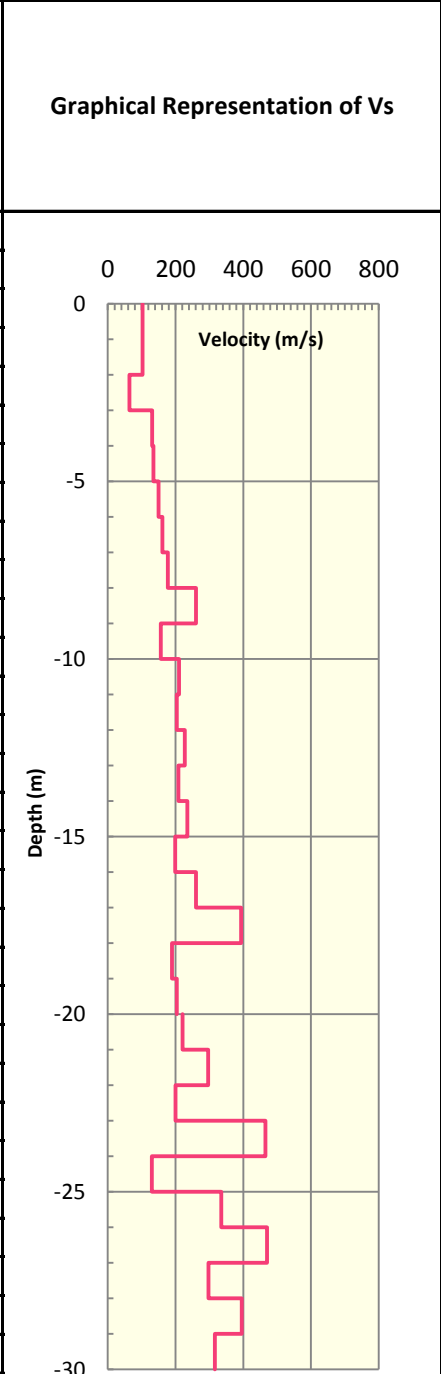


Layer Velocity

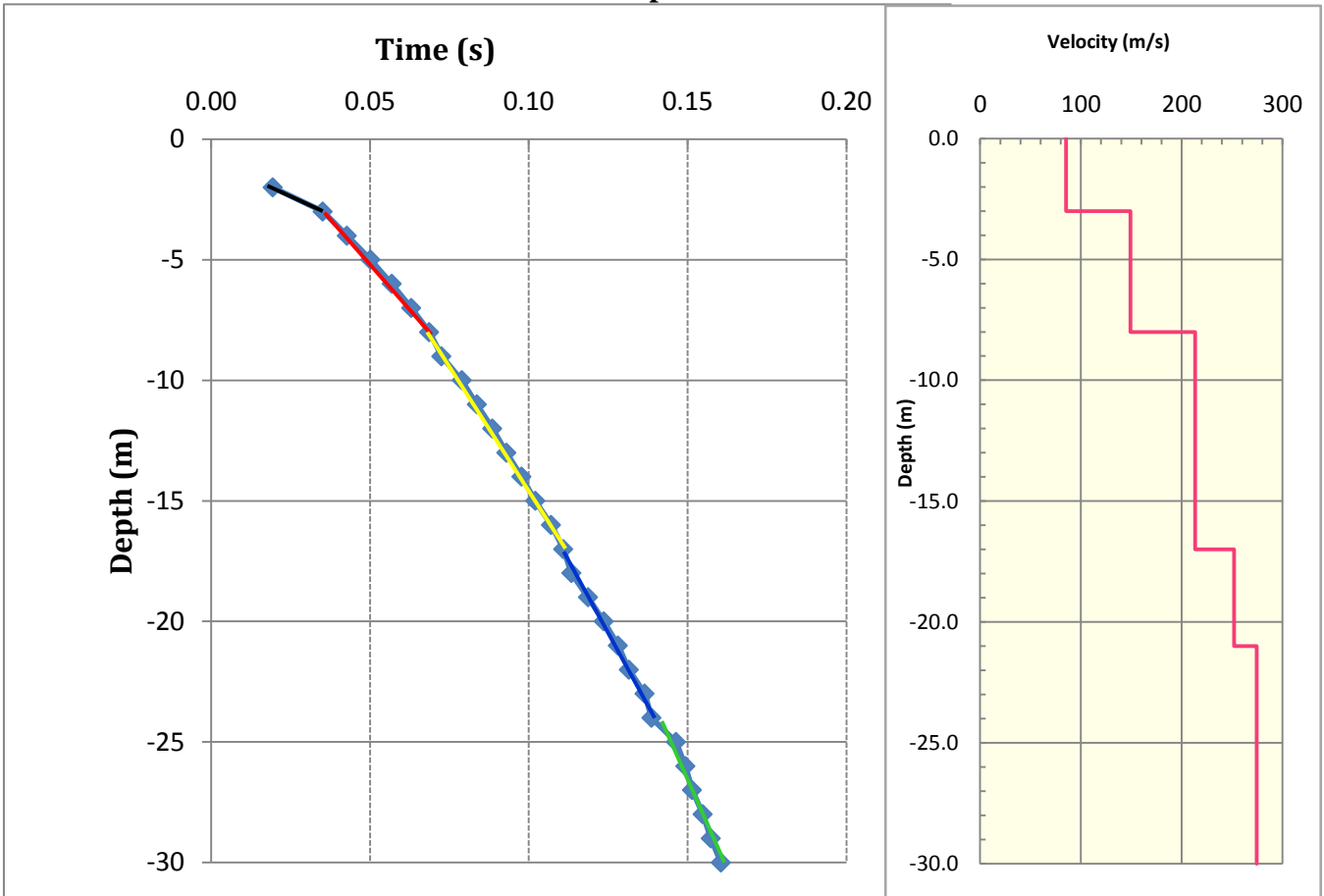
SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

Tested Date(dd/mm/yyyy) : 26/09/2013 Location : 72No. Govt. Primary School, Mymensingh PS ID: PS-Dapunia-06 Coordinate : Lat- 24° 44'45.677"N Long- 90°21'01.670" Operator : The Olson Instruments Downhole Seismic system	Source : 7kg Sledge Hammer Downhole Receiver : Tri-axial Geophone Recording Equipment : Freedom Data PC Borehole Information : Grouted Cased Borehole Casing Diameter : 75mm PVC Casing
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time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotonal Wave, tc=D*/R (s)	Shear Wave Velocity Vs, Vs=D/tc (m/s)	Shear Modulus,G (Mpa)
0.021740	2	1	2.236068	0.0194	103	21.6
0.037060	3	1	3.162278	0.0352	64	8.3
0.044080	4	1	4.123106	0.0428	131	35.3
0.051160	5	1	5.09902	0.0502	135	37.2
0.057620	6	1	6.082763	0.0568	150	45.8
0.063680	7	1	7.071068	0.0630	161	53.0
0.069220	8	1	8.062258	0.0687	177	64.0
0.072970	9	1	9.055385	0.0725	261	138.4
0.079320	10	1	10.04988	0.0789	156	49.7
0.084020	11	1	11.04536	0.0837	211	90.4
0.088880	12	1	12.04159	0.0886	204	85.0
0.093240	13	1	13.0384	0.0930	228	105.7
0.098020	14	1	14.03567	0.0978	208	88.3
0.102260	15	1	15.0333	0.1020	235	112.2
0.107260	16	1	16.03122	0.1071	199	81.0
0.111080	17	1	17.02939	0.1109	261	138.5
0.113600	18	1	18.02776	0.1134	394	316.9
0.118860	19	1	19.0263	0.1187	190	73.4
0.123760	20	1	20.02498	0.1236	204	84.6
0.128280	21	1	21.0238	0.1281	221	99.4
0.131640	22	1	22.02272	0.1315	297	179.6
0.136640	23	1	23.02173	0.1365	200	81.4
0.138780	24	1	24.02082	0.1387	465	441.7
0.146460	25	1	25.01999	0.1463	130	34.5
0.149440	26	1	26.01922	0.1493	335	228.6
0.151560	27	1	27.01851	0.1515	470	451.0
0.154920	28	1	28.01785	0.1548	297	180.1
0.157440	29	1	29.01724	0.1573	396	319.8
0.160600	30	1	30.01666	0.1605	316	203.7



PS-Dapunia-06



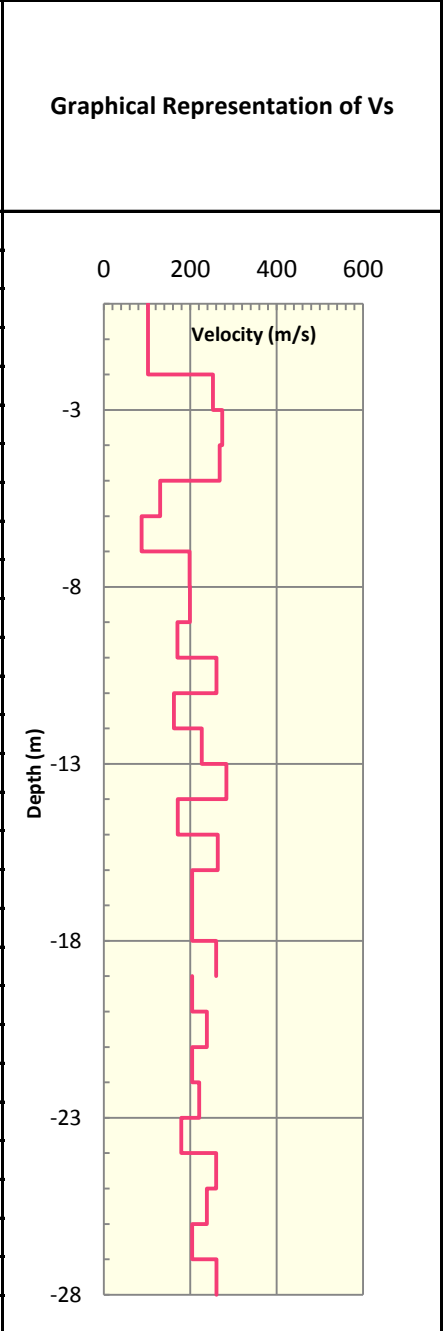
Time Distance Curve

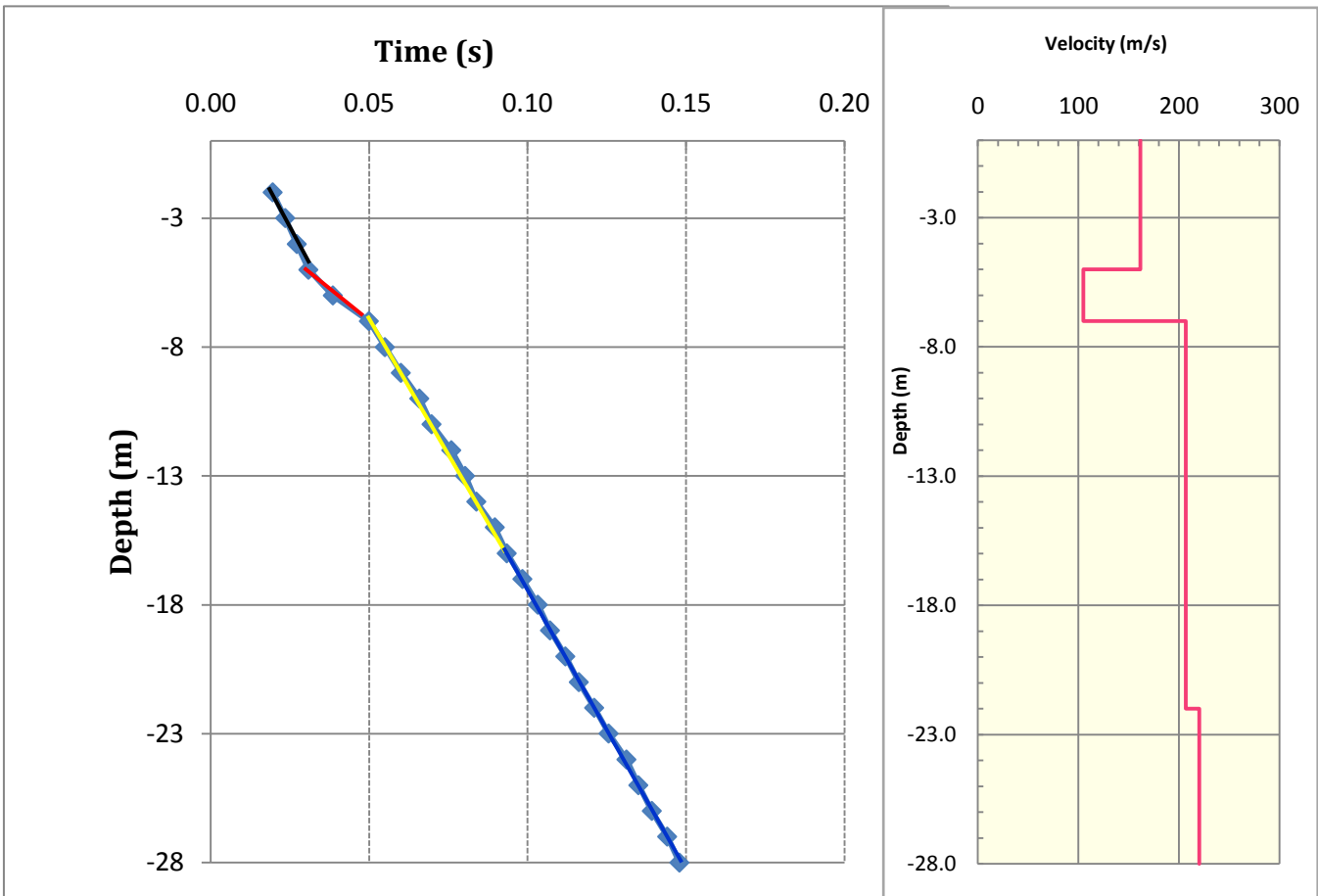
Layer Velocity

SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

Tested Date(dd/mm/yyyy) : 11/07/2014 Location : Char Borbila, Char-Ishwardia PS Id : Char-Ishwardia-07 Coordinate : Latitude- 24°48'43.07"N Longitude- 90°25'5.15"E Operator : The Olson Instruments Downhole Seismic system	Source : 7kg Sledge Hammer Downhole Receiver : Tri-axial Geophone Recording Equipment : Freedom Data PC Borehole Information : Grouted Cased Borehole Casing Diameter : 75mm PVC Casing
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time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotnal Wave, tc=D*/R (s)	Shear Wave Velocity Vs, Vs=D/tc (m/s)	Shear Modulus,G (Mpa)
0.021887	2	1	2.236068	0.0196	102	21.3
0.024809	3	1	3.162278	0.0235	253	130.1
0.028018	4	1	4.123106	0.0272	274	153.5
0.031521	5	1	5.09902	0.0309	268	146.8
0.039111	6	1	6.082763	0.0386	130	34.7
0.050497	7	1	7.071068	0.0500	88	15.7
0.055460	8	1	8.062258	0.0550	198	80.2
0.060423	9	1	9.055385	0.0601	199	80.9
0.066261	10	1	10.04988	0.0659	170	59.0
0.070056	11	1	11.04536	0.0698	261	138.6
0.076187	12	1	12.04159	0.0759	162	53.8
0.080566	13	1	13.0384	0.0803	227	105.1
0.084069	14	1	14.03567	0.0839	284	164.0
0.089908	15	1	15.0333	0.0897	171	59.5
0.093683	16	1	16.03122	0.0935	264	141.9
0.098563	17	1	17.02939	0.0984	204	85.2
0.103443	18	1	18.02776	0.1033	204	85.3
0.107278	19	1	19.0263	0.1071	260	137.9
0.112158	20	1	20.02498	0.1120	205	85.3
0.116341	21	1	21.0238	0.1162	239	116.1
0.121221	22	1	22.02272	0.1211	205	85.4
0.125752	23	1	23.02173	0.1256	220	99.1
0.131329	24	1	24.02082	0.1312	179	65.5
0.135164	25	1	25.01999	0.1351	260	138.2
0.139347	26	1	26.01922	0.1392	239	116.3
0.144227	27	1	27.01851	0.1441	205	85.5
0.148061	28	1	28.01785	0.1480	261	138.4
AVS 30					189 m/s	





Time Distance Curve

Layer Velocity

SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

Tested Date(dd/mm/yyyy) : 12/07/2014

Location : Raghobpur, Char Nilakshmia

PS Id : Char Nilakshmia-08

Coordinate : Lat- 24°45'22.51"N Long- 90°28'36.28"E

Operator : The Olson Instruments Downhole Seismic system

Source : 7kg Sledge Hammer

Downhole Receiver : Tri-axial Geophone

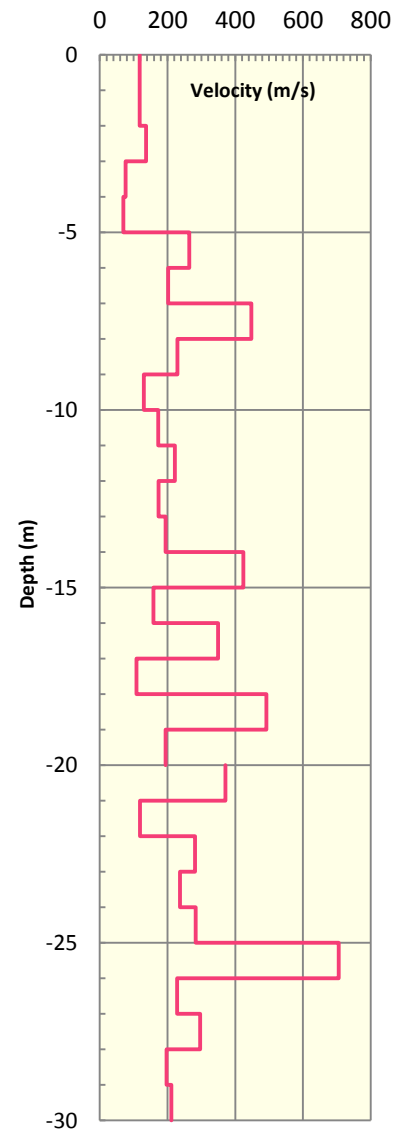
Recording Equipment : Freedom Data PC

Borehole Information : Grouted Cased

Casing Diameter : 75mm PVC Casing

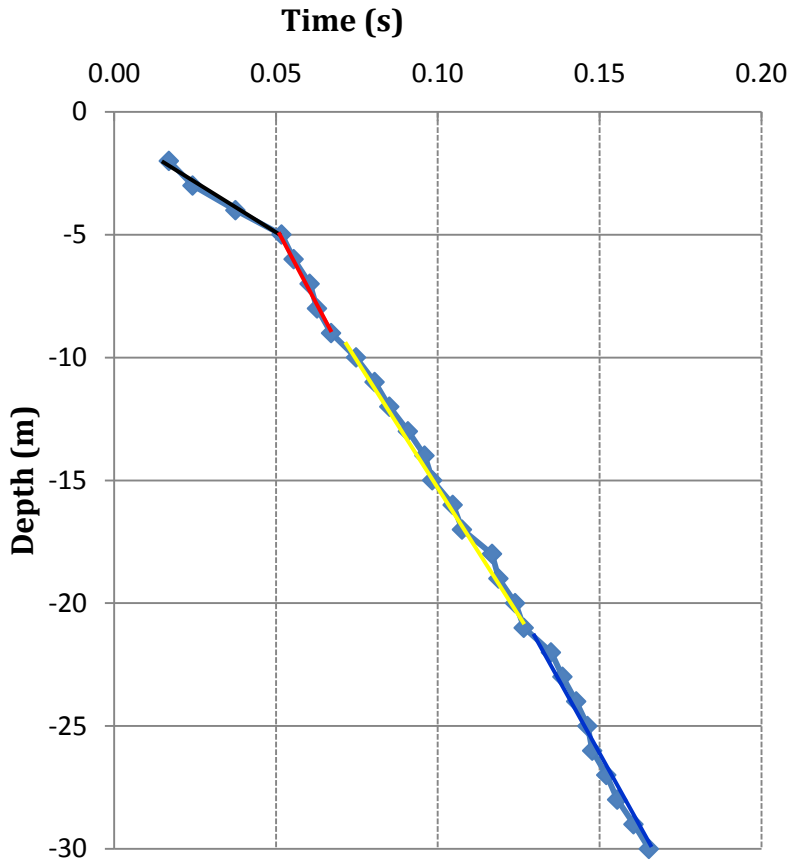
time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotonal Wave, $t_c = D^*/R$ (s)	Shear Wave Velocity $V_s, V_s = D/t_c$ (m/s)	Shear Modulus, G (Mpa)
0.018968	2	1	2.236068	0.0170	118	28.3
0.025605	3	1	3.162278	0.0243	137	38.0
0.038617	4	1	4.123106	0.0375	76	11.8
0.052775	5	1	5.09902	0.0518	70	10.0
0.056297	6	1	6.082763	0.0555	264	142.7
0.061091	7	1	7.071068	0.0605	202	83.4
0.063198	8	1	8.062258	0.0627	448	409.0
0.067475	9	1	9.055385	0.0671	230	107.7
0.075141	10	1	10.04988	0.0748	130	34.3
0.080891	11	1	11.04536	0.0806	173	60.8
0.085363	12	1	12.04159	0.0851	222	100.3
0.091112	13	1	13.0384	0.0908	173	61.1
0.096223	14	1	14.03567	0.0960	195	77.3
0.098555	15	1	15.0333	0.0983	424	366.7
0.104864	16	1	16.03122	0.1047	158	51.0
0.107711	17	1	17.02939	0.1075	349	248.4
0.116962	18	1	18.02776	0.1168	108	23.8
0.118980	19	1	19.0263	0.1188	492	493.1
0.124113	20	1	20.02498	0.1240	194	77.1
0.126795	21	1	21.0238	0.1267	371	281.1
0.135179	22	1	22.02272	0.1350	119	29.0
0.138721	23	1	23.02173	0.1386	282	161.8
0.142927	24	1	24.02082	0.1428	237	114.9
0.146448	25	1	25.01999	0.1463	283	163.9
0.147857	26	1	26.01922	0.1477	706	1016.0
0.152238	27	1	27.01851	0.1521	228	106.0
0.155604	28	1	28.01785	0.1555	297	179.5
0.160663	29	1	29.01724	0.1606	198	79.6
0.165395	30	1	30.01666	0.1653	211	90.9

Graphical Representation of Vs

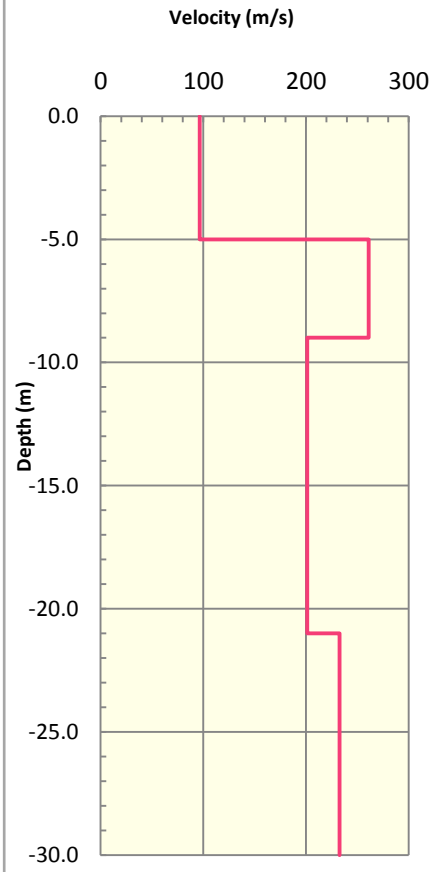


AVS 30

181 m/s



Time Distance Curve

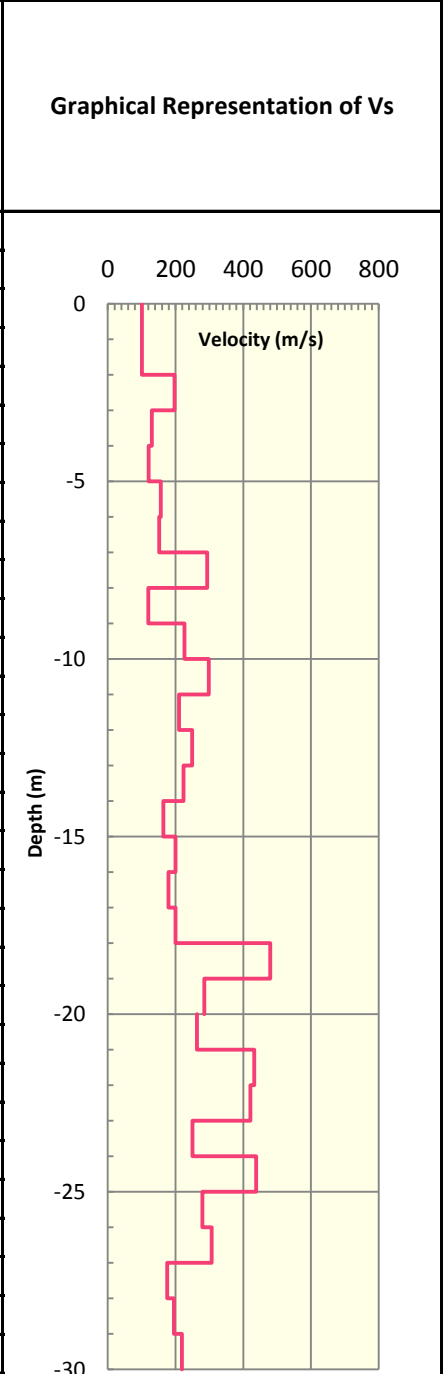


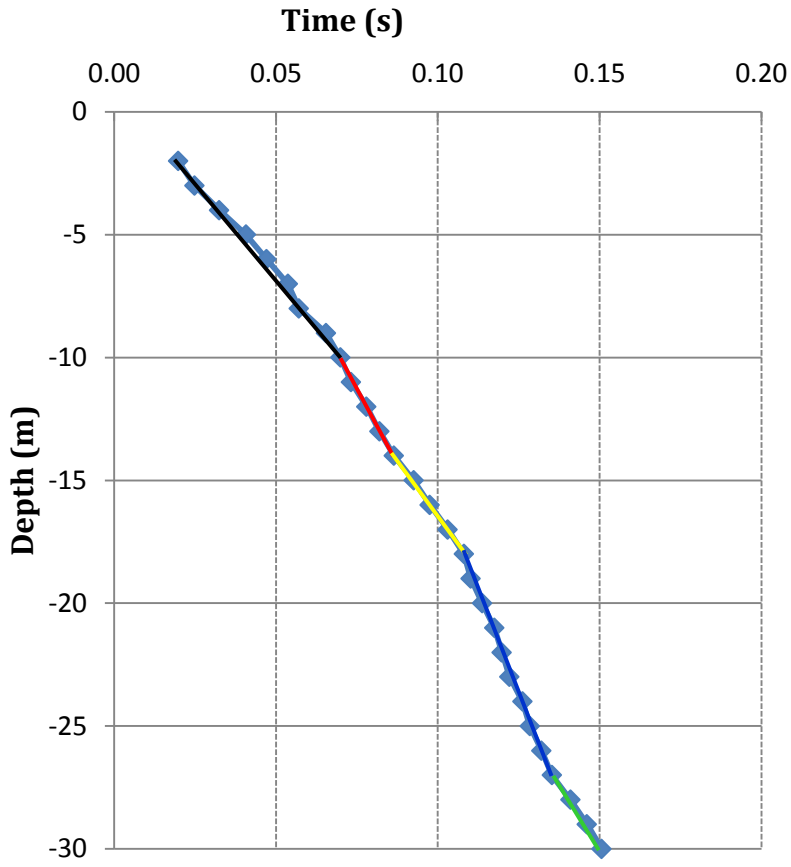
Layer Velocity

SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

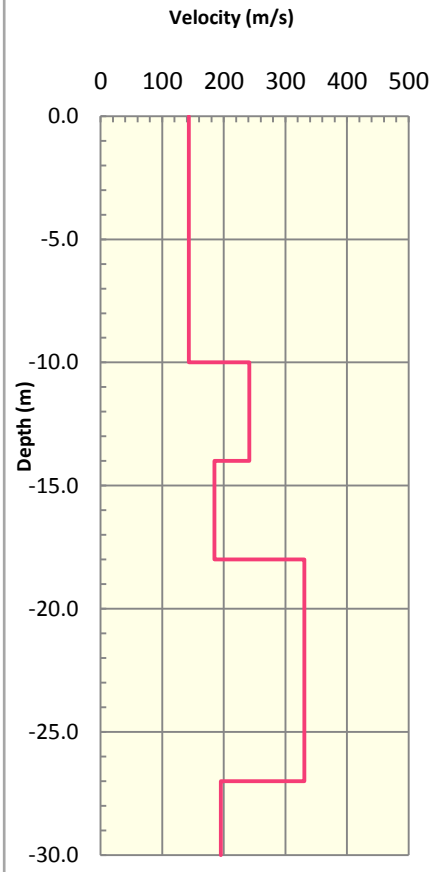
Tested Date(dd/mm/yyyy) : 20/07/2014 Location : Modhobarra, Ghagra PS Id : Ghagra-09 Coordinate : Latitude- 24°43'32.006"N Longitude- 90°22'56.175"E Operator : The Olson Instruments Downhole Seismic system	Source : 7kg Sledge Hammer Downhole Receiver : Tri-axial Geophone Recording Equipment : Freedom Data PC Borehole Information : Grouted Cased Borehole Casing Diameter : 75mm PVC Casing
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time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotonal Wave, tc=D*/R (s)	Shear Wave Velocity Vs, Vs=D/tc (m/s)	Shear Modulus,G (Mpa)
0.022086	2	1	2.236068	0.0198	101	20.9
0.026160	3	1	3.162278	0.0248	198	79.6
0.033477	4	1	4.123106	0.0325	131	34.8
0.041568	5	1	5.09902	0.0408	121	29.7
0.047779	6	1	6.082763	0.0471	157	50.3
0.054260	7	1	7.071068	0.0537	152	47.0
0.057560	8	1	8.062258	0.0571	294	176.3
0.065875	9	1	9.055385	0.0655	120	29.2
0.070240	10	1	10.04988	0.0699	226	104.4
0.073546	11	1	11.04536	0.0732	298	181.5
0.078261	12	1	12.04159	0.0780	211	90.5
0.082240	13	1	13.0384	0.0820	250	127.0
0.086683	14	1	14.03567	0.0865	224	102.3
0.092746	15	1	15.0333	0.0925	165	55.2
0.097727	16	1	16.03122	0.0975	200	81.7
0.103297	17	1	17.02939	0.1031	179	65.5
0.108278	18	1	18.02776	0.1081	200	81.8
0.110348	19	1	19.0263	0.1102	480	469.5
0.113849	20	1	20.02498	0.1137	285	165.4
0.117640	21	1	21.0238	0.1175	263	141.2
0.119940	22	1	22.02272	0.1198	433	382.4
0.122306	23	1	23.02173	0.1222	421	361.8
0.126291	24	1	24.02082	0.1262	251	128.0
0.128568	25	1	25.01999	0.1285	438	391.0
0.132147	26	1	26.01922	0.1320	279	158.8
0.135400	27	1	27.01851	0.1353	307	192.2
0.141093	28	1	28.01785	0.1410	176	62.9
0.146217	29	1	29.01724	0.1461	195	77.6
0.150772	30	1	30.01666	0.1507	219	98.2





Time Distance Curve

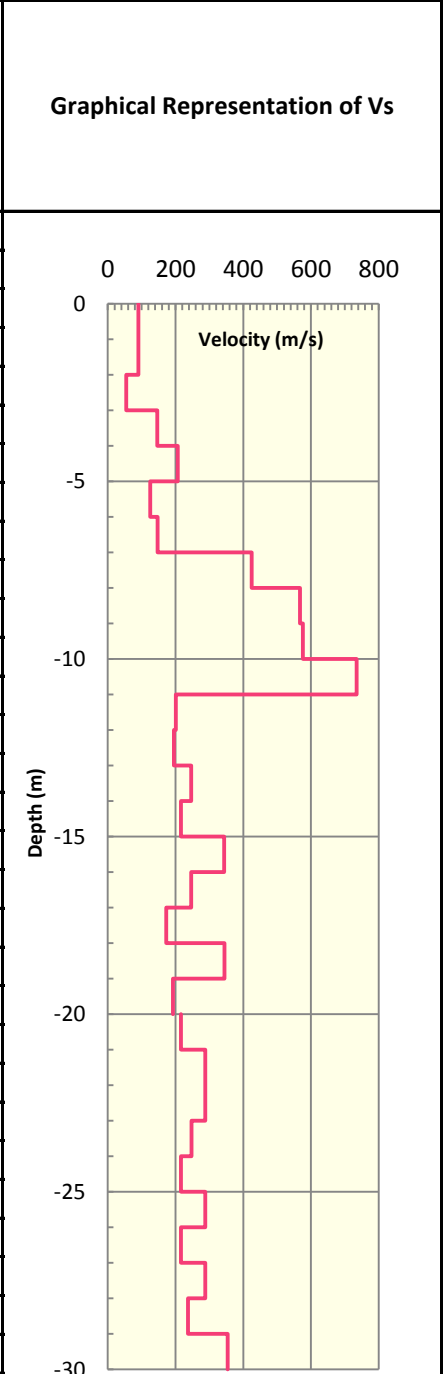


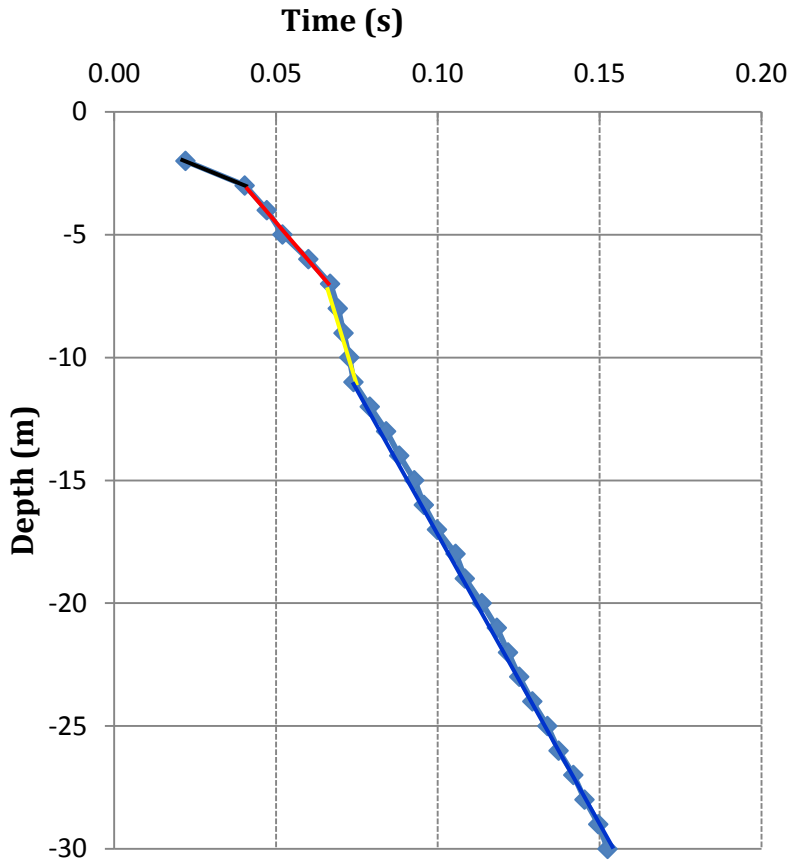
Layer Velocity

SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

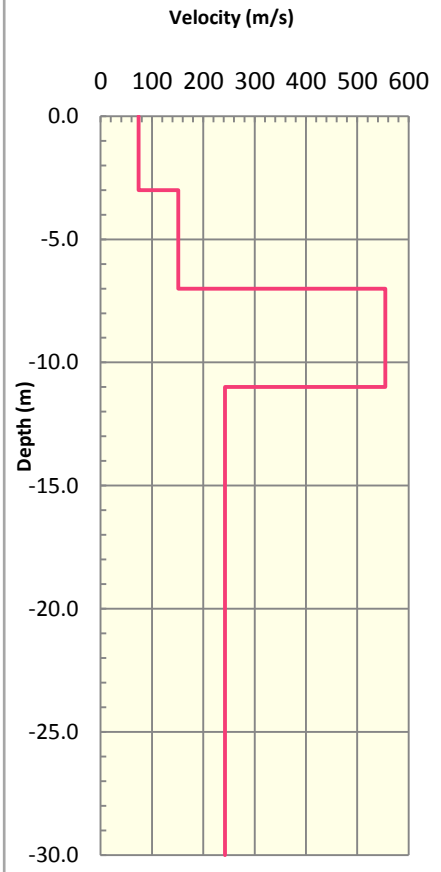
Tested Date(dd/mm/yyyy) : 12/07/2014 Location : Zoogiragli, Char Nilakshmia PS Id : Char Nilakshmia-10 Coordinate : Latitude- 24°43'32.48"N Longitude- 90°28'40.18"E Operator : The Olson Instruments Downhole Seismic system	Source : 7kg Sledge Hammer Downhole Receiver : Tri-axial Geophone Recording Equipment : Freedom Data PC Borehole Information : Grouted Cased Borehole Casing Diameter : 75mm PVC Casing
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time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotnal Wave, tc=D*/R (s)	Shear Wave Velocity Vs, Vs=D/tc (m/s)	Shear Modulus,G (Mpa)
0.024711	2	1	2.236068	0.0221	90	16.7
0.042579	3	1	3.162278	0.0404	55	6.1
0.048668	4	1	4.123106	0.0472	147	43.8
0.053096	5	1	5.09902	0.0521	206	86.7
0.060846	6	1	6.082763	0.0600	126	32.2
0.067488	7	1	7.071068	0.0668	147	44.2
0.069702	8	1	8.062258	0.0692	425	368.0
0.071363	9	1	9.055385	0.0709	567	656.3
0.073024	10	1	10.04988	0.0727	576	677.4
0.074327	11	1	11.04536	0.0740	735	1102.4
0.079262	12	1	12.04159	0.0790	201	82.7
0.084347	13	1	13.0384	0.0841	196	78.1
0.088388	14	1	14.03567	0.0882	246	123.4
0.093006	15	1	15.0333	0.0928	216	94.9
0.095893	16	1	16.03122	0.0957	344	241.5
0.099934	17	1	17.02939	0.0998	247	124.0
0.105706	18	1	18.02776	0.1055	173	61.0
0.108593	19	1	19.0263	0.1084	345	242.6
0.113788	20	1	20.02498	0.1136	192	75.3
0.118406	21	1	21.0238	0.1183	216	95.3
0.121870	22	1	22.02272	0.1217	288	169.1
0.125333	23	1	23.02173	0.1252	288	169.3
0.129374	24	1	24.02082	0.1293	247	124.5
0.133992	25	1	25.01999	0.1339	216	95.4
0.137456	26	1	26.01922	0.1374	288	169.4
0.142074	27	1	27.01851	0.1420	216	95.5
0.145538	28	1	28.01785	0.1454	288	169.5
0.149754	29	1	29.01724	0.1497	237	114.5
0.152573	30	1	30.01666	0.1525	354	255.9





Time Distance Curve

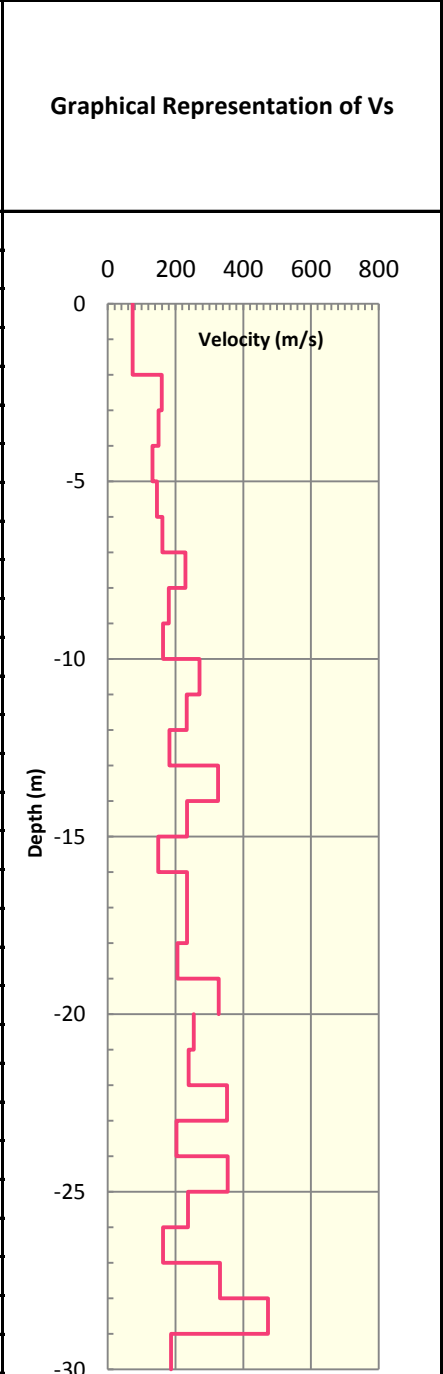


Layer Velocity

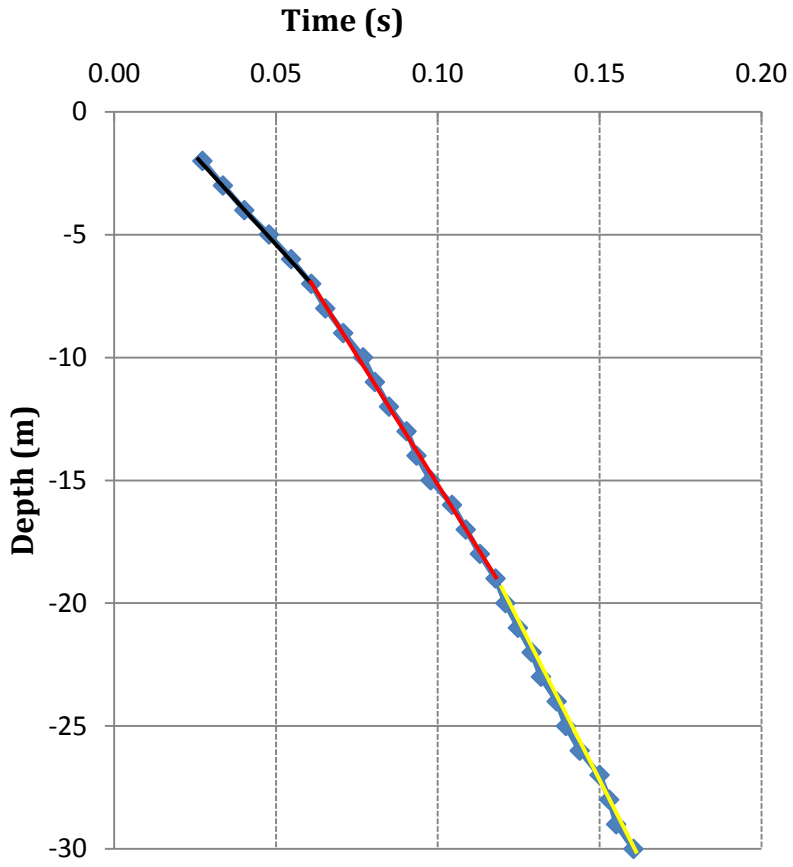
SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

Tested Date(dd/mm/yyyy) : 21/07/2014 Location : Suhila, Poschimpara, Ghagra PS Id : Ghagra-11 Coordinate : Latitude- 24°42'25.90"N Longitude- 90°20'23.33"E Operator : The Olson Instruments Downhole Seismic system	Source : 7kg Sledge Hammer Downhole Receiver : Tri-axial Geophone Recording Equipment : Freedom Data PC Borehole Information : Grouted Cased Borehole Casing Diameter : 75mm PVC Casing
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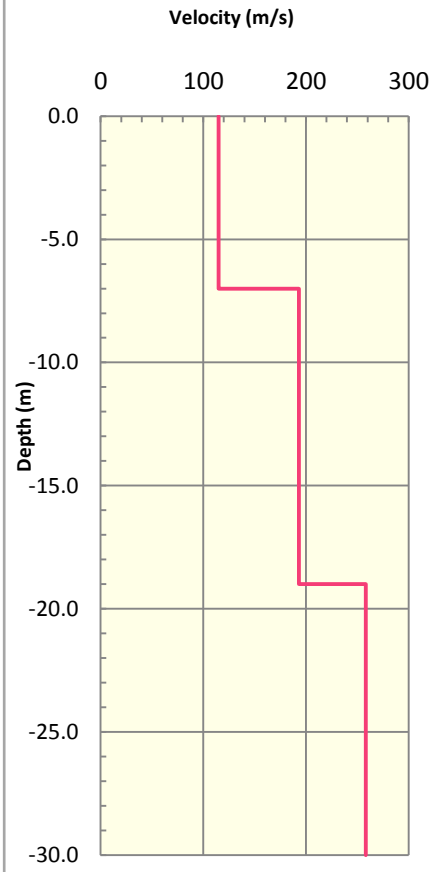
time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotnal Wave, tc=D*/R (s)	Shear Wave Velocity Vs, Vs=D/tc (m/s)	Shear Modulus,G (Mpa)
0.030566	2	1	2.236068	0.0273	73	10.9
0.035426	3	1	3.162278	0.0336	160	51.9
0.041502	4	1	4.123106	0.0403	150	46.1
0.048792	5	1	5.09902	0.0478	132	35.5
0.055475	6	1	6.082763	0.0547	145	43.1
0.061550	7	1	7.071068	0.0609	161	52.9
0.065803	8	1	8.062258	0.0653	229	107.1
0.071270	9	1	9.055385	0.0708	181	66.5
0.077346	10	1	10.04988	0.0770	163	54.3
0.080991	11	1	11.04536	0.0807	271	149.3
0.085244	12	1	12.04159	0.0849	233	110.8
0.090711	13	1	13.0384	0.0904	182	67.6
0.093749	14	1	14.03567	0.0935	326	216.8
0.098002	15	1	15.0333	0.0978	234	111.6
0.104684	16	1	16.03122	0.1045	149	45.5
0.108937	17	1	17.02939	0.1087	234	111.9
0.113190	18	1	18.02776	0.1130	234	112.0
0.118050	19	1	19.0263	0.1179	205	86.0
0.121088	20	1	20.02498	0.1209	328	219.2
0.125014	21	1	21.0238	0.1249	254	131.7
0.129198	22	1	22.02272	0.1291	239	116.0
0.132029	23	1	23.02173	0.1319	352	252.9
0.136952	24	1	24.02082	0.1368	203	83.9
0.139766	25	1	25.01999	0.1397	354	256.3
0.143986	26	1	26.01922	0.1439	237	114.2
0.150117	27	1	27.01851	0.1500	163	54.2
0.153129	28	1	28.01785	0.1530	331	224.0
0.155239	29	1	29.01724	0.1551	473	455.8
0.160577	30	1	30.01666	0.1605	187	71.5



PS Id : Ghagra-11



Time Distance Curve



Layer Velocity

SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

Tested Date(dd/mm/yyyy) : 17/07/2014

Location : Vatipara, Vati Ghagra

PS Id : Ghagra-12

Coordinate : Latitude- 24°41'2.98"N Longitude- 90°23'8.15"E

Operator : The Olson Instruments Downhole Seismic system

Source : 7kg Sledge Hammer

Downhole Receiver : Tri-axial Geophone

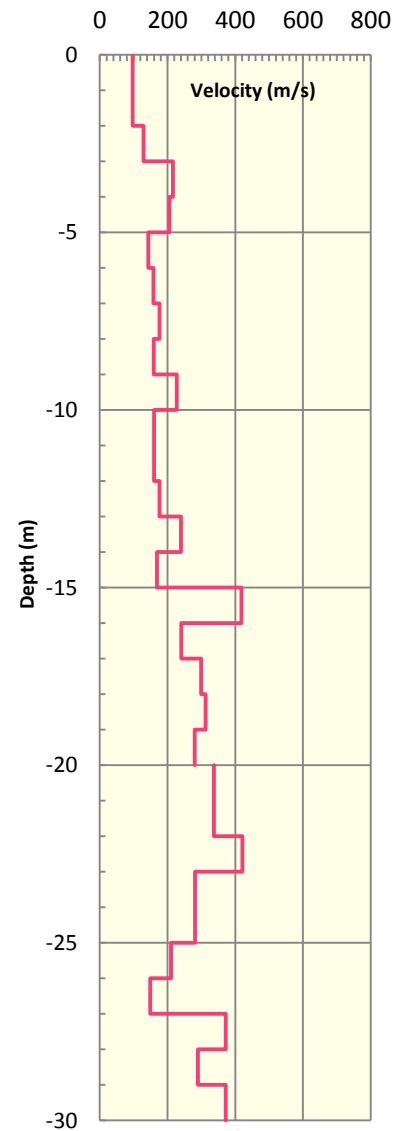
Recording Equipment : Freedom Data PC

Borehole Information : Grouted Cased Borehole

Casing Diameter : 75mm PVC Casing

time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotonal Wave, $t_c = D \cdot t_r / R$ (s)	Shear Wave Velocity $V_s, V_s = D/t_c$ (m/s)	Shear Modulus, G (Mpa)
0.023068	2	1	2.236068	0.0206	97	19.2
0.029904	3	1	3.162278	0.0284	129	34.1
0.034010	4	1	4.123106	0.0330	216	95.3
0.038606	5	1	5.09902	0.0379	206	86.3
0.045442	6	1	6.082763	0.0448	144	42.0
0.051657	7	1	7.071068	0.0511	158	51.2
0.057251	8	1	8.062258	0.0568	176	63.4
0.063466	9	1	9.055385	0.0631	160	51.9
0.067816	10	1	10.04988	0.0675	227	105.3
0.074032	11	1	11.04536	0.0737	160	52.2
0.080247	12	1	12.04159	0.0800	160	52.3
0.085880	13	1	13.0384	0.0856	177	63.7
0.090025	14	1	14.03567	0.0898	240	117.3
0.095947	15	1	15.0333	0.0957	168	57.8
0.098315	16	1	16.03122	0.0981	419	357.3
0.102461	17	1	17.02939	0.1023	240	117.8
0.105790	18	1	18.02776	0.1056	299	182.5
0.108975	19	1	19.0263	0.1088	313	199.5
0.112528	20	1	20.02498	0.1124	281	160.6
0.115489	21	1	21.0238	0.1154	337	231.1
0.118450	22	1	22.02272	0.1183	337	231.3
0.120818	23	1	23.02173	0.1207	421	361.2
0.124371	24	1	24.02082	0.1243	281	161.0
0.127924	25	1	25.01999	0.1278	281	161.0
0.132662	26	1	26.01922	0.1326	211	90.7
0.139381	27	1	27.01851	0.1393	149	45.1
0.142066	28	1	28.01785	0.1420	372	281.8
0.145517	29	1	29.01724	0.1454	289	170.8
0.148202	30	1	30.01666	0.1481	372	282.0

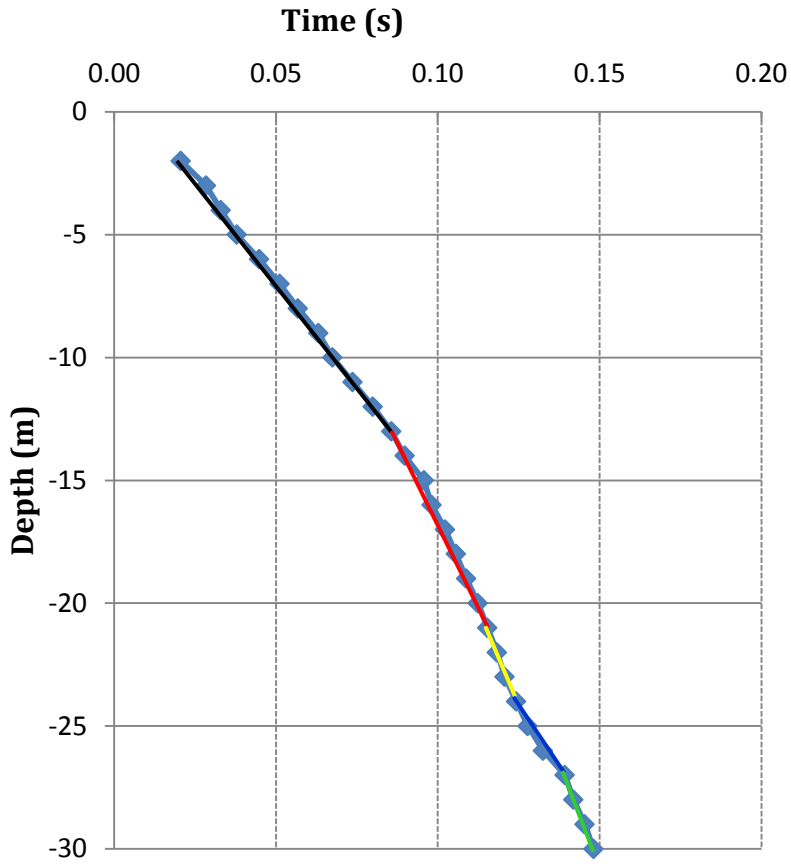
Graphical Representation of Vs



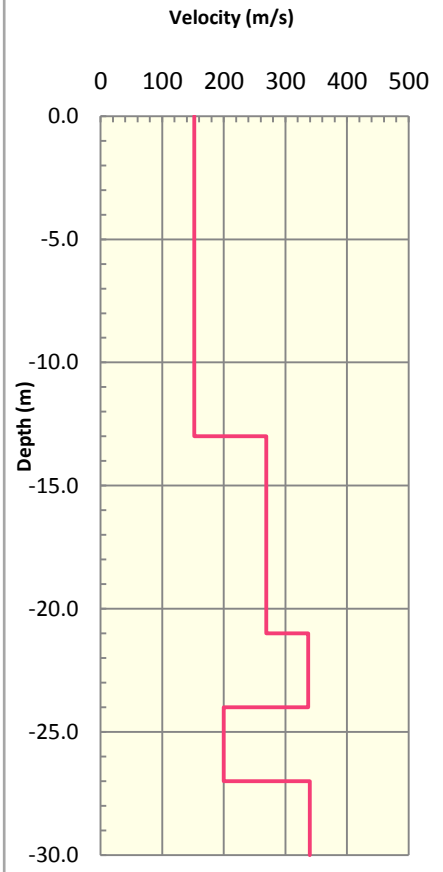
AVS 30

203 m/s

PS Id : Ghagra-12



Time Distance Curve



Layer Velocity

SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

Tested Date(dd/mm/yyyy) : 22/07/2014

Location : Dhohakhola, Kagir Panati

PS Id : Bhangnamari-13

Coordinate : Lat- 24°42'31.02"N Long- 90°30'23.25"E

Operator : The Olson Instruments Downhole Seismic system

Source : 7kg Sledge Hammer

Downhole Receiver : Tri-axial Geophone

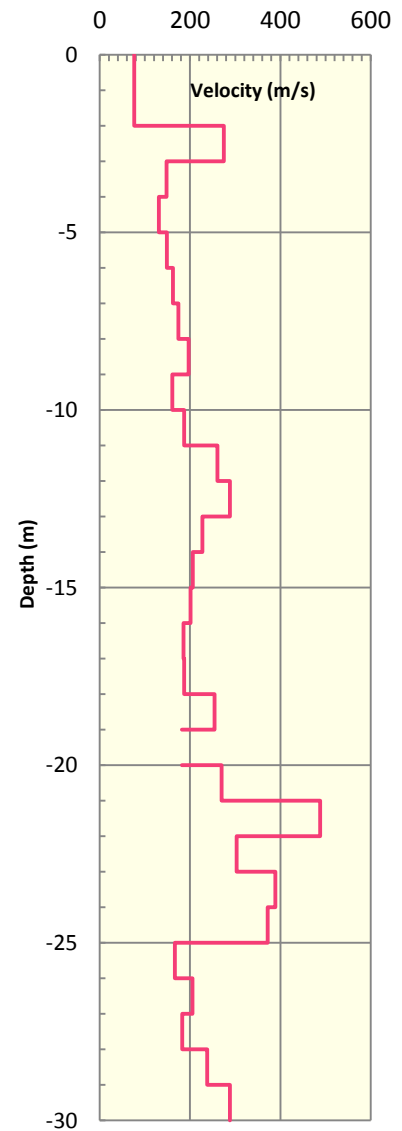
Recording Equipment : Freedom Data PC

Borehole Information : Grouted Cased

Casing Diameter : 75mm PVC Casing

time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotonal Wave, $t_c = D^*/R$ (s)	Shear Wave Velocity $V_s, V_s = D/t_c$ (m/s)	Shear Modulus, G (Mpa)
0.029220	2	1	2.236068	0.0261	77	11.9
0.031380	3	1	3.162278	0.0298	275	154.4
0.037660	4	1	4.123106	0.0365	148	44.6
0.045060	5	1	5.09902	0.0442	131	34.9
0.051616	6	1	6.082763	0.0509	149	45.0
0.057660	7	1	7.071068	0.0571	162	53.6
0.063301	8	1	8.062258	0.0628	174	62.1
0.068320	9	1	9.055385	0.0679	196	78.7
0.074500	10	1	10.04988	0.0741	161	52.6
0.079800	11	1	11.04536	0.0795	187	71.5
0.083600	12	1	12.04159	0.0833	260	138.4
0.087040	13	1	13.0384	0.0868	288	169.1
0.091420	14	1	14.03567	0.0912	227	105.1
0.096260	15	1	15.0333	0.0960	206	86.4
0.101211	16	1	16.03122	0.1010	201	82.7
0.106598	17	1	17.02939	0.1064	185	69.9
0.111929	18	1	18.02776	0.1118	187	71.4
0.115850	19	1	19.0263	0.1157	254	131.8
0.121342	20	1	20.02498	0.1212	182	67.4
0.125042	21	1	21.0238	0.1249	270	148.2
0.127080	22	1	22.02272	0.1269	488	486.0
0.130372	23	1	23.02173	0.1302	303	187.3
0.132936	24	1	24.02082	0.1328	389	308.3
0.135620	25	1	25.01999	0.1355	372	281.7
0.141620	26	1	26.01922	0.1415	167	56.6
0.146480	27	1	27.01851	0.1464	206	86.2
0.151960	28	1	28.01785	0.1519	182	67.8
0.156157	29	1	29.01724	0.1561	238	115.6
0.159620	30	1	30.01666	0.1595	288	169.7

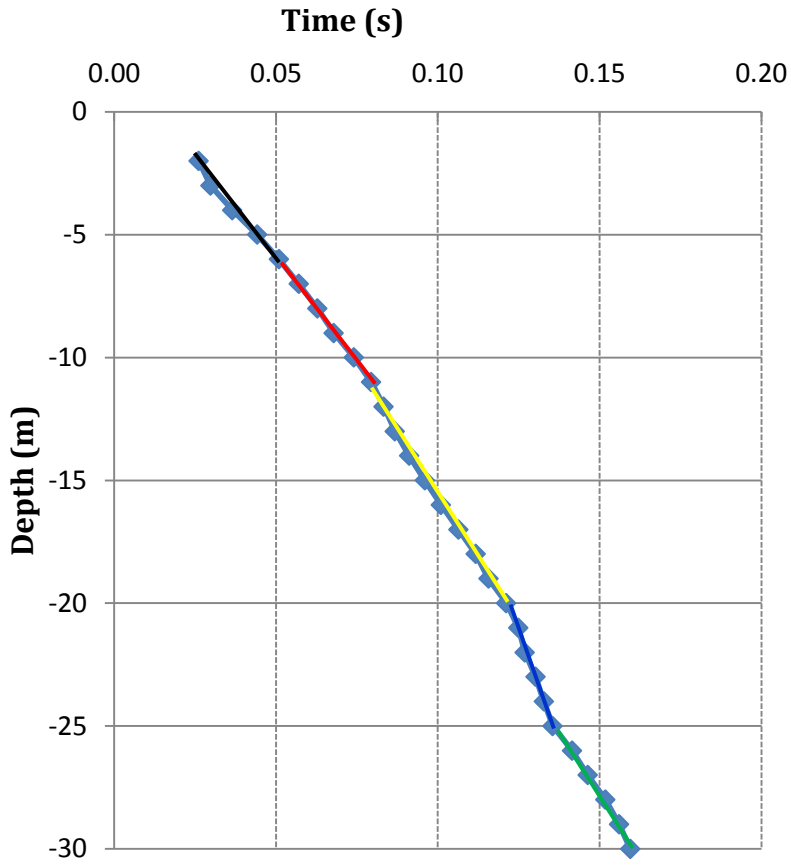
Graphical Representation of Vs



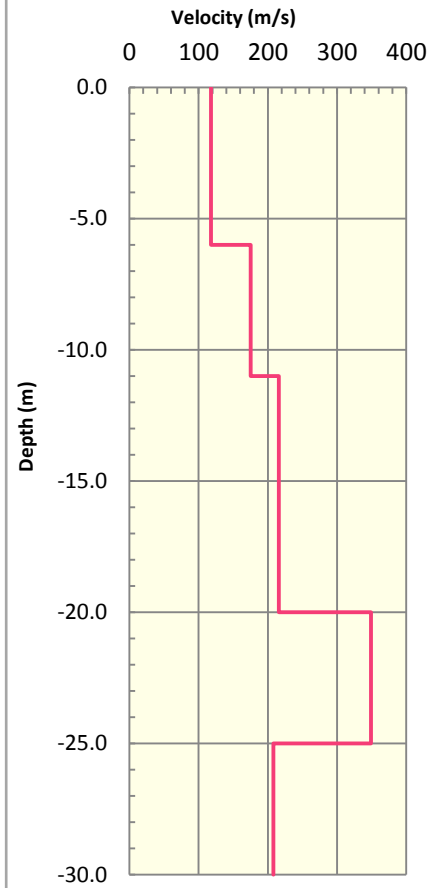
AVS 30

188 m/s

PS Id : Bhangnamari-13



Time Distance Curve

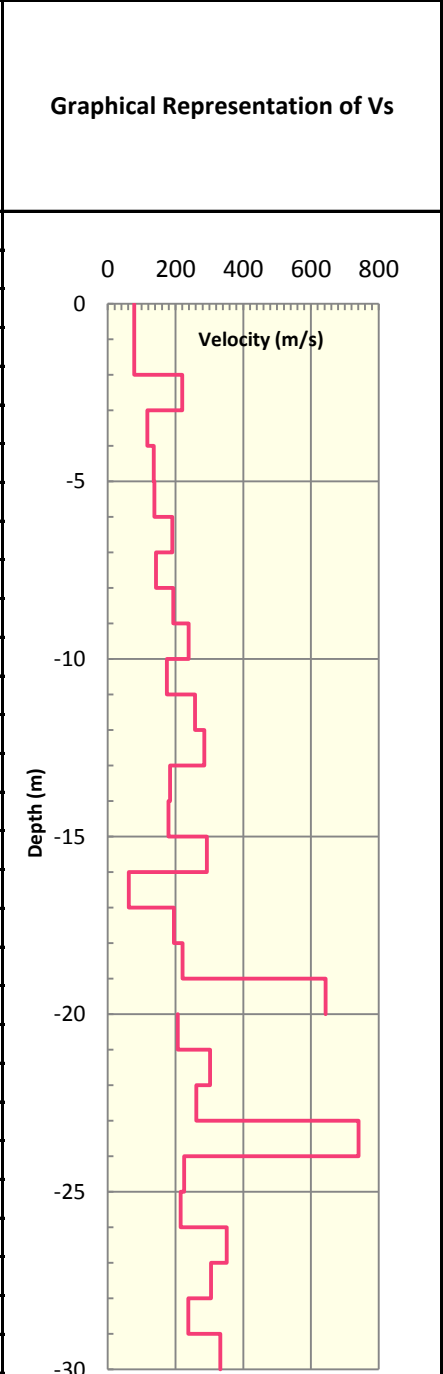


Layer Velocity

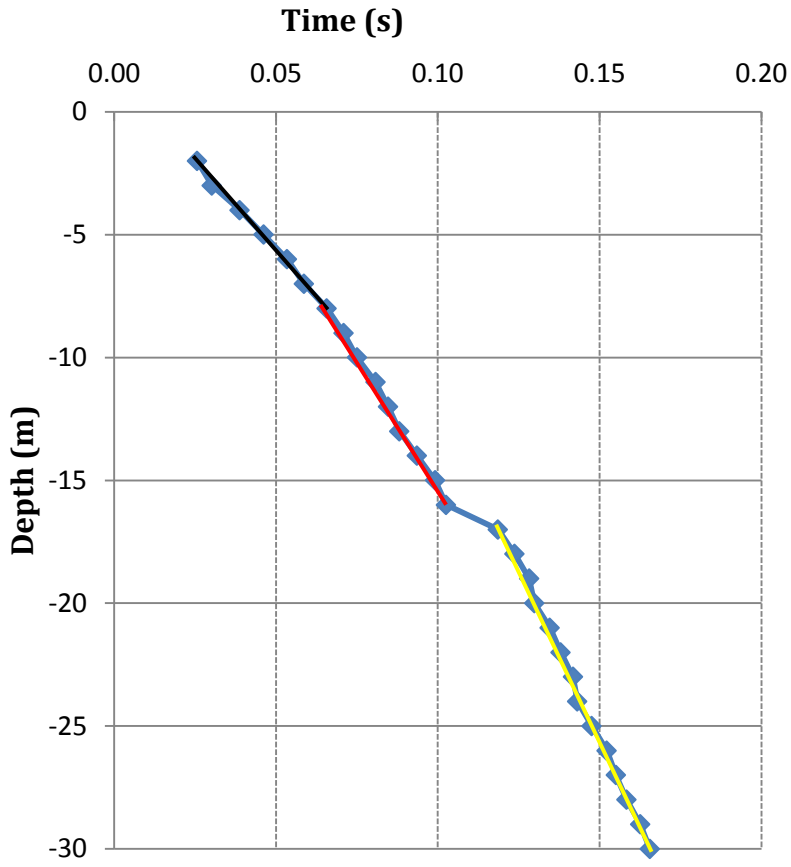
SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

Tested Date(dd/mm/yyyy) : 20/07/2014 Location : Dupipura, Nutonbazar, Shutiakhali PS Id : Bhubkhali 14 Coordinate : Latitude- 24°41'13.12"N Longitude- 90°26'31.32"E Operator : The Olson Instruments Downhole Seismic system	Source : 7kg Sledge Hammer Downhole Receiver : Tri-axial Geophone Recording Equipment : Freedom Data PC Borehole Information : Grouted Cased Borehole Casing Diameter : 75mm PVC Casing
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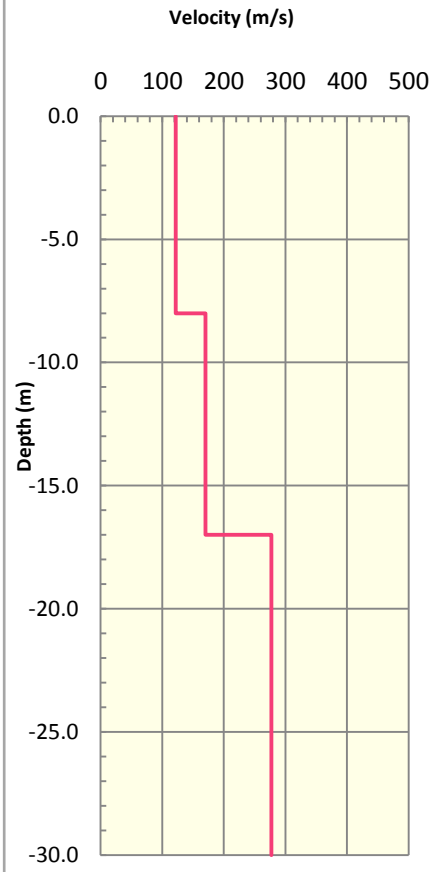
time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotronal Wave, $t_c = D^*/R$ (s)	Shear Wave Velocity $V_s, V_s = D/t_c$ (m/s)	Shear Modulus, G (Mpa)
0.028698	2	1	2.236068	0.0257	78	12.4
0.031860	3	1	3.162278	0.0302	219	98.2
0.040000	4	1	4.123106	0.0388	117	27.7
0.047080	5	1	5.09902	0.0462	136	37.6
0.054180	6	1	6.082763	0.0534	137	38.5
0.059280	7	1	7.071068	0.0587	191	74.2
0.066220	8	1	8.062258	0.0657	142	41.3
0.071320	9	1	9.055385	0.0709	193	76.1
0.075440	10	1	10.04988	0.0751	239	116.6
0.081120	11	1	11.04536	0.0808	175	62.3
0.084960	12	1	12.04159	0.0847	258	135.5
0.088440	13	1	13.0384	0.0882	285	165.3
0.093860	14	1	14.03567	0.0936	184	68.9
0.099420	15	1	15.0333	0.0992	179	65.5
0.102820	16	1	16.03122	0.1026	292	174.4
0.118840	17	1	17.02939	0.1186	62	8.0
0.123940	18	1	18.02776	0.1237	196	78.0
0.128460	19	1	19.0263	0.1283	221	99.2
0.130000	20	1	20.02498	0.1298	643	843.0
0.134820	21	1	21.0238	0.1347	207	87.4
0.138125	22	1	22.02272	0.1380	302	185.6
0.141940	23	1	23.02173	0.1418	262	139.5
0.143280	24	1	24.02082	0.1432	741	1119.4
0.147700	25	1	25.01999	0.1476	226	104.1
0.152340	26	1	26.01922	0.1522	215	94.5
0.155180	27	1	27.01851	0.1551	351	251.7
0.158457	28	1	28.01785	0.1584	305	189.3
0.162660	29	1	29.01724	0.1626	238	115.2
0.165664	30	1	30.01666	0.1656	332	225.3



PS Id : Bhubkhali 14



Time Distance Curve



Layer Velocity

SHEAR WAVE VELOCITY MEASUREMENTS DOWNHOLE SEISMIC TEST (PS LOGGING)

Tested Date(dd/mm/yyyy) : 22/07/2014

Location : Dhohakhola, Kagir Panati

PS Id : Bhangnamari-15

Coordinate : Lat- 24°42'31.02"N Long- 90°30'23.25"E

Operator : The Olson Instruments Downhole Seismic system

Source : 7kg Sledge Hammer

Downhole Receiver : Tri-axial Geophone

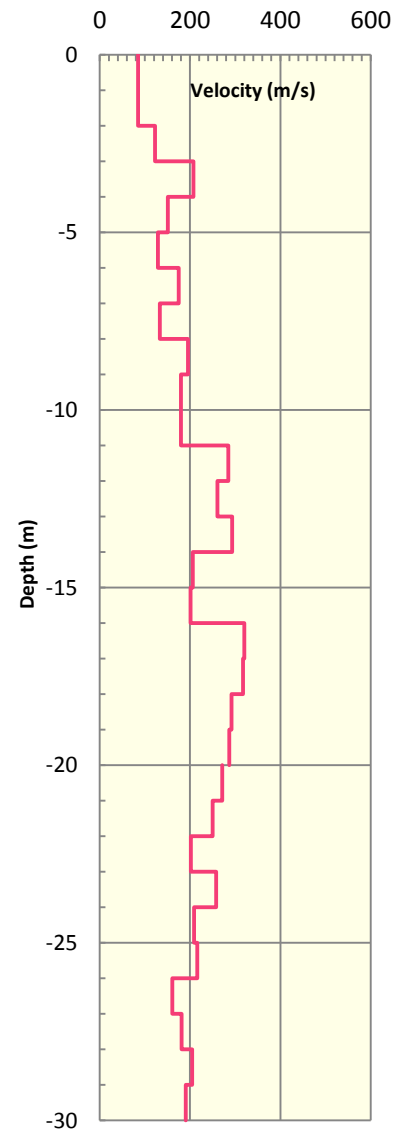
Recording Equipment : Freedom Data PC

Borehole Information : Grouted Cased

Casing Diameter : 75mm PVC Casing

time arrival (s)	Depth (m)	H (m)	Source Saint Distance (m), R	Corrected Travel Time for Comprotnal Wave, $t_c = D^*/R$ (s)	Shear Wave Velocity $V_s, V_s = D/t_c$ (m/s)	Shear Modulus, G (Mpa)
0.026320	2	1	2.236068	0.0235	85	14.7
0.033430	3	1	3.162278	0.0317	122	30.5
0.037660	4	1	4.123106	0.0365	207	87.7
0.044040	5	1	5.09902	0.0432	150	46.1
0.051646	6	1	6.082763	0.0509	129	33.9
0.057234	7	1	7.071068	0.0567	175	62.4
0.064670	8	1	8.062258	0.0642	133	36.1
0.069720	9	1	9.055385	0.0693	195	77.7
0.075230	10	1	10.04988	0.0749	180	65.9
0.080760	11	1	11.04536	0.0804	179	65.7
0.084230	12	1	12.04159	0.0839	285	165.5
0.088040	13	1	13.0384	0.0878	260	138.2
0.091420	14	1	14.03567	0.0912	294	175.7
0.096260	15	1	15.0333	0.0960	206	86.4
0.101211	16	1	16.03122	0.1010	201	82.7
0.104320	17	1	17.02939	0.1041	320	208.7
0.107456	18	1	18.02776	0.1073	317	205.5
0.110870	19	1	19.0263	0.1107	292	173.7
0.114342	20	1	20.02498	0.1142	287	168.2
0.118022	21	1	21.0238	0.1179	271	149.9
0.122010	22	1	22.02272	0.1219	250	127.7
0.126965	23	1	23.02173	0.1268	202	82.9
0.130834	24	1	24.02082	0.1307	258	135.8
0.135620	25	1	25.01999	0.1355	209	88.8
0.140248	26	1	26.01922	0.1401	216	95.0
0.146480	27	1	27.01851	0.1464	160	52.5
0.152000	28	1	28.01785	0.1519	181	66.8
0.156880	29	1	29.01724	0.1568	205	85.5
0.162123	30	1	30.01666	0.1620	191	74.1

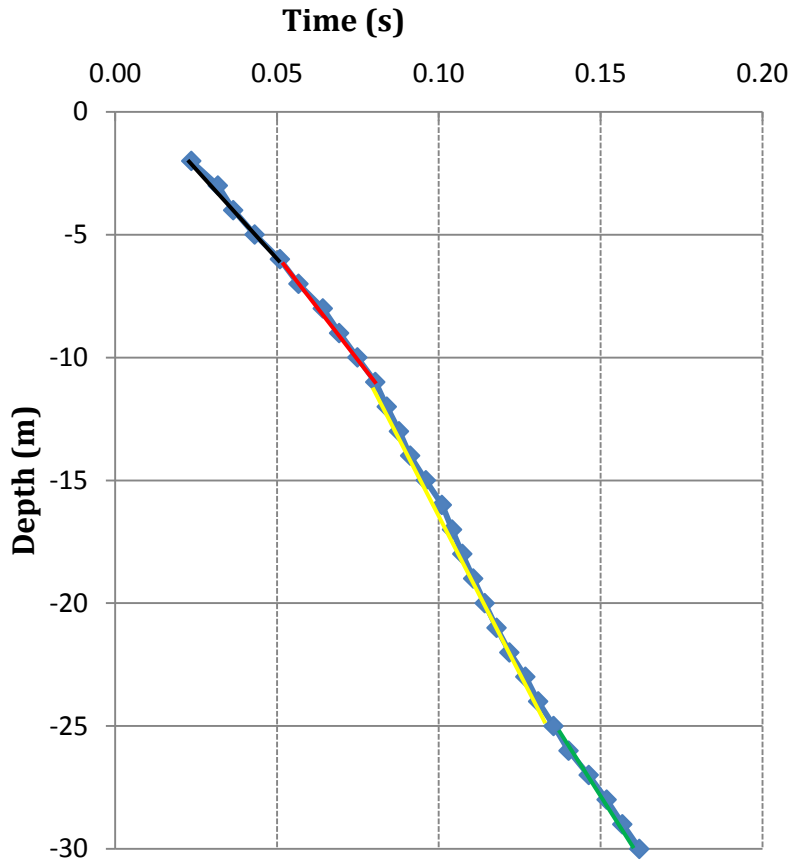
Graphical Representation of Vs



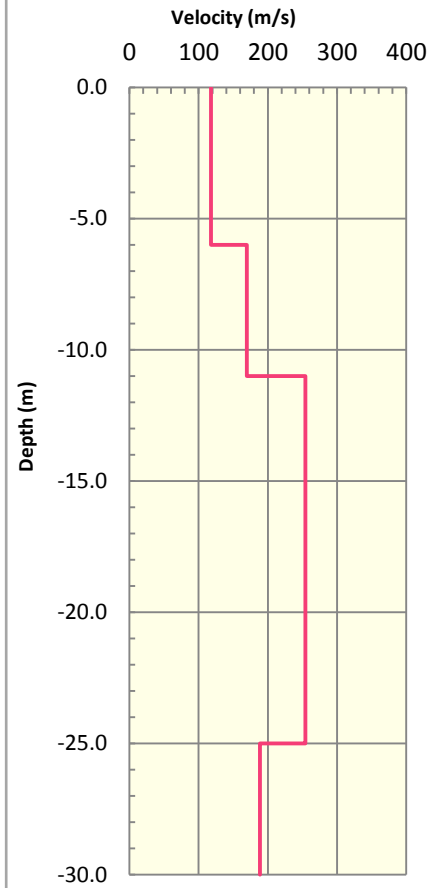
AVS 30

185 m/s

PS Id : Bhangnamari-15



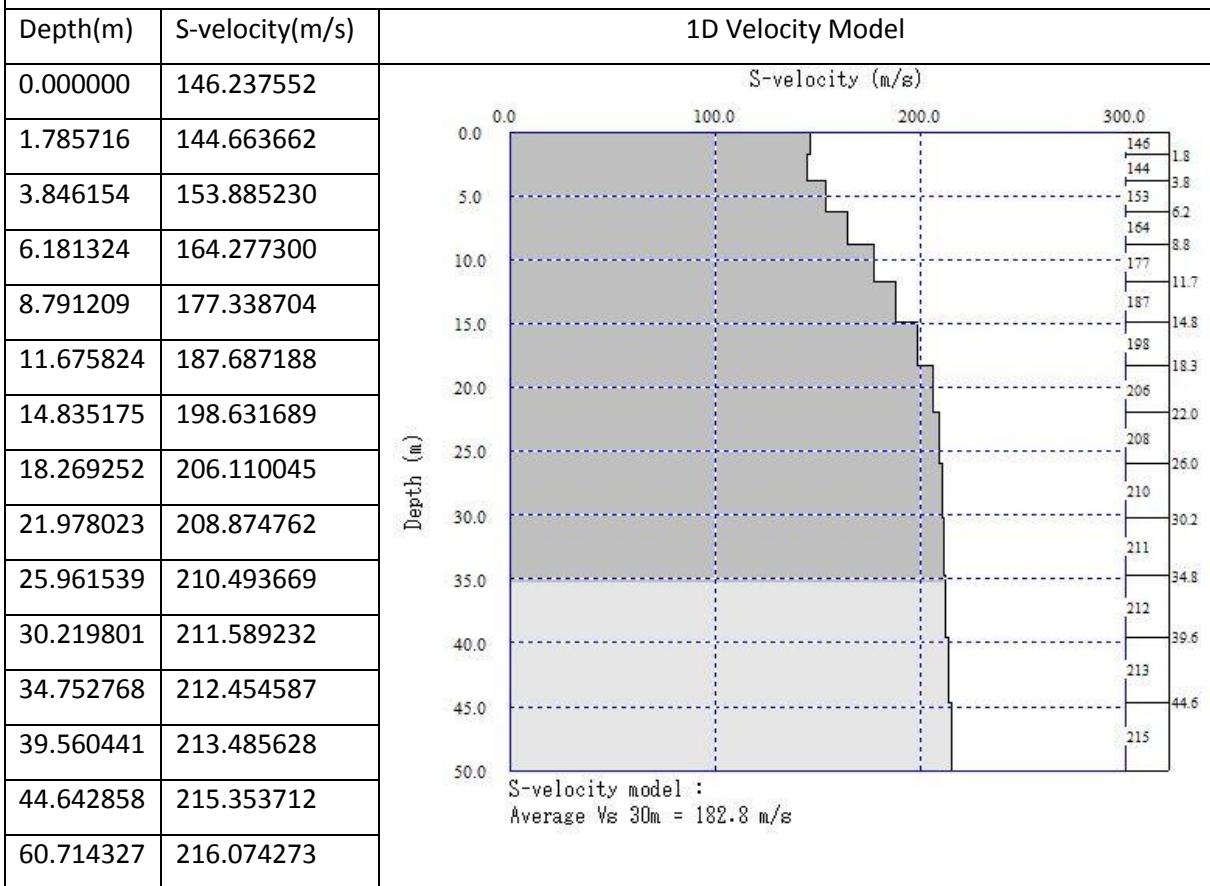
Time Distance Curve



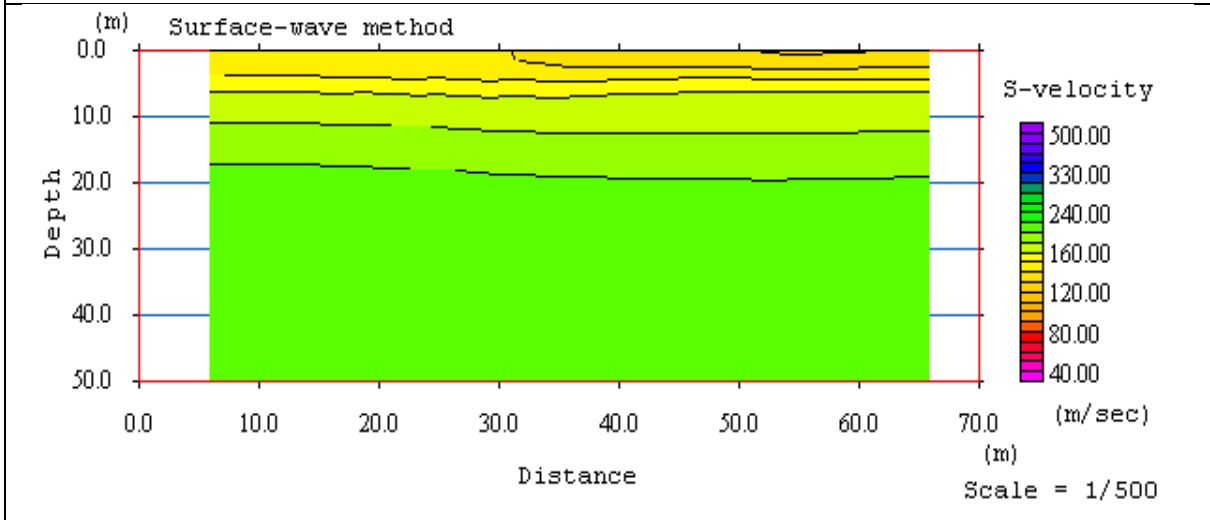
Layer Velocity

Appendix IV: Multi-channel Analysis of Surface Wave (MASW) 1D and 2D Models

Akua_11

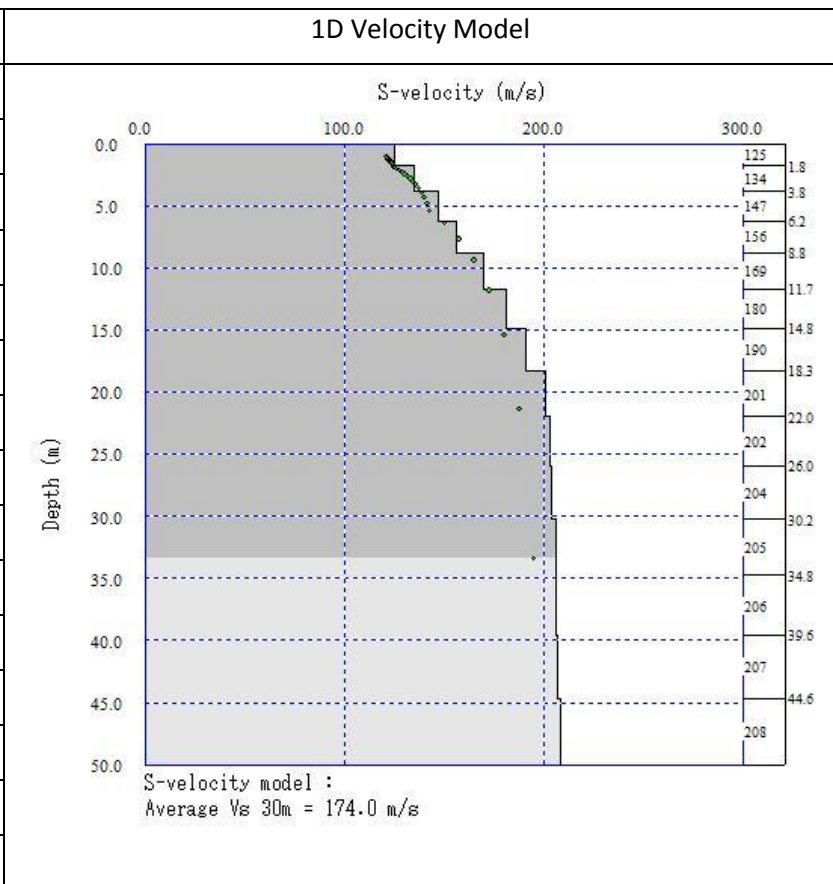


2D Velocity Model

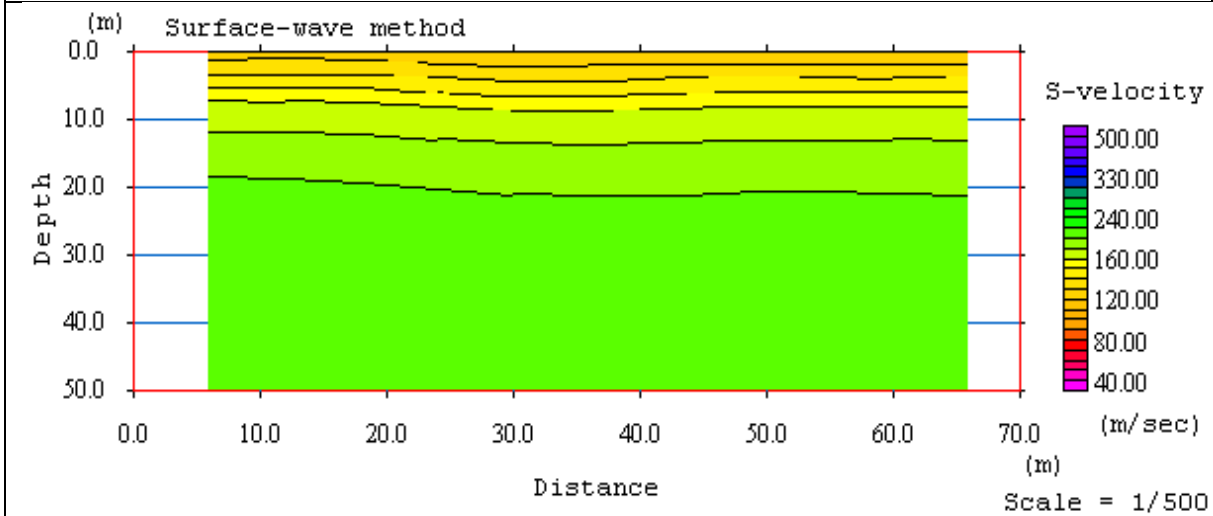


Bhangamari_18

Depth(m)	S-velocity(m/s)
0.000000	125.030637
1.785716	134.572566
3.846154	147.294521
6.181324	156.409681
8.791209	169.824049
11.675824	180.885971
14.835175	190.669253
18.269252	18.269252
21.978023	202.984944
25.961539	204.019845
30.219801	205.907777
34.752768	206.450179
39.560441	207.228422
44.642858	208.694682
60.714327	209.260464

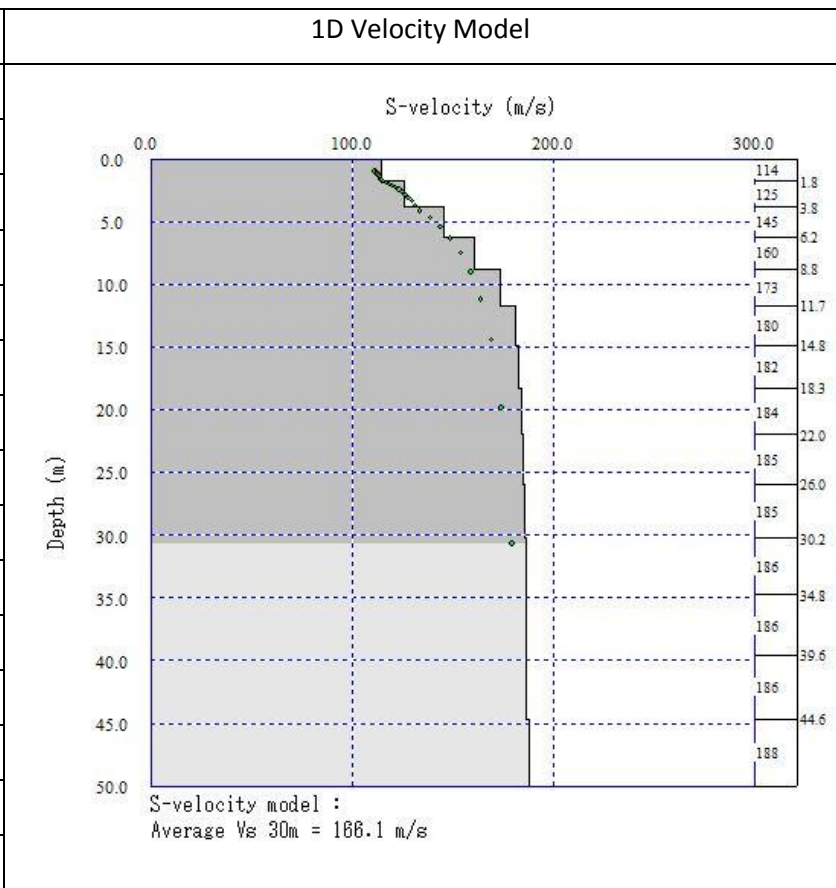


2D Velocity Model

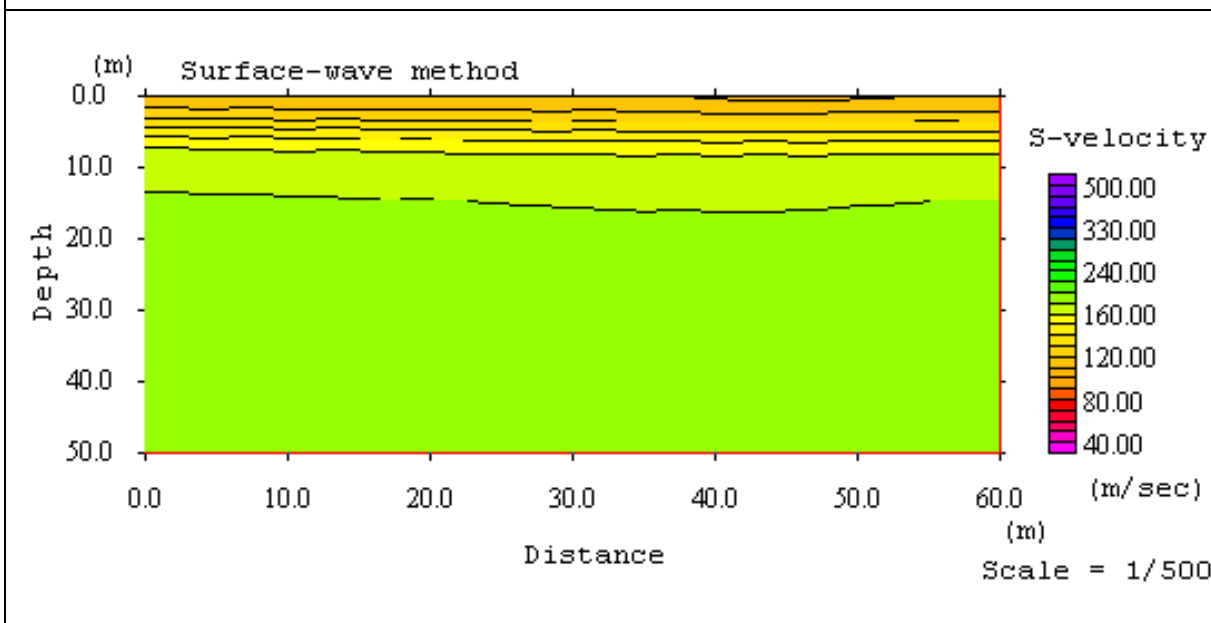


Bhangamari_19

Depth(m)	S-velocity(m/s)
0.000000	114.509106
1.785716	125.423148
3.846154	145.323440
6.181324	160.648271
8.791209	173.438340
11.675824	180.857509
14.835175	182.687446
18.269252	184.259728
21.978023	185.241446
25.961539	185.833588
30.219801	186.141670
34.752768	186.363652
39.560441	186.810106
44.642858	188.020661
60.714327	188.101172



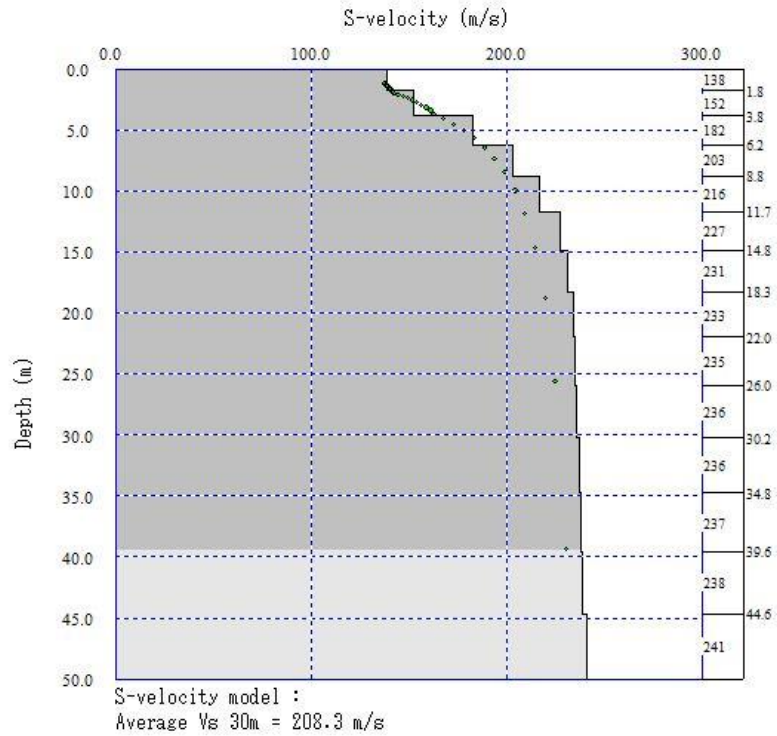
2D Velocity Model



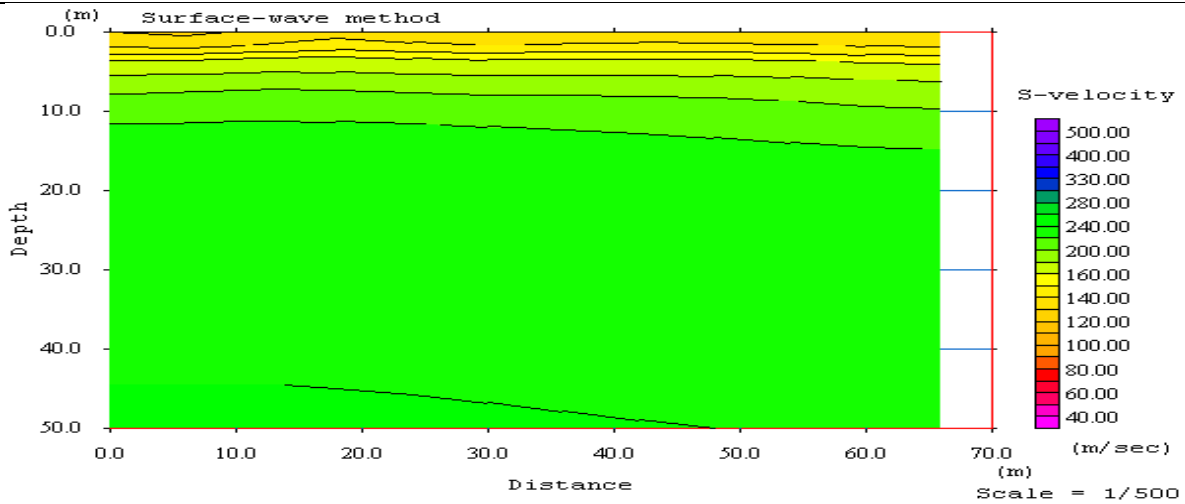
Bhangamari_25

Depth(m)	S-velocity(m/s)
0.000000	138.889864
1.785716	152.106807
3.846154	182.650432
6.181324	203.166679
8.791209	216.787323
11.675824	227.098137
14.835175	231.467232
18.269252	233.780921
21.978023	235.087484
25.961539	236.095950
30.219801	236.887887
34.752768	237.672612
39.560441	238.829345
44.642858	241.174936
60.714327	242.348894

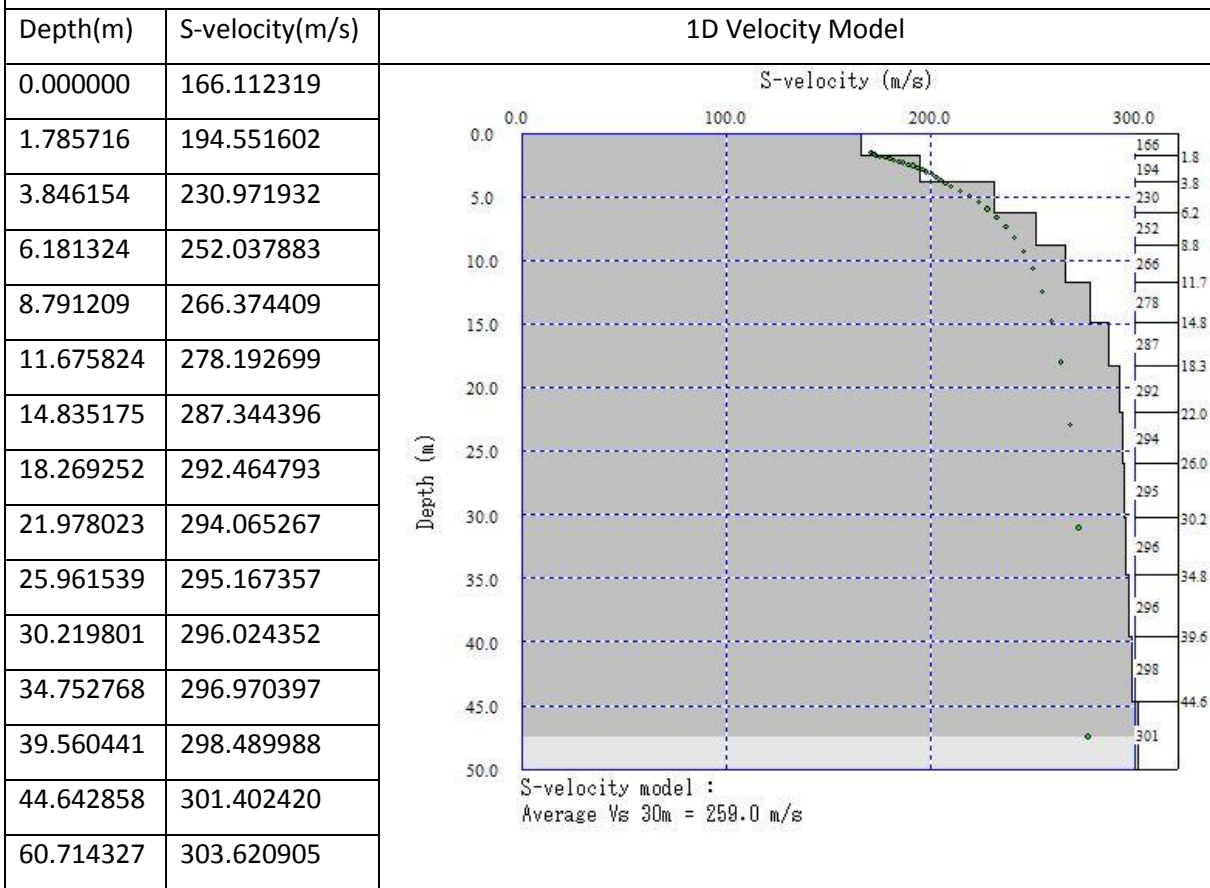
1D Velocity Model



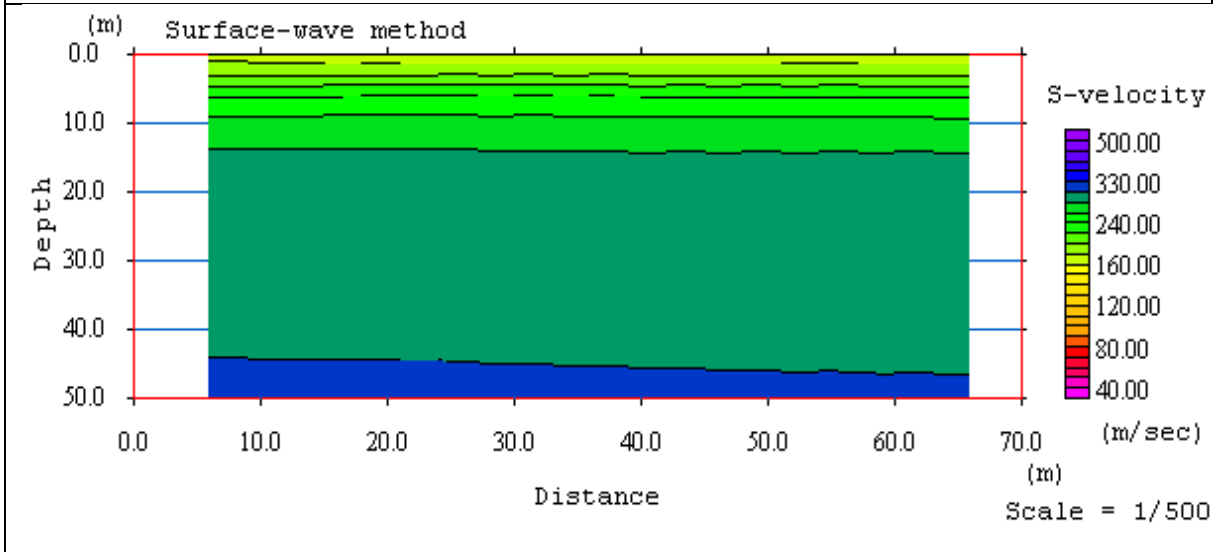
2D Velocity Model



Char Ishwardia_03



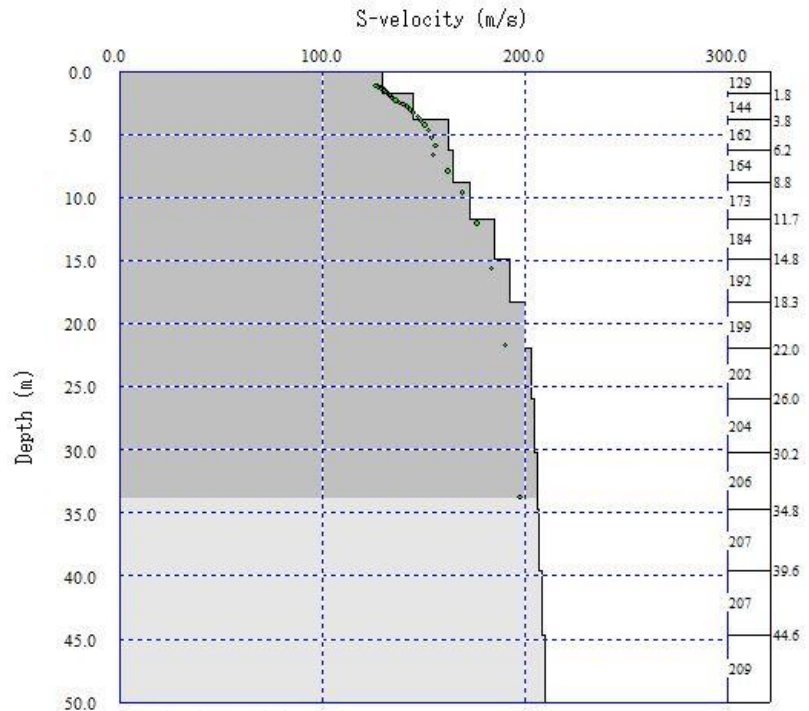
2D Velocity Model



Char Ishwardia_07

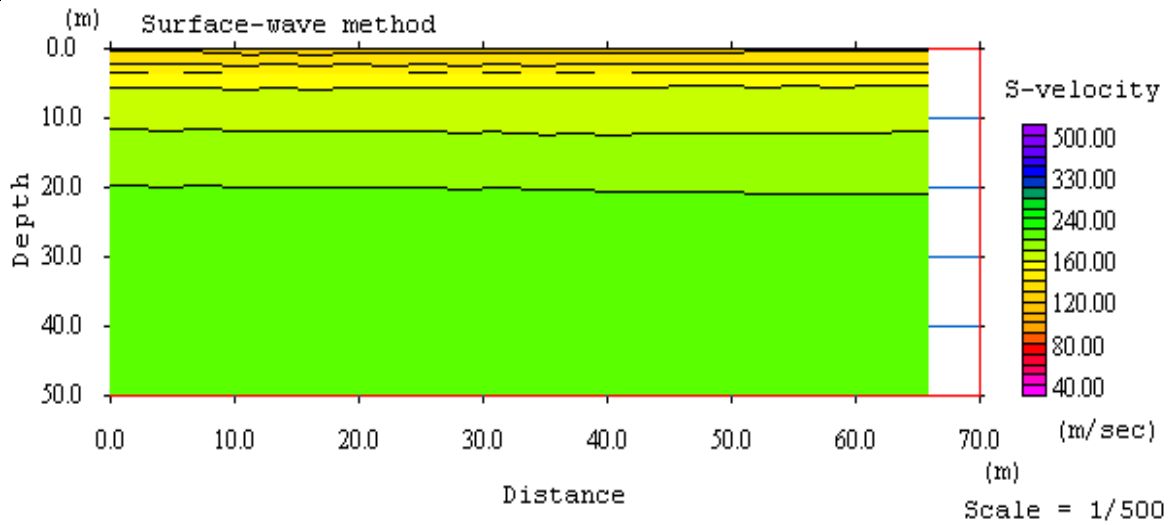
Depth(m)	S-velocity(m/s)
0.000000	129.273534
1.785716	144.484341
3.846154	162.290558
6.181324	164.592087
8.791209	173.051670
11.675824	184.531346
14.835175	192.639142
18.269252	199.896917
21.978023	202.984929
25.961539	204.891354
30.219801	206.348881
34.752768	207.047030
39.560441	207.960829
44.642858	209.830165
60.714327	210.374147

1D Velocity Model



S-velocity model :
Average Vs 30m = 178.8 m/s

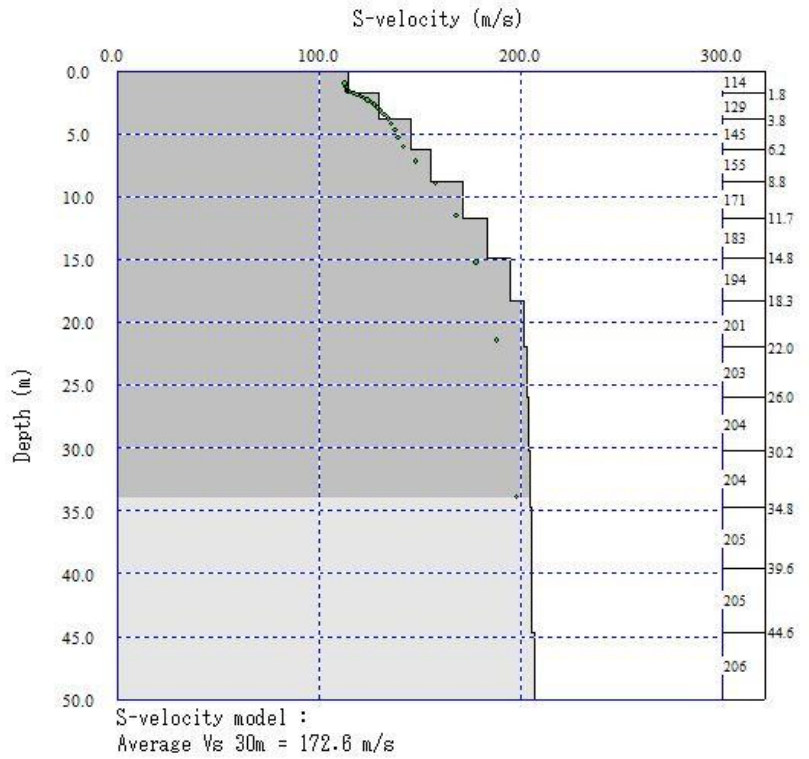
2D Velocity Model



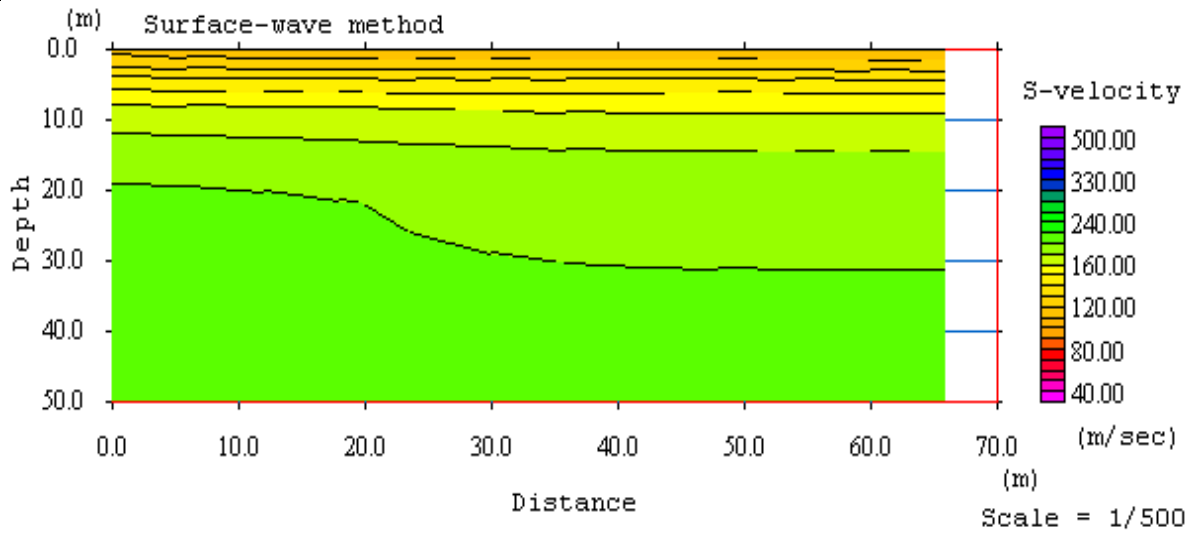
Char Nilakshmia_08

Depth(m)	S-velocity(m/s)
0.000000	114.325255
1.785716	129.725382
3.846154	145.519421
6.181324	155.216917
8.791209	171.129450
11.675824	183.619589
14.835175	194.596365
18.269252	201.878726
21.978023	203.325793
25.961539	204.050779
30.219801	204.870149
34.752768	205.089480
39.560441	205.523476
44.642858	206.889629
60.714327	207.113251

1D Velocity Model

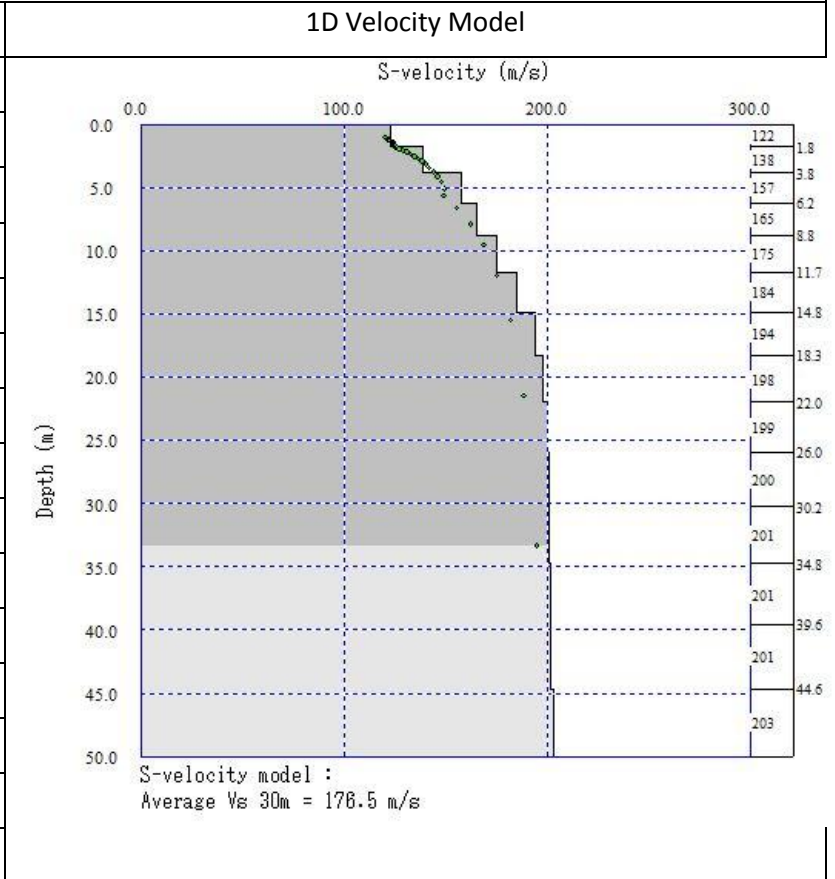


2D Velocity Model

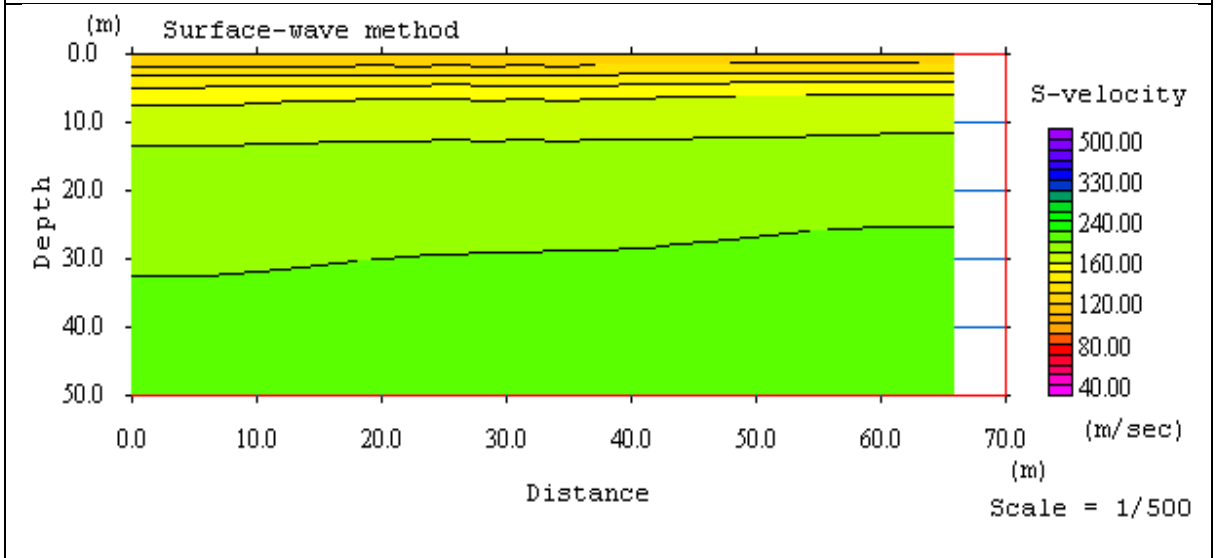


Char Nilakshmia_09

Depth(m)	S-velocity(m/s)
0.000000	122.959547
1.785716	138.902411
3.846154	157.589316
6.181324	165.140733
8.791209	175.220922
11.675824	184.734628
14.835175	194.309056
18.269252	198.166907
21.978023	199.813694
25.961539	200.685084
30.219801	201.104984
34.752768	201.374739
39.560441	201.866478
44.642858	203.227654
60.714327	203.488827



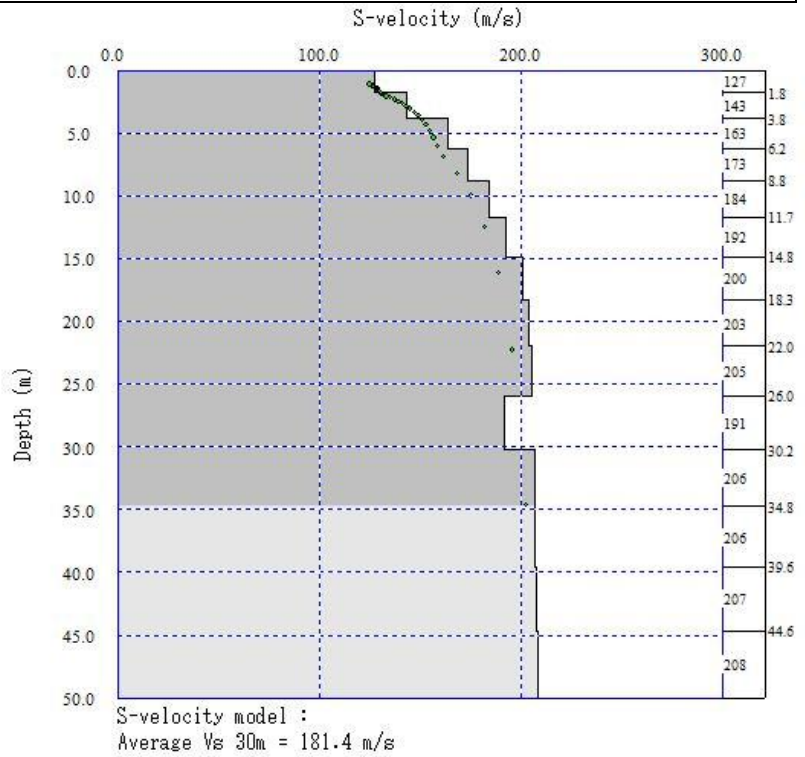
2D Velocity Model



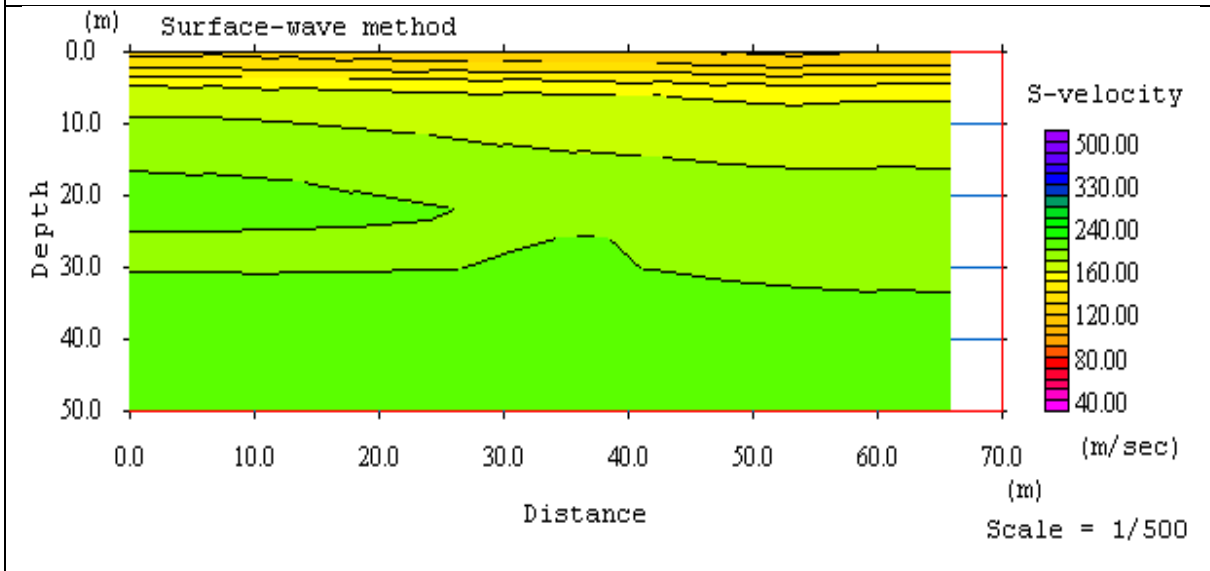
Char Nilakshmia_12

Depth(m)	S-velocity(m/s)
0.000000	127.446726
1.785716	143.549636
3.846154	163.898245
6.181324	173.813254
8.791209	184.163719
11.675824	192.851052
14.835175	200.788066
18.269252	203.986570
21.978023	205.450907
25.961539	191.854343
30.219801	206.725836
34.752768	206.969649
39.560441	207.332060
44.642858	208.624035
60.714327	208.705366

1D Velocity Model



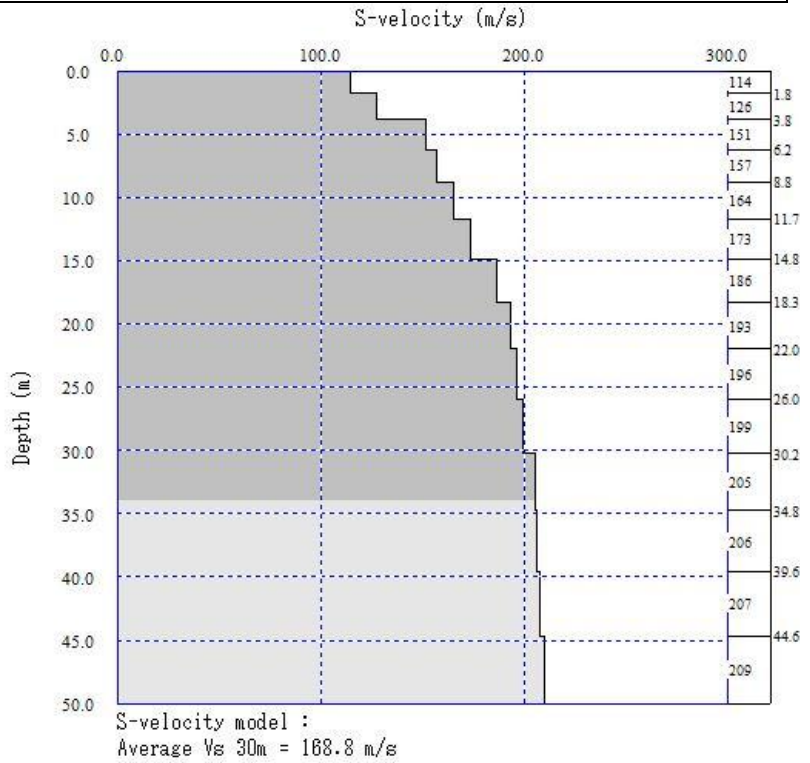
2D Velocity Model



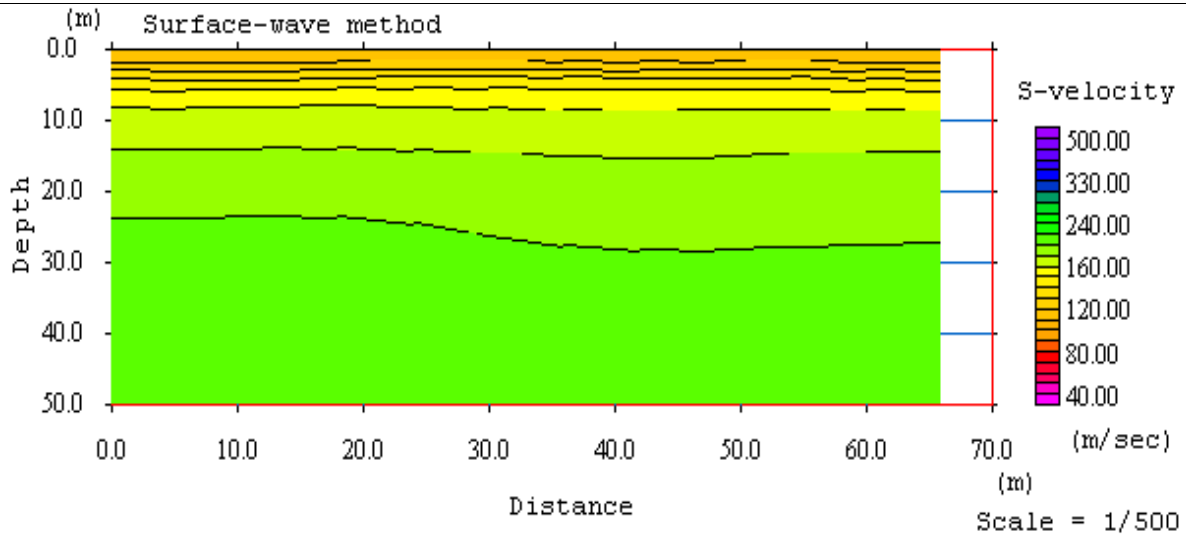
Char Nilakshmia_13

Depth(m)	S-velocity(m/s)
0.000000	114.588030
1.785716	126.955137
3.846154	151.717439
6.181324	157.156393
8.791209	164.984927
11.675824	173.176840
14.835175	186.063230
18.269252	193.097994
21.978023	196.596220
25.961539	199.178159
30.219801	205.194771
34.752768	206.397697
39.560441	207.621545
44.642858	209.530503
60.714327	210.066274

1D Velocity Model



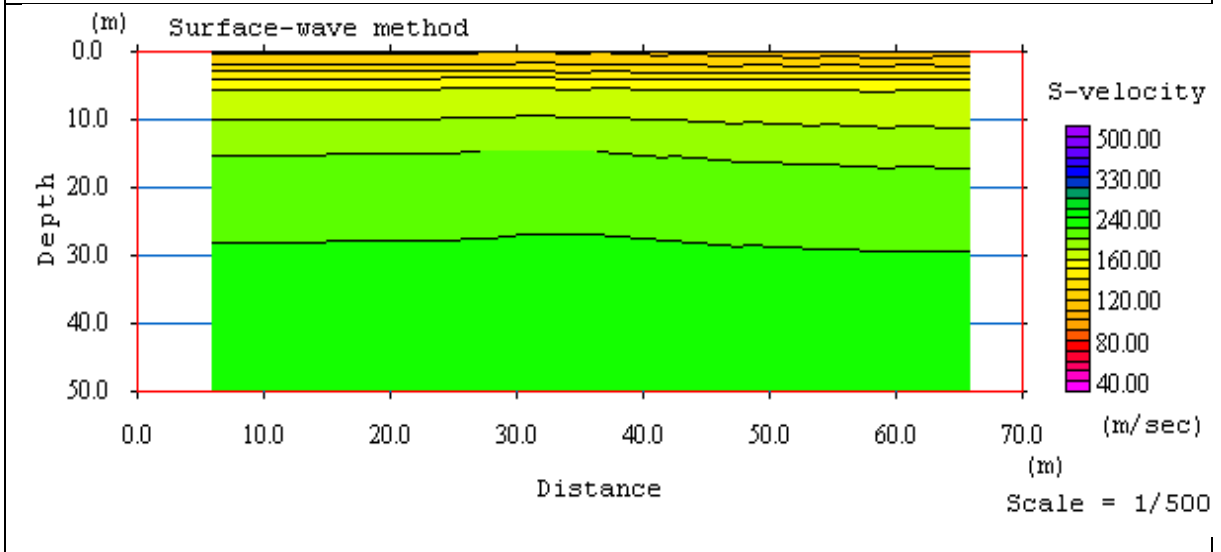
2D Velocity Model



Dapunia_10

Depth(m)	S-velocity(m/s)	1D Velocity Model
0.000000	120.175041	<p>S-velocity (m/s)</p> <p>Depth (m)</p> <p>S-velocity model : Average Vs 30m = 184.6 m/s</p>
1.785716	137.773424	
3.846154	160.027802	
6.181324	170.631796	
8.791209	183.306158	
11.675824	194.419891	
14.835175	206.962943	
18.269252	209.881961	
21.978023	218.919024	
25.961539	220.272571	
30.219801	223.324135	
34.752768	224.306107	
39.560441	225.160465	
44.642858	226.861283	
60.714327	227.572113	

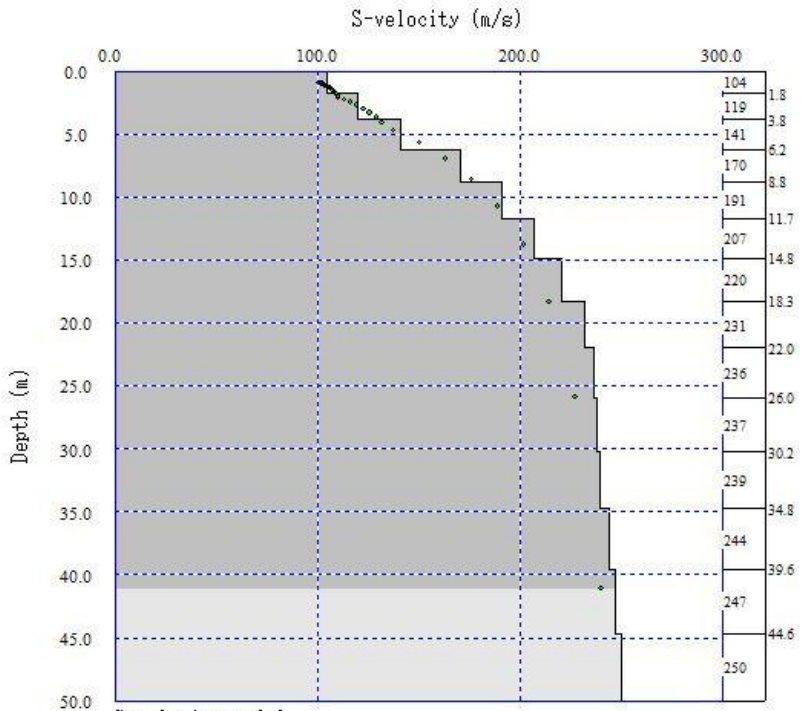
2D Velocity Model



Dapunia_14

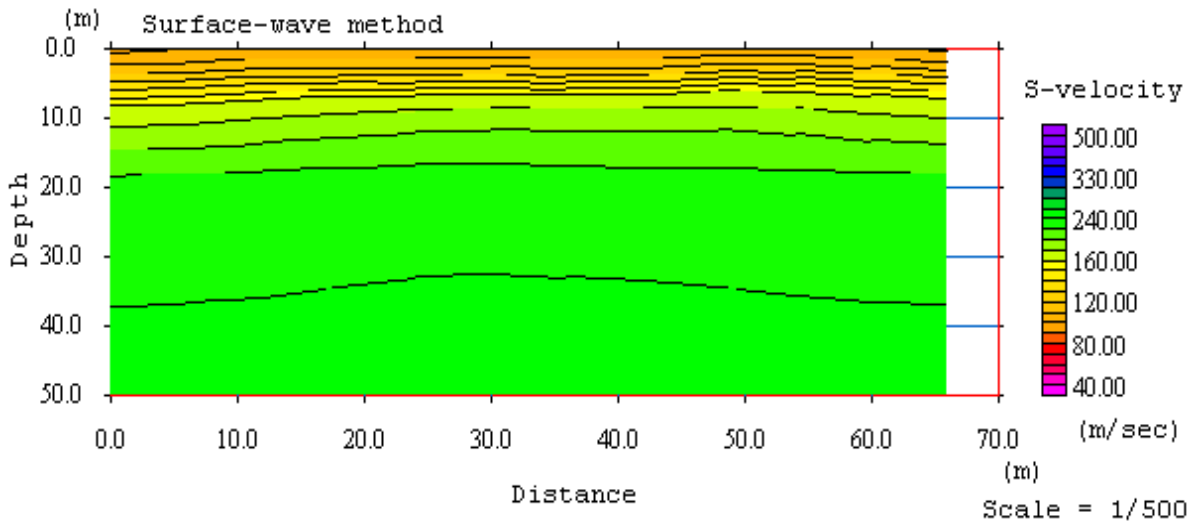
Depth(m)	S-velocity(m/s)
0.000000	104.836412
1.785716	119.698189
3.846154	141.277209
6.181324	170.327023
8.791209	191.363290
11.675824	207.067788
14.835175	220.464677
18.269252	231.794357
21.978023	236.468256
25.961539	237.757131
30.219801	239.141062
34.752768	244.277254
39.560441	247.357488
44.642858	250.367165
60.714327	252.196014

1D Velocity Model



S-velocity model :
Average Vs 30m = 185.4 m/s

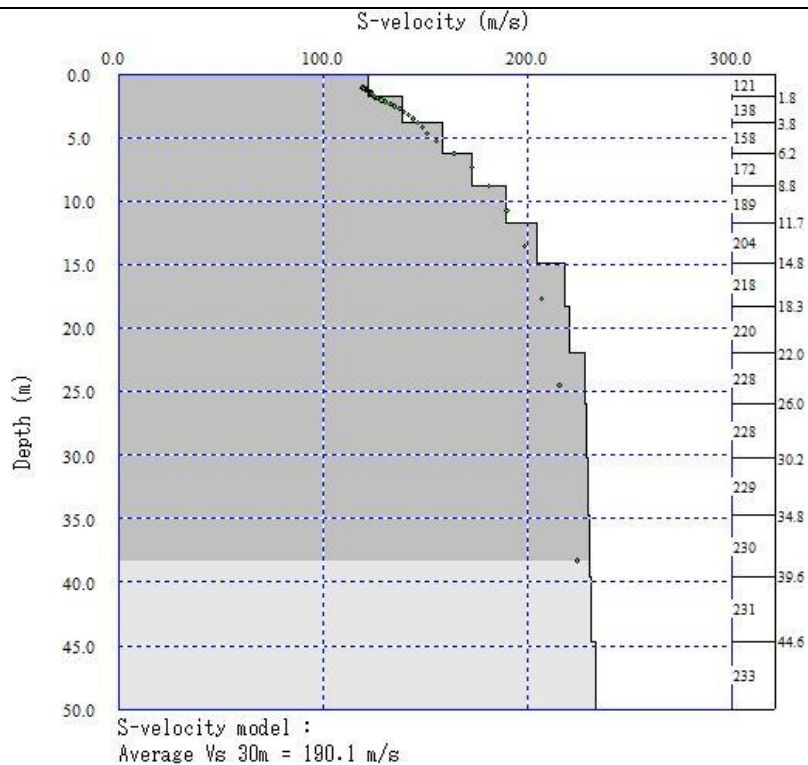
2D Velocity Model



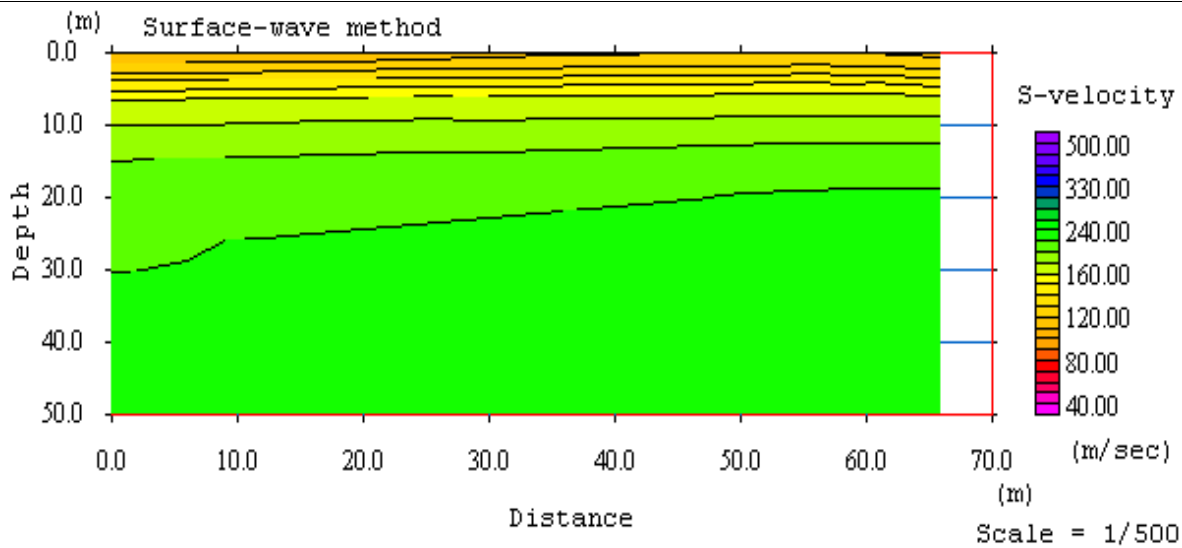
Ghagra_15

Depth(m)	S-velocity(m/s)
0.000000	121.612929
1.785716	138.601899
3.846154	158.294201
6.181324	172.510624
8.791209	189.145759
11.675824	204.350352
14.835175	218.031108
18.269252	220.515534
21.978023	228.141427
25.961539	228.926197
30.219801	229.468644
34.752768	230.441034
39.560441	231.366009
44.642858	233.419031
60.714327	234.396264

1D Velocity Model



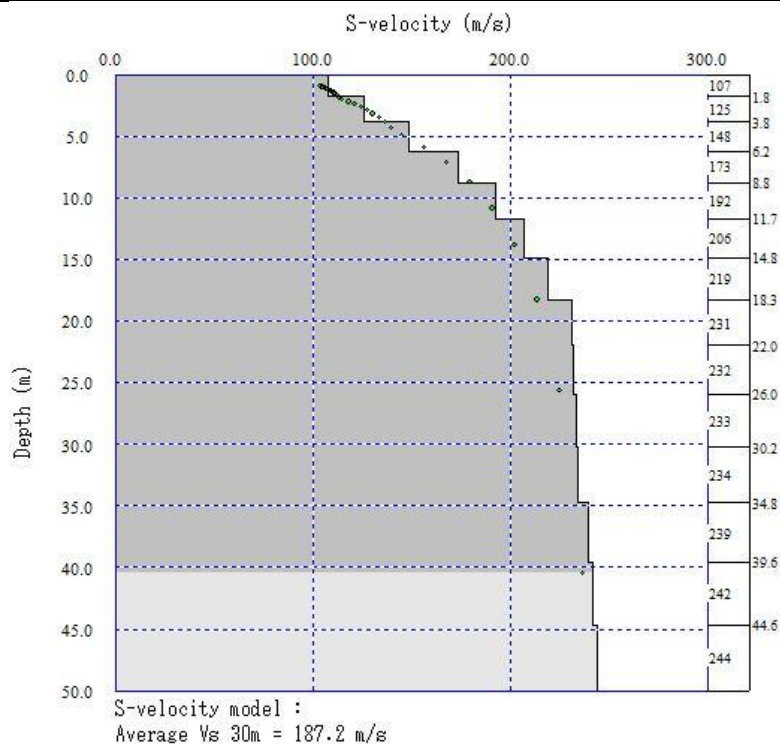
2D Velocity Model



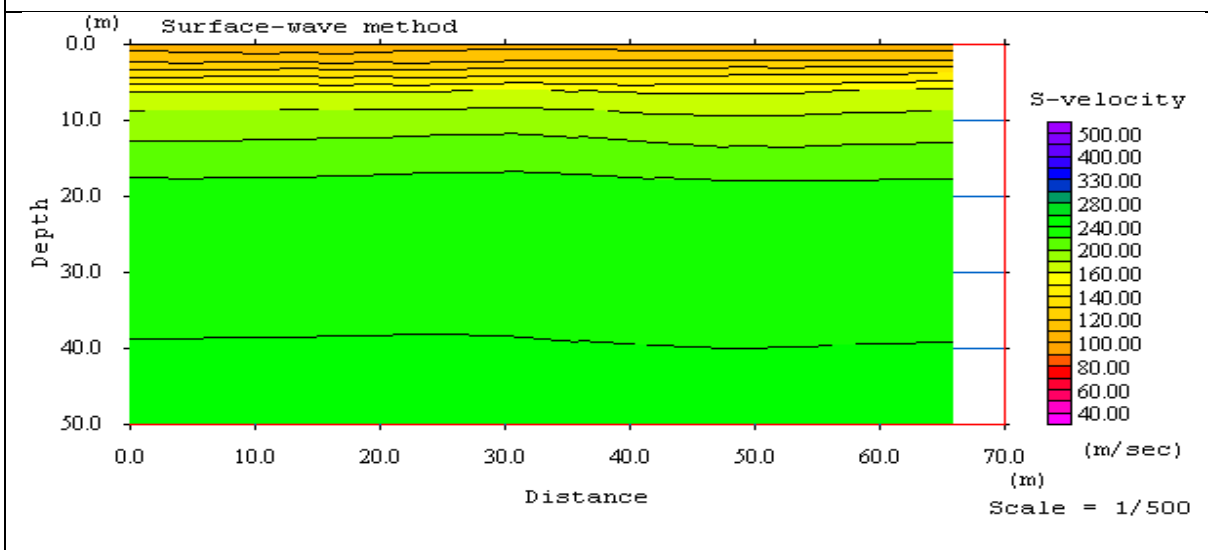
Ghagra_16

Depth(m)	S-velocity(m/s)
0.000000	107.303113
1.785716	125.512913
3.846154	148.580045
6.181324	173.645929
8.791209	192.529798
11.675824	206.559777
14.835175	219.092801
18.269252	231.164753
21.978023	232.168943
25.961539	233.165964
30.219801	234.143510
34.752768	239.477277
39.560441	242.147908
44.642858	244.277939
60.714327	245.490715

1D Velocity Model

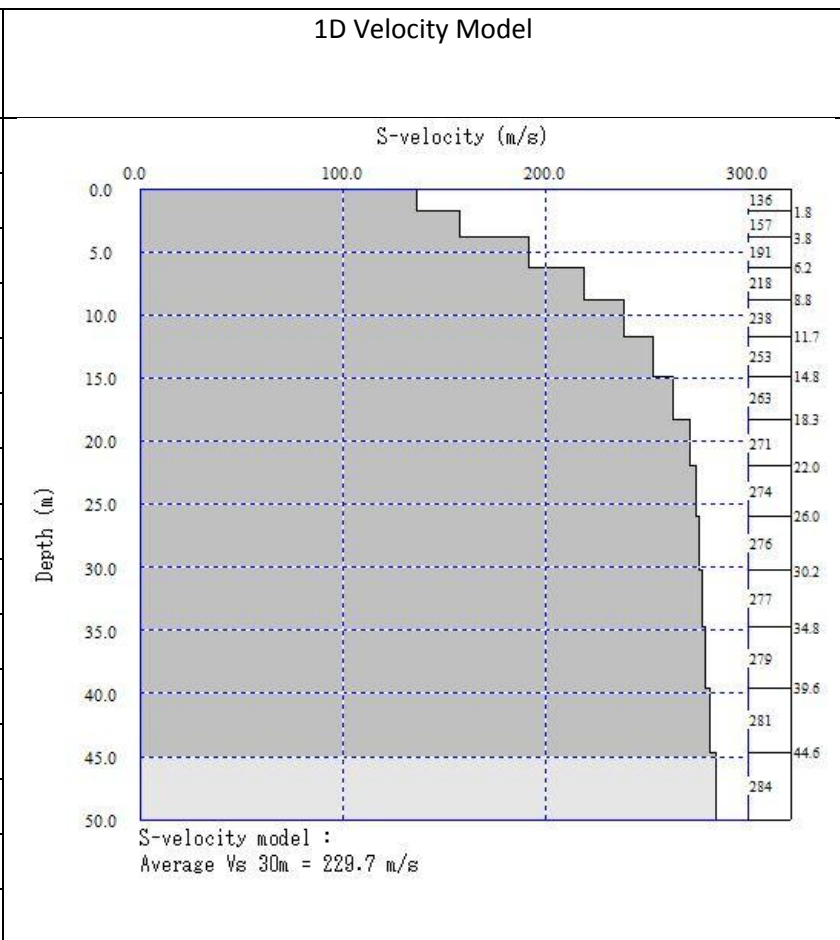


2D Velocity Model

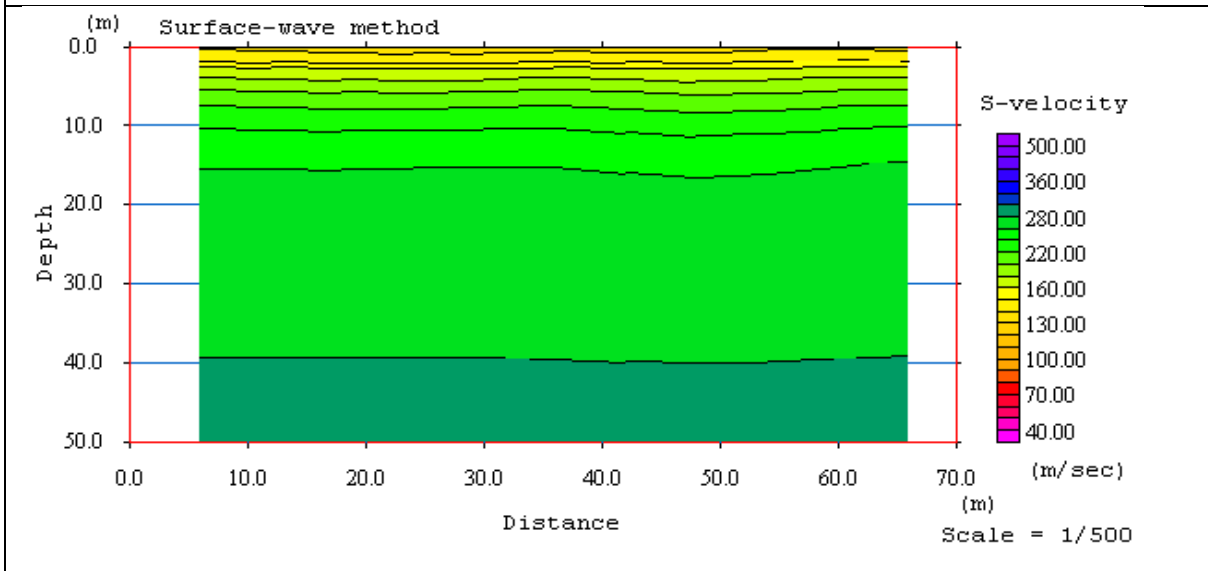


Ghagra_20

Depth(m)	S-velocity(m/s)
0.000000	136.537284
1.785716	157.851279
3.846154	191.613704
6.181324	218.985647
8.791209	238.963947
11.675824	253.136903
14.835175	263.127267
18.269252	271.751910
21.978023	274.699777
25.961539	276.205927
30.219801	277.589202
34.752768	279.060036
39.560441	281.086385
44.642858	284.440875
60.714327	286.935359



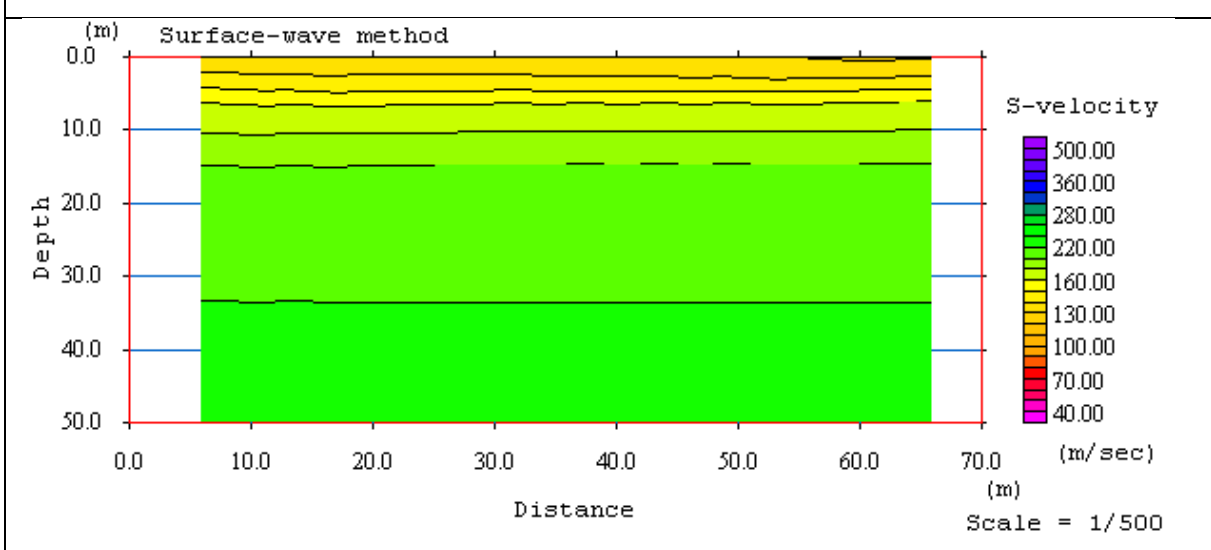
2D Velocity Model



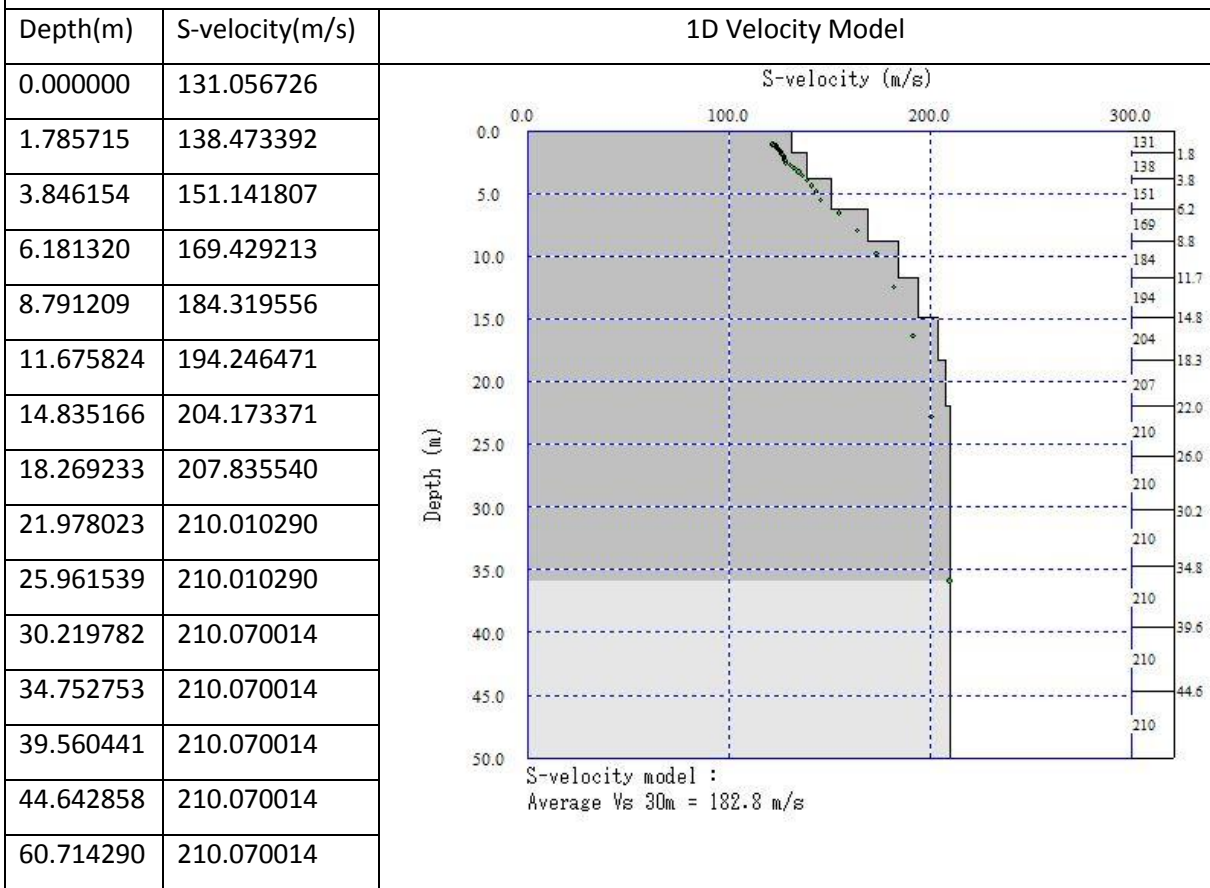
Ghagra_21

Depth(m)	S-velocity(m/s)	1D Velocity Model
0.000000	134.801507	<p style="text-align: center;">S-velocity model : Average Vs 30m = 184.8 m/s</p>
1.785716	141.923025	
3.846154	153.779283	
6.181324	163.983300	
8.791209	179.322362	
11.675824	192.851797	
14.835175	206.749812	
18.269252	210.040078	
21.978023	217.577949	
25.961539	218.938440	
30.219801	219.856620	
34.752768	220.703900	
39.560441	221.955851	
44.642858	224.383041	
60.714327	225.468323	

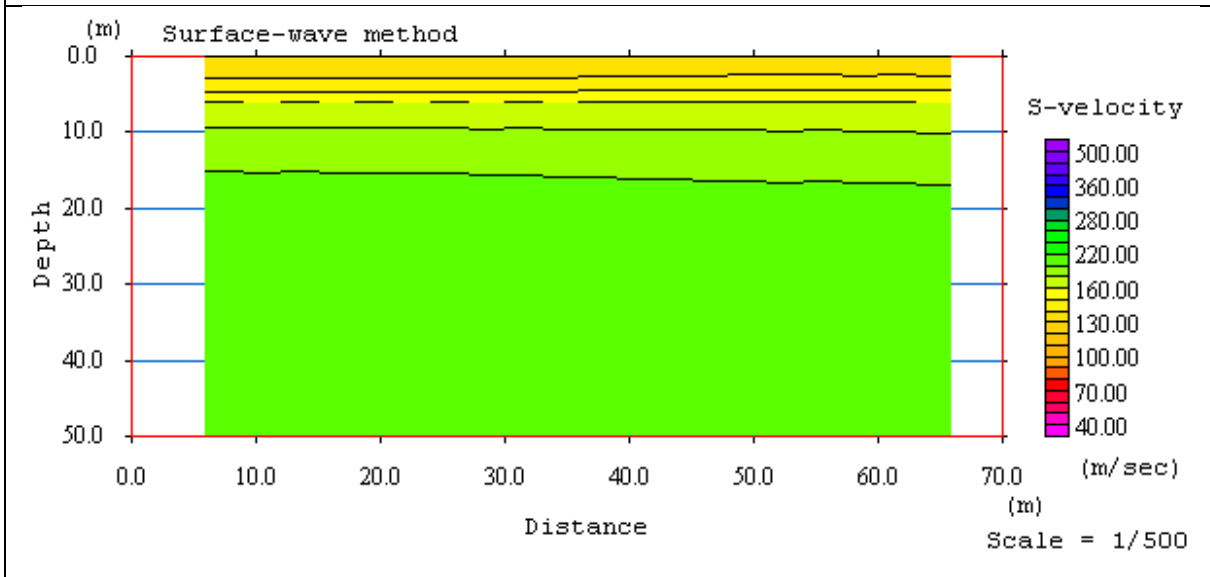
2D Velocity Model



Kewatkhali_17



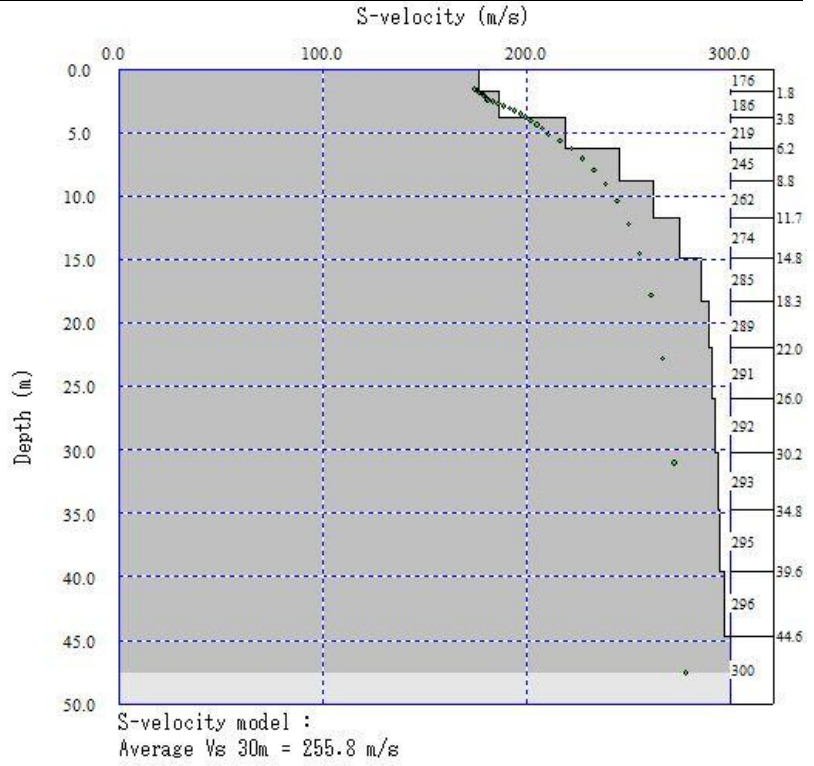
2D Velocity Model



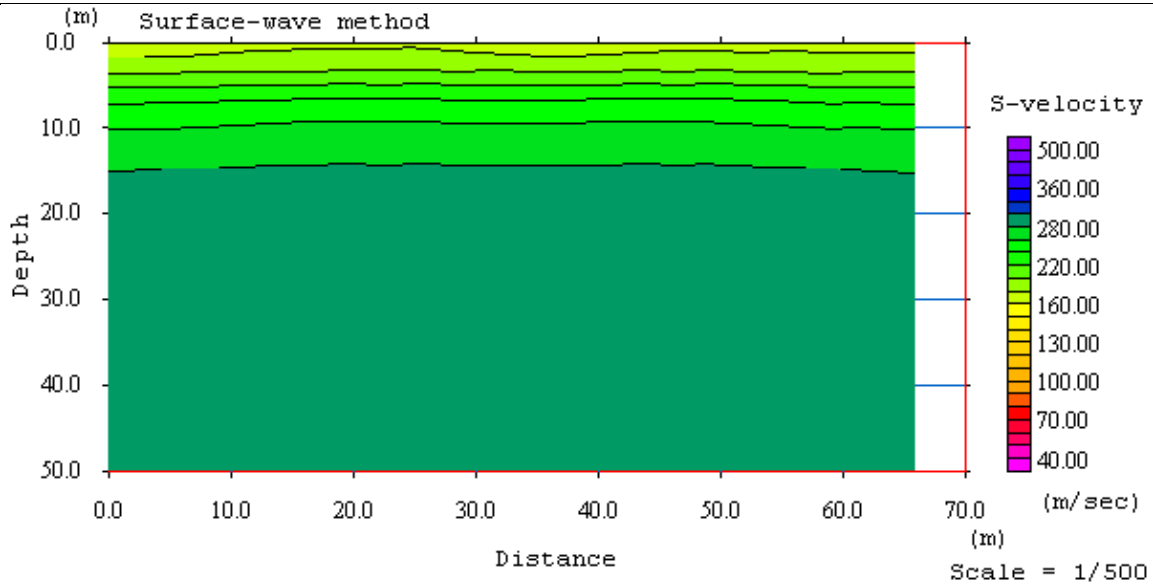
Khagdahar_04

Depth(m)	S-velocity(m/s)
0.000000	176.162705
1.785716	186.192319
3.846154	219.119549
6.181324	245.615646
8.791209	262.436837
11.675824	274.979353
14.835175	285.400093
18.269252	289.284140
21.978023	291.275412
25.961539	292.792499
30.219801	293.993235
34.752768	295.206696
39.560441	296.977341
44.642858	300.151080
60.714327	302.450925

1D Velocity Model



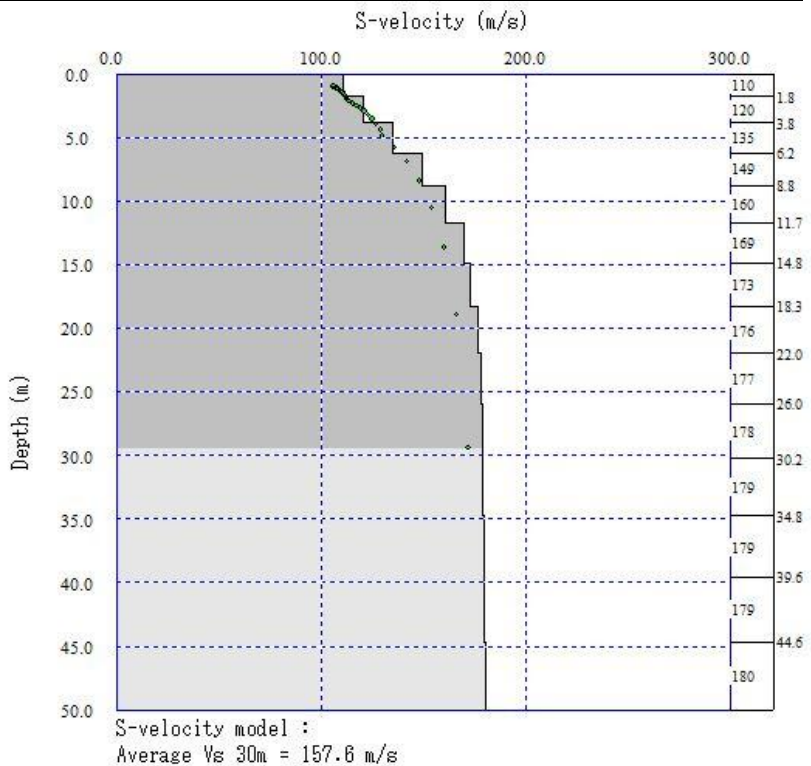
2D Velocity Model



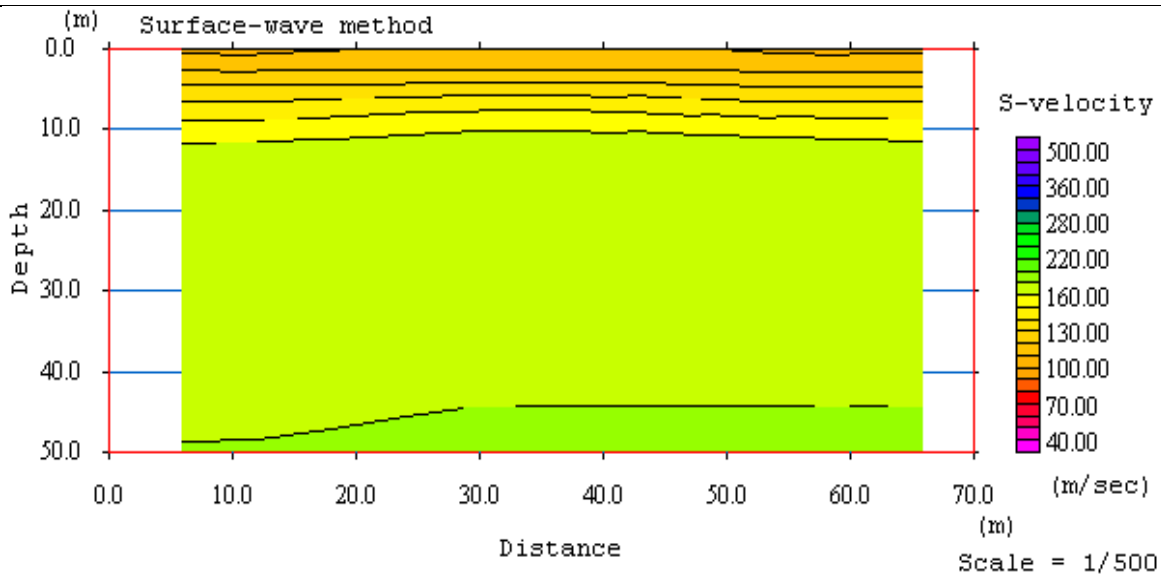
Khagdahar_05

Depth(m)	S-velocity(m/s)
0.000000	110.527843
1.785716	120.793536
3.846154	135.248452
6.181324	149.600804
8.791209	160.716251
11.675824	169.962123
14.835175	173.097670
18.269252	176.454157
21.978023	177.930221
25.961539	178.710505
30.219801	179.039329
34.752768	179.194823
39.560441	179.527462
44.642858	180.564970
60.714327	180.564970

1D Velocity Model



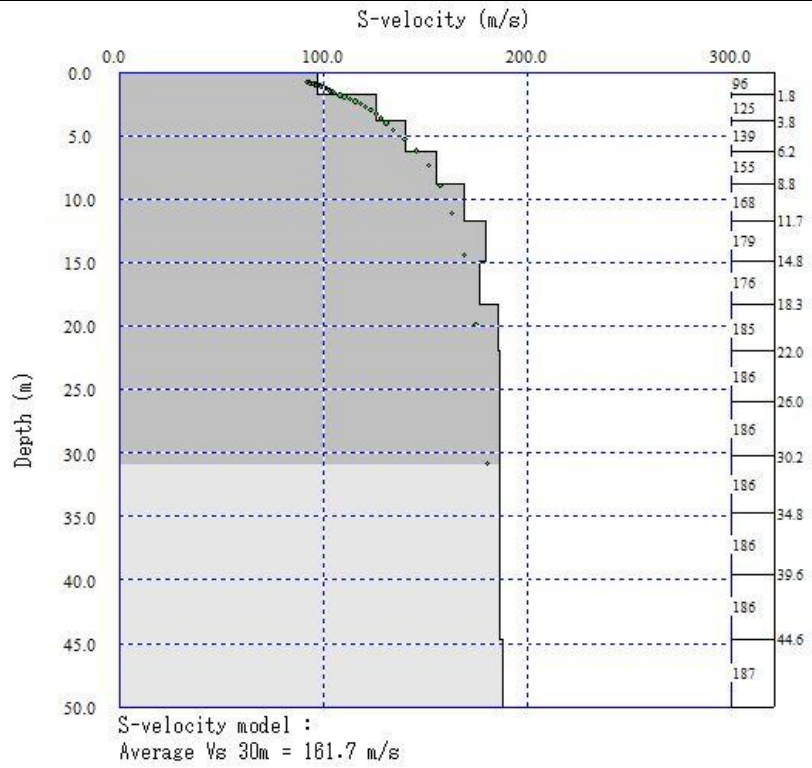
2D Velocity Model



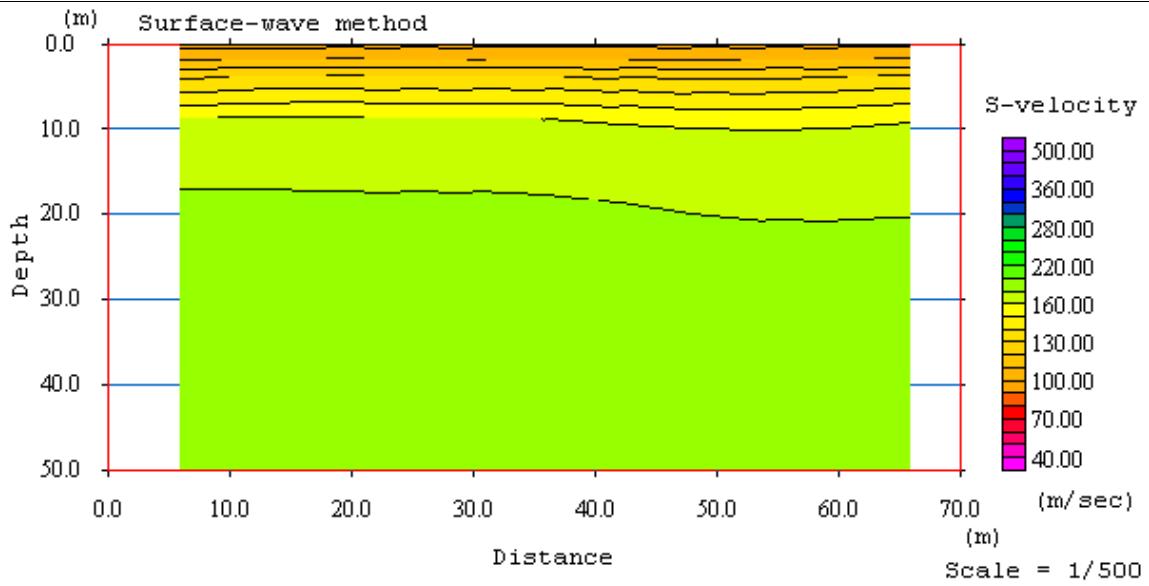
Khagdahar_06

Depth(m)	S-velocity(m/s)
0.000000	96.814133
1.785716	125.447005
3.846154	139.798015
6.181324	155.031443
8.791209	168.853685
11.675824	179.577485
14.835175	176.313251
18.269252	185.897008
21.978023	186.470464
25.961539	186.534598
30.219801	186.672464
34.752768	186.650485
39.560441	186.852887
44.642858	187.795788
60.714327	187.795788

1D Velocity Model



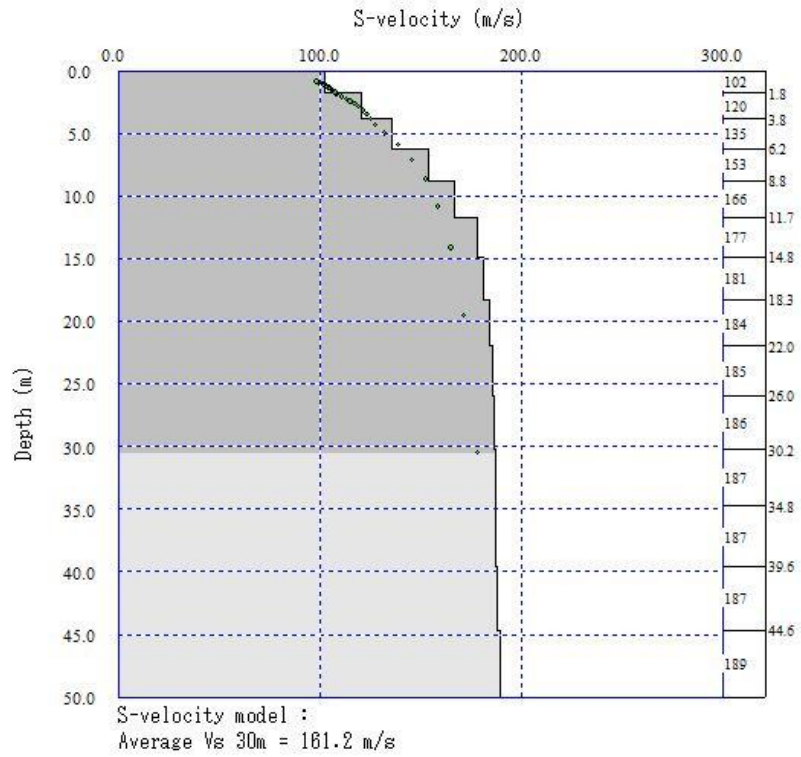
2D Velocity Model



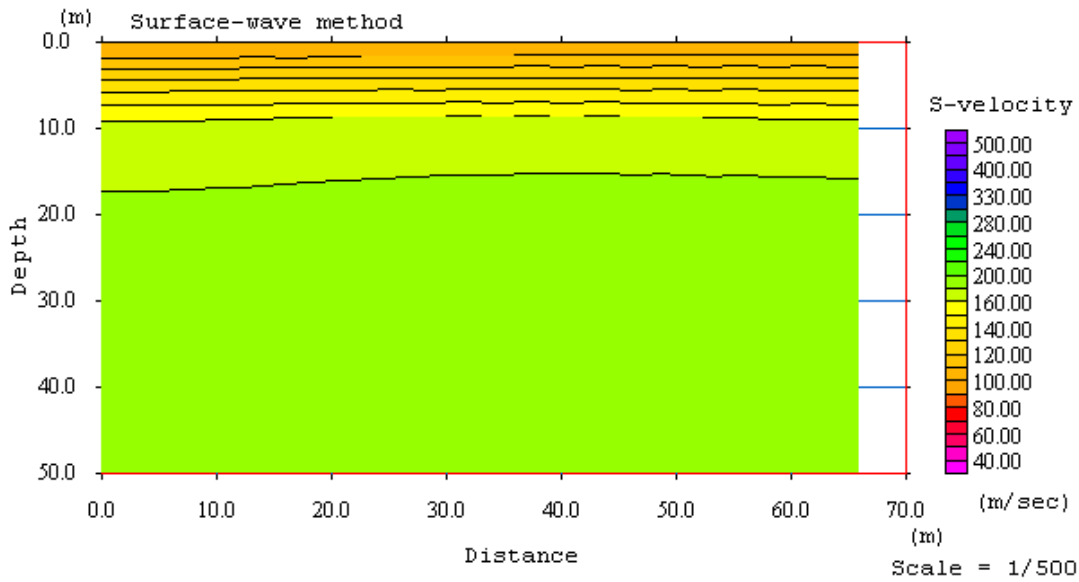
Sirta_01

Depth(m)	S-velocity(m/s)
0.000000	102.432735
1.785716	120.218746
3.846154	135.517374
6.181324	153.530955
8.791209	166.732937
11.675824	177.654997
14.835175	181.273341
18.269252	184.057221
21.978023	185.724691
25.961539	186.655596
30.219801	187.101290
34.752768	187.376425
39.560441	187.916413
44.642858	189.403534
60.714327	189.432546

1D Velocity Model



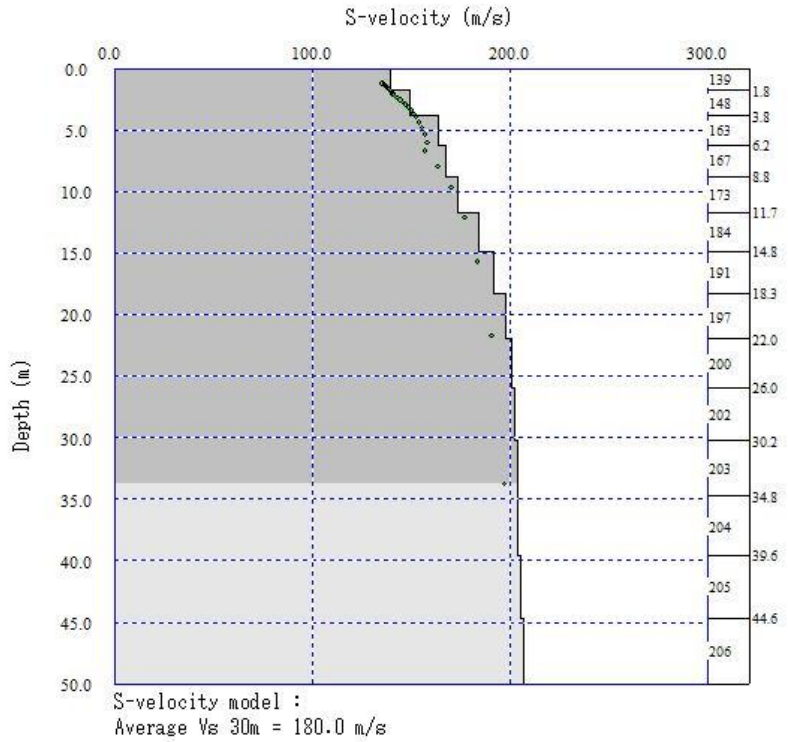
2D Velocity Model



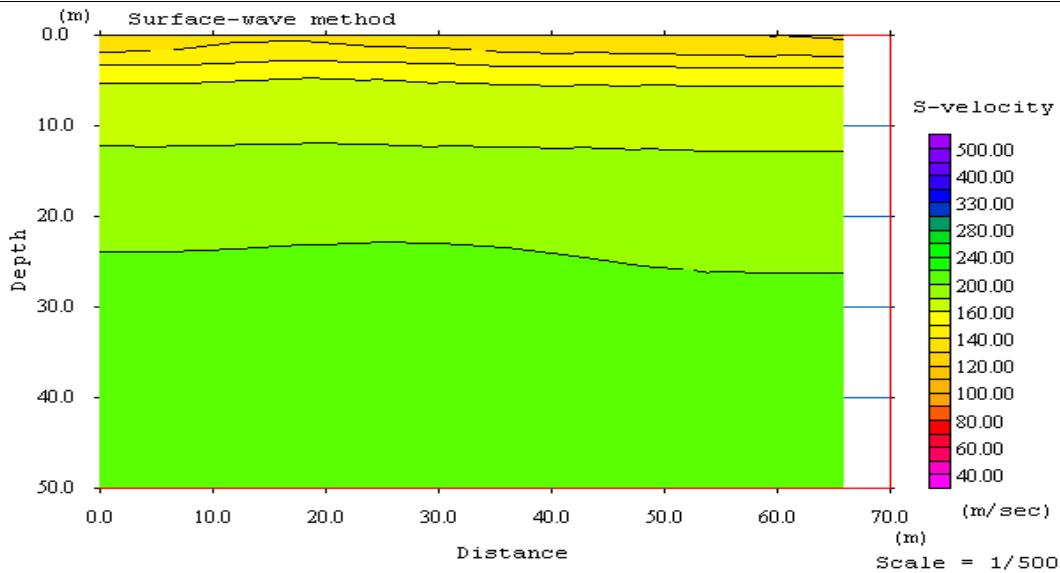
Sirta_02

Depth(m)	S-velocity(m/s)
0.000000	139.403760
1.785716	148.925111
3.846154	163.730368
6.181324	167.401060
8.791209	173.961699
11.675824	184.245214
14.835175	191.783562
18.269252	197.965667
21.978023	200.590357
25.961539	202.281505
30.219801	203.649744
34.752768	204.279318
39.560441	205.030009
44.642858	206.589580
60.714327	206.985787

1D Velocity Model

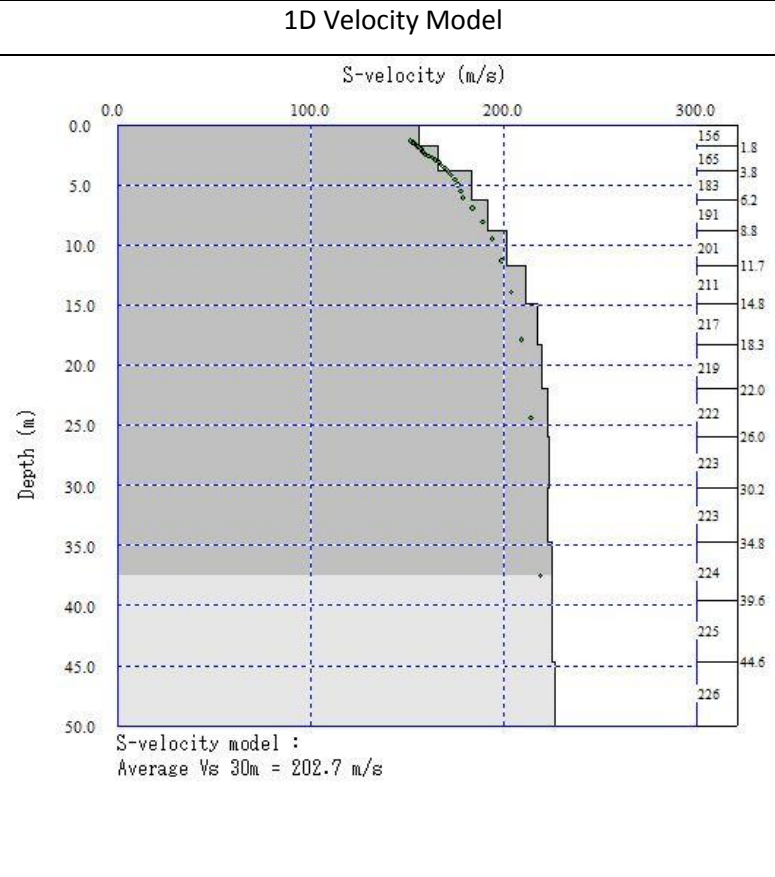


2D Velocity Model

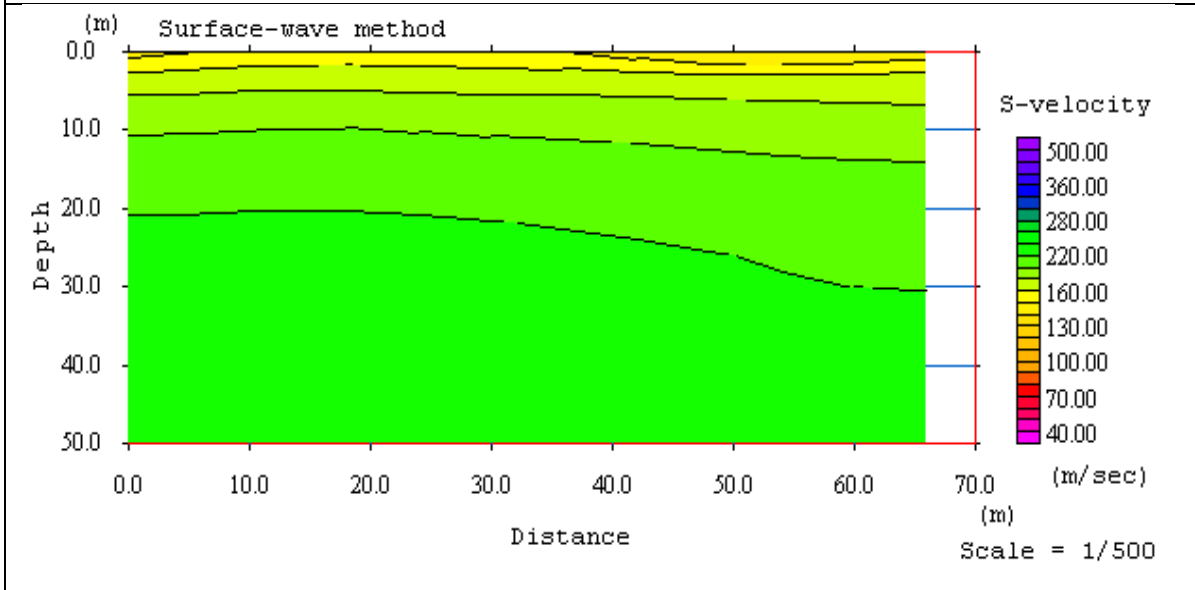


Bhabkhali_22

Depth(m)	S-velocity(m/s)
0.000000	156.237468
1.785716	165.781215
3.846154	183.593258
6.181324	191.889048
8.791209	201.871380
11.675824	211.636990
14.835175	217.292368
18.269252	219.951332
21.978023	222.775474
25.961539	223.832086
30.219801	223.222166
34.752768	224.761829
39.560441	225.328937
44.642858	226.793319
60.714327	227.389008



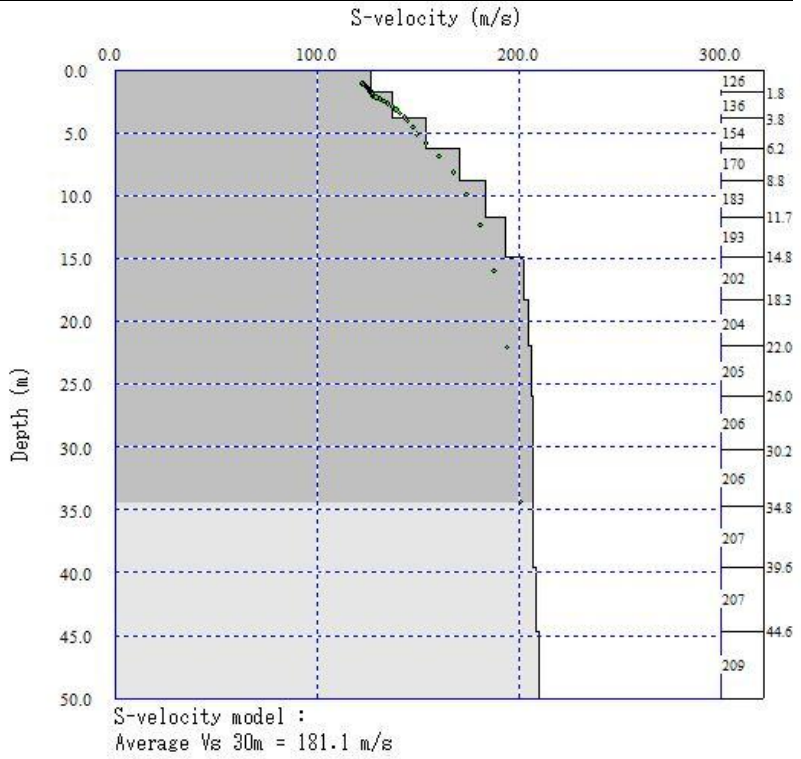
2D Velocity Model



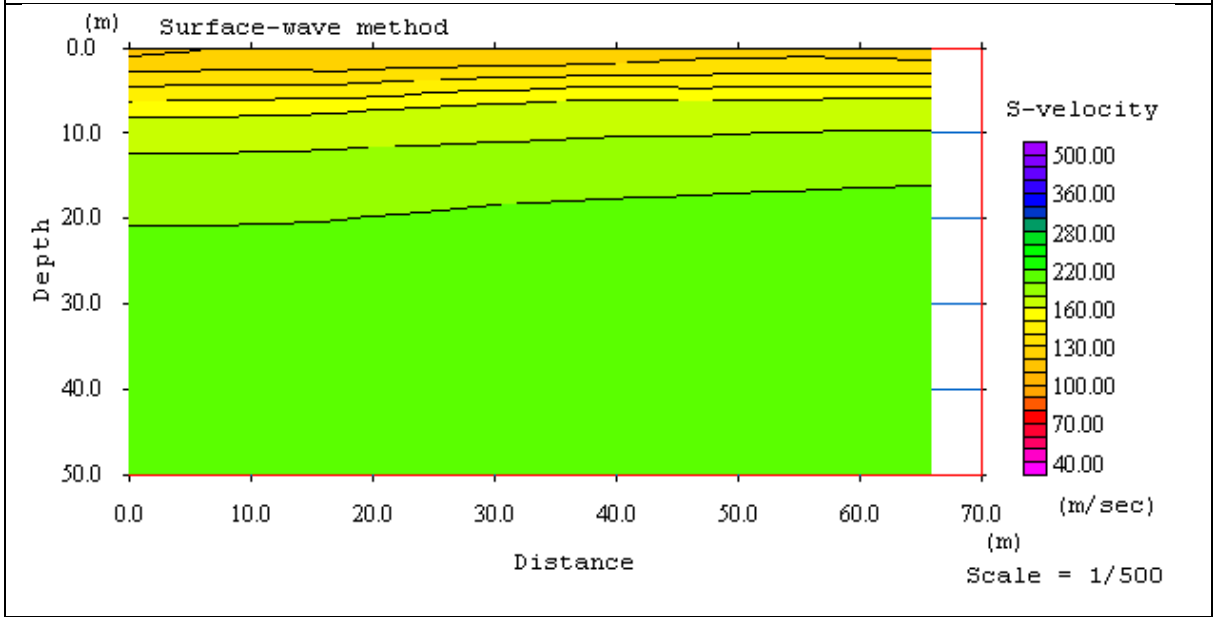
Bhbkhali_23

Depth(m)	S-velocity(m/s)
0.000000	126.459464
1.785716	136.797622
3.846154	154.151618
6.181324	170.640826
8.791209	183.208227
11.675824	193.447366
14.835175	202.211663
18.269252	204.883322
21.978023	205.924794
25.961539	206.509873
30.219801	206.885979
34.752768	207.271770
39.560441	207.963735
44.642858	209.617481
60.714327	210.126653

1D Velocity Model

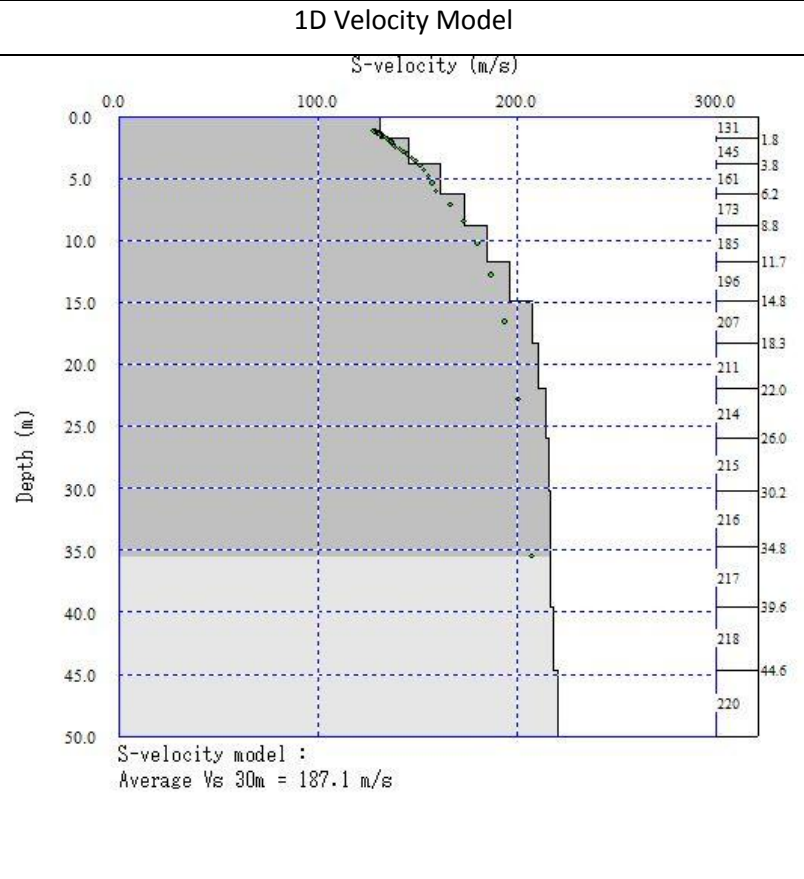


2D Velocity Model

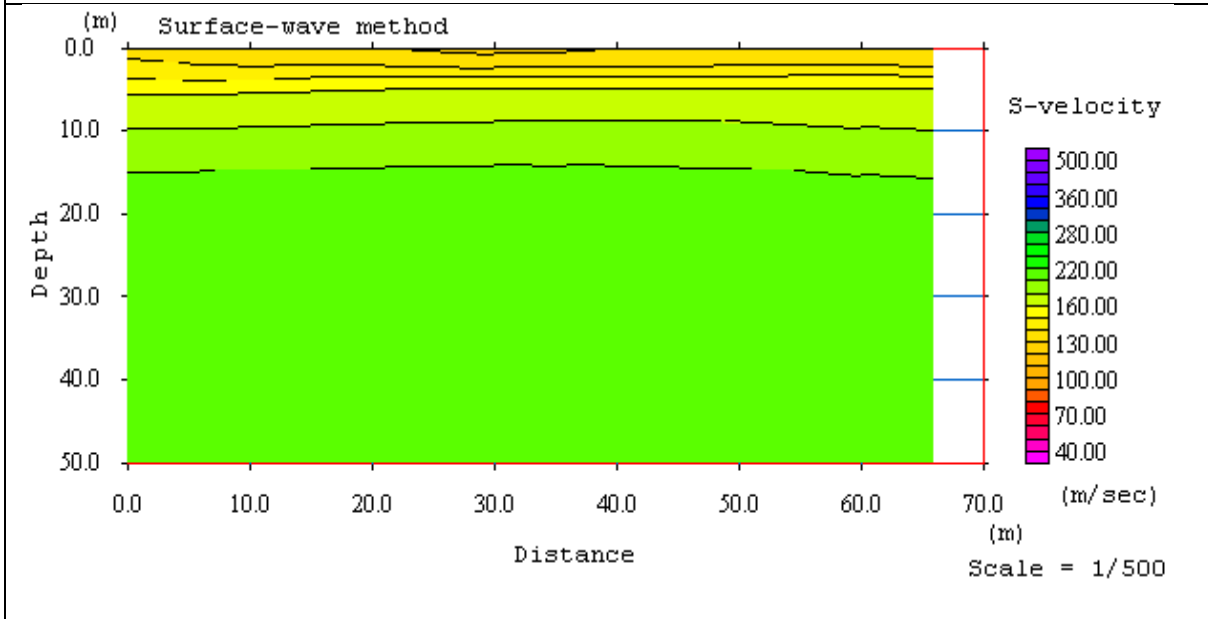


Bhabkhali_24

Depth(m)	S-velocity(m/s)
0.000000	131.362244
1.785716	145.620391
3.846154	161.558315
6.181324	173.309684
8.791209	185.076043
11.675824	196.180612
14.835175	207.620680
18.269252	211.104080
21.978023	214.428693
25.961539	215.794519
30.219801	216.577590
34.752768	217.198476
39.560441	218.166634
44.642858	220.234498
60.714327	221.039191



2D Velocity Model



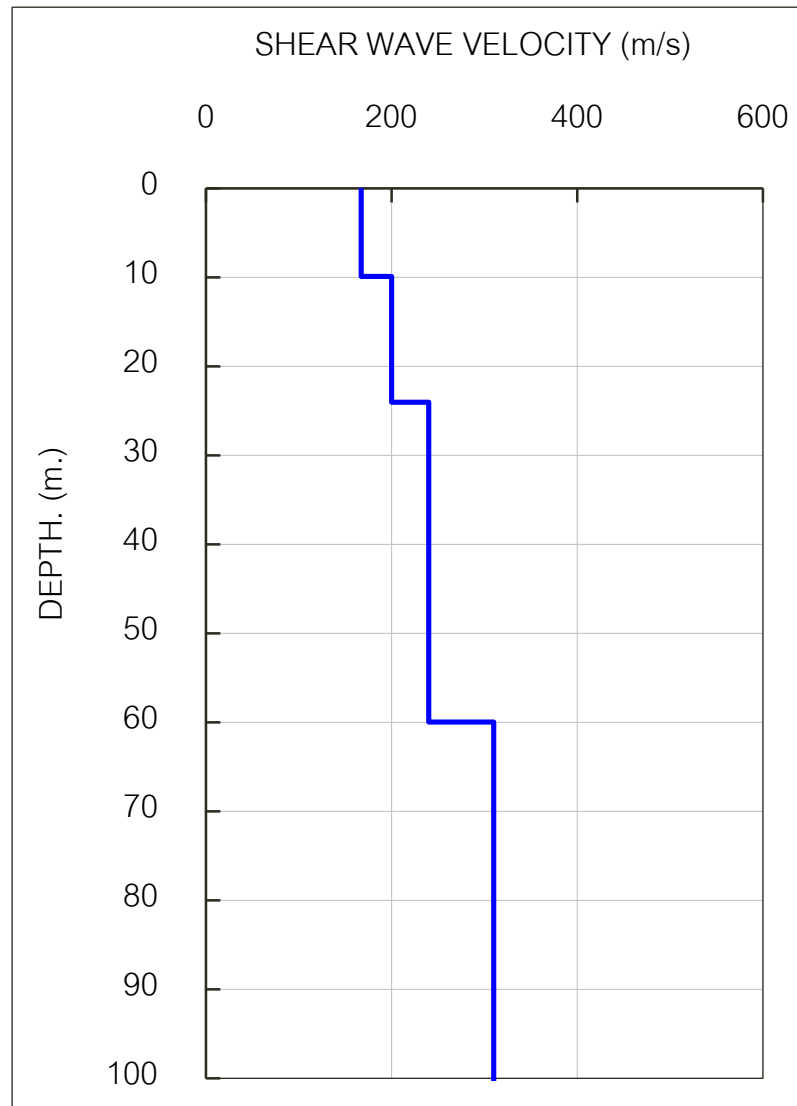
Appendix V: Array Microtremor Survey Results

Array-1

Date: 07/07/2014

Location's name: Bagun Bari, Khagdaher

Center Coordinate: Latitude: 24° 47' 15.180" Longitude: 90° 19' 00.683"

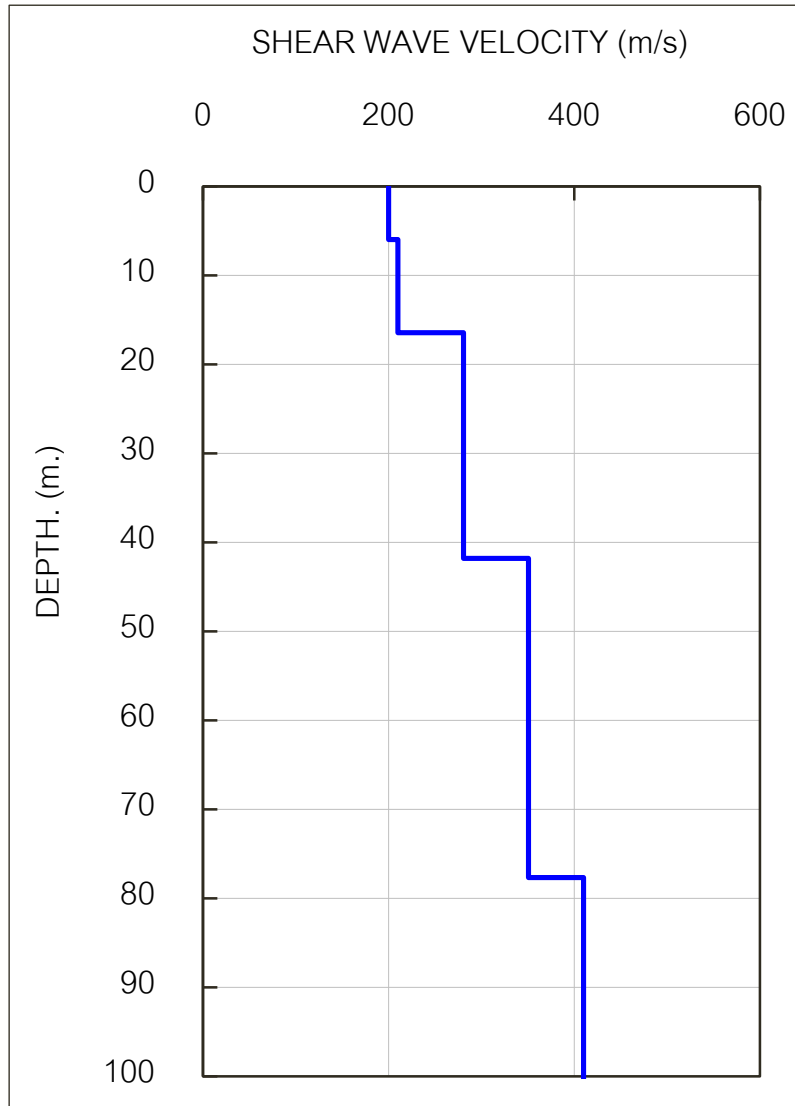


Array-2

Date: 10/07/2014

Location's name: Uzan Ghagra, Ghagra Union

Center Coordinate: Latitude: 24.71334 Longitude: 90.35938

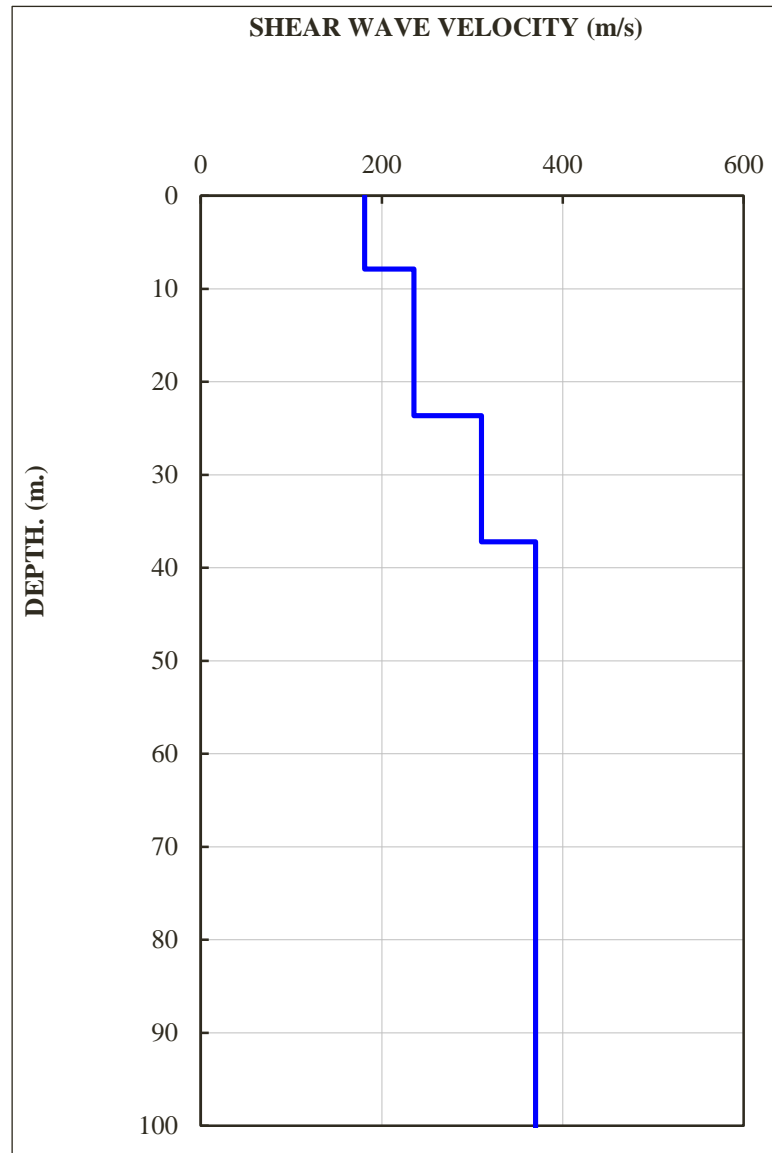


Array-3

Date: 19/07/2014

Location's name: Nikuria

Center Coordinate: Latitude: 24.74718 Longitude: 90.48255

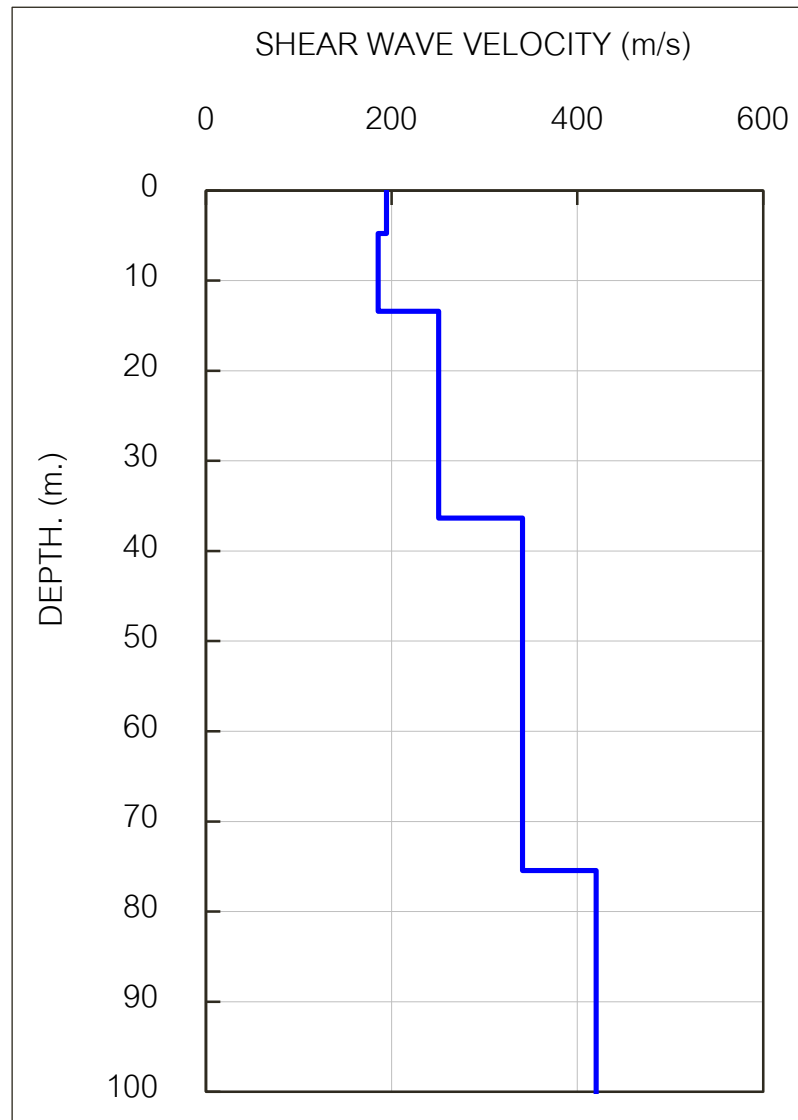


Array-4

Date: 19/07/2014

Location's name: Char Ishwardia Union Complex

Center Coordinate: Latitude: 24.77751 Longitude: 90.43461



Appendix VI: Single Microtremor survey Results

Single Microtremor Survey ID:

MT-01

Location:

Sirta Bazar

Union Name: Sirta

Coordinate:

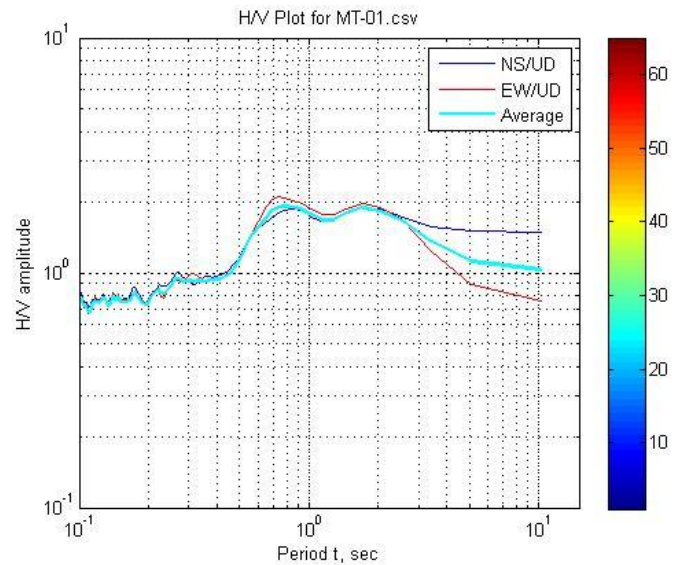
Lat- N 24°48'47.92"

Long- E 90°48'47.92"

Result:

Peak Amplitude- 1.929

Peak Period- 0.79



Single Microtremor Survey ID:

MT-02

Location:

Dumkona

Union Name: Sirta

Coordinate:

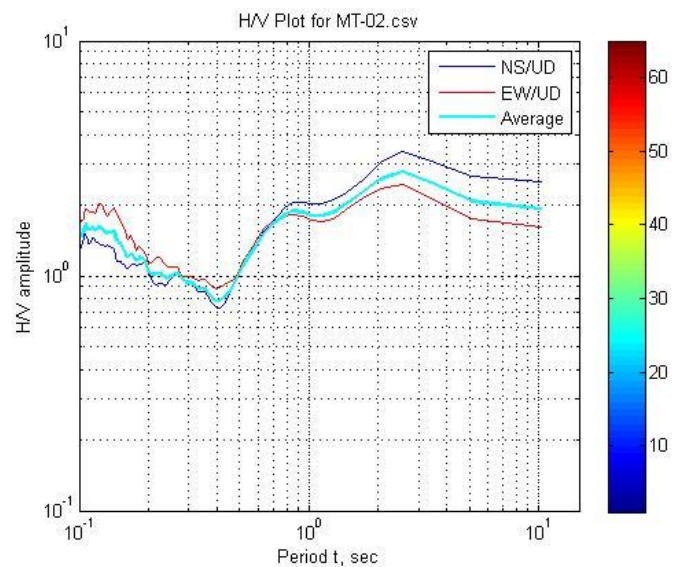
Lat- N 24°49'19.97"

Long- E 90°21'52.86"

Result:

Peak Amplitude- 1.896

Peak Period- 0.85



Single Microtremor Survey ID:

MT-03

Location:

Chor khoriccha

Union Name: Sirta

Coordinate:

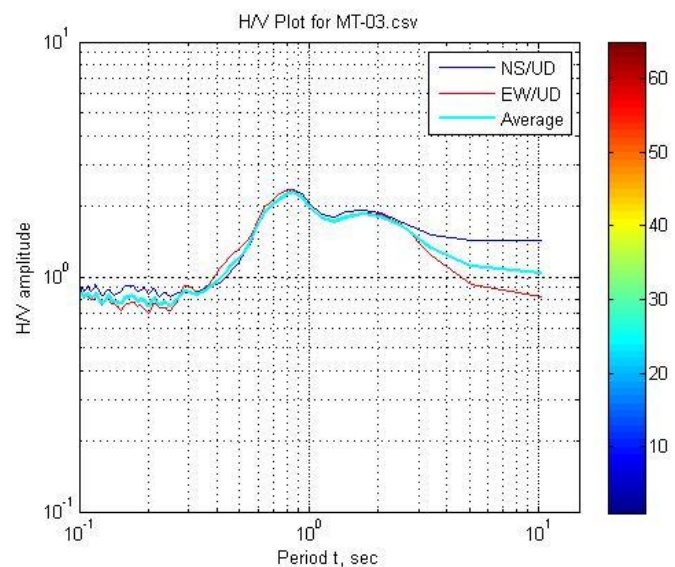
Lat- N 24°49'17.87"

Long- E 90°23'42.04"

Result:

Peak Amplitude- 2.313

Peak Period- 0.85



Single Microtremor Survey ID:

MT-04

Location:

Bariyaner mor

Union Name: Khagdahar

Coordinate:

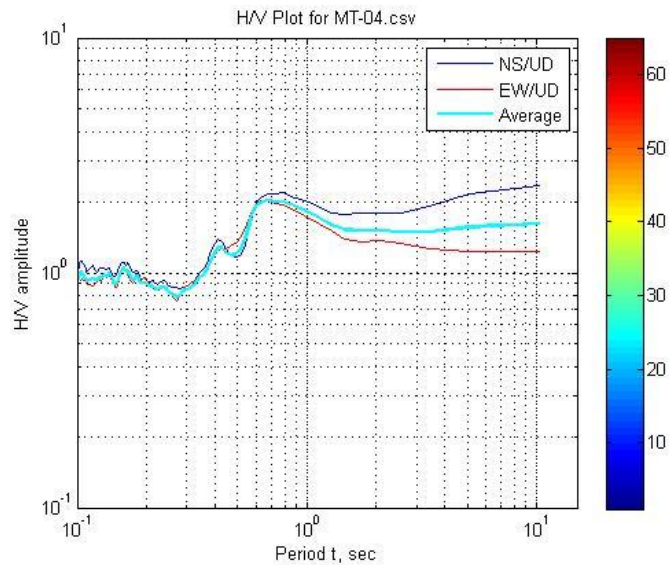
Lat- N 24°47'60"

Long- E 90°19'18"

Result:

Peak Amplitude- 2.041

Peak Period- 0.68



Single Microtremor Survey ID:

MT-05

Location:

Taragas mosque

Union Name: Khagdahar

Coordinate:

Lat- N 24°47'39"

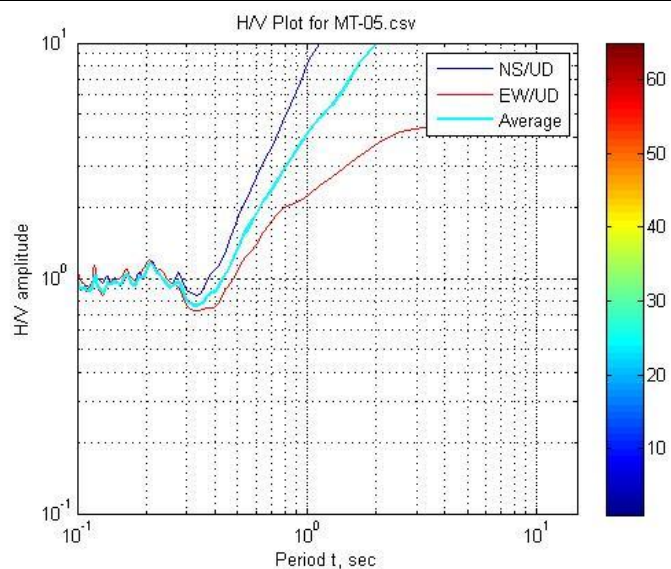
Long- E 90°19'57"

Result:

Peak Amplitude- 0.970

Peak Period- 0.28

Remark: **Bad Signal**



Single Microtremor Survey ID:

MT-06

Location:

Kaddura Bazar

Union Name: Khagdahar

Coordinate:

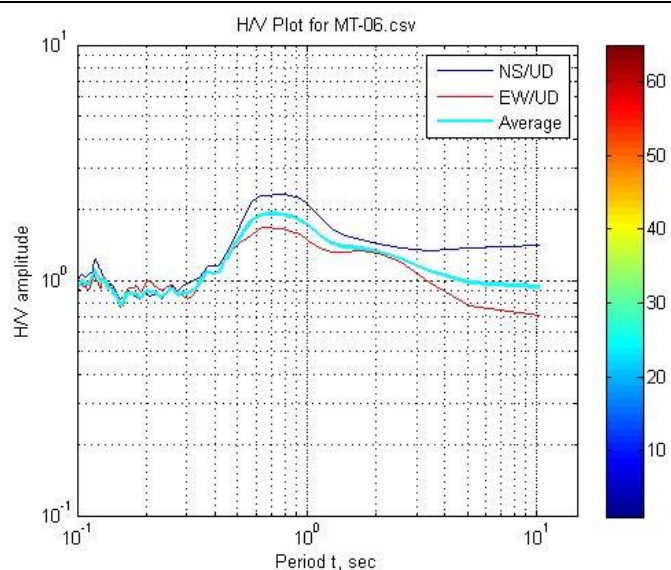
Lat- N 24°46'49.53"

Long- E 90°21'50.03"

Result:

Peak Amplitude- 1.932

Peak Period- 0.68



Single Microtremor Survey ID:

MT-07

Location:

Vobanipur Bazar

Union Name: Sirta

Coordinate:

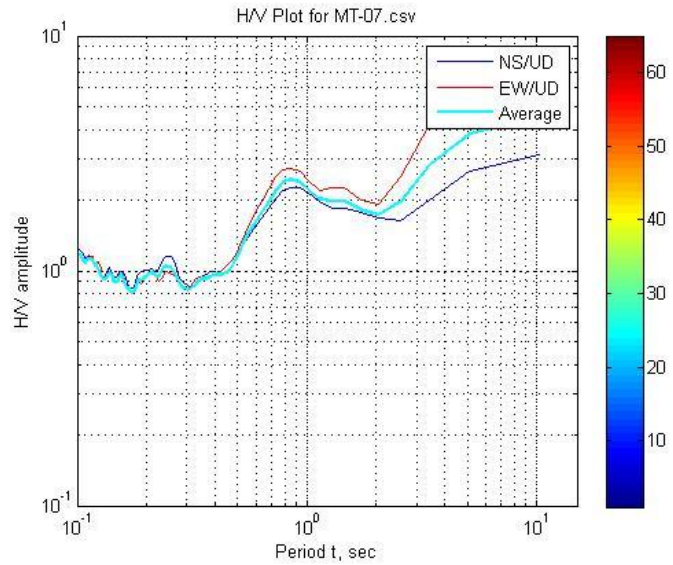
Lat- N 24°47'47.46"

Long- E 90°23'36.68"

Result:

Peak Amplitude- 2.452

Peak Period- 0.85



Single Microtremor Survey ID:

MT-08

Location:

Anondipur

Union Name: Sirta

Coordinate:

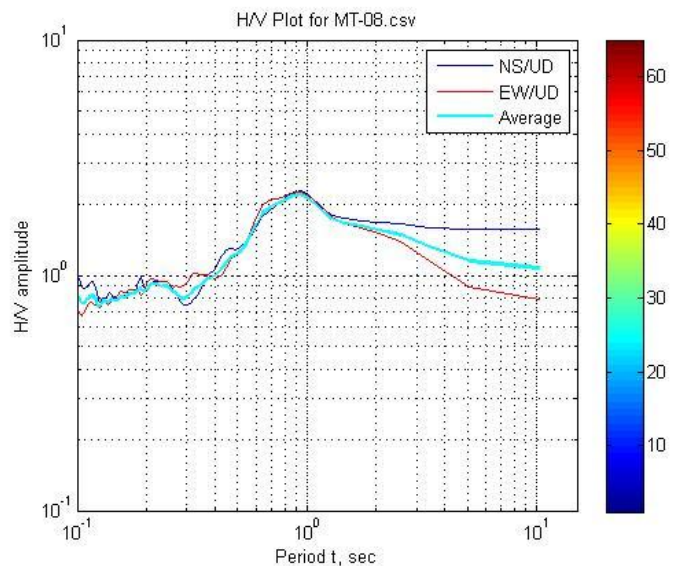
Lat- N 24°47'50.17"

Long- E 90°26'15.66"

Result:

Peak Amplitude- 2.224

Peak Period- 0.93



Single Microtremor Survey ID:

MT-09

Location:

Chor Horipur

Union Name: Char Ishwardia

Coordinate:

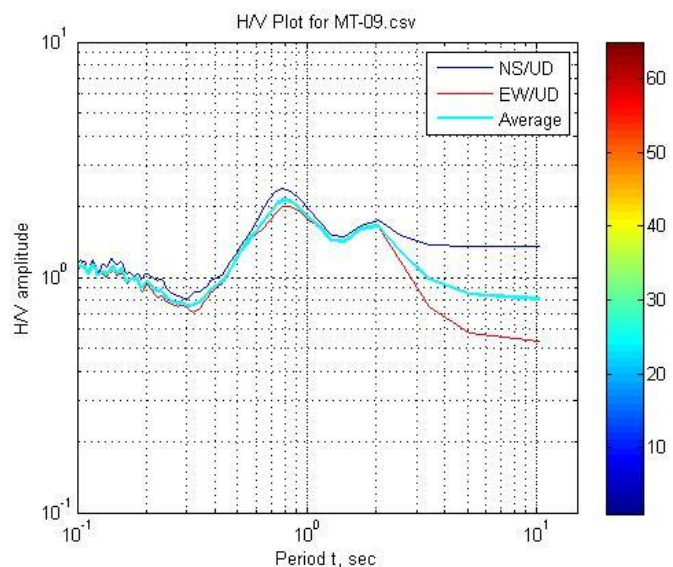
Lat- N 24°47'46.13"

Long- E 90°26'46.13"

Result:

Peak Amplitude- 2.143

Peak Period- 0.79



Single Microtremor Survey ID:

MT-10

Location:

Montola Bazar

Union Name: Khagdahar

Coordinate:

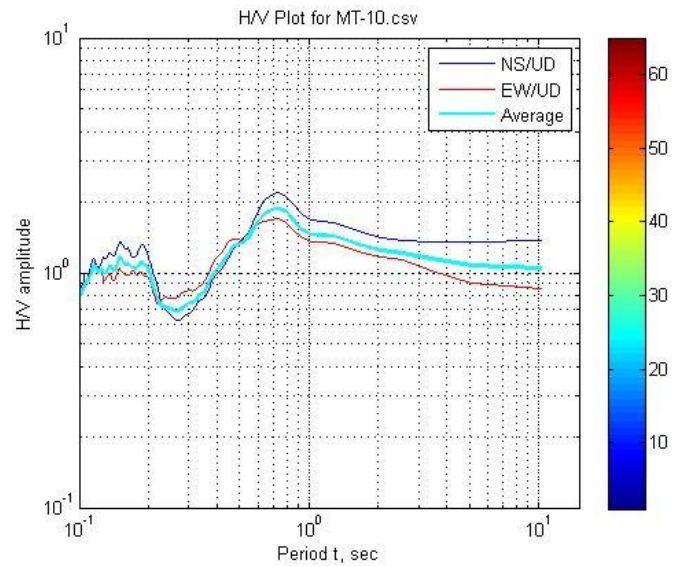
Lat- N 24°45'39"

Long- E 90°22'14"

Result:

Peak Amplitude- 2.888

Peak Period- 0.73



Single Microtremor Survey ID:

MT-11

Location:

Mayis Bari

Union Name: Khagdahar

Coordinate:

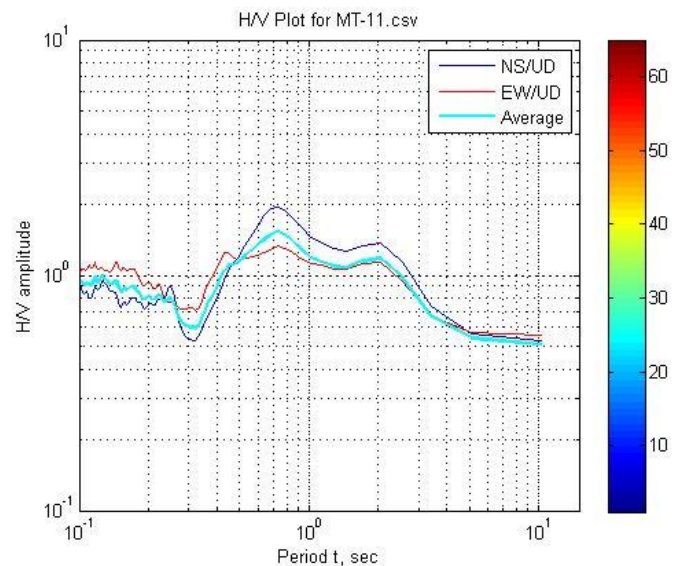
Lat- N 24°48'15"

Long- E 90°18'50"

Result:

Peak Amplitude- 1.539

Peak Period- 0.73



Single Microtremor Survey ID:

MT-12

Location:

Kolma

Union Name: Khagdahar

Coordinate:

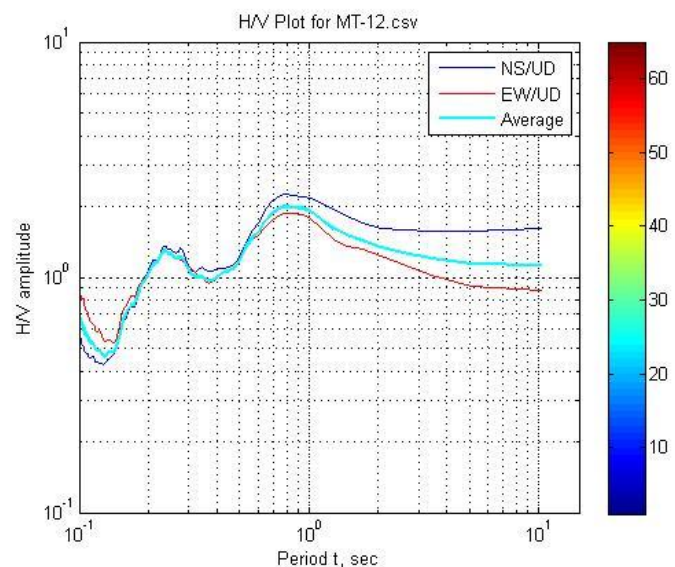
Lat- N 24°45'35"

Long- E 90°21'57"

Result:

Peak Amplitude- 2.012

Peak Period- 0.79



Single Microtremor Survey ID:

MT-13

Location:

Chor Issordia

Union Name: Char Ishwardia

Coordinate:

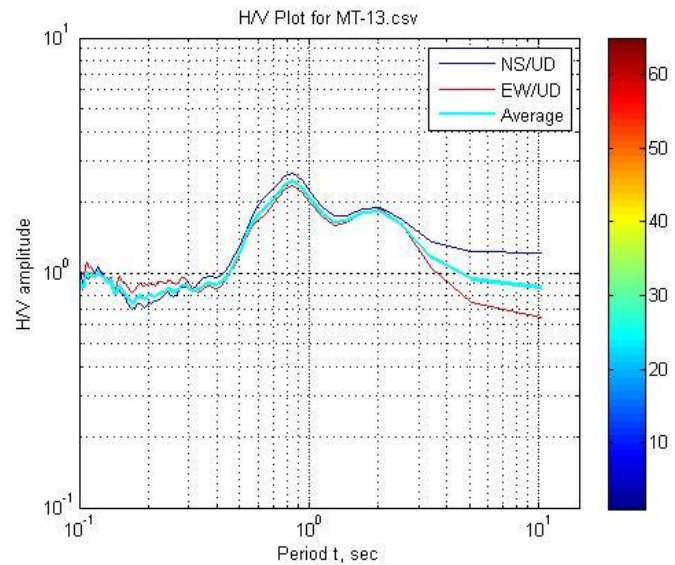
Lat- N 24°46'07.10"

Long- E 90°25'02.69"

Result:

Peak Amplitude- 2.466

Peak Period- 0.85



Single Microtremor Survey ID:

MT-14

Location:

Somuganj, Noyapara

Union Name: Char Nilakshmia

Coordinate:

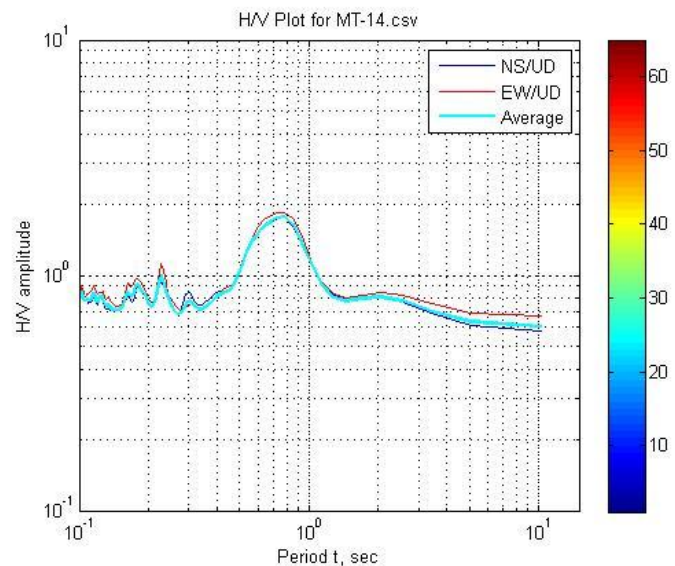
Lat- N 24°46'11.06"

Long- E 90°27'01.15"

Result:

Peak Amplitude- 1.786

Peak Period- 0.79



Single Microtremor Survey ID:

MT-15

Location:

Bakerganj

Union Name: Char Nilakshmia

Coordinate:

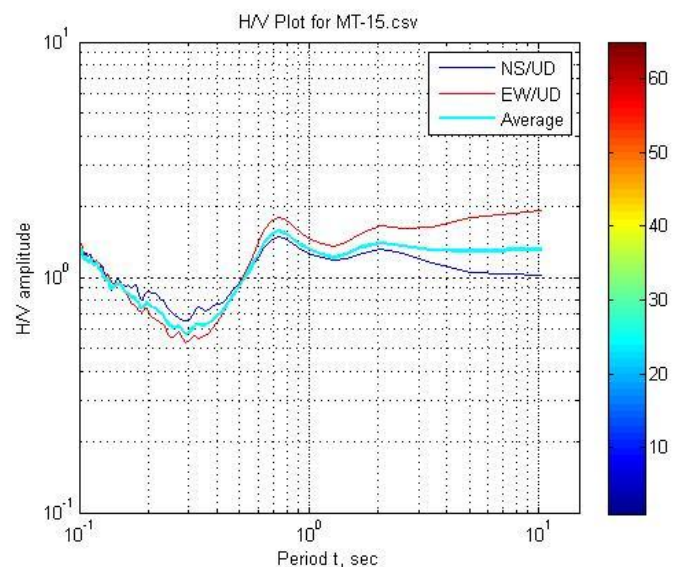
Lat- N 24°46'14.77"

Long- E 90°28'51.40"

Result:

Peak Amplitude- 1.581

Peak Period- 0.73



Single Microtremor Survey ID:

MT-16

Location:

Sosjomala

Union Name: Dapunia

Coordinate:

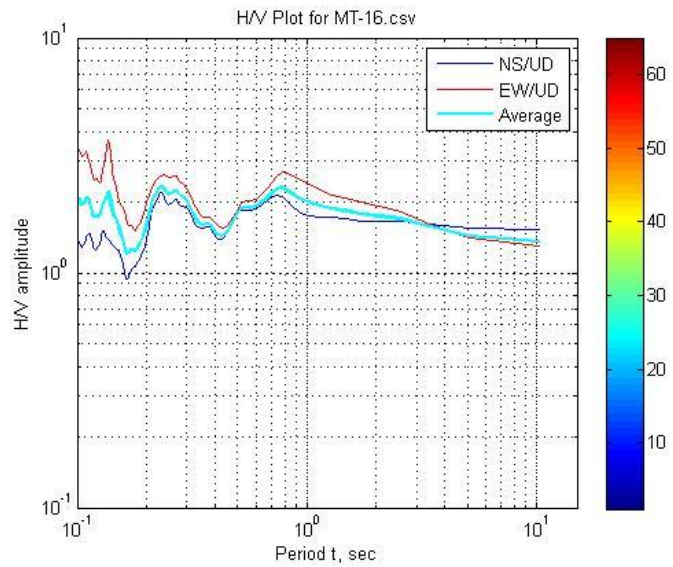
Lat- N 24°44'30.22"

Long- E 90°19'56.21"

Result:

Peak Amplitude- 2.330

Peak Period- 0.79



Single Microtremor Survey ID:

MT-17

Location:

North Dapunia Bazar

Union Name: Dapunia

Coordinate:

Lat- N 24°44'40.88"

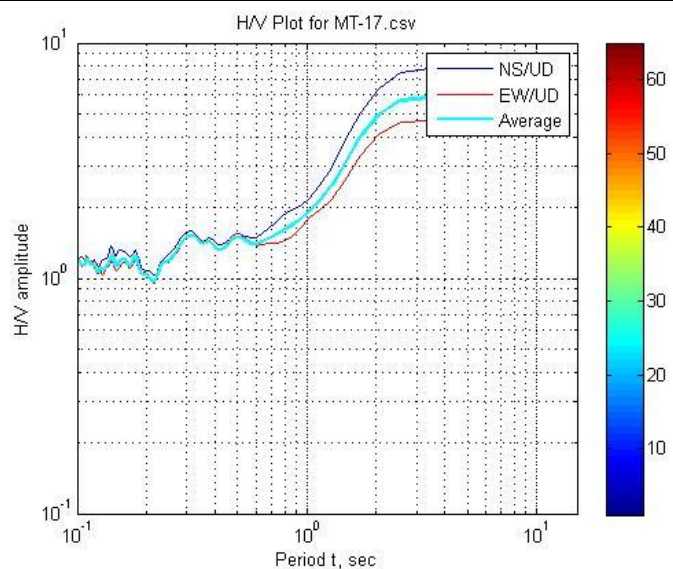
Long- E 90°21'41.51"

Result:

Peak Amplitude- 1.505

Peak Period- 0.51

Remark: **Bad Signal**



Single Microtremor Survey ID:

MT-18

Location:

Morolpara

Union Name: Akua

Coordinate:

Lat- N 24°44'37.3"

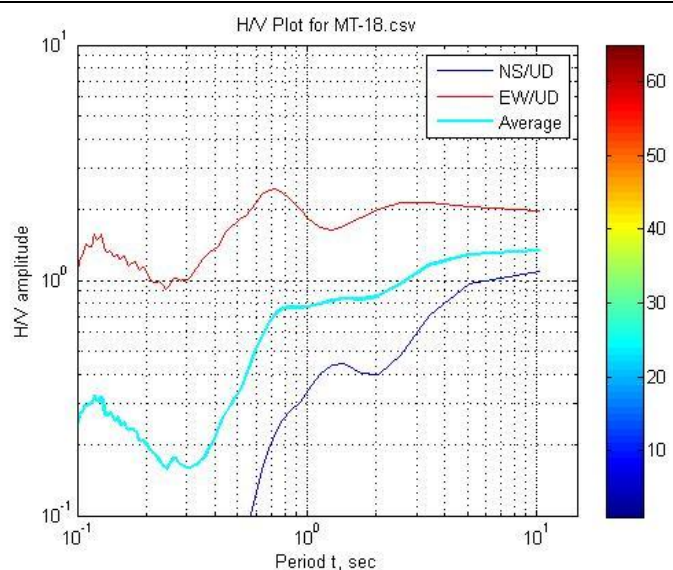
Long- E 90°23'38.3"

Result:

Peak Amplitude- 0.774

Peak Period- 0.85

Remark: **Bad Signal**



Single Microtremor Survey ID:

MT-19

Location:

Chor Kalibari

Union Name: Char Ishwardia

Coordinate:

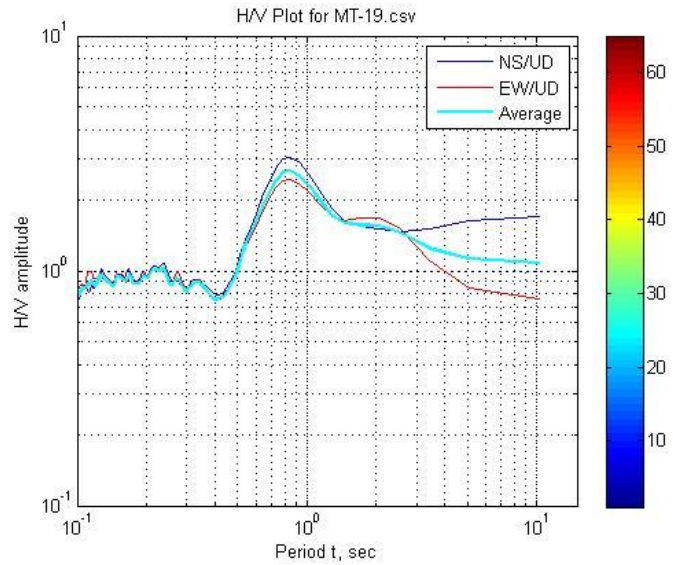
Lat- N 24°46'13.01"

Long- E 90°25'25.48"

Result:

Peak Amplitude- 2.677

Peak Period- 0.85



Single Microtremor Survey ID:

MT-20

Location:

Kalibari

Union Name: Char Ishwardia

Coordinate:

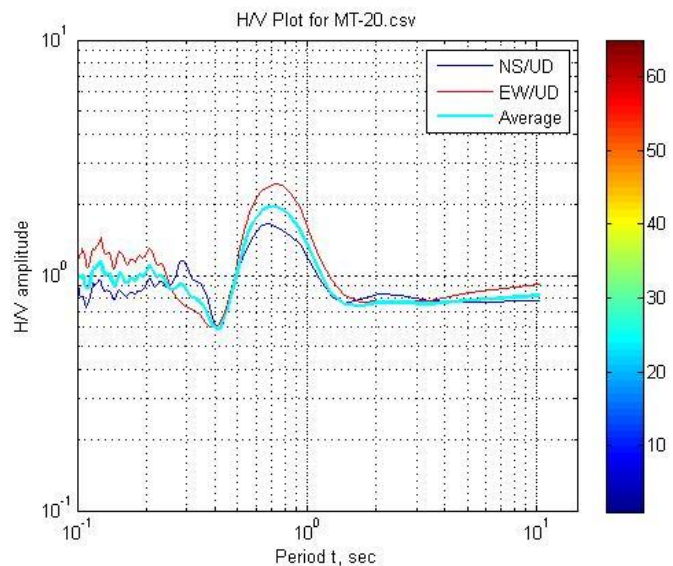
Lat- N 24°44'41.50"

Long- E 90°27'06.73"

Result:

Peak Amplitude- 1.910

Peak Period- 0.79



Single Microtremor Survey ID:

MT-21

Location:

Rakobpur

Union Name: Char Nilakshmia

Coordinate:

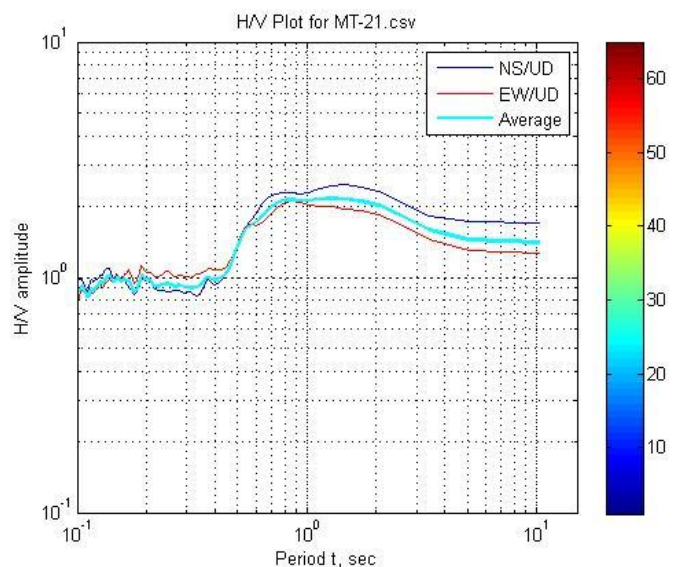
Lat- N 24°44'37.59"

Long- E 90°28'55.64"

Result:

Peak Amplitude- 2.150

Peak Period- 0.85



Single Microtremor Survey ID:

MT-22

Location:

Koltapara

Union Name: Char Nilakshmia

Coordinate:

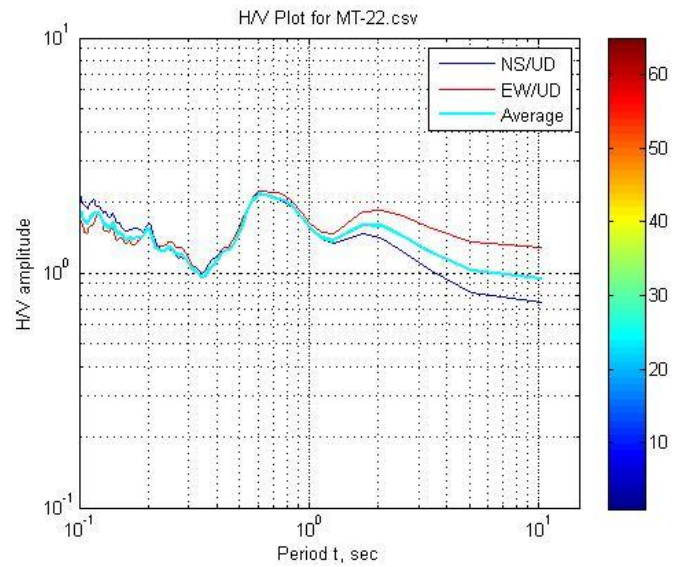
Lat- N 24°44'52.20"

Long- E 90°30'25.32"

Result:

Peak Amplitude- 2.178

Peak Period- 0.60



Single Microtremor Survey ID:

MT-23

Location:

Borrori Chonder Bazar

Union Name: Dapunia

Coordinate:

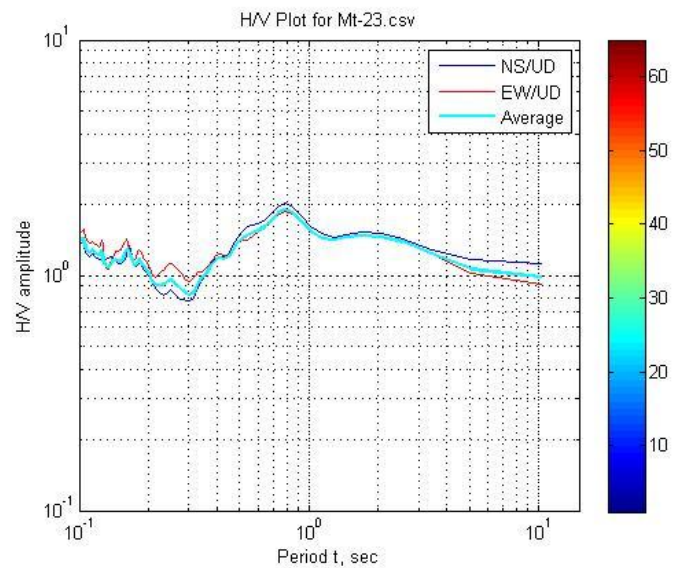
Lat- N 24°42'39.17"

Long- E 90°18'13.91"

Result:

Peak Amplitude- 1.910

Peak Period- 0.79



Single Microtremor Survey ID:

MT-24

Location:

Katlasen

Union Name: Dapunia

Coordinate:

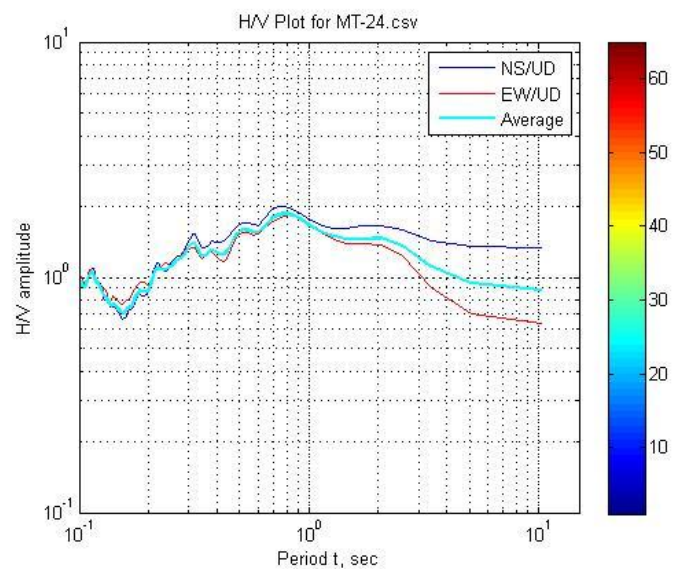
Lat- N 24°42'54.26"

Long- E 90°19'98.10"

Result:

Peak Amplitude- 1.875

Peak Period- 0.79



Single Microtremor Survey ID:

MT-25

Location:

Sohila(Budbaria)

Union Name: Ghagra

Coordinate:

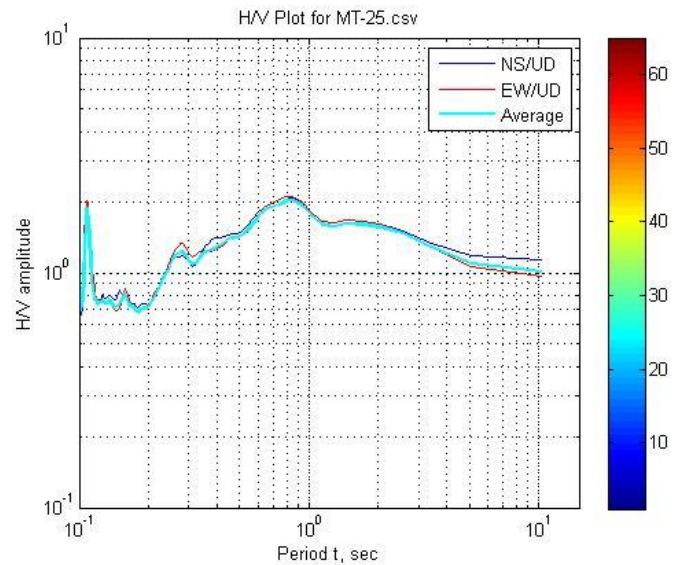
Lat- N 24°43'15.25"

Long- E 90°21'30.43"

Result:

Peak Amplitude- 2.055

Peak Period- 0.85



Single Microtremor Survey ID:

MT-26

Location:

Ujan Ghagra

Union Name: Ghagra

Coordinate:

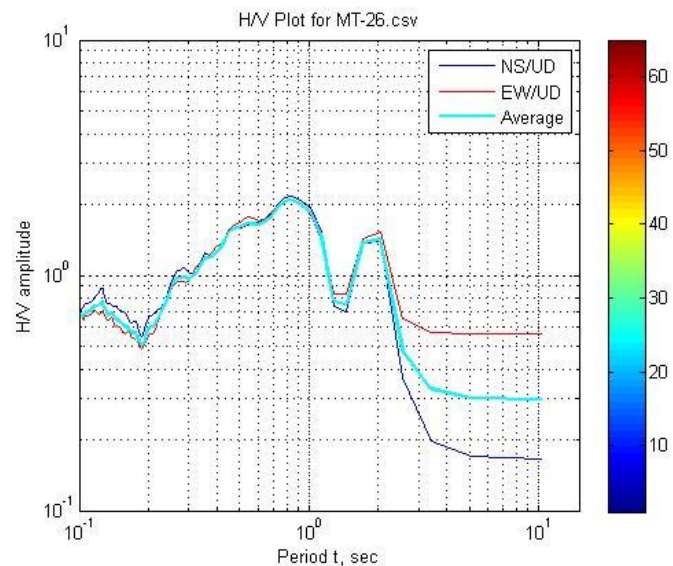
Lat- N 24°43'14.32"

Long- E 90°23'41.79"

Result:

Peak Amplitude- 2.099

Peak Period- 0.85



Single Microtremor Survey ID:

MT-27

Location:

Agricultural University

Union Name: Char Nilakshmia

Coordinate:

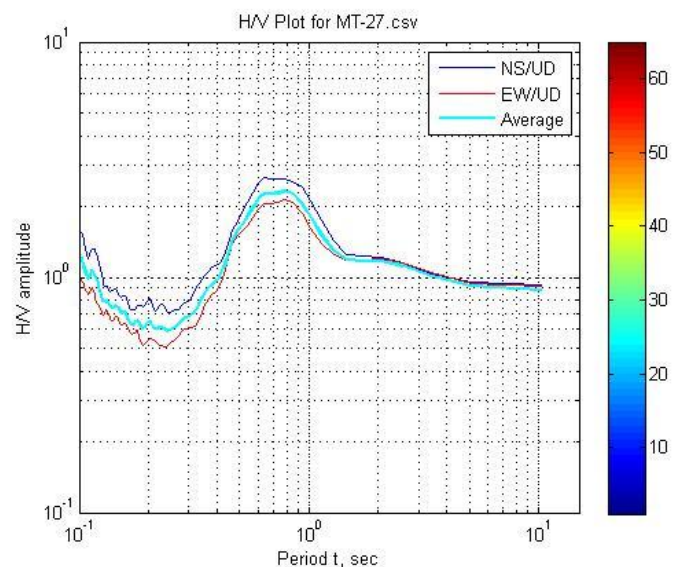
Lat- N 24°42'52.40"

Long- E 90°26'58.85"

Result:

Peak Amplitude- 2.330

Peak Period- 0.79



Single Microtremor Survey ID:

MT-28

Location:

Dubror Chor

Union Name: Bhangnamari

Coordinate:

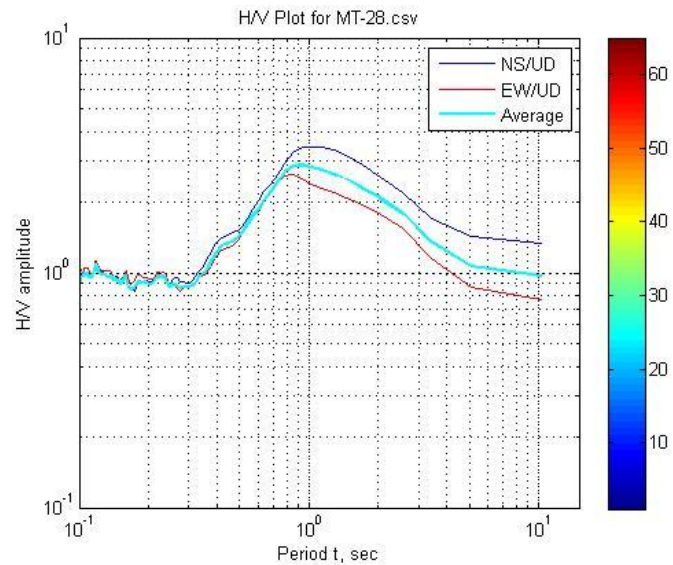
Lat- N 24°42'58.25"

Long- E 90°28'49.51"

Result:

Peak Amplitude- 2.891

Peak Period- 0.93



Single Microtremor Survey ID:

MT-29

Location:

Majihati

Union Name: Dapunia

Coordinate:

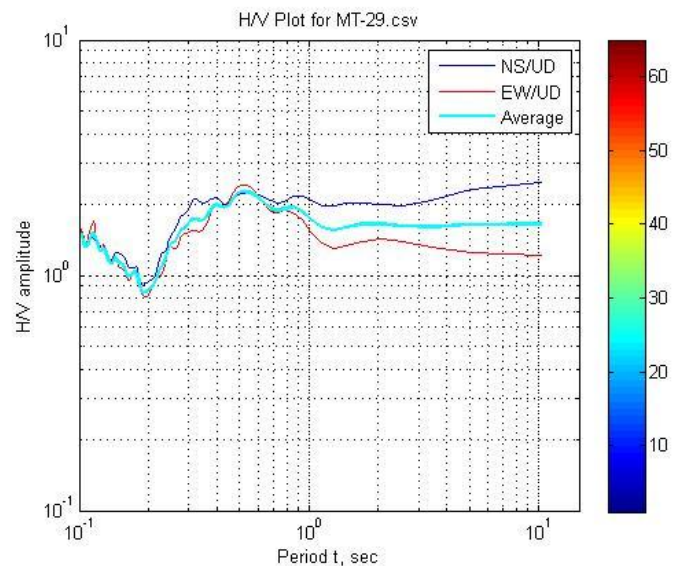
Lat- N 24°42'3.6"

Long- 90°20'3.12"

Result:

Peak Amplitude- 1.956

Peak Period- 0.85



Single Microtremor Survey ID:

MT-30

Location:

Gopal Nagar

Union Name: Ghagra

Coordinate:

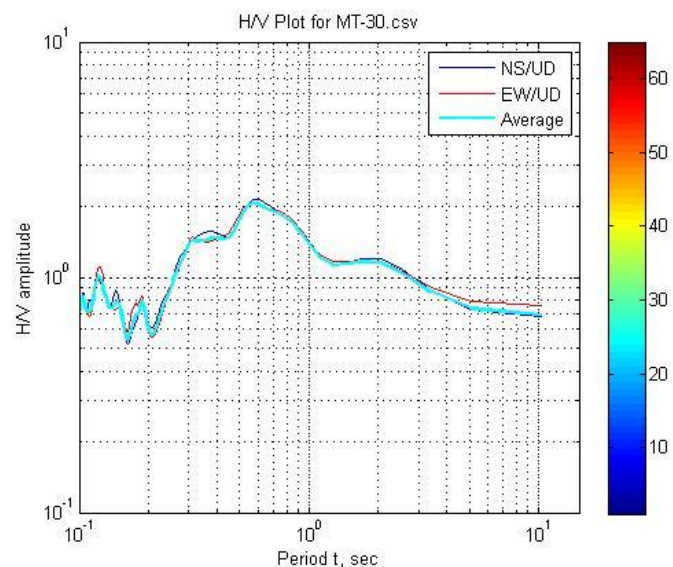
Lat- N 24°41'23.73"

Long- E 90°21'44.23"

Result:

Peak Amplitude- 2.073

Peak Period- 0.57



Single Microtremor Survey ID:

MT-31

Location:

Vati Ghagra

Union Name: Ghagra

Coordinate:

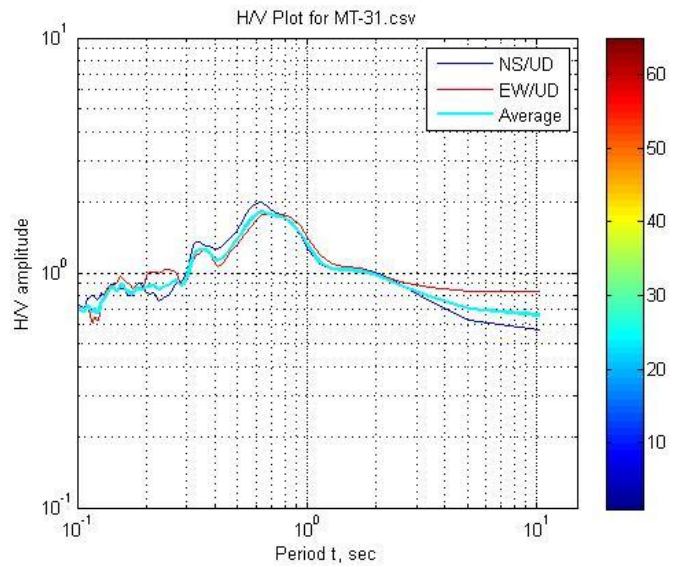
Lat- N 24°41'04.70"

Long- E 90°23'25.32"

Result:

Peak Amplitude- 1.845

Peak Period- 0.64



Single Microtremor Survey ID:

MT-32

Location:

Chourkai

Union Name: Bhabkhali

Coordinate:

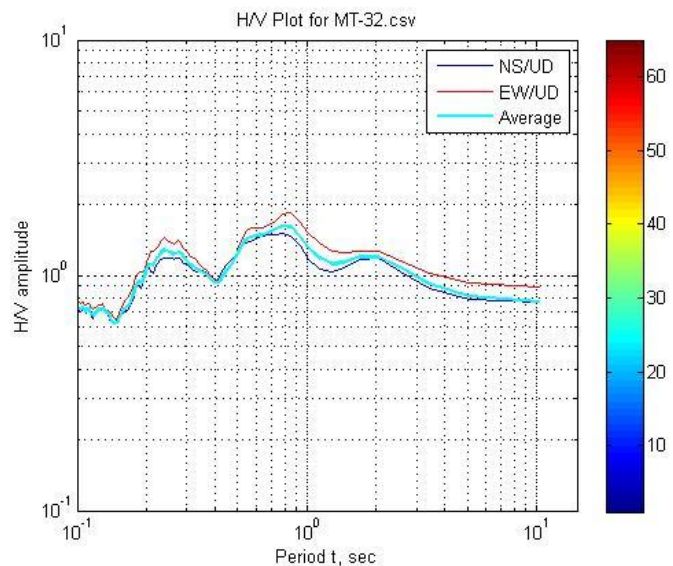
Lat- N 24°41'08.49"

Long- E 90°25'11.06"

Result:

Peak Amplitude- 1.627

Peak Period- 0.79



Single Microtremor Survey ID:

MT-33

Location:

Sutiakhali

Union Name: Bhabkhali

Coordinate:

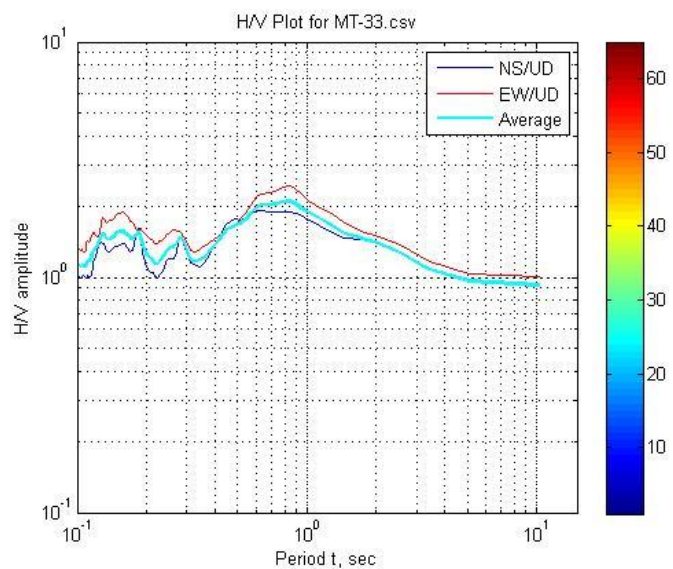
Lat- N 24°41'27.36"

Long- E 90°27'05.33"

Result:

Peak Amplitude- 2.116

Peak Period- 0.85



Single Microtremor Survey ID:

MT-34

Location:

Gajaria

Union Name: Bhangnamari

Coordinate:

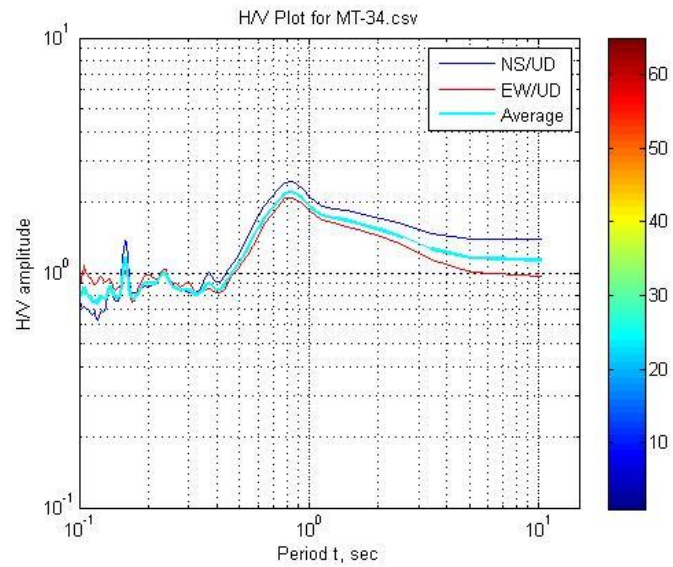
Lat- N 24°41'18.44"

Long- E 90°28'51.32"

Result:

Peak Amplitude- 2.217

Peak Period- 0.85



Single Microtremor Survey ID:

MT-35

Location:

Doler Par Majihati

Union Name: Ghagra

Coordinate:

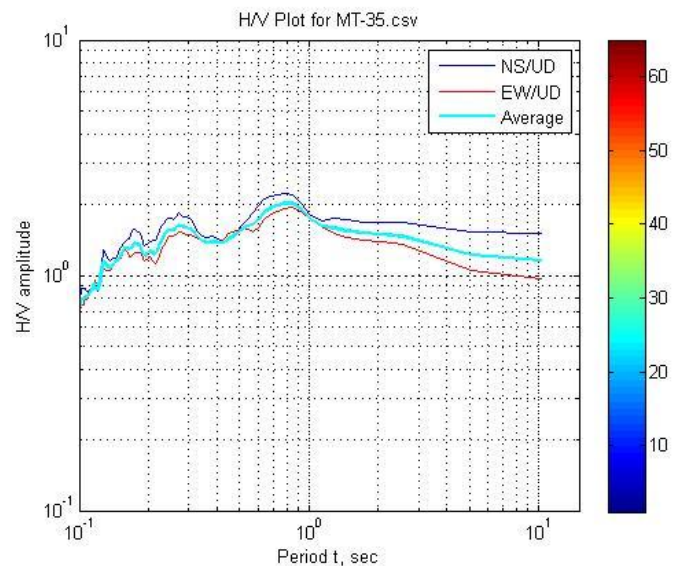
Lat- N 24°40'33.01"

Long- E 90°20'53.43"

Result:

Peak Amplitude- 2.034

Peak Period- 0.85



Single Microtremor Survey ID:

MT-36

Location:

Pawn Ghagra

Union Name: Bhabkhali

Coordinate:

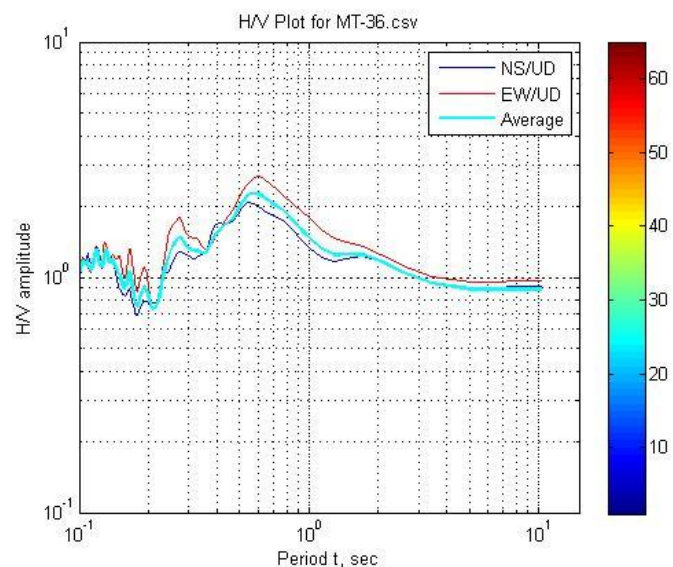
Lat- N 24°40'03.46"

Long- E 90°23'23.64"

Result:

Peak Amplitude- 2.286

Peak Period- 0.57



Single Microtremor Survey ID:

MT-37

Location:

Konaipar

Union Name: Bhabkhali

Coordinate:

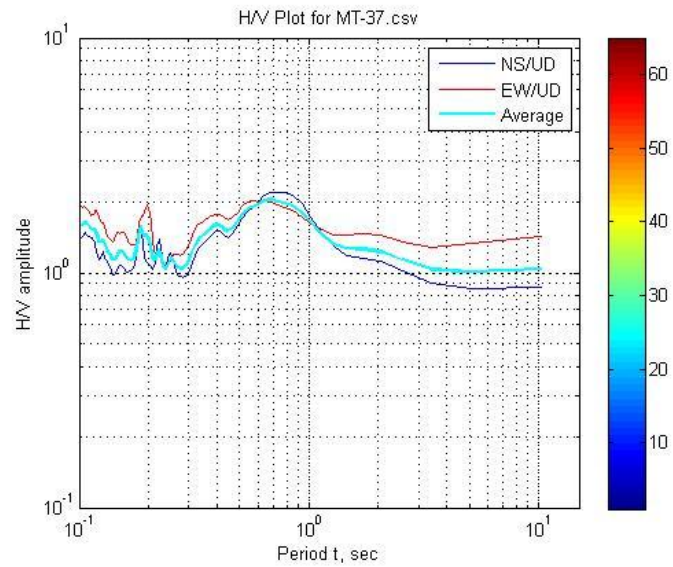
Lat- N 24°39'34.65"

Long- E 90°25'01.07"

Result:

Peak Amplitude- 2.061

Peak Period- 0.68



Single Microtremor Survey ID:

MT-38

Location:

Narayanpur Chourkai

Union Name: Bhabkhali

Coordinate:

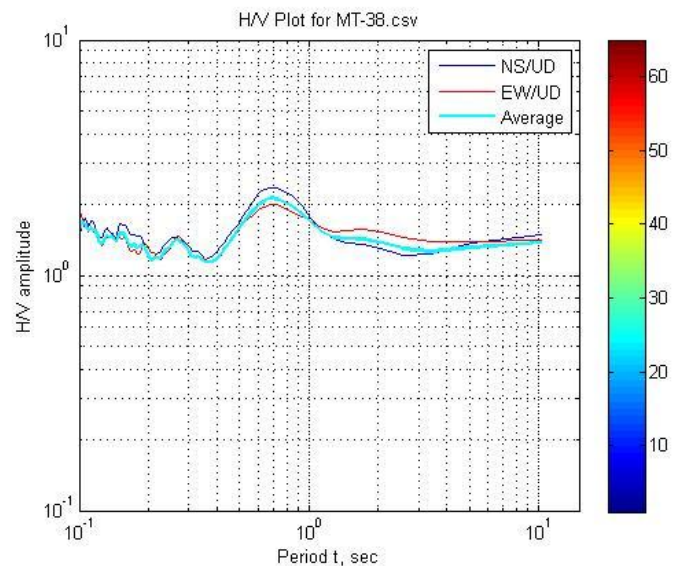
Lat- N 24°39'38.16"

Long- E 90°27'11.36"

Result:

Peak Amplitude- 2.144

Peak Period- 0.68



Single Microtremor Survey ID:

MT-39

Location:

Vatipara

Union Name: Bhangnamari

Coordinate:

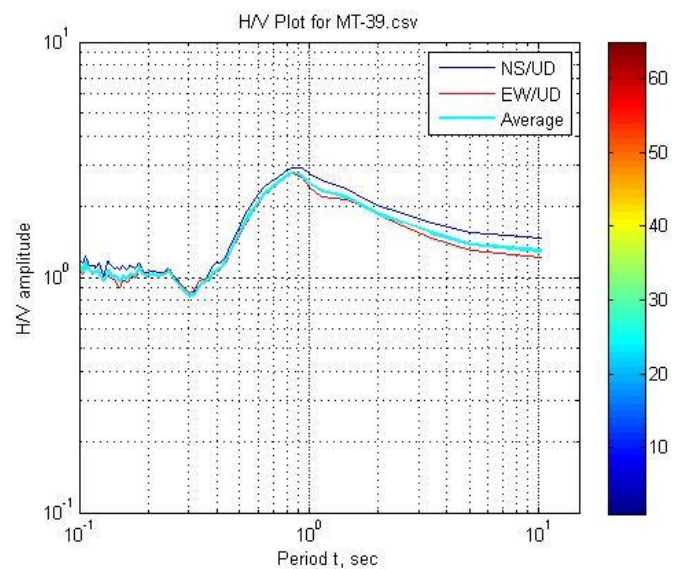
Lat- N 24°39'48.92"

Long- E

Result:

Peak Amplitude- 2.802

Peak Period- 0.85



Single Microtremor Survey ID:

MT-40

Location:

Nawvanga

Union Name: Bhangnamari

Coordinate:

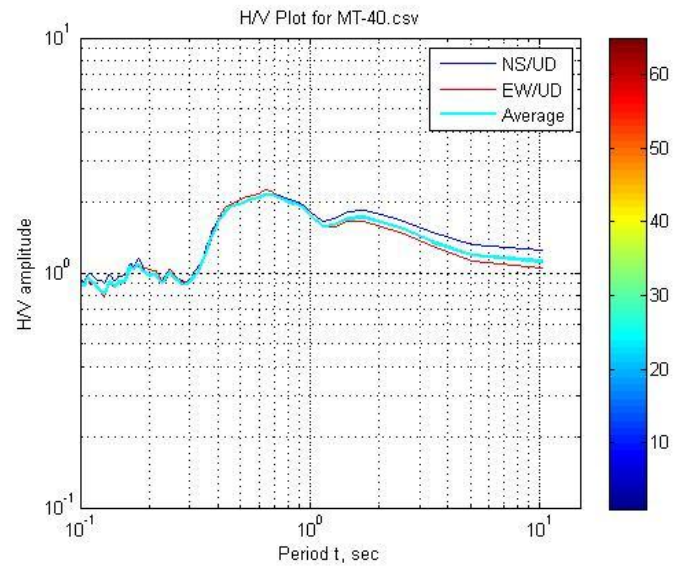
Lat- N 24°39'27.41"

Long- E 90°30'37.26"

Result:

Peak Amplitude- 2.165

Peak Period- 0.68



Appendix VII: Relation between N values and Vs at each Boring

Bore hole No:		BH-Shirta-01		
Locations name:		Holia mari, Sirta,Mymenshingh		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	7	5	153	
3	5	3	138	
4.5	5	3	138	
6	5	3	138	
7.5	5	3	138	
9	17	11	199	
10.5	20	14	209	
12	20	14	209	
13.5	22	15	215	
15	24	16	221	
16.5	28	19	232	
18	29	20	234	
19.5	32	22	241	
21	35	24	248	
22.5	39	26	256	
24	43	29	264	
25.5	45	30	267	
27	36	24	250	
28.5	40	27	258	
30	43	29	264	
AVS 30			202	

Bore hole No:		BH-Shirta-02		
Locations name:		Nayapara, Sirta,Mymenshingh		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	4	3	129	
3	4	3	129	
4.5	7	5	153	
6	9	6	165	
7.5	7	5	153	
9	8	5	159	
10.5	14	9	188	
12	18	12	203	
13.5	21	14	212	
15	17	11	199	
16.5	22	15	215	
18	27	18	229	
19.5	12	8	180	
21	13	9	184	
22.5	32	22	241	
24	36	24	250	
25.5	43	29	264	
27	46	31	269	
28.5	52	35	279	
30	60	41	291	
AVS 30			193	

Bore hole No:		BH-Shirta-03		
Locations name:		Golakata Mor, Sirta,Mymenshingh		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	9	6	165	
3	8	5	159	
4.5	10	7	170	
6	12	8	180	
7.5	14	9	188	
9	23	16	218	
10.5	27	18	229	
12	30	20	237	
13.5	32	22	241	
15	30	20	237	
16.5	34	23	246	
18	38	26	254	
19.5	39	26	256	
21	26	18	227	
22.5	29	20	234	
24	32	22	241	
25.5	36	24	250	
27	39	26	256	
28.5	44	30	265	
30	48	32	272	
AVS 30			220	

Bore hole No:		BH-Shirta-04		
Locations name:		New Char Kharicha Bazar, Sirta,Mymenshingh		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	4	3	129	
3	5	3	138	
4.5	11	7	175	
6	12	8	180	
7.5	15	10	192	
9	20	14	209	
10.5	24	16	221	
12	25	17	224	
13.5	21	14	212	
15	22	15	215	
16.5	32	22	241	
18	36	24	250	
19.5	30	20	237	
21	35	24	248	
22.5	37	25	252	
24	42	28	262	
25.5	46	31	269	
27	53	36	281	
28.5	55	37	284	
30	61	41	293	
AVS 30			215	

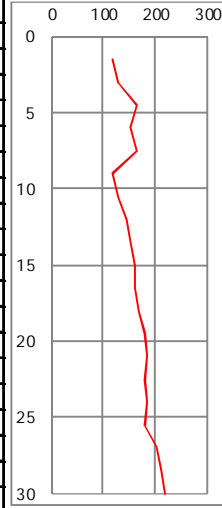
Bore hole No:		BH-Char Ishwardia-05	
Locations name:		Alia Madrasha, Borobil, Ishwardia Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	3	2	118
3	5	3	138
4.5	8	5	159
6	11	7	175
7.5	13	9	184
9	14	9	188
10.5	16	11	196
12	20	14	209
13.5	22	15	215
15	31	21	239
16.5	36	24	250
18	39	26	256
19.5	44	30	265
21	47	32	271
22.5	51	34	277
24	54	36	282
25.5	65	44	299
27	44	30	265
28.5	48	32	272
30	50	34	276
AVS 30			213

Bore hole No:		BH-Khagdahar-06	
Locations name:		Begun Bari Bazar, khagdahar, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	7	5	153
3	8	5	159
4.5	4	3	129
6	5	3	138
7.5	7	5	153
9	9	6	165
10.5	11	7	175
12	9	6	165
13.5	6	4	146
15	5	3	138
16.5	7	5	153
18	7	5	153
19.5	15	10	192
21	14	9	188
22.5	24	16	221
24	44	30	265
25.5	46	31	269
27	47	32	271
28.5	49	33	274
30	47	32	271
AVS 30			177

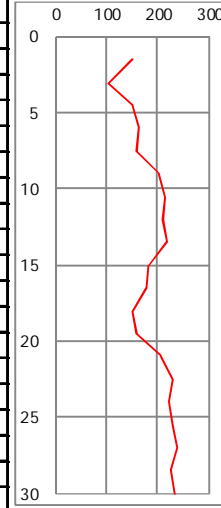
Bore hole No:		BH-Khagdahar-07	
Locations name:		Kallanpur, Khagdahar, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	8	5	159
3	6	4	146
4.5	5	3	138
6	5	3	138
7.5	6	4	146
9	11	7	175
10.5	9	6	165
12	20	14	209
13.5	16	11	196
15	6	4	146
16.5	5	3	138
18	10	7	170
19.5	11	7	175
21	10	7	170
22.5	10	7	170
24	30	20	237
25.5	47	32	271
27	48	32	272
28.5	55	37	284
30	59	40	290
AVS 30			178

Bore hole No:		BH-khagdahar-08	
Locations name:		Bou bazar, khagdahar, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	4	3	129
3	5	3	138
4.5	6	4	146
6	8	5	159
7.5	7	5	153
9	9	6	165
10.5	9	6	165
12	10	7	170
13.5	10	7	170
15	12	8	180
16.5	11	7	175
18	12	8	180
19.5	12	8	180
21	15	10	192
22.5	19	13	206
24	18	12	203
25.5	19	13	206
27	16	11	196
28.5	20	14	209
30	22	15	215
AVS 30			173

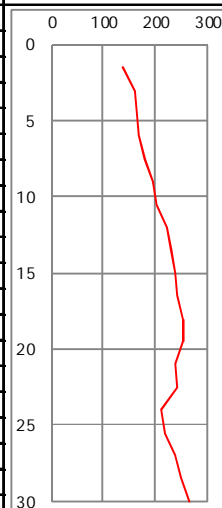
Bore hole No:		BH-Khagdahar-09	
Locations name:		Khagdahar Govt. Primary School, Ghonti	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	3	2	118
3	4	3	129
4.5	9	6	165
6	7	5	153
7.5	9	6	165
9	3	2	118
10.5	4	3	129
12	6	4	146
13.5	7	5	153
15	8	5	159
16.5	8	5	159
18	10	7	170
19.5	12	8	180
21	13	9	184
22.5	12	8	180
24	13	9	184
25.5	12	8	180
27	18	12	203
28.5	21	14	212
30	23	16	218
AVS 30			160



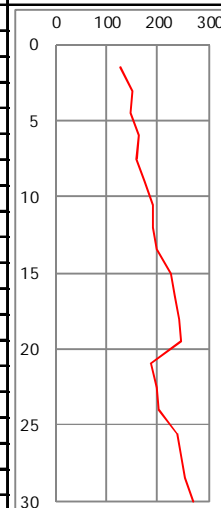
Bore hole No:		BH-Shirta-10	
Locations name:		Konapara mor, Chourasta, Sirta, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	7	5	153
3	2	1	105
4.5	7	5	153
6	9	6	165
7.5	8	5	159
9	18	12	203
10.5	21	14	212
12	20	14	209
13.5	23	16	218
15	13	9	184
16.5	12	8	180
18	7	5	153
19.5	8	5	159
21	19	13	206
22.5	27	18	229
24	24	16	221
25.5	27	18	229
27	31	21	239
28.5	26	18	227
30	28	19	232
AVS 30			184



Bore hole No:		BH-Shirta-11	
Locations name:		Joybangla, Sirta, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	5	3	138
3	8	5	159
4.5	9	6	165
6	10	7	170
7.5	12	8	180
9	16	11	196
10.5	18	12	203
12	24	16	221
13.5	27	18	229
15	30	20	237
16.5	33	22	243
18	37	25	252
19.5	38	26	254
21	30	20	237
22.5	33	22	243
24	20	14	209
25.5	23	16	218
27	30	20	237
28.5	36	24	250
30	45	30	267
AVS 30			209



Bore hole No:		BH-Shirta-12	
Locations name:		Sirta, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	4	3	129
3	7	5	153
4.5	6	4	146
6	9	6	165
7.5	8	5	159
9	11	7	175
10.5	15	10	192
12	15	10	192
13.5	17	11	199
15	25	17	224
16.5	28	19	232
18	32	22	241
19.5	33	22	243
21	14	9	188
22.5	17	11	199
24	18	12	203
25.5	31	21	239
27	33	22	243
28.5	37	25	252
30	46	31	269
AVS 30			194



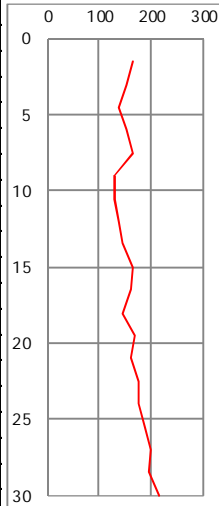
Bore hole No:		BH-Char Ishwardia-13	
Locations name:		Charborbila, Char Ishwardia, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	4	3	129
3	10	7	170
4.5	11	7	175
6	13	9	184
7.5	15	10	192
9	16	11	196
10.5	18	12	203
12	20	14	209
13.5	23	16	218
15	20	14	209
16.5	22	15	215
18	24	16	221
19.5	28	19	232
21	29	20	234
22.5	33	22	243
24	35	24	248
25.5	39	26	256
27	46	31	269
28.5	51	34	277
30	57	38	287
AVS 30			211

Bore hole No:		BH-Khagdahar-14	
Locations name:		Montolar Bazar, Khagdahar, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	8	5	159
3	4	3	129
4.5	5	3	138
6	9	6	165
7.5	10	7	170
9	14	9	188
10.5	11	7	175
12	4	3	129
13.5	5	3	138
15	14	9	188
16.5	16	11	196
18	15	10	192
19.5	14	9	188
21	38	26	254
22.5	41	28	260
24	41	28	260
25.5	45	30	267
27	48	32	272
28.5	50	34	276
30	54	36	282
AVS 30			188

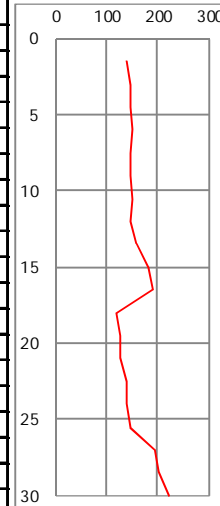
Bore hole No:		BH-Khagdahar-15	
Locations name:		Bagunbari Bazar, Khagdahar, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	3	2	118
3	5	3	138
4.5	10	7	170
6	10	7	170
7.5	13	9	184
9	14	9	188
10.5	17	11	199
12	5	3	138
13.5	6	4	146
15	7	5	153
16.5	9	6	165
18	9	6	165
19.5	10	7	170
21	12	8	180
22.5	28	19	232
24	31	21	239
25.5	41	28	260
27	49	33	274
28.5	54	36	282
30	56	38	285
AVS 30			181

Bore hole No:		BH-Khagdahar-16	
Locations name:		Rahmatpur, Khagdahar, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	3	2	118
3	4	3	129
4.5	9	6	165
6	12	8	180
7.5	14	9	188
9	15	10	192
10.5	17	11	199
12	9	6	165
13.5	8	5	159
15	7	5	153
16.5	6	4	146
18	11	7	175
19.5	12	8	180
21	28	19	232
22.5	43	29	264
24	36	24	250
25.5	10	7	170
27	11	7	175
28.5	55	37	284
30	60	41	291
AVS 30			180

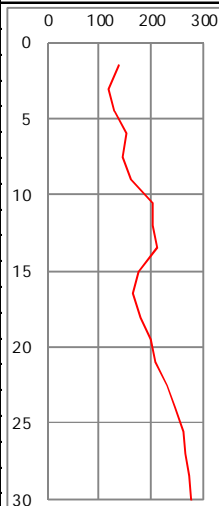
Bore hole No:		BH-Khagdahar-17	
Locations name:		Behind BGB Camp, khagdahar, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	9	6	165
3	7	5	153
4.5	5	3	138
6	7	5	153
7.5	9	6	165
9	4	3	129
10.5	4	3	129
12	5	3	138
13.5	6	4	146
15	9	6	165
16.5	8	5	159
18	6	4	146
19.5	10	7	170
21	8	5	159
22.5	11	7	175
24	11	7	175
25.5	14	9	188
27	17	11	199
28.5	16	11	196
30	22	15	215
AVS 30			160



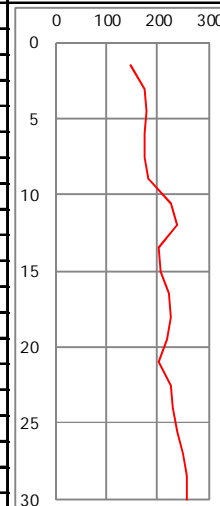
Bore hole No:		BH-Khagdahar-18	
Locations name:		Dholadia Salaiha market, khagdahar, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	5	3	138
3	6	4	146
4.5	6	4	146
6	7	5	153
7.5	6	4	146
9	6	4	146
10.5	7	5	153
12	6	4	146
13.5	8	5	159
15	13	9	184
16.5	15	10	192
18	3	2	118
19.5	4	3	129
21	4	3	129
22.5	5	3	138
24	5	3	138
25.5	6	4	146
27	16	11	196
28.5	18	12	203
30	24	16	221
AVS 30			152



Bore hole No:		BH-Sirta-19	
Locations name:		Gobindapur, sirta, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	5	3	138
3	3	2	118
4.5	4	3	129
6	7	5	153
7.5	6	4	146
9	8	5	159
10.5	18	12	203
12	18	12	203
13.5	21	14	212
15	11	7	175
16.5	9	6	165
18	12	8	180
19.5	17	11	199
21	19	13	206
22.5	27	18	229
24	35	24	248
25.5	42	28	262
27	44	30	265
28.5	49	33	274
30	51	34	277
AVS 30			185



Bore hole No:		BH-Ishwardia-20	
Locations name:		Char Ishwardia, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	6	4	146
3	11	7	175
4.5	12	8	180
6	11	7	175
7.5	11	7	175
9	13	9	184
10.5	25	17	224
12	30	20	237
13.5	18	12	203
15	19	13	206
16.5	24	16	221
18	26	18	227
19.5	23	16	218
21	18	12	203
22.5	25	17	224
24	27	18	229
25.5	30	20	237
27	36	24	250
28.5	39	26	256
30	40	27	258
AVS 30			207



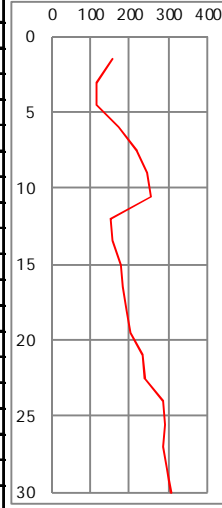
Bore hole No:		BH-Char Ishwardia-21		
Locations name:		Char Ishwardia, Mymensingh		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	3	2	118	
3	11	7	175	
4.5	13	9	184	
6	9	6	165	
7.5	11	7	175	
9	12	8	180	
10.5	11	7	175	
12	24	16	221	
13.5	28	19	232	
15	23	16	218	
16.5	10	7	170	
18	10	7	170	
19.5	13	9	184	
21	11	7	175	
22.5	11	7	175	
24	34	23	246	
25.5	34	23	246	
27	33	22	243	
28.5	38	26	254	
30	44	30	265	
AVS 30			191	

Bore hole No:		BH-Char Ishwardia-22		
Locations name:		Shabazpur Brac school, Char Ishwardia		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	9	6	165	
3	6	4	146	
4.5	3	2	118	
6	5	3	138	
7.5	9	6	165	
9	12	8	180	
10.5	16	11	196	
12	20	14	209	
13.5	21	14	212	
15	27	18	229	
16.5	30	20	237	
18	33	22	243	
19.5	28	19	232	
21	36	24	250	
22.5	33	22	243	
24	37	25	252	
25.5	41	28	260	
27	42	28	262	
28.5	46	31	269	
30	52	35	279	
AVS 30			202	

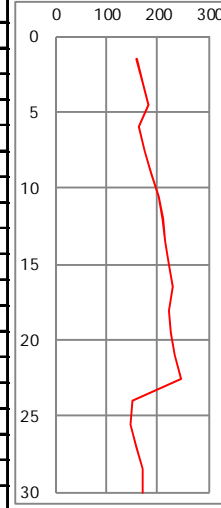
Bore hole No:		BH-Dapunia-23		
Locations name:		Hartti Govt. Primary School, Dapunia,		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	5	3	138	
3	2	1	105	
4.5	12	8	180	
6	14	9	188	
7.5	16	11	196	
9	12	8	180	
10.5	8	5	159	
12	7	5	153	
13.5	10	7	170	
15	13	9	184	
16.5	6	4	146	
18	8	5	159	
19.5	11	7	175	
21	12	8	180	
22.5	15	10	192	
24	36	24	250	
25.5	35	24	248	
27	36	24	250	
28.5	39	26	256	
30	45	30	267	
AVS 30			179	

Bore hole No:		BH-Dapunia-24		
Locations name:		Azmatpur, Parbopara, Dapunia, Mymensingh		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	6	4	146	
3	7	5	153	
4.5	4	3	129	
6	13	9	184	
7.5	13	9	184	
9	13	9	184	
10.5	10	7	170	
12	5	3	138	
13.5	7	5	153	
15	9	6	165	
16.5	15	10	192	
18	16	11	196	
19.5	17	11	199	
21	27	18	229	
22.5	30	20	237	
24	33	22	243	
25.5	39	26	256	
27	46	31	269	
28.5	66	45	300	
30	69	47	304	
AVS 30			190	

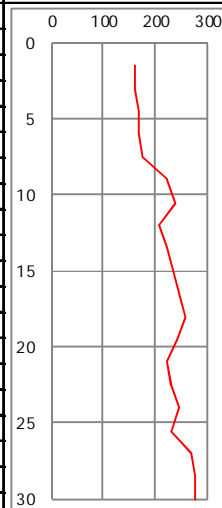
Bore hole No:		BH-Khagdahar-25	
Locations name:		Baday Kolpha, Khagdahar, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	8	5	159
3	3	2	118
4.5	3	2	118
6	11	7	175
7.5	23	16	218
9	35	24	248
10.5	38	26	254
12	7	5	153
13.5	8	5	159
15	12	8	180
16.5	13	9	184
18	15	10	192
19.5	18	12	203
21	30	20	237
22.5	32	22	241
24	56	38	285
25.5	60	41	291
27	58	39	288
28.5	63	43	296
30	70	47	305
AVS 30			198



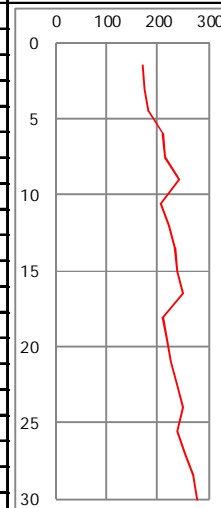
Bore hole No:		BH- Char Ishwardia-26	
Locations name:		Chaina mor, Char Ishwardia, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	8	5	159
3	10	7	170
4.5	13	9	184
6	9	6	165
7.5	11	7	175
9	14	9	188
10.5	18	12	203
12	20	14	209
13.5	21	14	212
15	24	16	221
16.5	27	18	229
18	24	16	221
19.5	26	18	227
21	29	20	234
22.5	33	22	243
24	7	5	153
25.5	6	4	146
27	8	5	159
28.5	10	7	170
30	10	7	170
AVS 30			187



Bore hole No:		BH- Nilakshmia- 27	
Locations name:		Shombuganj railgate, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	8	5	159
3	8	5	159
4.5	10	7	170
6	10	7	170
7.5	11	7	175
9	24	16	221
10.5	31	21	239
12	19	13	206
13.5	24	16	221
15	29	20	234
16.5	35	24	248
18	40	27	258
19.5	32	22	241
21	25	17	224
22.5	28	19	232
24	34	23	246
25.5	27	18	229
27	46	31	269
28.5	51	34	277
30	51	34	277
AVS 30			216



Bore hole No:		BH- Nilakshmia- 28	
Locations name:		7 no Char nilakshmia, Ragob pur, Mymensingh.	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	10	7	170
3	11	7	175
4.5	13	9	184
6	20	14	209
7.5	22	15	215
9	32	22	241
10.5	19	13	206
12	24	16	221
13.5	28	19	232
15	30	20	237
16.5	35	24	248
18	20	14	209
19.5	23	16	218
21	25	17	224
22.5	30	20	237
24	35	24	248
25.5	30	20	237
27	37	25	252
28.5	45	30	267
30	51	34	277
AVS 30			222



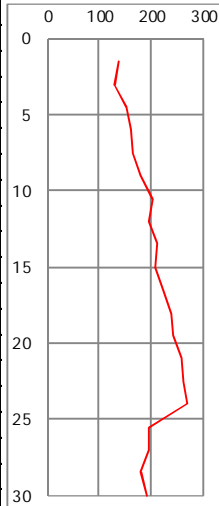
Bore hole No:		BH- Nilakhsmia- 29		
Locations name:		Bijoynagar, Char nilakhsmia, Mymensingh.		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	4	3	129	
3	5	3	138	
4.5	7	5	153	
6	4	3	129	
7.5	9	6	165	
9	12	8	180	
10.5	13	9	184	
12	17	11	199	
13.5	22	15	215	
15	27	18	229	
16.5	29	20	234	
18	33	22	243	
19.5	37	25	252	
21	37	25	252	
22.5	33	22	243	
24	48	32	272	
25.5	54	36	282	
27	61	41	293	
28.5	74	50	310	
30	69	47	304	
AVS 30			204	

Bore hole No:		BH- Dapunia -30		
Locations name:		72 no govt. primary school, Mymensingh.		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	3	2	118	
3	10	7	170	
4.5	12	8	180	
6	8	5	159	
7.5	10	7	170	
9	12	8	180	
10.5	14	9	188	
12	26	18	227	
13.5	29	20	234	
15	9	6	165	
16.5	10	7	170	
18	8	5	159	
19.5	9	6	165	
21	10	7	170	
22.5	12	8	180	
24	10	7	170	
25.5	10	7	170	
27	44	30	265	
28.5	48	32	272	
30	20	14	209	
AVS 30			179	

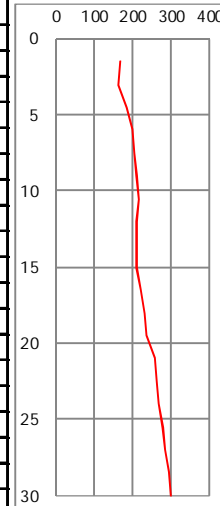
Bore hole No:		BH- Dapunia -31		
Locations name:		Harguzipar, Dapunia, Mymensingh		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	4	3	129	
3	9	6	165	
4.5	10	7	170	
6	5	3	138	
7.5	7	5	153	
9	18	12	203	
10.5	22	15	215	
12	11	7	175	
13.5	7	5	153	
15	11	7	175	
16.5	12	8	180	
18	10	7	170	
19.5	12	8	180	
21	18	12	203	
22.5	21	14	212	
24	30	20	237	
25.5	37	25	252	
27	42	28	262	
28.5	46	31	269	
30	50	34	276	
AVS 30			187	

Bore hole No:		BH- Akua-32		
Locations name:		Hazi jalal uddin High School, Akua ,		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	5	3	138	
3	4	3	129	
4.5	4	3	129	
6	3	2	118	
7.5	12	8	180	
9	14	9	188	
10.5	7	5	153	
12	7	5	153	
13.5	8	5	159	
15	9	6	165	
16.5	11	7	175	
18	19	13	206	
19.5	20	14	209	
21	22	15	215	
22.5	34	23	246	
24	35	24	248	
25.5	45	30	267	
27	47	32	271	
28.5	53	36	281	
30	59	40	290	
AVS 30			182	

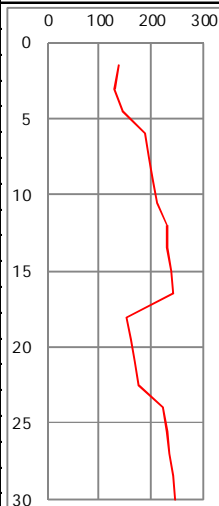
Bore hole No:		BH-Char Ishwardia-33	
Locations name:		Char Ishwardi, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	5	3	138
3	4	3	129
4.5	7	5	153
6	8	5	159
7.5	9	6	165
9	12	8	180
10.5	18	12	203
12	16	11	196
13.5	20	14	209
15	19	13	206
16.5	24	16	221
18	31	21	239
19.5	33	22	243
21	40	27	258
22.5	42	28	262
24	47	32	271
25.5	16	11	196
27	16	11	196
28.5	12	8	180
30	15	10	192
AVS 30			192



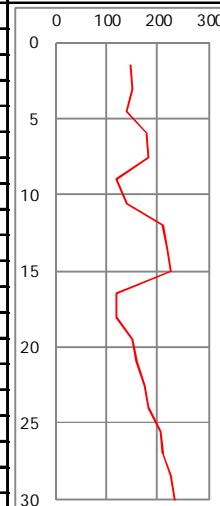
Bore hole No:		BH-Nilakshmia- 34	
Locations name:		Uzanpara, Char nilakshmia, Mymensingh.	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	10	7	170
3	9	6	165
4.5	13	9	184
6	17	11	199
7.5	19	13	206
9	20	14	209
10.5	23	16	218
12	21	14	212
13.5	20	14	209
15	21	14	212
16.5	24	16	221
18	28	19	232
19.5	30	20	237
21	40	27	258
22.5	43	29	264
24	47	32	271
25.5	51	34	277
27	55	37	284
28.5	64	43	297
30	68	46	303
AVS 30			225



Bore hole No:		BH-Nilakshmia- 35	
Locations name:		Ragobpur, Char nilakshmia, nikoria,	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	5	3	138
3	4	3	129
4.5	6	4	146
6	14	9	188
7.5	16	11	196
9	18	12	203
10.5	21	14	212
12	27	18	229
13.5	28	19	232
15	30	20	237
16.5	33	22	243
18	7	5	153
19.5	8	5	159
21	10	7	170
22.5	11	7	175
24	24	16	221
25.5	27	18	229
27	29	20	234
28.5	33	22	243
30	35	24	248
AVS 30			191



Bore hole No:		BH- Char Nilakshmia- 36	
Locations name:		Baiskhali, Hachery Char, nilakshmia, Mymensingh.	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	6	4	146
3	7	5	153
4.5	5	3	138
6	12	8	180
7.5	13	9	184
9	3	2	118
10.5	5	3	138
12	20	14	209
13.5	23	16	218
15	25	17	224
16.5	3	2	118
18	3	2	118
19.5	7	5	153
21	8	5	159
22.5	11	7	175
24	13	9	184
25.5	19	13	206
27	20	14	209
28.5	25	17	224
30	28	19	232
AVS 30			166



Bore hole No:		BH- Dapunia- 37	
Locations name:		Gosta gram, Dapunia, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	3	2	118
3	5	3	138
4.5	6	4	146
6	6	4	146
7.5	4	3	129
9	4	3	129
10.5	5	3	138
12	5	3	138
13.5	4	3	129
15	6	4	146
16.5	7	5	153
18	14	9	188
19.5	15	10	192
21	17	11	199
22.5	19	13	206
24	28	19	232
25.5	31	21	239
27	44	30	265
28.5	48	32	272
30	52	35	279
AVS 30			166

Bore hole No:		BH-Dapunia-38	
Locations name:		Dapunia, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	2	1	105
3	4	3	129
4.5	6	4	146
6	7	5	153
7.5	8	5	159
9	4	3	129
10.5	5	3	138
12	8	5	159
13.5	10	7	170
15	9	6	165
16.5	12	8	180
18	18	12	203
19.5	20	14	209
21	12	8	180
22.5	15	10	192
24	22	15	215
25.5	26	18	227
27	30	20	237
28.5	34	23	246
30	44	30	265
AVS 30			170

Bore hole No:		BH- Dapunia-39	
Locations name:		D.K.G.S United College, Dapunia, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	2	1	105
3	4	3	129
4.5	7	5	153
6	10	7	170
7.5	16	11	196
9	3	2	118
10.5	8	5	159
12	12	8	180
13.5	13	9	184
15	27	18	229
16.5	29	20	234
18	20	14	209
19.5	21	14	212
21	15	10	192
22.5	17	11	199
24	33	22	243
25.5	28	19	232
27	50	34	276
28.5	85	57	324
AVS 30			183

Bore hole No:		BH- Ghagra-40	
Locations name:		Moddo barra, Ghagra, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	6	4	146
3	5	3	138
4.5	5	3	138
6	4	3	129
7.5	7	5	153
9	7	5	153
10.5	10	7	170
12	9	6	165
13.5	8	5	159
15	6	4	146
16.5	7	5	153
18	16	11	196
19.5	16	11	196
21	18	12	203
22.5	27	18	229
24	35	24	248
25.5	40	27	258
27	45	30	267
28.5	50	34	276
30	54	36	282
AVS 30			178

Bore hole No:		BH- Char Nilakshmia-41	
Locations name:		Nilakshmia, Mymensing	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	4	3	129
3	6	4	146
4.5	4	3	129
6	8	5	159
7.5	8	5	159
9	9	6	165
10.5	12	8	180
12	22	15	215
13.5	26	18	227
15	34	23	246
16.5	36	24	250
18	37	25	252
19.5	36	24	250
21	45	30	267
22.5	53	36	281
24	15	10	192
25.5	18	12	203
27	13	9	184
28.5	11	7	175
30	13	9	184
AVS 30			189

Bore hole No:		BH- Char Nilakshmia-42	
Locations name:		Jugir, Agli, Char Nilakshmia, Mymensing	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	5	3	138
3	6	4	146
4.5	8	5	159
6	14	9	188
7.5	15	10	192
9	18	12	203
10.5	20	14	209
12	18	12	203
13.5	20	14	209
15	24	16	221
16.5	27	18	229
18	29	20	234
19.5	32	22	241
21	5	3	138
22.5	4	3	129
24	6	4	146
25.5	5	3	138
27	5	3	138
28.5	6	4	146
30	7	5	153
AVS 30			170

Bore hole No:		BH- Dapunia-43	
Locations name:		Nama- katla-shon, Mymensing	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	3	2	118
3	3	2	118
4.5	4	3	129
6	6	4	146
7.5	7	5	153
9	10	7	170
10.5	12	8	180
12	14	9	188
13.5	16	11	196
15	44	30	265
16.5	47	32	271
18	52	35	279
19.5	57	38	287
21	10	7	170
22.5	11	7	175
24	6	4	146
25.5	7	5	153
27	9	6	165
28.5	56	38	285
30	66	45	300
AVS 30			178

Bore hole No:		BH- Dapunia-44	
Locations name:		Dapunia, Mymensing	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	3	2	118
3	4	3	129
4.5	5	3	138
6	8	5	159
7.5	6	4	146
9	7	5	153
10.5	5	3	138
12	7	5	153
13.5	10	7	170
15	12	8	180
16.5	13	9	184
18	8	5	159
19.5	9	6	165
21	9	6	165
22.5	27	18	229
24	29	20	234
25.5	34	23	246
27	38	26	254
28.5	46	31	269
30	61	41	293
AVS 30			172

Bore hole No:		BH- Ghagra-45	
Locations name:		Suhila west para, Ghagra, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	2	1	105
3	2	1	105
4.5	3	2	118
6	10	7	170
7.5	12	8	180
9	5	3	138
10.5	6	4	146
12	5	3	138
13.5	6	4	146
15	6	4	146
16.5	7	5	153
18	10	7	170
19.5	12	8	180
21	13	9	184
22.5	16	11	196
24	14	9	188
25.5	16	11	196
27	29	20	234
28.5	34	23	246
30	42	28	262
AVS 30			160

Bore hole No:		BH- Ghagra-47	
Locations name:		Char- Ghagra, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	3	2	118
3	2	1	105
4.5	2	1	105
6	7	5	153
7.5	9	6	165
9	4	3	129
10.5	5	3	138
12	4	3	129
13.5	5	3	138
15	4	3	129
16.5	4	3	129
18	17	11	199
19.5	20	14	209
21	16	11	196
22.5	18	12	203
24	28	19	232
25.5	32	22	241
27	14	9	188
28.5	16	11	196
30	18	12	203
AVS 30			155

Bore hole No:		BH- Akua-48	
Locations name:		Vati Barra, Akua, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	5	3	138
3	4	3	129
4.5	7	5	153
6	8	5	159
7.5	9	6	165
9	5	3	138
10.5	4	3	129
12	5	3	138
13.5	5	3	138
15	9	6	165
16.5	10	7	170
18	11	7	175
19.5	12	8	180
21	21	14	212
22.5	35	24	248
24	42	28	262
25.5	44	30	265
27	46	31	269
28.5	50	34	276
30	53	36	281
AVS 30			176

Bore hole No:		BH- Barra-49	
Locations name:		Chalabondi, Kichuribill, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	4	3	129
3	9	6	165
4.5	10	7	170
6	7	5	153
7.5	8	5	159
9	3	2	118
10.5	4	3	129
12	12	8	180
13.5	11	7	175
15	5	3	138
16.5	6	4	146
18	12	8	180
19.5	16	11	196
21	22	15	215
22.5	26	18	227
24	45	30	267
25.5	47	32	271
27	9	6	165
28.5	10	7	170
30	7	5	153
AVS 30			167

Bore hole No:		BH- Bhangnamari-50	
Locations name:		Bhangnamari, Anantogonj bazar, Mymensingh,	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	1	1	85
3	11	7	175
4.5	12	8	180
6	14	9	188
7.5	17	11	199
9	26	18	227
10.5	22	15	215
12	21	14	212
13.5	24	16	221
15	26	18	227
16.5	27	18	229
18	34	23	246
19.5	32	22	241
21	45	30	267
22.5	37	25	252
24	28	19	232
25.5	30	20	237
27	30	20	237
28.5	40	27	258
30	45	30	267
AVS 30			207

Bore hole No:		BH- Bhanghamari- 51	
Locations name:		Bhanghamari, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	4	3	129
3	2	1	105
4.5	3	2	118
6	6	4	146
7.5	6	4	146
9	5	3	138
10.5	11	7	175
12	13	9	184
13.5	13	9	184
15	12	8	180
16.5	4	3	129
18	5	3	138
19.5	17	11	199
21	18	12	203
22.5	23	16	218
24	25	17	224
25.5	35	24	248
27	36	24	250
28.5	40	27	258
30	44	30	265
AVS 30			169

Bore hole No:		BH- Bhanghamari- 52	
Locations name:		Dhouhaghola, kajir panarty, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	2	1	105
3	1	1	85
4.5	6	4	146
6	6	4	146
7.5	6	4	146
9	7	5	153
10.5	5	3	138
12	8	5	159
13.5	9	6	165
15	2	1	105
16.5	2	1	105
18	13	9	184
19.5	15	10	192
21	14	9	188
22.5	13	9	184
24	29	20	234
25.5	30	20	237
27	25	17	224
28.5	27	18	229
30	32	22	241
AVS 30			154

Bore hole No:		BH- Ghagra-53	
Locations name:			
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	6	4	146
3	5	3	138
4.5	5	3	138
6	8	5	159
7.5	14	9	188
9	14	9	188
10.5	13	9	184
12	6	4	146
13.5	14	9	188
15	4	3	129
16.5	7	5	153
18	11	7	175
19.5	11	7	175
21	11	7	175
22.5	26	18	227
24	44	30	265
25.5	51	34	277
27	41	28	260
28.5	58	39	288
30	68	46	303
AVS 30			182

Bore hole No:		BH- Ghagra-54	
Locations name:		87 no vati, ghagra govt. primary school, ghagra,	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	4	3	129
3	5	3	138
4.5	7	5	153
6	15	10	192
7.5	13	9	184
9	13	9	184
10.5	7	5	153
12	12	8	180
13.5	14	9	188
15	6	4	146
16.5	7	5	153
18	11	7	175
19.5	14	9	188
21	40	27	258
22.5	44	30	265
24	48	32	272
25.5	50	34	276
27	55	37	284
28.5	58	39	288
30	65	44	299
AVS 30			191

Bore hole No:		BH- Ghagra-56	
Locations name:		Churknai, Jamtoli, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	7	5	153
3	9	6	165
4.5	10	7	170
6	10	7	170
7.5	7	5	153
9	5	3	138
10.5	4	3	129
12	5	3	138
13.5	3	2	118
15	6	4	146
16.5	7	5	153
18	10	7	170
19.5	20	14	209
21	21	14	212
22.5	23	16	218
24	36	24	250
25.5	46	31	269
27	55	37	284
28.5	59	40	290
30	67	45	301
AVS 30			177

Bore hole No:		BH- Bhabkhali-57	
Locations name:		Namapara, Bhabkhali,	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	2	1	105
3	4	3	129
4.5	2	1	105
6	5	3	138
7.5	6	4	146
9	7	5	153
10.5	4	3	129
12	6	4	146
13.5	4	3	129
15	9	6	165
16.5	10	7	170
18	11	7	175
19.5	9	6	165
21	13	9	184
22.5	9	6	165
24	35	24	248
25.5	36	24	250
27	38	26	254
28.5	43	29	264
30	38	26	254
AVS 30			160

Bore hole No:		BH- Bhabkhali-58	
Locations name:		Dupipara, Notun bazar, Sutiakhali, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	4	3	129
3	6	4	146
4.5	7	5	153
6	6	4	146
7.5	7	5	153
9	6	4	146
10.5	8	5	159
12	9	6	165
13.5	11	7	175
15	13	9	184
16.5	15	10	192
18	9	6	165
19.5	11	7	175
21	15	10	192
22.5	32	22	241
24	35	24	248
25.5	23	16	218
27	29	20	234
28.5	31	21	239
30	32	22	241
AVS 30			178

Bore hole No:		BH- Bhangnamari-59	
Locations name:		Bhangnamari, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	4	3	129
3	6	4	146
4.5	7	5	153
6	7	5	153
7.5	9	6	165
9	10	7	170
10.5	12	8	180
12	12	8	180
13.5	14	9	188
15	17	11	199
16.5	19	13	206
18	20	14	209
19.5	29	20	234
21	30	20	237
22.5	7	5	153
24	8	5	159
25.5	11	7	175
27	13	9	184
28.5	32	22	241
30	36	24	250
AVS 30			179

Bore hole No:		BH- Bhangnamari-60	
Locations name:		Bhangnamari, barmari, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	4	3	129
3	5	3	138
4.5	6	4	146
6	9	6	165
7.5	10	7	170
9	14	9	188
10.5	16	11	196
12	18	12	203
13.5	20	14	209
15	29	20	234
16.5	34	23	246
18	37	25	252
19.5	35	24	248
21	7	5	153
22.5	8	5	159
24	8	5	159
25.5	10	7	170
27	11	7	175
28.5	33	22	243
30	37	25	252
AVS 30			183

Bore hole No:		BH- Ghagra-61	
Locations name:		Pon ghagra mohila alia madrasa, Vhabkhali,	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	3	2	118
3	8	5	159
4.5	10	7	170
6	12	8	180
7.5	13	9	184
9	4	3	129
10.5	4	3	129
12	10	7	170
13.5	11	7	175
15	13	9	184
16.5	15	10	192
18	27	18	229
19.5	30	20	237
21	24	16	221
22.5	27	18	229
24	28	19	232
25.5	14	9	188
27	8	5	159
28.5	9	6	165
30	13	9	184
AVS 30			175

Bore hole No:		BH-Bhabkhali-62	
Locations name:		Binind, CBMC, Bhabkhali, Mymensingh	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	4	3	129
3	7	5	153
4.5	6	4	146
6	7	5	153
7.5	4	3	129
9	4	3	129
10.5	7	5	153
12	8	5	159
13.5	10	7	170
15	10	7	170
16.5	16	11	196
18	18	12	203
19.5	22	15	215
21	31	21	239
22.5	33	22	243
24	34	23	246
25.5	34	23	246
27	42	28	262
28.5	47	32	271
30	52	35	279
AVS 30			182

Bore hole No:		BH- Bhabkhali-63		
Locations name:		Bhabkhali tonnar par, churghai, Mymensingh		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	8	5	159	
3	4	3	129	
4.5	6	4	146	
6	6	4	146	
7.5	5	3	138	
9	5	3	138	
10.5	6	4	146	
12	9	6	165	
13.5	11	7	175	
15	7	5	153	
16.5	8	5	159	
18	9	6	165	
19.5	14	9	188	
21	20	14	209	
22.5	25	17	224	
24	33	22	243	
25.5	36	24	250	
27	39	26	256	
28.5	44	30	265	
30	55	37	284	
AVS 30			176	

Bore hole No:		BH- Bhabkhali-64		
Locations name:		Bhabkhali , Mymensingh		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	2	1	105	
3	3	2	118	
4.5	4	3	129	
6	5	3	138	
7.5	7	5	153	
9	3	2	118	
10.5	8	5	159	
12	9	6	165	
13.5	8	5	159	
15	20	14	209	
16.5	21	14	212	
18	24	16	221	
19.5	11	7	175	
21	13	9	184	
22.5	35	24	248	
24	38	26	254	
25.5	10	7	170	
27	11	7	175	
28.5	12	8	180	
30	12	8	180	
AVS 30			163	

Bore hole No:		BH- Bhabkhali-65		
Locations name:		Old Bhabkhali bazar, Mymensingh		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	3	2	118	
3	3	2	118	
4.5	5	3	138	
6	7	5	153	
7.5	6	4	146	
9	15	10	192	
10.5	14	9	188	
12	3	2	118	
13.5	3	2	118	
15	10	7	170	
16.5	12	8	180	
18	18	12	203	
19.5	20	14	209	
21	13	9	184	
22.5	14	9	188	
24	38	26	254	
25.5	15	10	192	
27	12	8	180	
28.5	11	7	175	
30	13	9	184	
AVS 30			163	

Bore hole No:		BH- Bhangnamari-66		
Locations name:		Bhangnamari, Mymensingh		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	5	3	138	
3	4	3	129	
4.5	5	3	138	
6	6	4	146	
7.5	8	5	159	
9	8	5	159	
10.5	5	3	138	
12	8	5	159	
13.5	3	2	118	
15	4	3	129	
16.5	5	3	138	
18	11	7	175	
19.5	18	12	203	
21	20	14	209	
22.5	25	17	224	
24	28	19	232	
25.5	28	19	232	
27	32	22	241	
28.5	37	25	252	
30	43	29	264	
AVS 30			168	

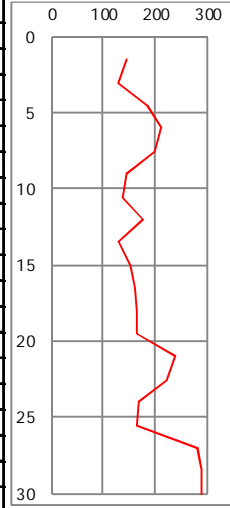
Bore hole No:		BH- Bhangnamari-67		
Locations name:		Ramnagar, Eub ali r bari , Mymensing		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	8	5	159	
3	8	5	159	
4.5	4	3	129	
6	6	4	146	
7.5	5	3	138	
9	6	4	146	
10.5	7	5	153	
12	5	3	138	
13.5	6	4	146	
15	3	2	118	
16.5	4	3	129	
18	5	3	138	
19.5	6	4	146	
21	16	11	196	
22.5	18	12	203	
24	28	19	232	
25.5	39	26	256	
27	46	31	269	
28.5	49	33	274	
30	49	33	274	
AVS 30			165	

Bore hole No:		BH- Bhabkhali-68		
Locations name:		Sarkar bari, Narayanpur, Bhabkhali, Mymensing		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	4	3	129	
3	2	1	105	
4.5	3	2	118	
6	3	2	118	
7.5	4	3	129	
9	14	9	188	
10.5	15	10	192	
12	19	13	206	
13.5	23	16	218	
15	22	15	215	
16.5	25	17	224	
18	17	11	199	
19.5	19	13	206	
21	30	20	237	
22.5	37	25	252	
24	30	20	237	
25.5	39	26	256	
27	47	32	271	
28.5	51	34	277	
30	55	37	284	
AVS 30			185	

Bore hole No:		BH- Bhabkhali- 69		
Locations name:		Bhabkhali char, Mymensing		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	5	3	138	
3	5	3	138	
4.5	2	1	105	
6	3	2	118	
7.5	4	3	129	
9	10	7	170	
10.5	13	9	184	
12	16	11	196	
13.5	6	4	146	
15	7	5	153	
16.5	24	16	221	
18	32	22	241	
19.5	35	24	248	
21	36	24	250	
22.5	40	27	258	
24	40	27	258	
25.5	40	27	258	
27	45	30	267	
28.5	51	34	277	
30	55	37	284	
AVS 30			183	

Bore hole No:		BH- Bhangnamari-70		
Locations name:		Bhangnamari, Mymensing		
Depth (m)	N value	corrected N Value	Shear wave velocity Vs	Graphical Representation of Vs (m/s)
1.5	4	3	129	
3	5	3	138	
4.5	8	5	159	
6	10	7	170	
7.5	6	4	146	
9	5	3	138	
10.5	14	9	188	
12	10	7	170	
13.5	13	9	184	
15	6	4	146	
16.5	9	6	165	
18	6	4	146	
19.5	22	15	215	
21	26	18	227	
22.5	35	24	248	
24	45	30	267	
25.5	41	28	260	
27	44	30	265	
28.5	48	32	272	
30	49	33	274	
AVS 30			183	

Bore hole No:		BH-71	
Locations name:		45 no. gondropa govt. primary school,	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	6	4	146
3	4	3	129
4.5	13	9	184
6	20	14	209
7.5	17	11	199
9	6	4	146
10.5	5	3	138
12	11	7	175
13.5	4	3	129
15	7	5	153
16.5	8	5	159
18	9	6	165
19.5	9	6	165
21	30	20	237
22.5	25	17	224
24	10	7	170
25.5	9	6	165
27	53	36	281
28.5	57	38	287
30	57	38	287
AVS 30			176



Bore hole No:		BH- Char Ishwardia-72	
Locations name:		Beside Jute Mill, Char Ishwardia, Mymensing	
Depth (m)	N value	corrected N Value	Shear wave velocity Vs
1.5	7	5	153
3	10	7	170
4.5	12	8	180
6	11	7	175
7.5	13	9	184
9	15	10	192
10.5	16	11	196
12	18	12	203
13.5	17	11	199
15	17	11	199
16.5	19	13	206
18	19	13	206
19.5	16	11	196
21	17	11	199
22.5	20	14	209
24	16	11	196
25.5	18	12	203
27	22	15	215
28.5	24	16	221
30	30	20	237
AVS 30			195

